

Digital Technologies in Supply Chain Management for Production and Digital Economy Development

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Abstract- the paper analyzes the development of digital technology and the establishment of blockchain systems in the supply chain management for digital economy development. We examined how blockchain is likely to affect key supply chain management objectives such as cost, quality, speed, dependability, risk reduction, sustainability and flexibility. The authors attempt to classify different kinds of tokens and explain the terminology related to cryptocurrencies. They analyze the economic development of tokens and legal regulation surrounding their usage in supply chain. The study revealed the advantages of using digital technologies in supply chain management over traditional business management technologies and logistics systems, especially in covid-19 conditions.

Keywords; blockchain, supply chain, digital economy, production, token, covid-19

1. Introduction

Over the last decade, the modern economy has been witness to the rapid development of trade using blockchain systems. Among many activities that are likely to be transformed by blockchain, supply chain thus deserves special attention. An increasing reliance on the use of Internet-of-things (IoT) applications is among the trends that will affect supply chain management (SCM). Much research has been conducted on cryptocurrency, mainly focusing on two aspects of its development. The first is the technical side—that is, how blockchain platforms, including cryptocurrencies and tokens, will be modernized over time. The second aspect looks at how supply chain system can profit from these blockchain projects, what risks can investors expect, and what guarantees might be in this segment of digital business.

The basic idea behind one of the most famous cryptocurrencies (and the most successful one)—bitcoin—is described in the paper by anonymous creator Satoshi Nakamoto [1]. We should note that the classification of different types of cryptocurrencies (primarily bitcoin) as well as the first attempts to classify tokens appear in the work by Princeton University professor Arvind Narayanan (Bitcoin's Academic Pedigree by A. Narayanan and J. Clark // Communications of the ACM). Similar extensive research into different aspects of applying blockchain technology, including with economic analysis, is conducted by Melanie Swan in *Blockchain: Blueprint for a New Economy*. This book offers a comprehensive analysis of technical aspects of blockchain technologies in terms of their economic applications. Essentially, this book serves as a fundamental

user guide in the blockchain world. The only disadvantage is that many of the aspects discussed are quickly becoming obsolete due to the rapid development of new types of tokens and cryptocurrencies as well as new technical standards in the sphere of blockchain.

Another detailed study into cryptotoken capabilities is the work dedicated to security tokens and stablecoins (*Security Tokens and Stablecoins Quick Start Guide: Learn How to Build STO and Stablecoin Decentralized Applications* by Weimin Sun, Xun (Brian) Wu, Angela Kwok 2019). We should also note the fundamental work about bitcoin technologies, *Mastering Bitcoin* by [2], in which the author explains in as much detail as possible the peculiarities of working with cryptocurrencies, including the mining procedure.

Among the general works about blockchain technologies, it is important to note the following: *Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World* by Don Tapscott and Alan Tapscott, *The Age of Cryptocurrency: How Bitcoin and the Blockchain Are Challenging the Global Economic Order* by Paul Vigna and Michael J. Casey, *Digital Gold: Bitcoin and the Inside Story of the Misfits and Millionaires Trying to Reinvent Money* by Nathaniel Popper, *The Ultimate Bitcoin Business Guide: For Entrepreneurs & Business Advisors* by Kirk David Phillips, and *Valueweb: How Fintech Firms Are Using Bitcoin Blockchain and Mobile Technologies to Create the Internet of Value* by Chris Skinner.

Florian Glacier from the Karlsruhe Institute of Technology analyzes prospects for market digitization and new challenges related to the anonymity of blockchain technologies (*Pervasive Decentralization of Digital Infrastructures: A Framework for Blockchain-Enabled System and Use Case Analysis*. 50th Hawaii International Conference on System Sciences. Issues of further development of cryptotokens are both economic and legal in nature because new technologies in the digital economy open up possibilities for unlawful actions and infringement of law. Legal issues of using cryptocurrencies and blockchain technologies were analyzed in detail in *Financial and Other Frauds in the United States: A Panel Analysis Approach* by Shuming Bai and Kai S Koong, authors from the University of Texas

Several publications in the *Journal of Money Laundering Control* pointed to current problems of anonymity for cryptopayments and cryptotokens in cases when they are used for money laundering (The problem of regulating the easy way out—EU money laundering regulation). In addition, wide-ranging possibilities for regulating

cryptocurrencies and cryptotokens are analyzed in several applied works on legislation (Blockchain Startups and Prospectus Regulation by Dmitri Boreiko, Guido Ferrarini, and Paolo Giudici, 2019) and economic analysis. Several conceptual suggestions for regulating cryptocurrency exchanges within the EEU are given in works by Russian scientists (Cryptocurrency Regulation in the BRICS Countries and the Eurasian Economic Union by [3]).

