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CRYPTOCURRENCY AS ELEMENT OF DIGITAL ECONOMY

Author: ***Dzmitry Pashkevich***
Advisor: ***Ekaterina Dudko***
BSEU(Belarus)

Abstract. *Today, new digital technologies and innovative business models are penetrating all spheres of the economic life of society, influencing the very essence of the economy, forming qualitative structural changes in it. As a result, the digital economy is formed as a subsystem of the traditional economy, characterized by the active use of digital technologies and the circulation of specific electronic goods. The level of development of the digital economy is closely correlated with the country's competitiveness, which requires special attention from the state and business to its development. It has been established that today the electronic economy is already going beyond purely economic processes. Digitalization is being introduced into social processes, the successful life of people increasingly depends on it, in addition, there is a large-scale introduction of digital technologies into the work of government organizations and structures.*

In this work, a closer look will be taken at the general legal status of cryptocurrencies in the modern world, particularly in the largest economies of the world. Also, a specific case of using cryptocurrencies and blockchain technology will be analyzed on the example of Russian ICO-Project "Storiqa".

Keywords: *Blockchain, Cryptocurrency, Digital Economy, Legal status, Digital Marketing, IT*

I. INTRODUCTION

The relevance of the chosen topic is explained by the fact that the rapid development of digital technologies against the background of the globalization of the economy served as the basis for the digital revolution. In scientific research, discussions about blockchain and cryptocurrencies do not subside: their impact on the modern economy, pros and cons, development prospects.

During local economic crises, the bitcoin rate on local sites often rises above the market average. For example, cryptocurrency is super popular in Argentina and Venezuela.

When people lose confidence in their national currencies, they try to find alternatives to save their money. Bitcoin, despite insane volatility, is not subject to inflation and, moreover, hyperinflation. Therefore, it looks like a great investment option.

In order to start trading bitcoin, you do not need to have special licenses or knowledge. It is enough to go through the registration procedure on a crypto exchange or download an electronic wallet. However, this is fraught with the fact that many people far from the world of finance lose money on literally blind investments. Bitcoin is used not only for investment or cheap transfers. Also, users with the help of cryptocurrency can purchase illegal substances or launder criminal proceeds. But even if an ordinary user does not use cryptocurrencies for criminal purposes, he can

still suffer. For example, if you buy “dirty cryptocurrency” from an exchanger or from another person. In this case, the funds may be frozen. But this can be avoided by checking transactions using special services.

Bitcoin is a decentralized system that does not have a single governing body. Because of this, BTC holders are not immune to errors. For example, if an investor forgets the password for his digital wallet or loses access to it, it will not be possible to return the cryptocurrency, it is simply impossible. An irrecoverable loss of funds will also occur if the user sends them to the wrong address: the transaction cannot be canceled in the blockchain. In this case, one can only hope that the recipient will return them at his own request.

One of the drivers of growth in the value of bitcoin is considered to be its recognition in society: the higher demand, the higher the price. However, the spread of digital money is slowing down due to a controversial reputation. Often, BTC and other cryptocurrencies are used in criminal schemes, for example, for money laundering, buying illegal substances, or building financial pyramids. This causes negative associations and forces the government to take prohibitive measures.

The rapidity of the spread of the digital economy is explained by the following figures: in the world, the Internet is used by about 4 billion people (almost half of the population), of which 53% use the mobile Internet; across OECD countries, Internet users are: 97% (80% in the world) of young (16 to 24 years old) and 63% of older people (55 to 74 years old); 5.5% of employees are ICT specialists among men and 1.4% among women; 90% of businessmen contact via the Internet, although only 20% use digital technologies in production. By 2020, according to Google forecasts, the number of Internet users in the world will exceed 5 billion people.

The purpose of the work is to analyze the features of using blockchain technologies in modern international business

II. LITERATURE ANALYSIS

2.1 Regulatory system and legal status of cryptocurrencies

To understand what role the cryptocurrencies already play in the modern world, we may analyze their current regulation and legal status in some of the most prominent countries. The USA, China, Russia, Japan, Germany and EU were used as an example in this work.

