

SECTION 5. MANAGEMENT

5.1 Blockchain technology: problems and their solutions

Abstract. Blockchain technologies are radically changing the structure and organization of economic life. We can assess and understand its impact through the analogy between blockchain and the Internet. When the internet first appeared, there were several new players in the market. Their economic models are almost entirely based on the Internet, which makes them pure players. However, we cannot limit the impact of the Internet to the creation of these companies: every business in the traditional economy has been able to use the Internet to create new features (e.g. online ordering) or improve internal processes (e.g. reducing communication costs through video conferencing), so blockchain technology can have the same impact on economic life as the Internet: on the one hand, there will be clean players whose economic models will be completely based on technology; on the other hand, there will be new business processes that can improve internal functions.

Many people initially learned about blockchain technology through the availability of bitcoin, but it is important to be aware of the difference between the two. Blockchain is the technology behind bitcoin technology. Bitcoin is an application that uses blockchain technology. Other applications that use blockchain technology have nothing to do with bitcoin.

Since the invention of containers for transporting raw materials, global trade has become an important part of the economy of most countries. Countries depend on importing foreign products as raw materials for production or finished products for consumption. Similarly, by exporting their own products, they stimulate economic activity, create jobs, and increase tax revenues. Globalization has led to the fact that most of the supply chains are international. According to OECD statistics, the value of imports of goods to OECD countries in 2017 amounted to 9,604,635 million US dollars, in 2018 – 10,526,040 million US dollars. At the same time, the value of exports

in the OECD countries was 9,351,995 million US dollars, in 2018-10,188,980 million US Dollars.

Keywords: blockchain, digital technology, solutions, goverment, economy.

Introduction

A blockchain is a distributed database that stores an ordered chain of records (so-called blocks), which is constantly growing. The data is protected from forgery and distortion. Each block contains a timestamp, the hash of the previous block, and transaction data presented as a hash tree. Such a distributed database is the basis of the Bitcoin cryptocurrency (it was described in 2008 and implemented in 2009), where it serves as an accounting book for all transactions. Such a database is called a blockchain [173, 182, 185].

Considerations about the need to study blockchain are becoming increasingly relevant, as, for example, the COVID-19 pandemic highlights the need for more reliable data and future economic recovery through the introduction of the digital economy and, in particular, digital trade. At the same time, blockchain can cause significant concern for those who are unfamiliar with this digitization tool.

Over the past few years, there has been a lot of discussion about cryptocurrencies in general and blockchain technology in particular. But the absolute majority of experts note that this technology has many advantages over a traditional data storage system, since it can store records of all data or money transactions made between any two parties in a secure, immutable and transparent way. According to world experts, blockchain technology will certainly be implemented in various sectors of the economy, and it is expected that in the future blockchain technology will become revolutionary in traditional business processes around the world.

Therefore, to begin with, we will assume that the blockchain is a digital register in which all transactions between clients using this digital register are stored chronologically and publicly. Blockchain technology is also called distributed ledger technology.

The main and main feature of the blockchain is the use of software calculation algorithms, as well as eliminating outside interference in the work and minimizing the influence of the human factor when making decisions by the system. In this regard, it is important to analyze how this technology is already used by leading companies and developed countries in the world.

The European market is the largest in the world, where the world's largest resources (finance, goods, services) rotate. Therefore, the regulatory environment in Europe is well developed, and new technologies enjoy both strong academic and political support. Based on this, the European Union is constantly interested in new technologies and in blockchain in particular. The EU executive body and the European Commission are actively exploring ways to introduce new technologies. We are seeing constant investment (public and private), which gives Europe a competitive advantage in how the latest technologies are implemented in the European market.

With the most developed regulatory environment, strong academic support, and a long history of supporting technological development, the United States is a fertile ground for new technologies of any kind. The US government is actively preparing to use blockchain technology to modernize military personnel, help law enforcement agencies, approve government contracts, and promote transparency of government grants. As more and more officials finally see blockchain technology in a positive light, we can expect that more pilot projects will be launched in the near future.