We should note that, despite large amounts of research on the theory and practices behind blockchain, international literature lacks comprehensive propositions for universalizing legal regulation of using cryptocurrencies and cryptotokens. There are several risks involved in the legalization of cryptocurrencies, in particular, the nontransparency of investments, payments, and transfers. Moreover, there is currently no unified terminology related to the market of cryptotokens and cryptocurrencies.

2. Data and Methodology

The adoption of blockchain has been successfully implemented in a variety of industries and situations from supply chain to consumer goods. Walmart, for example, adopted blockchain in its supply chain to track goods. Blockchain enabled Walmart to do what usually was performed in seven days in 2.2 seconds. The word "token" is derived from the Anglo-Saxon word "tacen" that meant "sign" or "symbol." We should note that the semantics of this term is much broader. The word "token" can mean any sign, but in this article we consider only tokens that symbolize and represent material value; some asset measured in the form of money, a product, or service, or a combination thereof. It's important to note that the modern term "token," which is currently related to the area of e-payments, has a long-standing history. Essentially, the history of using tokens as a payment unit dates back at least 100 years.

Annual VC-backed deals and financing, 2015 – 2019 (\$M)

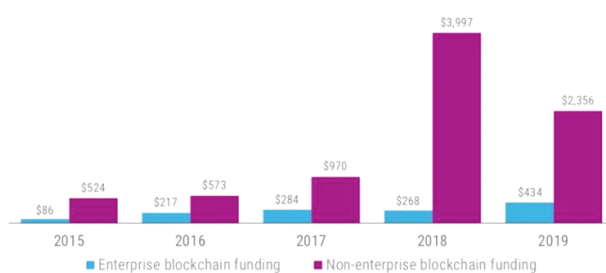


Figure 1: effect of block chain in SCM and digital economy

In this article, we will not be using the broader interpretation of token that implies any currency note or coin that, after renunciation of the gold standard, began to have universal functionality established by the state and supported solely by the authority of that state's financial institutions. Up until the beginning of the 20th century, many state currencies had a direct relation to gold and could be freely exchanged for a certain amount of gold [1]. For instance, the English gold pound was equal to 12 ounces of gold, and the US dollar could be theoretically exchanged for a troy ounce of gold at a ratio of 35 to 1 (an ounce is 372 g of gold). But in 1971, the conversion of the dollar into gold was shut

down by the US government due to the disparity between the money supply and gold reserves.

The rapid development of IT technologies has led to the creation of digital supply chains and their development. Digital supply chains help you personalize a product or service. It also makes it possible to adjust to the needs of consumers and reduce the financial costs of moving goods along the logistics chain. In the context of this paper, we are interested in electronic or cryptotokens, which many economists call private money [3].

The history of online tokens dates back to 1983. At that time, American cryptographer David Chaum had the idea of anonymous cryptographic electronic money—e-cash [4]. Later on, in 1995, he implemented this project and called his tokens Digicash. This was an early form of cryptographic e-payments, but it allowed digital money to bypass the bank, the state, and any third party. The results of this stage of cryptotoken development were summarized in the article "How to Make a Mint: The Cryptography of Anonymous Electronic Cash"[5].

In 1998, Wei Dai published a description of b-money, an anonymous distributed electronic cash system. Soon after, well-known cryptographer Nick Szabo presented his concept of bit gold [6]. As well as bitcoin and other subsequent cryptocurrencies, this system required "proof of work"—that is, verification of the transactions to resolve the trust issue, specifically the lack of trust between blockchain participants who don't know each other [7].

The first fully functional decentralized cryptocurrency—bitcoin—was created in 2009 by anonymous developer [8]. Bitcoin also uses the "proof of work" concept [9].

Here, we should emphasize another term used in the e-tokens system, the so-called cryptotokens. In contrast to the types of tokens discussed above, the cryptotoken doesn't have a physical form. It is an entry in the blockchain that can perform payments and/or execute any other nonpayment functions, such as in relation to smart contracts or distributed applications, known as dApps. Blockchain is a system of distributed data storage that allows reducing risks of data loss due to multiple storage on several computers. Blockchain literally means "a chain of blocks"—that is, blocks that are linked to a single chain by unique identifiers.