United States of America. Consider the history and facts of the adoption of elements of the digital economy in the United States. In March 2013, the FinCEN Financial Crimes Commission announced that transactions for exchanging any cryptocurrency for fiat money should be regulated in the same way as transactions for exchanging fiat money among themselves (for example, dollars for euros). Not only bitcoin exchanges, but also exchange offices must register as financial service providers (Money Service Business) and report suspicious transactions to law enforcement agencies. In official reports from the World Bank and the FBI, Bitcoin is considered a "virtual currency". According to the classification of the FinCEN Commission under the US Treasury Department, Bitcoin is referred to as “decentralized virtual currencies” [1]. The US Securities and Exchange Commission

has decided to equate ICO with securities. Companies that fail to register a cryptocurrency release or ICO will be punished. In August 2013, a judge for the Eastern District of Texas (USA) made the following decision. Because bitcoins can be used as money to pay for goods or exchanged for common currencies such as the US dollar, euro, yen, or yuan, bitcoin is a currency or form of money. On March 25, 2014, the US Internal Revenue Service released a guide to taxing transactions with bitcoins and other virtual currencies. Miners who mine bitcoins on their own hardware are also subject to taxation. The miner is required to include the fair market value of the mined cryptocurrency in his annual gross income. The legal policy in relation to cryptocurrencies in the states of the country differs. In the state of New York, licensing of the activities of persons involved in the circulation of cryptocurrencies is carried out, the license costs about $ 5,000. California has passed amendments to legislation previously approved by the State Senate declaring bitcoin and other cryptocurrencies “legal tender”. This law allows any transactions in the state in any electronic currency, including bitcoins [2]. Thus, the United States has now institutionally recognized all objects of the digital economy and began to regulate this process by law, including in the field of taxation.

China, in spite of the actions in the United States related to the legalization of cryptocurrency, the Chinese government has become unable to regulate the new free world of cryptocurrency, although its rate has grown significantly due to the speculative demand for coins in this country. Consider how the Chinese government authorities regulate the issue of determining the legal status of cryptocurrencies and their use in different ways. In 2013, the value of bitcoin increased 89 times, which led to increased attention to e-currency from Chinese investors as an alternative means of payment. In this regard, the People's Bank of China (PBOC) imposed a ban on transactions with bitcoin by financial companies, including the publication of quotes, as well as insurance of financial products related to this cryptocurrency. According to Interfax, the NBK justified this ban on the lack of legal status of bitcoin as a currency. At the same time, the prohibition did not apply to individuals who could use bitcoin in Internet transactions, taking on all the risks associated with the use of this means of payment [3]. The key event of 2017 was the ban by the People's Bank of China on holding ICOs for Chinese companies. In addition, the NBK obliged local ICO platforms and companies that have already issued tokens to return all funds raised [4]. According to the official position of the NBK, all ICOs in the state from September 4, 2017 began to be considered illegal. In the future, the regulator intends to punish such violations. He threatened with legal consequences, including for already completed ICOs. According to the Chinese National Committee of Experts on Financial Security Technologies on the Internet, as of July 2017, 43 ICO platforms were operating in China, 65 ICOs were completed by July 18, the placement of tokens allowed companies to raise $ 398 million [5]. The cryptocurrency market received a very negative news about the ICO ban in China. According to Coindesk, Bitcoin dropped 5% in trading, while Ethereum lost 15% of its value [6]. The introduction of this restriction in China provoked a correction, the scale of which for bitcoin reached 40%, but this did not last long. The head of the CryptoFund,

Alexander Boyarintsev, indicated that the introduction of barriers in a single country leads to the flow of capital to other markets [6]. This is what happened in this situation. Forex Club analyst Irina Rogova noted that Chinese traders have switched to the exchanges of Hong Kong and Japan. As a result, trading volumes on the Hong Kong exchange Gatecoin jumped 24%.