According to the World Intellectual Property Organization, China leads the world in blockchain-related patents [180]. For example, JD.com – one of the largest online stores in China-uses blockchain technology to verify its supply chain for customers and business partners who believed that the retailer could sell fake versions of luxury brands. The company recently decided to make its platform publicly available to all users. China's General Customs Administration uses blockchain to control 26 cross-border ports and markets located along China's southwestern border. China is already going to launch its national blockchain platform, which is part of the country's grand strategy to digitalize the global economy. BSN is an open network of blockchain

services that any enterprise and business that owns cloud services and data centers can use to create a public city node and connect to the network for free [181].

Material and methods

The concept of regulation by Advanced Technologies is unrealistic and unattainable in itself. Technology is changing exponentially, and social, economic, and legal systems are changing gradually. From this we can draw a logical conclusion that the current regulation will quickly become obsolete and become more vulnerable and less relevant. On the other hand, the very trend of technology development is crucial to justify changes in legislation and regulations. The goal of regulation should never be to slow down or limit technology, because this inevitably leads to the degradation of future innovations. The focus should be on creating certain global standards, as well as ethical and good governance principles, as they are essentially the tools needed for the growth and development of new technologies.

While some governments are moving towards blockchain adoption, many national and regional regulators are taking a "wait-and-see" approach, preferring to study and understand the implications of blockchain before moving forward with additional legislative and regulatory requirements or recommendations. The lack of regulatory certainty and a well-developed legal and regulatory situation is difficult for market participants, and it is necessary that they constantly evaluate their participation in blockchain networks.

The blockchain has the ability to cross the boundaries of jurisdiction, since blockchain nodes can be located anywhere in the world. This may entail a number of complex jurisdictional issues that require careful consideration of the relevant activities of the platform and its participants, as well as contractual relations between them. To address such issues, a number of legal and regulatory mechanisms are increasingly emerging that have non-territorial effect, for example, the GDPR (regulation within the framework of European Union legislation on the protection of personal data of all persons within the European Union and the European Economic Area [175]).

The question arises, “Can there be a blockchain without cryptocurrencies?” The answer depends on the type of blockchain. You need to distinguish between public and private blockchains. Bitcoin is the first example of a public blockchain [183]. This is a type of distributed ledger technology that is not controlled by a central organization, but relies on a society consisting of miners, chains, and users. A public blockchain cannot exist without crypto assets, since miners must receive rewards and users must trade cryptocurrencies to use the network [176].

Results

A few years ago, cryptocurrencies experienced their peak, their use was widespread in all spheres of life: from business to individual operations of individuals. This type of currency confirmed the assumption that the world can exist on non-cash payment, and electronic money in the future will become a familiar thing. Although this type of currency is currently developing rather slowly, its creation had another positive impact on the world economy – the discovery of blockchain technology.

Blockchain is a distributed database technology based on an ever-growing chain of records. At the beginning of its existence, it was used in cryptocurrencies, namely in bitcoin technology, because it made it possible to conduct chain transactions with a high level of protection against falsification and forgery or theft of data, as well as high speed of processing operations.