Essentially, a blockchain is another way to store and distribute information. Whereas conventional databases store data in files and folders, blockchain stores information in blocks. Each block has its own unique ID. It's impossible to modify the contents or location of an existing block in the blockchain; any editing causes a new block to be added about the fact that a previous block was edited, but the block itself doesn't change. All information can be tracked by any participant of the blockchain and the owner of the corresponding program in real time. Another system attribute of blockchain is the lack of regulation entity [10]. In a classic blockchain, transactions are verified and approved by allocated groups of blockchain participants or all other participants rather than by an administrator with special rights. Conditionally, blockchain technology can be described as "digital democracy" as the technology makes it possible to respect the equal rights of all blockchain program owners [11].

The same goes for the term "crypto" that means "secret" in Latin. The program creates a cipher code that reliably

protects informational blocks with data about the token. The encryptor program allows you to work with an unlimited amount of tokens. There are several popular protocols. The ERC-20 protocol is for tokens based on the Ethereum blockchain, and SRC-20, for security tokens. Many platforms (Blockchain.com, Polymath, Securrency, etc.) offer their help to create, store, promote, and trade company tokens, and an ecosystem for digital assets is under development.

Blockchain architecture doesn't involve a regulation entity, such as a bank. For instance, if subject N, an individual, wants to transfer \$100 to another individual's account, they have to go through the following procedures.

First, the bank has to verify the customer, our Mr. N. In international financial law, this procedure is called "know your customer" (KYC). This routine is implemented in banks in most countries, primarily in the USA, where it is supervised by the Financial Crime Enforcement Network (FinCEN), a subdivision of the US Treasury Department [12]. A similar procedure is used in Switzerland where the Swiss Financial Market Supervisory Authority (FINMA) acts as the regulatory authority. In this paper, we limit ourselves to a description of the general verification routine applicable in the majority of developed countries around the world, including the US and the EU.

Reducing logistics costs, increasing the efficiency and flexibility of supply chains significantly affects the performance of various companies. Therefore, the logistics sector is now becoming a powerful driver of development and increasing the competitiveness of companies [2]. There are various methods for improving the efficiency of supply chains, but one of the most promising today are methods that involve the use of digital technologies. Banks also have to check the origin of funds on bank accounts for any signs of illegal activity, for instance, financing of terrorism, fraudulent transactions with securities, or market manipulation. This procedure is known as AMLD (Anti Money Laundering Directive), often further abbreviated to AML or AM. In the EU, for instance, the 5th EU Anti Money Laundering Directive (AMLD5) has been in place since 2018 [13]. This procedure requires extensive control by bank employees and implies extra waiting time for customers.

Blockchains in typical cryptocurrencies work differently: checking (verification) is performed by miners—that is, a group of bitcoin blockchain participants. Instead of receiving some of your money for verifying transactions, they get a portion of newly generated bitcoin. This is an extremely important aspect since this ensures that money transfers to participants are virtually free of charge.

It is important here to provide some clarifications concerning the software that allows for working with blockchain technology [14]. From a technical viewpoint, such software programs are ordinary chains of software code designed for personal computers and various mobile devices (smartphones, tablets, etc.). The software is adapted to be operated by nonprofessional users, which makes it possible for anyone to use it.

The demand for global cryptocurrencies will grow as we transition to the sixth technological paradigm. According to forecasts by analysts from the Russian Academy of Science, the sixth technological paradigm began in 2010–2020 and, if

the current pace of technical and economic development remains unchanged, will reach its maturity in the 2040s. However, in 2020–2025, a new technical, scientific, and technological revolution is expected, which will be based on developments that combine the achievements in the abovementioned basic knowledge-intensive areas, such as biotech (including biogenetics, bioengineering, thermonuclear power and fusion, photonics, membrane and quantum technologies, micromechanics, and nanoelectronics). These forecasts did not appear out of the blue. In the USA, for example, the share of productive forces for the fifth wave is 60%, and for the fourth, 20%. At present, 5% is already attributed to the sixth technological paradigm [15]. We should also note the development of virtual technologies, neural networks, and the global media space. The advancement of communication channels allows some scientists to speak of a new development phase for the economy, whether digital or virtual.