In addition, Japan began to host Chinese ICO startups [7]. On October 24, 2017, the 19th Congress of the National Congress of the Chinese Communist Party ended in China. As a result of the congress, some temporary rules and regulations were canceled. Presumably, they included a ban on bitcoin trading [8]. Along with Beijing's actions regarding the closure of bitcoin exchanges and the prohibition of token sales and ICOs, we note that China is striving to spread blockchain technology. Active work is underway to create a distributed ledger, and the Ministry of Information Technology of China is supporting the blockchain laboratory, which was created after the bans on cryptocurrency exchanges. In addition, bans in China are associated by a number of experts with the readiness of the NBK to issue its own state cryptocurrency, as evidenced by the creation of a research institute for the study of cryptocurrencies [9]. Thus, the events taking place in the field of cryptocurrencies in foreign countries can serve as an experience for determining the status of cryptocurrencies and ICOs in Russia, since today there is no legal regulation of the Bitcoin network and operations with cryptocurrencies.

A characteristic feature of the state policy in the field of cryptocurrencies in Russia is that its course is formed based on the positions of a number of federal agencies (Central Bank, Ministry of Finance, Rosfinmonitoring, Ministry of Economic Development, General Prosecutor's Office), which do not have a single position. At the beginning of 2014, the Central Bank classified bitcoin and other virtual currencies as a “money surrogate”, which will have the status of dubious money laundering and criminal activities. The head of the Central Bank of the Russian Federation Elvira Nabiullina considers it inappropriate to legalize cryptocurrencies on Russian exchanges and defines “cryptocurrency” as a digital asset, not a virtual currency [10], but does not deny the prospects for the development of the blockchain technology that underlies it. According to her, the regulator is considering the possibility of creating a platform for transmitting financial messages using the blockchain, as well as creating a national cryptocurrency based on it [11]. From 2014 to March 2016, the Ministry of Finance recognized cryptocurrencies as a “monetary surrogate” and tightened measures on transactions with them, from fines to imprisonment [12]. However, already in August 2017, the Ministry of Finance recognized the need to amend the legislation on operations with cryptocurrencies in connection with their active use and legalization in some of the leading countries of the world (USA, Switzerland, Japan) [59]. According to the President of the Russian Association of Cryptocurrencies and Blockchain Yuri Pripachkin, ICO seriously reduces the cost of raising funds and speeds it up, as well as ICO removes a number of barriers between investors 'and issuers' money, and will serve the further development of the economy [13].

Sberbank CEO German Gref noted that blockchain is such an explosive technology, the implementation of which is necessary. According to him, this technology is already being used by Sberbank to implement a number of processes. In addition, in 2015, he announced that he possesses a small amount of cryptocurrency [14]. According to the President of the Russian Federation Vladimir Putin, it is unacceptable to create barriers to improve the financial system, and it is necessary to formulate regulatory measures. In this regard, the task of the Ministry of Finance is to develop a framework bill on the regulation of cryptocurrencies by the end of 2017. Also, the Government of the Russian Federation and the Central Bank need to change the legislation of the Russian Federation on the regulation of public attraction of cryptocurrencies and funds through the placement of tokens (ICO) by analogy with the regulation of the initial placement of securities before July 1, 2018 in the framework of the Digital Economy program. In addition, the head of state instructed them to develop requirements for the organization of "mining", determine its taxation and registration of miners [15]. The Russian government expects to legalize bitcoin and other cryptocurrencies in the country in order to reduce the risks associated with illegal transfers and "money laundering," as Deputy Finance Minister Alexei Moiseev explained [16]. Government agencies are interested in the development of efficient blockchain-based technologies. On October 20, 2020, the Prosecutor General of the Russian Federation Igor Krasnov announced that, based on the adopted law on virtual currency, officials from 2021 will have to indicate the presence of cryptocurrency in their income declarations

On October 22, 2015, the European Court of Justice (ECJ) ruled that exchanges of bitcoins for fiat currencies are exempt from VAT. The court decision specifies that the VAT law applies to the supply of goods and the provision of services. Bitcoin transactions have been classified as payment transactions in currencies, coins, and banknotes and are therefore not subject to VAT. The court recommended that all EU member states exclude cryptocurrencies from the list of assets subject to taxation.