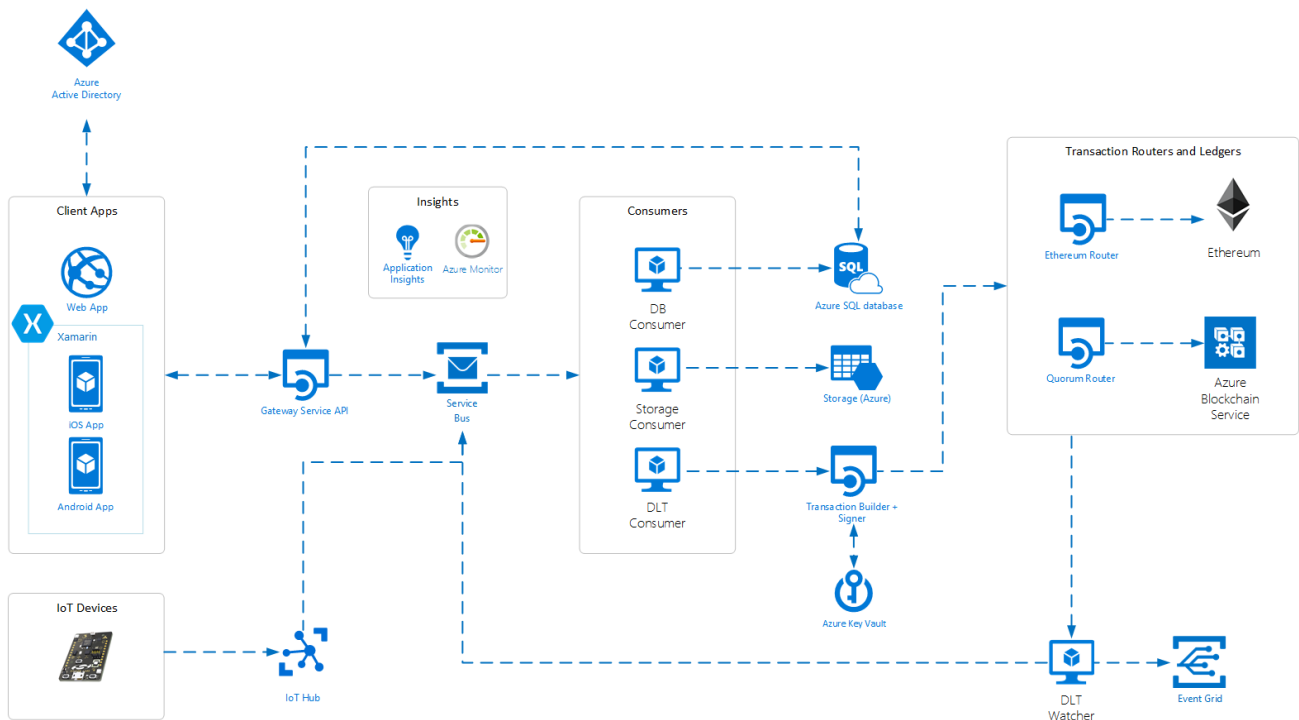


Figure 1. Azure Blockchain Workbench

(<https://docs.microsoft.com/en-us/azure/blockchain/workbench/architecture>)

In general, this technology can be represented as an ever-growing sequence of blocks distributed among participants. A timestamp (hashsum) is added to each block, which is formed in a strictly defined chain. If you try to change such a sequence, the system will reject such a chain, since the sequence will be defined as incorrect. To prevent the correct hash amount from being read, Blockchain technology uses several security tools, among which proof of work and proof of ownership are the most important. This means that transaction participants cannot deceive each other, and the data is transparent, since there is a single database.

Despite the fact that blockchain technologies have a significant potential in solving many financial and economic issues for various sectors of the economy, in practice, certain nuances arise when implementing such technologies. For example, technology requires a unique level of organization – companies need to agree to introduce new resource-intensive technical, functional and legal mechanisms. Despite spending 1.7 billion annually on blockchain, many financial companies were unable to realize the benefits of early investments, and a number of pilot projects were shut down. Technological risks. Effective development and implementation of blockchain-based

solutions requires identifying and solving a list of technological risks and problems. The list includes data privacy and transactions on the blockchain, security risks, limitations related to the performance of the underlying blockchain platform, and issues related to integration with other enterprise systems.

Operational risks. Implementing blockchain-based applications, especially in a consortium of several organizations, is complex and involves addressing a number of issues related to operational risk, such as managing, controlling, auditing blockchain operations, and verifying asset ownership.

Legal and regulatory risks. Blockchain as a technology may not be regulated, but applications built on blockchain technology must comply with relevant regulations, such as the European Union's General Data Protection Regulation (GDPR), which deals with data protection and Privacy. Legal and regulatory risks include uncertainty about inter-jurisdictional regulations, antitrust violations, use of smart contracts, anti-money laundering (money laundering) and customer protection (KYC) and intellectual property protection (IP).