As a matter of fact, in times of globalization, the development of digital and virtual exchange technologies is merely evidence of the corresponding demand from transnational corporations that are interested in further liberalization of capital and freedom to move such capital across borders and jurisdictions. The development of offshore jurisdictions, the aim to minimize time spent on purchasing and selling securities and financial assets, and simplified money transfers are all signs that financial flows are being developed in a corporate sector that requires no government control. Globalization of production, intensification of transborder capital potential, commodity flows, labor migration—all these tendencies are evidence of global players' striving to make maximum profit, which in turn leads to the financial version of a traditional product—an asset—becoming the subject of market relations, instead of the product itself [16]. In this case, a token may act as the counterpart to a digital or virtual asset.

The emerging role of virtual assets in the global economy allows using tokens and cryptocurrencies as the most efficient tools for redistribution of capital [7]. The absence of a major regulatory authority in the form of governmental agencies allows corporations to respond to market situations in a flexible way while increasing their financial capacity for investment [8].

In the first few years after the bitcoin project began in 2009, cryptocurrencies began to evolve from mere payment systems to systems that supported additional operations, mainly the execution of smart contracts [9]. Smart contracts consist of files that contained an embedded *modus operandi*. By executing a certain software application, users can perform actions that lead to executing a transaction. However, here this does not refer to an implied contract covered by civil law theory but rather technical operations upon completion of which the contract is deemed executed. Moreover, the smart contract may be self-executing. This means that the goods will instantly be shipped as soon as the price in the particular market reaches the one indicated in the smart contract [10].

The term "cryptocurrency" itself is currently interpreted in two ways; in the narrow sense when the cryptocurrency acts merely as the payment instrument (e.g., bitcoin) and in the broader sense when any token is cryptocurrency regardless of the number of functions performed [11].

Utility tokens reached the peak of their popularity in 2017 when investors showed massive interest in ICO (Initial Coin Offerings), which created a situation very similar to the gold rush that took place in the USA in the 19th century. ICO was essentially a kind of tool for attracting investments, the same as British tokens in the 19th century. A buyer would pay for coins that might further be exchanged or sold to gain profit. In terms of their functional purpose, coins and tokens are actually the same tool; the difference in the terms is explained by the difference in sources and partly by different functionalities in usage.

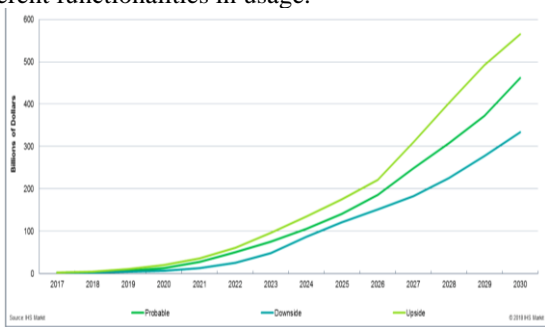


Figure 2: The business value for the digital economy

Initial Coin Offerings offered utility tokens. These tokens were offered for use across various blockchain projects and at the same time were for sale in cryptocurrency exchange. Thousands of rises and falls in exchange rates within hours or even minutes prevented the use of these tokens as an exchange tool in the projected blockchain digital markets and stores. At that time, the number of goods offered for sale through utility tokens was huge. It seemed that anything and everything was proposed to be tokenized; working time so that it would become a new currency, the recognition of photos for artificial intelligence, projects in the field of intellectual property, and even collaboration in the R&D domain. There was an abundance of investors, especially those people who purchased bitcoins and ethers during the launch phase when they were really cheap and the people who believed that blockchain was the solution to all problems. The interference of the Securities and Exchange Commission (SEC), the US service for monitoring the securities market, put an end to the rush. The SEC declared utility tokens to be securities (based on Howey), which meant that utility tokens were now subject to the same registration procedure. Attempts to ignore the recommendations given by the SEC followed, which ultimately led to threats to bring in the Federal Bureau of Investigation (FBI) to prosecute the violators of the law. This put an immediate end to the ICO market [14]. Utility tokens are currently used mainly within blockchain projects, mostly in the domain of virtual entertainment and computer games.

However, demand on the global trade market for new trade and investment instruments remained (and still remains) in place [15]. Corporations need new tools for financial independence, especially considering that technical capabilities allow them to close online deals utilizing tools that ensure a high degree of reliability and transparency with

regard to the participants. Their interests are fall in line with those of smaller companies and microbusinesses that do not want to overpay banks for services to attract funds [16].