In Germany, at the end of August 2013, the Ministry of Finance of the Federal Republic of Germany made a statement that bitcoin cannot be classified as an electronic or foreign currency, but rather fits the definition of private money, with which multilateral clearing operations can be carried out.

Until March 2014, the Bank of Japan did not have any plans to regulate bitcoin circulation. However, after the collapse of Mt.Gox, based in Tokyo, the Japanese authorities announced the need to regulate this market. Development of taxation norms is expected. Bank of Japan Governor Haruhiko Kuroda said the Banking Institute for Monetary and Economic Research is currently conducting research into Bitcoin. Bitcoin has been legal tender in Japan since March 2016.

2.2 Marketing campaign organization for "Storiqa" project

Online shopping has become an integral part of modern society. The convenience of shopping without leaving home is also due to the fact that most of the trading platforms have adapted their processes for different platforms: users can place orders using their laptops, desktop computers, tablets, smartphones and even smart

speakers like Alexa.

An online marketplace or platform is a website or application that facilitates purchases from different stores. The operator of the trading platform does not own the goods offered on the platform, his task is only to provide the users of the site with the goods of the stores and control the money transfers. eBay is a great example of an online marketplace, the platform allows you to sell and buy all kinds of goods for all tastes.

Of course, marketplaces have some drawbacks. Since these sites offer products from a large number of stores, information about them is often inaccurate and delivery times vary. Keeping the online marketplace running smoothly means bringing in multiple vendors at the same time and ensuring that the site's services run smoothly for consumers — a result that is quite difficult to achieve.

There are currently three types of online trading platforms:

- vertical;
- horizontal;
- global.

A vertical marketplace sells similar products from a variety of sources. For example, TrueFacet.com only sells jewelry and related products. The site guarantees the authenticity of jewelry, which is extremely important considering that jewelry is a very expensive item. Of course, such a guarantee is included in the added value of the goods.

The horizontal marketplace sells products of different types, but they all have a common characteristic. For example, Dote's online store offers women who don't want to download individual retail apps the ability to shop at the same time from multiple retailers including Madewell, Forever 21, J. Crew, Lululemon, Brandy Melville, Topshop, Free People, Ann Taylor. Loft, Zara, etc. Users can see products from different retailers at the same time in one application. Dote focuses on a specific type of customer and offers them several products in different types of retail chains.

The global marketplace sells everything. EBay is a prime example. EBay has 167 million users, over 1 billion products to sell, over 80% of new products, and nearly $ 90 billion in merchandise sold this year. The attractiveness of the site lies in the breadth of the assortment. Bob Coopbens, VP of Seller Relations at eBay, said on Shoptalk, “Scale determines price transparency. If there are enough products to be bought and sold, users can see what the price must be to be considered fair; they feel like they are paying fair value. "

Storiqa is a Russian project created with the aim of launching an international trading platform based on blockchain technology.

The position of cryptocurrency in the modern world is growing rapidly: the aggregate market capitalization of all cryptocurrencies has more than tripled since the beginning of 2016, reaching almost $ 150 billion in August 2017. According to the latest data, the number of active cryptocurrency users is now constantly increasing. The number of users of cryptocurrency wallets is estimated at about 6 million. Based on this state of affairs, the problem of using cryptocurrency arose.

Crypto is a means of payment, but it cannot pay for goods in stores, buy

groceries or clothes. While more and more merchants are beginning to accept cryptocurrency as a means of payment, those who own some bitcoins or “altcoins” still cannot use them in their day-to-day financial transactions.

The idea of creating an online trading platform came to the project team after the success of the crowdfunding platform, where small industries and startups found funding to develop their projects and implement ideas. Over 5 years, Boomstarter has helped finance more than 1,500 projects that have become full-fledged profitable commercial ventures. This prompted the Storiqa team to think that small-scale industries with significant potential do not have the opportunity to declare themselves on the global market. Through the control and study of their work from the inside, we understood what prevents them from participating in world trade.