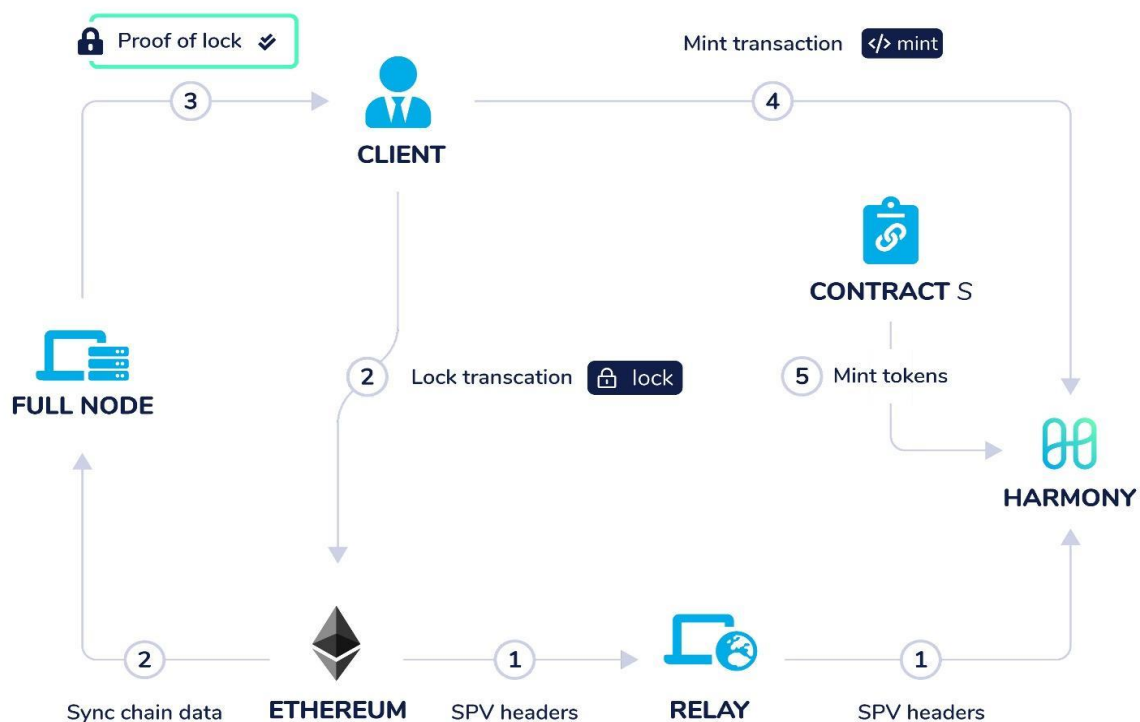


Figure 2. Smart contract in Ethereum blockchain

(<https://blog.harmony.one/priedstavliaiem-horizon-ethereum-harmony-kroschiein-bridzh/>)

Strategic risks. Integrating blockchain technologies and business models is a strategic bet for organizations. Thus, this entails a number of strategic issues, such as determining applicable value propositions, brand and reputation management, and change management.

Financial risks. The overall goal of implementing blockchain is to simplify the transfer of values. When designing such blockchain applications, platforms, and infrastructure, it is necessary to take into account various financial risks, such as the risk of potential financial losses, the finality of transaction settlement, risks associated with consortium financing, and intellectual property protection issues. In addition, there are a number of accounting and reporting issues that need to be considered, depending on the financial transaction application and the information used in the financial statements.

For many years, the lack of end-to-end transparency of supply chains has been a major problem in logistics and customs operations.

Blockchain experts say that distributed ledger technology will make intermediaries, such as banks, insurance companies, auditors, etc., redundant. Since the blockchain is designed to resist modification of stored records, it can be concluded that blockchain protocols have a high level of protection and trust. In other words, you don't need to find intermediaries for blockchain technologies, for example, for the payment, money transfer, audit, etc. industries.