3. Findings and Discussion

Digital transmission chain management is a new direction in the development of information integration. It has gained wide popularity. "Companies can gain competitive advantages (costs, delivery times, pre-sales preparation, time, and after-sales service) by managing the digital delivery chain. There have also been recent changes in business development and IT technologies in this industry. Using these solutions will help increase the level of collaboration and openness of the supply chain. This creates the basis for a modern logistics strategy such as CPFR, S & OP, EDI, ECR, JIT, QR, or VMI that can be implemented, and additional benefits are created for effective management and development of supply chains. To address the specific challenges posed by ICO, a concept was developed proposing a new format for security tokens and their placement, Security Token Offering (STO). This format entails legally assigning the status of securities to tokens, in full compliance with SEC requirements. This project helped significantly reduce the risks inherent to ICO and increase the level of legality and controllability on the part of government agencies [15]. For the purpose of STO implementation, the USA developed a number of stringent conditions. Among other things, only professional investors accredited in accordance with US legislation were allowed to purchase tokens. The following requirements were imposed on such investors: they must have a certain amount of funds (at least \$1 million, excluding real estate where the investor resides), a steady income (at least \$200,000 for an individual or \$300,000 for a married couple). For businesses, the amount of funds required increases to \$5 million, or there is another option if business owners are accredited investors.

The so-called access tokens [2] are similar in functionality to security tokens. Another name used along with access tokens is "asset-backed tokens." This format is needed to provide access to real assets, which could take the form of the rights to develop a mineral deposit, a part of some great artist's masterpiece, or real estate. A system of blockchain tokens for timeshares in elite yachts, aircraft, and resorts is actively being developed in this field. Access rights can also be ensured with the KYC (Know Your Customer) and AML (Anti Money Laundering) verification procedures described above, and blockchain ensures the inalterability of the booked rental dates for the yacht. This is why access tokens are very similar to security tokens, as they provide not the right to own the asset but the right to access it—that is, use it for a limited period of time. Matters related to using cryptotokens for funding social projects (crowdfunding) are also investigated widely. However, modern research largely clarifies the data obtained earlier, and also allows the classification of tokens and other crypto tools of global financial investment.

Table 1: Chronology of crypto tools' development by characteristics

	First generation	Second generation	Third generation	Forth generation
The origin time	Before 1995	2008	2015	2020
Economic value	no	yes	yes	yes
Investment opportunities	no	no	yes	yes
State regulation	no	no	no	yes
Name of the document	crypto programs	cryptocurrencies bitcoin	Cryptotokens utilitarian tokens, ethereum	Cryptoplatforms Stable Coins

Another type of token currently available is known as stablecoins. Stablecoins are an important class of cryptotokens. They differ from other tokens in that they have a fixed rate to any currency, the value of gold, the stock price, or to its own algorithm. Stablecoins are necessary as an intermediate link between a utility token and typical money. For example, when a large company has to pay wages in dozens of countries in different currencies strictly by a certain date, the cost of such an operation can be significant. But if the entire payroll budget is converted into stablecoins, and electronic wallets are open for all employees, you can transfer stablecoins into the wallets, and then the employees can convert them into their local currencies themselves. In this case, the cost of the payroll operation for an international corporation will decrease significantly.

Stablecoins are commonly used by cryptoinvestors to "wait out the storm without leaving the cryptomarket." Stablecoins tied to the value of gold and the dollar are especially popular. In the context of the economic crisis caused by coronavirus, an increase in the capitalization of major stablecoins is expected [11].

Some current examples of tokenization with binding to specific material assets include projects such as El Petro, CaskCoin, TilCoin, and Property coin.

For example, in the El Petro project, which was founded by the Venezuelan government, the token is tied to the cost of one barrel of oil, and the state guarantees the free sale of the token on its territory. During the presale period, the project allowed the Venezuelan government to attract more than two billion dollars. The main purpose was to attract investors under the current US sanctions, including investors who did not want to disclose their jurisdiction [12].

