

Blockchain in Public Administration: Worldwide Experience

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Abstract — The article discusses the main approaches to the blockchain technology for managing financial flows between enterprises, and between the state and enterprises. The entry of Ukraine into the global information space and the introduction of cryptocurrency in the domestic financial market will expand the investment market and provide targeted budgetary investments to national producers. They, in turn, can increase production through final product, services, net exports or the creation of products that replace imported ones. Three important functions of the blockchain technology-based financial services sector have been proposed: registration of transactions in an enterprise, identity verification (legal address), and contracting. The principles of state policy in the field of financial institutions in the cryptocurrency market are considered. Operations on the cryptocurrency market carried out by their participants at their own risk are described. The article discusses state guarantees for the observance and protection of property and other rights and legal interests of professional participants of the cryptocurrency market and other persons engaged in mining or operations with cryptocurrency, conditions of free competition in the provision of financial services in the cryptocurrency market.

Keywords — *blockchain technology, cryptocurrency, bitcoin, functions, information environment.*

I. INTRODUCTION

The blockchain technology is based on the rational use of the classical block system without the cost of links - it can be classified as irrational and not necessary. Technologies today are developing faster than the state manages to adapt its regulation to global trends.

When new financial instruments and fundamentally different business models are generated, revolutionary changes in the world of technology, finance, and investment are also created on the basis of blockchain technologies, which require a response from various countries of the world [1, 11].

The blockchain technology can take on all three important functions of the financial services sector: registration of transactions, identity verification (legal address) and contracting. This will be of great importance since the financial services market is the largest all over the world in terms of market capitalization. The transfer of at least part of this system to the blockchain technology will lead to the rupture of a large number of links in the financial services

sector. It will significantly improve the efficiency of these services at the same time.

Blockchain technology can be very useful outside the financial services sector, for example, when concluding contracts. It can use any kind of digital information, including computer code for storage. This code snippet can be programmed so that it is executed only when both parties enter their keys, agreeing to enter into a contract. A code can also receive information from external data streams (stock prices, meteorological information, news headlines, and anything else that can be analyzed by a computer) and create contracts that will automatically be recorded in certain conditions.

Professional participants of the cryptocurrency market are not liable for the obligations of the state, and the state for the obligations of such participants. All operations on the cryptocurrency market are carried out by their participants at their own risk. The state guarantees the observance and protection of property and other rights and legitimate interests of professional participants of the cryptocurrency market and other persons. It is carried out by mining or operations from a cryptocurrency and create conditions for free competition in the provision of financial services in the cryptocurrency market. Intervention in the activities of professional participants of the cryptocurrency market by a government and other authorities is prohibited unless it is associated with the powers of the authorities exercising state supervision and control over the activities of financial institutions that provide financial services in the cryptocurrency market [1].

The use of blockchain technology in enterprises in financial activities, it should be noted, little studied and its practical implementation is rarely considered on the example of the blockchain system in the enterprise.

The question of the importance of the use of cryptocurrency in the financial calculations of enterprises has attracted much attention in the literature, especially economic and legal. Therefore, information on the use of technology blockchain in enterprises will contribute to the development, strengthening, and security of financial calculations in business. Formulation of research objectives. The purpose of this article is to consider scientific approaches to the management of blockchain technology between enterprises and between enterprises and the state in the field of financial services.

II. MATERIAL AND METHODS

The purpose of the state policy in the field of regulation of the cryptocurrency market and its professional participants: establish the basic legal and organizational basis for carrying out their activities in Ukraine, stimulating the development of payment and digital infrastructure, ensuring the production and circulation of cryptocurrency, ensuring the rights and legitimate interests of the persons carrying out the extraction of cryptocurrency, and investors. Cryptocurrency is used not only as a payment system but also as a tool for investment. For a long time, the legal status of digital currency remained uncertain, but today it is gradually being subjected to new rules and regulations. Bitcoins can easily replace fiat money. It can be exchanged for any of the existing currencies. And so the tax authorities of some countries already offer specific taxation measures.

Cryptocurrency is considered a financial asset for the purposes of legal regulation [1]. In other words, so-called banknotes, the issue and accounting of which is carried out using asymmetric encryption using cryptographic means of protection. The digital economy is the production, sale, and delivery of products through computer networks.

The entry of Ukraine into the global information space and the introduction of cryptocurrency in the domestic financial market will expand the investment market and provide targeted budgetary investments to national producers. They, in turn, can provide an increase in production at the expense of the final product, services, net exports or the creation of products, replacing the imported one.

Difference blockchain from the classic database. The classic database is stored on dedicated servers that are controlled by the organization that owns this database. Blockchain is not controlled by any one person or organization. Security is provided by a distributed architecture. If a part of computers with a blockchain will be broken, this will not affect the operation of the entire system - it is impossible for a classic database.

In the regulatory field of Ukraine, the term "currency" is classified as national and foreign. It is defined as currency in various forms, being legal means of payment.