The main reasons for the failure of projects in the global market were:

- lack of trust of potential customers to an unknown seller who offers goods of unconfirmed quality;
- impossibility of providing services at the level of an international company;
- lack of multilingual 24/7 customer support;
- lack of a functional "package" of goods and multilingual localization;
- lack of knowledge in international marketing.

Building an e-commerce system is not an easy task. The company must spend a lot of resources on team building and distribution channels. In addition, you need to know how to promote a product in the light of new trends and the specifics of a particular market.

With the easy-to-use Storiqa online store builder, any seller will be able to create their own point of sale using a wide range of platform functions for a minimal fee. Storiqa offers ample opportunities for private entrepreneurs, small producers, family businesses and handicraft manufacturers; such as tools for customer feedback, accounting, sales analysis, advertising and promotion, as well as a convenient, intuitive interface.

An online store builder that allows you to create a multi-platform online sales channel and promotes goods is a convenient solution for a small business. Storiqa provides a ready-to-use interface and promotes e-commerce by providing high quality service.

The goal of such a platform is to create an environment in which any user can create a personal online store and receive technical support without wasting time and a huge amount of resources on activities that can distract from the production of high-quality goods.

However, there is currently no solution on the market that combines an advanced e-commerce system and new technologies such as smart contracts, cryptocurrency payments, multi-platform integration and comprehensive 24/7 customer support.

In the current market situation, business owners have to use their resources ineffectively: spend time managing an online store and conducting advertising campaigns without outside help. In addition, the entry of small manufacturers into the global market requires significant early-stage investment and additional monthly

maintenance costs for online store functions. In addition, manufacturing faces bureaucratic difficulties and transaction fees when making international payments. Few small businesses can afford this expense while still being prepared for the risk of international sales and new market entry.

Storiqa has focused its project on small-scale producers, which typically produce around 50 units and operate in a local or regional market. The staff of such a company usually includes from two to ten people. Each of them combines several responsibilities and functions within the company. Customer support and marketing are often run by the business owner or one or two employees.

Problems faced by small producers:

- Lack of round-the-clock multilingual customer support.

Selling goods internationally means the need to constantly maintain customer-seller feedback to be able to assist customers in different time zones, and the lack of real-time customer support makes communication much less effective;

- lack of localization.

Small manufacturers cannot provide translation of product descriptions and characteristics, taking into account the specifics of different countries, which makes it impossible to enter the international market;

- high commissions on existing platforms and various additional fees of payment systems.

Existing platforms retain a significant portion of the transaction cost, not to mention transaction fees and taxes;

- lack of buyer's trust in an unknown seller.

The client prefers trusted sellers who offer goods of confirmed quality, and unknown sellers with no established reputation and client base are forced to compete with them;

- impossibility of automating the process.

In addition to all of the above problems, the owner of a small production facility is financially and technologically not ready to fully automate the online store;

- competition with global corporations.

International corporations have a wide range of tools for marketing high-quality goods around the world, to which small industries do not have access, which makes it impossible for them to enter the world market;

- shortage of funds.

Companies receive money from sales only after a certain delay, and increasing sales without taking this delay into account will sooner or later prove to be an impossible task.

On the other hand, there are a number of challenges associated with the customer experience with small scale manufacturers:

a. search for goods.

Many unique products produced by small businesses do not have adequate descriptions or photographs, making it difficult to find the right product. In addition, many good quality small-scale products cannot be ordered online;

b. lack of reliable reviews.

Without some way of verifying the authenticity of reviews posted on specialized sites of online stores, buyers cannot form a realistic impression of the product;

in. no guarantees.

Many online stores offer prepaid products, but not all shoppers are willing to risk sending money to an unfamiliar online store, which may turn out to be a fly-by-night site.

With the global economic growth, online commerce is gradually taking over the international retail market and increasing the number of users of e-commerce platforms, both among buyers and sellers.

Global e-commerce is gaining momentum, with a turnover of $ 2.2 trillion in 2018. The growth rate is 20% (Figure 1)[17].

Every year, the number of people who regularly shop online is growing steadily. According to market research Global E-commerce Report by Nielsen (a marketing measurement company), online shoppers are growing by an average of 16% annually and currently stands at 1.66 billion worldwide.