Despite a number of failures regarding the Venezuelan El Petro project, the "targeted" implementation of cryptoassets by the state can be looked at as a positive experience. For example, the Republic of Belarus opened the world's first official state cryptocurrency exchange in 2019. On the exchange, it is possible to legally buy tokens from various enterprises and companies, including those producing oil, gas, metals, and other types of raw materials, company shares, and indices bound to the base market value of traditional financial assets. Investors must undergo preliminary testing before being able to purchase and sell cryptocurrency tokens (Bitcoin, Ethereum, Litecoin) or fiat money (US dollars, euros, Belarusian or Russian rubles). Investor testing is required to verify basic financial literacy and is not related to their legal status. All legally competent individuals and legal entities can trade on the cryptocurrency exchange. There are also opportunities to increase the level of trust in the exchange through the verification procedure. A standard client has minimum and maximum limits for

depositing funds (from 100 to 24,000 dollars, or the equivalent in cryptocurrencies or other fiat money). The exchange provides credit support (so-called "leverage") with a twofold and fivefold margin. In general, the set of restrictions is quite democratic—only residents from countries that appear on the list compiled by the Financial Action Task Force on Money Laundering (FATF) are not allowed to trade.

Table 2. Distribution of blockchain startups by country,

1.	USA	36,9%
2.	GB	14,8%
3.	China	4,5%
4.	Canada	4%
5.	Germany	2,8%
6.	Australia	2,6%
7.	Singapore	2,5%
8.	Netherlands	2,4%
9.	other	29,5%

In 2020, the cryptocurrency exchange looks to expand the set of investment products: "Token assets include the shares of large technology companies (Microsoft, Twitter, HP, AT&T, Salesforce), transport giants (Boeing, Tesla, Ford, BMW), financial enterprises (American Express, JPMorgan Chase, and Deutsche Bank), food and drinks producers, retailers, and entertainment companies. You can invest in token assets for silver, gold, platinum, and palladium. The platform has supported two types of token assets for crude oil (US Crude and Brent) and one for natural gas since the beginning. Token assets will be available on popular indices such as NASDAQ-100, Dow Jones 30, S&P 500, FTSE, and China A50" [14].

At the same time, the Belarusian cryptocurrency exchange is an isolated kind of experimental project because in accordance with Presidential Decree No. 8 dated December 21, 2017, "On the Development of the Digital Economy" the cryptocurrency exchange operates only within the special tax regime of the High Technology Park (HTP) and is managed by the Park Administration. That said, companies trading on the exchange do not have to pay taxes (until 2023), the activities involving tokens are not considered entrepreneurial, the state's exchange regulations do not apply to the exchange, and certain provisions of the republic's civil law do not apply to the users of the cryptoplatform (regarding the predominant right to purchase shares/stakes in the ownership fund, the creation of the ownership fund and some others). In general, we can talk about the creation of an investment cluster based on IT technologies at the state level, which is currently operating successfully.

The CaskCoin project is based on a token tied to Scotch whisky. Investors invest money (starting from 30,000 pounds at present) in barrels of Scotch whisky, which are expected to grow in value.

The TilCoin project offers similar investments but in paintings. The buyer of the token is given ownership of a part of the painting, which is also expected to grow in value. The company assets include collections of paintings by Soviet and Russian artists, posters, and a large collection of twenty-century stamps. All collections were digitized and made available on the internet on an ongoing basis. The company puts on exhibitions of original works from time to time. According to the CEO, the first presale conference attracted \$2.5 million for the company.

Some interesting projects that are currently under way include Property coin, a US real estate investment project, and the domestic cryptoplatform Waves that offers universal services for promoting tokens and creating/maintaining investment projects, including creating start-up companies. The term "crowdfunding" is widely used in Russia, which in fact means "public funding." These are projects that aim to attract contributions from ordinary citizens via the internet, usually for charitable or socially useful purposes. In some cases, blockchain technologies and tokenization are used (for example, the Waves platform has such capabilities).

Despite the Chinese authorities' negative views on cryptocurrencies and tokens, it decided to launch a pilot project in April 2020 run by the People's Bank of China to implement "crypto yuan" in several cities (Shenzhen, Chengdu). Those taking part in the project include major service companies (Starbucks, McDonald's, Subway, etc.) as well as residents of the cities participating in the pilot project who will be able to receive part of the money (including salaries) in "crypto yuan" [3].

The experiment is expected to allow the People's Bank of China to solve the problem of a critical reduction in interest rates by attracting deposits from citizens. Of course, this experiment does not fully free us from "the curse of cash" described in the book by [6]. However, economic recovery after the COVID-19 pandemic could be faster with the help of e-money policies.