Let's take a closer look at audit activities. Auditors are trusted because they certify that the financial statements are presented fairly or not. Consider how blockchain and other cutting-edge technologies can displace auditors:

- smart contracts built on the blockchain could be used to automate almost all transactions of the company, which, in turn, would be invariably recorded in a distributed ledger. We can see that entire financial departments are being replaced by automation that follows the If / Then (if/then algorithm) protocols;

- consider a distribution company. When a distributor receives electronic-tagged inventory from a manufacturer, smart contracts can automate all accounts payable functions;

- if the effectiveness of the internal control mechanism becomes an integral part of smart contract technology, then traditional riskier manual control would become redundant;
- artificial intelligence systems can be used to continue working where blockchain technology has been disabled (for example, when processing accounting charges and estimates) [183].

The immutability of blockchain and smart contracts with absolute trust can completely save us from audits and auditors in general. But now we are not yet at the stage to fully entrust the work to the program. Auditors will still need to verify that smart contracts have been configured to handle legitimate transactions. If a smart contract is used to pay employees working under a contract based on registered hours, auditors will need to check whether employees are actually paid for performing genuine work, and that fraudulent payments are not made by the smart contract developer. In addition, auditors need to check whether the AI (artificial intelligence) black boxes used for making estimates are functioning properly.

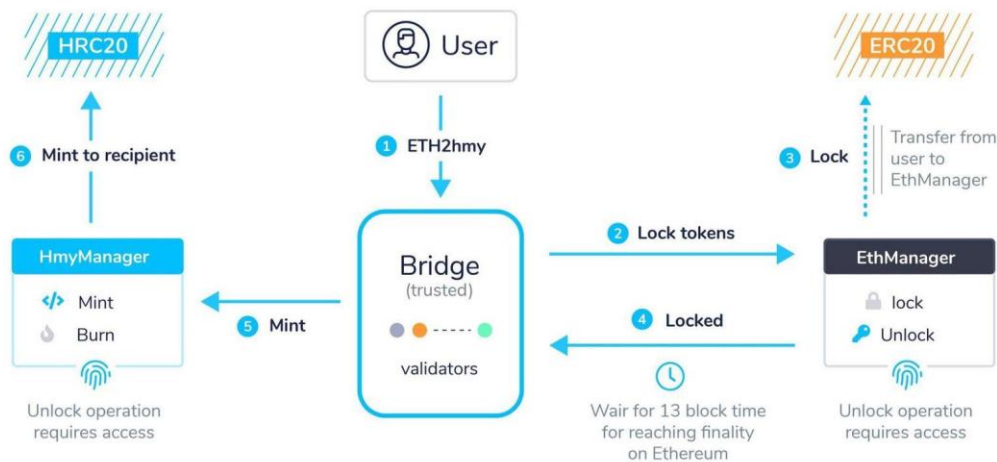


Figure 3. Blockchain cross-chain compatibility

(<https://blog.harmony.one/priedstavliaiem-horizon-ethereum-harmony-kroschiein-bridzh/>)

Blockchain technology can significantly improve the state of the accounting sector through:

1. Increase efficiency. Blockchain-based accounting software is more efficient than traditional accounting systems. Blockchain integration will significantly increase competitiveness in the market, allowing you to quickly and accurately serve your customers.

2. Minimize errors. Blockchain technology automates accounting processes, thus significantly minimizing human errors. It simplifies the data entry process by building an encrypted template of time-tested blocks.

3. Improve security. Once you store your accounting data in a decentralized blockchain network, it becomes difficult to change the data. Even if you try to change the record, you will have to make similar changes to each copy of the distributed ledger at the same time, which is almost impossible.

4. Real-time reporting. Enables accounting teams to work seamlessly with external auditors, providing them with real-time reporting.

5. Accounting model with triple entries. Typically, modern accounting firms follow a double-entry accounting system, where financial transactions are entered in the ledgers twice as a credit and debit. To combat disagreements, the blockchain has introduced triple-entry accounting to strengthen its security features. The triple-entry accounting model follows an additional step to ensure that all financial transactions are cryptographically secured by a third entry [185].