Forms of currencies are different, and the electronic form of currencies (electronic money) is a modern form of their representation.

Cryptocurrencies have protection in the form of a cryptographic code, which allows them to be emitted by any user-operator, bypassing the actions and positions of the central bank. The blockchain technology (from English "Blockchain" - a chain of crypto-transaction blocks) is based on special encryption algorithms, which requires appropriate IT support.

Now there are many projects based on blockchain technology. For example, the Coinut bitcoin options exchange helps to make money when hedging risks in growing and falling markets. Visa announced the launch of B2B Connect payment service together with blockchain startup Chain last year. The system should provide greater security of payments and at the same time transparency. People will be able to see all the information about the transaction.

Thus, it is not necessary to be an expert in programming to work with the blockchain. Everything is implemented using a graphics system and software modules. The developer of programs in the field of air travel SITA is working on the possibility of confirming the identity of a passenger at border

crossings on the basis of blockchain technology. If you create special codes for smartphones that will open access to encrypted passenger data, all you need to do is to take a photo of the traveler's face and scan the code on his mobile device.

III. RESULTS AND DISCUSSION

The concept of bitcoins was first described in an official document published in October 2008. The author is Satoshi Nakamoto, but it is still unknown who exactly is behind this name - one person or a group of developers. Now the developer community is responsible for further developing and coordinating the functioning of the network. However, this does not mean that only developers decide which direction the bitcoins will move. Any significant changes in the protocol are possible only after the majority of mining pools-associations of owners of computer capacities, which produce new bitcoins, agree with them. Bitcoins are a relatively young phenomenon. However, the possibilities for using it as a means of payment when buying real goods or services today are quite a lot.

Bitcoin as a new kind of digital money appeared before others. Therefore, it is not surprising that bitcoin has become the most popular cryptocurrency. At the moment, it has become almost a full-fledged currency. Bitcoin is recognized by many countries and several US states. This seems to be the beginning of economic innovation. Bitcoins have a number of advantages compared to other means, namely: open source, no inflation, peer-to-peer cryptocurrency networks, unlimited transaction possibilities. Bitcoins exist outside of boundaries.

These are almost free transfers of funds between users, and it doesn't matter how far the sender and receiver are from each other. Bitcoins can be used to pay: in some catering establishments, hotels, buy air tickets, digital content, host sites and domains, pay for training courses, software, buy in online stores and use taxi services. There are special services that allow using the bitcoins to replenish the phone account. The number of online casinos that allow you to make a deposit in the cryptocurrency is growing.

There are examples when the digital currency was used for expensive acquisitions: houses, cars, and yachts. Finally, many enthusiasts see bitcoins as an attractive long-term investment and trading. In addition to bitcoin, there are other cryptocurrencies. The most popular are the Litecoins (LTC) and Dogecoin.

Dogecoin – one of the newest cryptocurrency, which differs from others in the absence of restrictions on the total amount of money, which is characteristic of other cryptocurrencies. Calculations are done very quickly and with a minimum commission in this monetary system.

There are interesting things in the Bitcoins protocol that is possible, but have not been implemented anywhere yet, for example:

- multi-signature transactions - the ability to create transactions in which there will be a signature with more than one private key. That is, in the simplest case - two-factor authorization embedded directly into the protocol. For example, you need to simultaneously enter a password and log in to your phone to send bitcoins. A more complicated option is to create accounts with multiple ownership. That is, the money belongs to several different people and only their general consent can make this transfer;
- proof of existence - the ability to embed in the blockchain several any data when sending a transaction. For example, by

sending a transaction to yourself, you can embed the hash of a specific file. This hash will be securely stored in the blockchain, tied to a specific address and date. This will actually confirm the existence of this file at a specified point in time, as well as the availability of the file to the owner of the wallet from which the transaction was going;

- time-limited deposit - create a transaction that will be visible to all interested, but at the same time until a certain point it will be impossible to spend it - transfer money further. That is, the money will be safely frozen inside the blockchain, clearly visible but not available at the request of individual participants in the process. Emergency access to money will still be possible, but with the consent of the owners of all private keys that signed the transaction;

- reasonable property - specific blockchain application to RL. If you tie a public key to the RL object (for example, embed it inside the car) and transfer the corresponding private key to the owner, it will be possible to create a transaction. The public key of the server will be transferred to the new owner with the help of some cryptographic magic, and the number of bitcoins will be transferred in the opposite direction. That is, in simple terms, the act of sale and purchase, all sides of the process, the unique property ID and the amount paid will be reliably and independently confirmed by the blockchain. The purchase transaction will not require trusted intermediaries and clearance. To cheat or fake a blockchain is technically extremely difficult. The whole process of sale and purchase can be automated, and all that the seller and buyer need are to meet with smartphones in the car. Of course, this does not protect against abductions and other methods of appropriating someone else's property [11]. And that's not all: the capabilities and applications of technologies based on Bitcoins are many, and some undermine existing systems. World practice on this issue shows various options for the regulation of cryptocurrency.