There are over 1.5 billion online market users worldwide (Figure 2)[18].

The volume of global e-commerce is trillions of dollars a year. The leaders in terms of spending are China, the United States, the United Kingdom and Japan.

With the constant growth of consumer demand in the field of e-commerce, more and more small and medium-sized companies need the help of marketplaces to bring their products to new markets and attract new customers.

The Storiqa project was able to pinpoint the shortcomings of modern e-commerce and propose a solution that could take the current economic situation to a new level.

Most small businesses and private producers are unable to enter the global market. The huge expense it takes to start an online store is impossible for a small business. However, there is a demand for exclusive products and users are willing to buy products. Storiqa used a very clever strategy: focusing its platform on small businesses and individual entrepreneurs, it secured itself not only a customer base, because, as mentioned earlier, people are always ready to buy, but also a client base in the face of small businesses.

The marketing of the project was quite productive: Storiqa were active on social media such as Twitter, Medium and YouTube video hosting. Also, the so-called STQ token airdrops were constantly carried out - free distribution of tokens for registration and participation in voting.

The most successful marketing move was the early launch of the beta version of the platform at the end of May 2018: the cost of STQ tokens more than doubled (Figure 3)[19].

The highlighted fragment of the diagram clearly shows how the popularity of the token increased after the launch of the beta version of the platform.

Based on the analysis of the organization of marketing campaigns for ICO projects “Vertex” and “Storiqa”, we can draw several conclusions. The creation of projects within the blockchain and, directly, for the development of the system is the

most clearly visible trend among new ICO projects. Successful projects are aimed at cryptocurrency owners and provide an opportunity to implement these funds.

A huge number of projects using blockchain technology use artificial intelligence to control the operations performed and perform basic functions and transactions on platforms. Smart contract technology is gaining popularity: contracts that transfer funds automatically after the terms of the contract are fulfilled by both parties. Smart contracts are used in all types of ICO projects: secondary market platforms, Ethereum-based online stores, even blockchain-based video games use smart contracts to transfer funds

Online shopping is a convenient and modern way of shopping, and their number has increased dramatically in recent years. Opening an online trading platform is one of the most lucrative businesses right now, as users access vendor inventory electronically without the site needing to own a store to offer their products. In addition, statistics have shown that shoppers do not like to use branded apps from individual stores. Considering how much of the blockchain's work is automated due to new technologies, it is logical to assume that it needs at least some form, if not control, but a method to streamline everything that happens within the system. The emergence of projects like "Vertex" proves that this assumption is true.

III. OBJECT, SUBJECT, AND METHODS OF RESEARCH

Object of research — cryptocurrency

Subject if research — cryptocurrency as part of the modern digital economy and its development trends

Research methods: generalization, method of description, systematization and classification, analytical method, statistical and graphical method.

IV. RESULTS

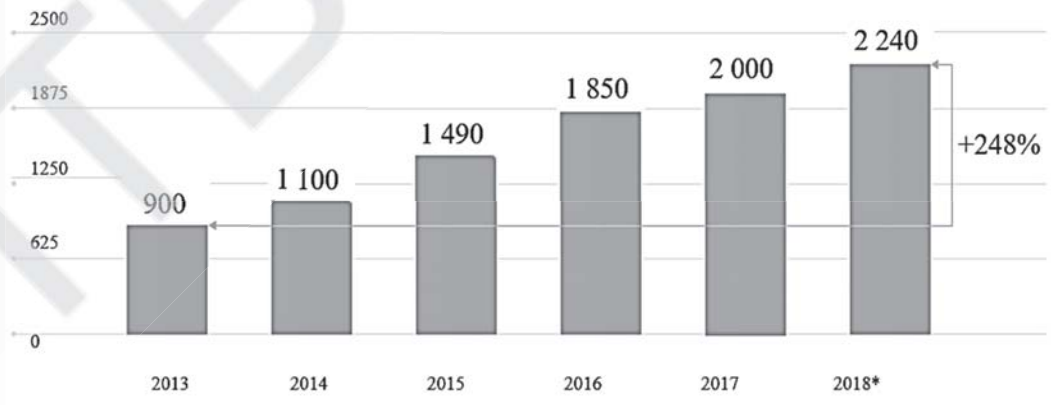

Fig. 1. Global e-commerce turnover (trillion dollars)