But the audit and accounting industry is struggling to adapt quickly to future changes. RSM, the world's fifth-largest accounting firm covering more than one hundred and twenty countries, recently announced a partnership with Lukka, a cryptocurrency-focused company, to offer a targeted approach to cryptocurrency taxation. [179]

On April 13, 2020, the Association of Chartered Accountants (ACCA) and Tezos of Southeast Asia (TCA) announced that they have signed a memorandum of understanding (Memorandum of understanding) to study Tezos blockchain applications in accounting. TSA is a non-profit organization based in Singapore whose

mission is to help and assist the industry with the adoption of Tezos blockchain in the Asia-Pacific region. Through this partnership, ACCA will share its knowledge of accounting standards, while TSA will provide technical guidance on integrating blockchain technologies to address accounting issues. The two sides will also develop strategies and educational initiatives to encourage integration among each other's networks, as well as form partnership programs to teach participants the basics of blockchain technology [183].

Banking. Bankers have realized that they can also use blockchain. Over the past three years, the technology has contributed to the international transaction system, improving customer authentication and, in particular, to the fight against fraud.

Standard banking services consist of processes such as issuing loans, mortgages, transactions, and payment services. Most of these services are implemented using outdated methods and technologies. For example, between verifying information, evaluating creditworthiness, processing a loan, and distributing funds to individuals, it takes 30-60 days to get a mortgage, and 60-90 days for small and medium-sized enterprises to get a commercial loan. Blockchain can optimize banking and credit services, reducing counterparty risk and reducing settlement time. This allows you to:

- compare customer documentation and data, reducing operational risks and allowing you to check financial documents in real time;
- optimize credit forecasting and credit scoring markets, instantly get information by comparing user activity and data across the entire network;
- automate syndicate formation, underwriting and disbursement of funds, i.e. payment of principal and interest, cost reduction and delays;
- facilitating asset security, as the technology allows real-time asset management, monitoring, and compliance with regulatory controls [184].

A large number of financial institutions around the world have already witnessed the fruits of cooperation with technology firms. For example, five Canadian banks have partnered with SecureKey Technologies Inc., so that consumers can securely verify their identity digitally to access banking services.

Another success story is the payment platform of JPMorgan financial holding, the Interbank Information Initiative, based on the Ethereum blockchain platform. The project was tested in 2017, and currently its network includes more than 340 banks around the world [178].

The World Economic Forum has revealed that more than 40 central banks are considering using blockchain for ten different areas of their possible application. These include central bank-issued digital currencies, decentralized supply, SEPA (single euro payment area) sharing, credit identifiers, and simplified information exchange between public authorities and private organizations.

Payment processing. Innovations in financial technologies are changing the world of money transfers in many ways. But so far, the blockchain is not used in processing any large payments. One explanation for this is the inability of the technology to support multiple transactions simultaneously. By comparison, SWIFT can process up to 24 million transactions every 24 hours, while Visa can process 65,000 transactions per second. The Bitcoin blockchain, on the other hand, can only process about 2,000 payments in ten minutes a day.

Technical experts are fully aware of the limitations of blockchain. Until they can increase the block size to host more transactions, blockchain platforms will not be able to compete with MasterCard, PayPal, and other payment processing giants.

However, what can push blockchain and cryptocurrencies to mass use is Facebook Libra. This controversial project aims to create a decentralized payment network outside of the traditional financial system. Libra's medium of exchange is Stablecoin. The Libra Association, as a body created to manage money, will monitor the Reserve to maintain a stable value of the digital coin. If nearly two and a half billion Facebook users start using Libra to buy things and send money to other people, the Libra payment network will be able to destroy the monetary system and ruin global markets [174]. If Libra proves successful, it will give the social media titan and its investors financial and political influence significant enough to promote their ideas in government.

It is clear that in many countries, regulators are hostile to Facebook's ambitious goal. Given the company's ongoing stories of vulnerabilities to cyberattacks, Mark Zuckerberg and management have done a tremendous job to survive the tough global government scrutiny so that Libra can see the green light.

Insurance. As an industry that is constantly loaded with tons of paperwork, data warehouses, and legacy systems, insurance is the most promising for implementing blockchain. This innovation can also solve one of the fundamental problems in this business: the issue of trust.