Cryptocurrency officially became a means of payment with the adoption of the relevant law in Japan in April 2017. At the same time, the yen remained the official currency. It is assumed that the control of virtual currencies will implement the Financial Services Agency. Cryptocurrency transactions will be documented for safeguarding against abuse. Market operators must have at least \$ 100,000 in reserve currency and pay a one-time licensing fee of \$ 300,000. The fee is not refundable if the license is denied. A consortium of Japanese banks received permission from the Central Bank of Japan to create their own digital currency, J Coin. It is supposed to use later in 2020 (the year of the Summer Olympics in Japan) to pay for goods by tourists and transfer money using smartphones. It is predicted that by 2020 the cryptocurrency market in Japan will increase tenfold.

Financial regulators of the United States, Singapore, and Canada made statements alleging the desirability of perceiving various types of cryptocurrency as securities given the traditional exit of companies on the exchange. WingCash is a national digital currency platform that expands to the United States. Federal Reserve System (FRS) is interested in the development of this platform for the expansion of the US dollar in the digital sphere. It is assumed that this will allow the FRS to improve its ability to perform the function of money management simultaneously with wide and non-discriminatory access to effective means of electronic commerce. Digital Fed records will not replace physical bills and coins with a legislative authorization of digital banknotes but will be an additional service to the FRS.

Bitcoins are considered as foreign currency in the UK. All tax rules apply to cryptocurrency by analogy with foreign currency. However, speculative transactions are not taxed. The UK Revenue Service does not provide accurate information about the tax status of transactions with digital currencies. It is only known that any operation on Bitcoins is considered individually.

Bitcoin has been equated to private money in Germany since 2013. Digital currency is taxed at 25% when profits are received within 1 year from the date of receipt of the bitcoins. As a result, if you sell bitcoins more than a year after their purchase, it will not be taxed, and the transaction will be regarded as a private sale. Also in Germany, bitcoins are equal to investment instruments.

Bitcoin is recognized as an official means of payment in Japan. Sales of digital currency are exempt from consumption tax from July 1, 2017. A cryptocurrency is regarded as an asset value carrier. Profit from operations with Bitcoins is equal to the income from doing business and is taxed on capital gains.

In Australia, cryptocurrency transactions are defined as barter transactions. In terms of taxation, bitcoins are treated as an asset. Cryptocurrency companies should keep records of transactions by date and content. Bitcoins received in the form of payments are valued in Australian dollars and equal to ordinary income. If bitcoins pay for goods or services for personal use, and the size of the transaction does not exceed \$10,000, transactions are exempt from taxation. Mining and exchange of bitcoins for commercial purposes is defined as exchange trading and is subject to appropriate tax.

In Malaysia, the manager of the central bank of Malaysia told reporters at a symposium on September 19 that the institution wants to develop rules for the circulation of a cryptocurrency. This process will also include the strengthening of existing anti-money-laundering and anti-terrorist financing rules. "We hope that by the end of the year we will be able to come up with recommendations on cryptocurrency, in particular, concerning the fight against money laundering and the financing of terrorism. We want clear guidelines for those who want to participate in this area." At present, it is unclear in what form these regulations will operate and whether other regulatory bodies will participate in this process. However, this step is a positive change in the position of the Central Bank, which declared in early 2014 that it does not plan to regulate operations with Bitcoins. In addition, the statement of the country's central bank demonstrates the attention of regulators to the new technology. Earlier this month, the Malaysian Securities Commission warned potential investors of the risks associated with ICO.

ICO stands for Initial Coin Offering, that is, the initial placement of coins (tokens). During the ICO, the project team sells digital tokens for cryptocurrency or fiduciary money to investors. Later, these coins can be used as a local currency on the project platform or traded on exchanges. Also, the term "crowdsale" is often used instead of ICO. In fact, ICO is another implementation of the crowdfunding model. Participants finance the development of the company now in order to get some benefits from it in the future.

IV. CONCLUSION

The adoption of this draft Law of Ukraine [1] will create the prerequisites for the development of the economy on the basis of the latest technologies in Ukraine. This will lead to

additional high-tech investment, increase the country's competitiveness in the global market and contribute to the growth of GDP. The objectives of the adoption of this project are: create conditions for stimulating the development of cryptocurrency activities in Ukraine and their mining, use cryptocurrencies in everyday life when carrying out barter transactions by business entities, protect the rights and legal interests of professional market participants and qualified investors. The purpose of this project is to establish the basic legal and organizational basis for carrying out their activities in Ukraine, stimulating the development of payment and digital infrastructure to ensure the extraction and circulation of cryptocurrency, ensuring the rights and legitimate interests of those engaged in the extraction of cryptocurrency and investors. If we talk about cryptocurrency today, it has established itself as a highly liquid investment asset, and not as valuable money. The impact of bitcoins on the global economy is difficult to predict. However, experts are inclined to believe that virtual money will not replace paper money, but a non-cash settlement system can change radically.

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