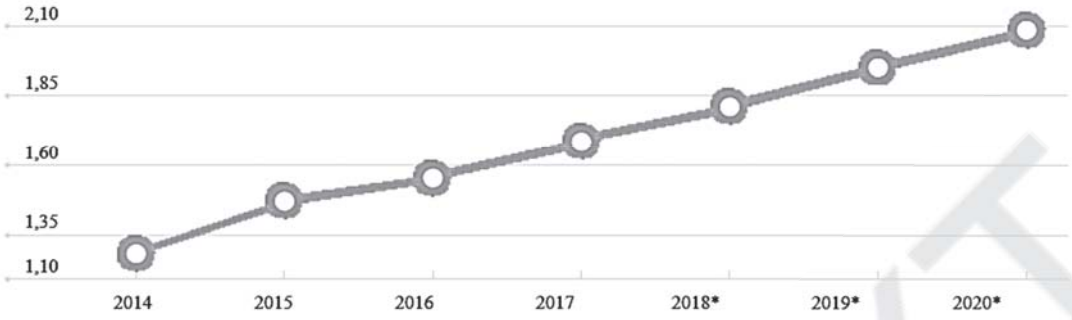

Fig. 2. Number of users on online trading platforms (billion)

Fig. 3. Price dynamics of STQ token after the launch of the beta version

V. CONCLUSIONS

The legal status of cryptocurrencies, in particular the Bitcoin system, varies considerably in different countries. In a number of countries, operations with cryptocurrencies are officially allowed. They are usually treated as a commodity or investment asset or money and are subject to relevant legislation for tax purposes.

The volume of global e-commerce is trillions of dollars a year. The leaders in terms of spending are China, the United States, the United Kingdom and Japan. With

the constant growth of consumer demand in the field of e-commerce, more and more small and medium-sized companies need the help of marketplaces to bring their products to new markets and attract new customers. The Storiqa project was able to pinpoint the shortcomings of modern e-commerce and propose a solution that could take the current economic situation to a new level. Most small businesses and private producers are unable to enter the global market. The huge expense it takes to start an online store is impossible for a small business. However, there is a demand for exclusive products and users are willing to buy products. Storiqa used a very clever strategy: focusing its platform on small businesses and individual entrepreneurs, it secured itself not only a customer base, because, as mentioned earlier, people are always ready to buy, but also a client base in the face of small businesses. The marketing of the project was quite productive: Storiqa were active on social media such as Twitter, Medium and YouTube video hosting. Also, the so-called STQ token airdrops were constantly carried out - free distribution of tokens for registration and participation in voting. The most successful marketing move was the early launch of the beta version of the platform at the end of May 2018.

In general, it is obvious that cryptocurrencies have become an important part of the economy of many countries, and are becoming a tool for achieving profit for many new startups and companies, and this process will only gain speed in the future.

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DEVELOPMENT OF A MILLING MACHINE WITH COMPUTER NUMERICAL CONTROL

Author**:** ***Serhii Shevchenko***
Advisor**:** ***Serhii Kochuk***
National Aerospace University M. E. Zhukovsky «Kharkiv Aviation Institute» (Ukraine)

Abstract. *The use of computer numerical control (CNC) machines makes it possible to reduce labor intensity and increase labor productivity by reducing the time required to prepare a product for production, reducing rejects, and ensuring the interchangeability of parts. Therefore, the design and further improvement of CNC machines is an urgent and priority task.*

The paper shows one of the possible approaches to the design and manufacture of a CNC milling machine based on a portable personal computer and an "open control system".

Stepper motors are selected as actuators, which are controlled by special drivers. Machine control programs can be written in the G-code language.

The machine is made in a single copy, has been working for 3 years and is constantly being improved through the introduction of new hardware and algorithmic components of the control system.

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