Traditionally, policy holders have no choice but to believe and allow their insurers to give them the funds provided for in the contract, provided that the circumstances stipulated in the contract occur. However, insurance companies carefully try to avoid cases in which they will have to pay compensation.

Many insurance firms have already used blockchain smart contracts to promote mutual trust between insurers and policyholders. These coded policies provide absolute liability for both parties [175].

For example, Fizzy, a subsidiary of AXA, is developing a blockchain tool for checking flight delays and processing payments quickly. PolicyPal fully automates the insurance indemnity procedure for delayed accidents by using automatically executed digital contracts. These smart policies, linked to departure and arrival data, perform almost all the complex tasks for customers and insurers.

The Guardtime decentralized platform offers a variety of KSI-based solutions, which in turn help insurance companies better conduct their business and offer a variety of services. From supporting reinsurance standards, insurance policies, subrogation, regulatory compliance, to the connected vehicle and healthcare sectors.

State Farm and the United Services Automobile Association, a group of Fortune 500 financial companies, have teamed up to speed up the process of subrogation of automatic applications using a blockchain solution.

FidentiaX has created a marketplace for tokenized insurance products and a decentralized digital ledger for immutable user policy histories.

What's more, some insurance tech startups are combining P2P networks with blockchain to allow people to create cash pools to jointly insure each other without any authoritarian third party.

Teambrella and Lemonade are high – tech P2P insurance platforms with unique models. The former gives network members the right to approve claims and make compensation decisions through a transparent voting process, while the latter uses smart contracts to verify the legality of the claim and issue payments in record time.

English company Dynamis is a P2P Social Capital insurance startup that uses blockchain to verify a client's employment status using LinkedIn to ensure proper payments.

Cryptocurrency rental startup Beenest has joined forces with WeTrust to create a blockchain-based insurance product for the community of property owners.

In the field of Agriculture, the German company Etherisc has created a decentralized application that allows farmers to document weather-damaged crops and plots of land with fewer problems.