Table 3. Risks of crypto tools' dishonest use

Dishonest use possibilities			
	cryptocurrencies	Utility Tokens	Security Tokens
Crime financing	High	Medium	Low
Money laundering	Medium	High	Medium
Fraud	Low	High	Medium

In the field of oil and gas production, the American company Ziyen Inc, registered in the state of Wyoming, is of great interest. This company initially developed software for oil, gas, and energy companies in general. Since 2016, it has been developing its own ZiyenCoin, which is based on 18 real company deposits located in the Illinois River Basin in the states of Illinois, Indiana, and Kentucky. Based on the classification of tokens, ZiyenCoin falls into the category of security token, which allows the company to legalize the project in accordance with SEC requirements.

4. Conclusion

It can be concluded that the capabilities of blockchain technologies in supply chain improvement are expanding in the modern world and, above all, in the digital economy. Over the past decade, tokens have gone from being an exotic hobby for a narrow circle of programmers to a global financial instrument for major corporations and countries. Should we expect an even greater expansion of tokens and cryptoassets in the future? The answer is a definite yes. Tokens have become a financial instrument with wide capabilities: from simple payment (bitcoin) to almost fully electronic securities (security tokens). Powerful investment opportunities for utility tokens still spark interest among many companies, entrepreneurs, and individuals. Finally, access tokens have been enabling the mobilization of funds in the service and digital entertainment industries for many years, creating large-scale projects such as online casinos, gaming portals, and sales of copyrights and patents.

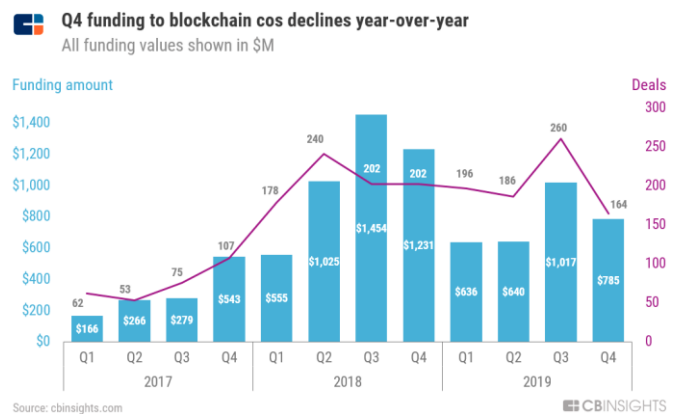


Figure 3. Funding of blockchain in time

The question of security with regard to tokens as a financial investment instrument has essentially the same issues as any other risky asset. All securities have varying levels of risk, like tokens. The problem of token jurisdiction is similar to the regulation of ordinary securities. Some countries monitor cryptocurrency and token transactions with higher scrutiny (USA, Switzerland), but many countries allow you to make money without detailed checks on investors and their projects (Japan, the Netherlands), and in some countries cryptocurrencies are prohibited entirely (China, Republic of Korea). As described in the paper, the experience of ICO in the USA shows that cryptoassets and tokens are not prohibited en masse at all levels since they are fully consistent with the basic human right for freedom of enterprise. Yes, fraud and manipulation are possible on the cryptocurrency and token market (especially when it comes to utility tokens); this market does not prevent money laundering and criminal investor transactions. However, the experience of the American SEC shows that the fight against fraud and money laundering in the field of IT is no different from the typical procedures used on the securities and investment market. Thus, we can conclude that, in principle, it is possible to regulate the cryptoassets market and prosecute violators.

We can also conclude that cryptotools have benefits for financing and investment purposes. Utility and security tokens show that business projects can be financed much faster and cheaper than when using bureaucratic procedures

involving banks and financial institutions. Individuals and small companies save significant time and money by cutting out the services of numerous intermediaries. Security tokens also allow large companies and corporations to make similar savings, albeit to a lesser extent. Finally, those who want to invest in stable assets that will not depreciate over time are finally able to do so with stablecoins.

Blockchain facilitates valid and effective measurement of outcomes and performance of key SCM processes. Flexible token usage conditions will make it possible to use them simultaneously at the micro- and macroeconomic levels, giving way to both small investment projects (through ICO, crowdfunding) and large-scale projects at the corporate level (through security and asset tokens). At the state level, it is possible to use resources of high-tech companies, institutions, and high-tech industries to attract investment by creating special jurisdiction zones.

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