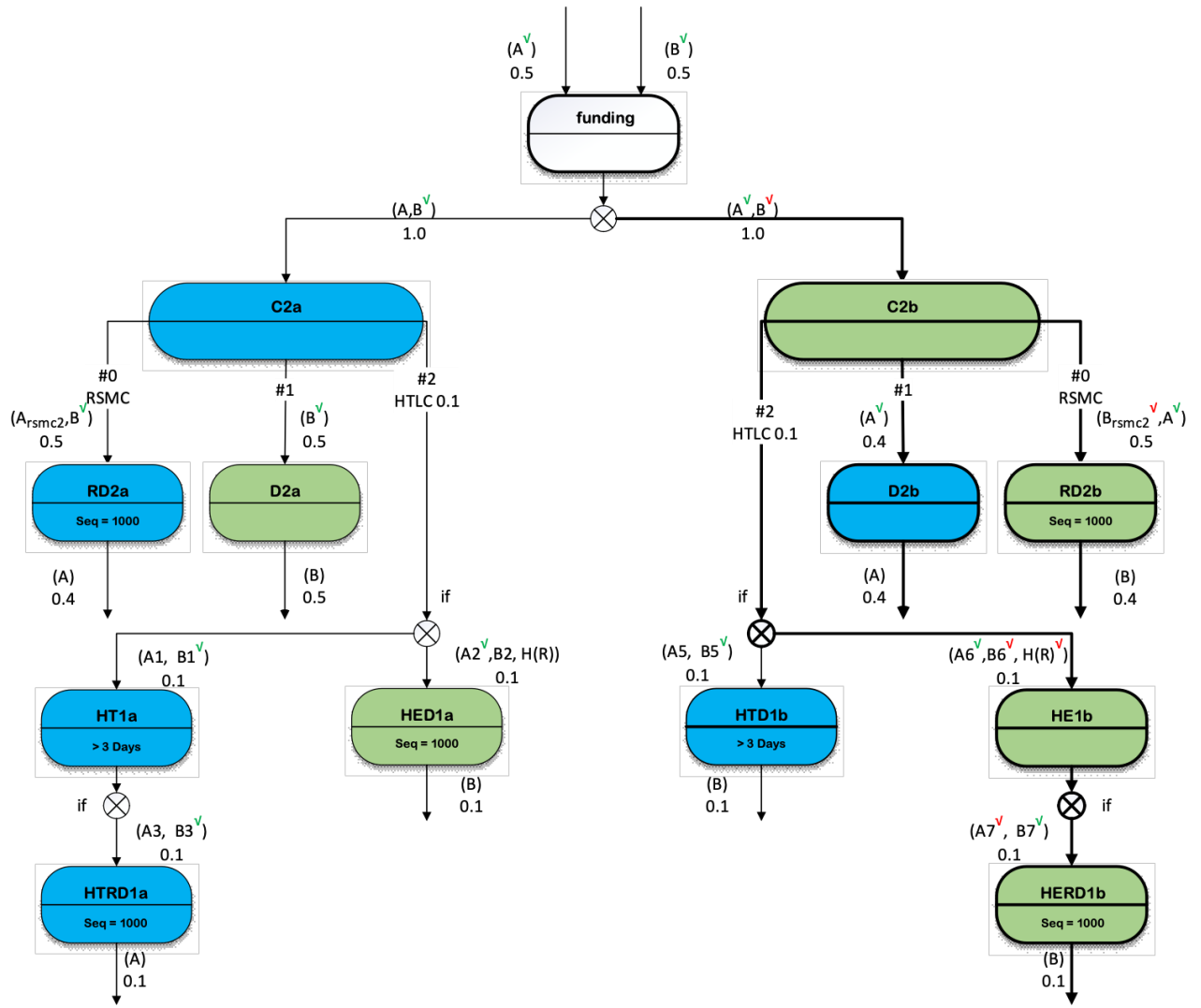


Figure 4. Algorithm of heshing blockchain in code

Real estate. As an insurance business, real estate is synonymous with a huge amount of documentation and uncertainty. The obvious needs of the real estate market are the decentralization of databases and the use of smart contracts. Moody's estimates that you can save up to 1 billion by integrating blockchain into single mortgage applications.

UBITQUITY is one of the firms that already uses blockchain to solve common real estate problems. The startup provides "recordkeeping-as-a-service" in European countries such as Sweden and the United Kingdom.

The United Arab Emirates, which intends to digitize half of the government's activities as early as 2021, is actively working with the private sector to implement its plans using blockchain [181].

Among the busiest agencies is the Dubai Land Department. In 2019, it partnered with Mashreq Bank to deploy a database of blockchain-driven mortgage transactions and with multinational telecommunications firm Etisalat to improve real estate registration and verification procedures.

Silicon Valley Blockchain Company Propy uses smart contracts based on the Ethereum blockchain to create a single place to sell real estate without third-party involvement. The startup recently helped sell a London estate worth 224 million in bitcoin. Even more impressively, in Russia, Propy promoted the sale of the first real estate that was purchased using Cryptocurrency in history. In the near future, the company plans to allow payment exclusively with digital coins. In Propy, cryptocurrency can be exchanged for P2P by eliminating fraud in transactions and democratizing real estate investments.

Rentberry, a startup operating in the US real estate market, is the most successful ICO in the real estate sector to date, it is rethinking the traditional model of renting housing in major cities around the world. The startup allows potential tenants to enter a tender war for rent, rather than paying on the terms of the landlord.

The idea of implementing blockchain is also very attractive for government agencies that have to administer large amounts of data. Currently, each government agency has its own separate database, so they have to constantly request information about residents from each other. However, the introduction of blockchain technologies for effective data management will improve the functioning of such agencies.

In this section, we go beyond the basics to look at how blockchain technology can transform government processes and experiences. To illustrate, let's look at customs in international logistics, which covers a number of government operations and the commercial world and involves numerous transactions. An important point for many parties involved is the lack of effective traceability, transparency, and predictability of shipments. This lack of information can lead to increased costs and reduced efficiency.

As traditional supply chains become more digitized, the delivery process creates and captures many new data points, offering opportunities to improve the process and

share information. The use of blockchain can have a transformative impact across all supply chains. For customs authorities around the world, this can mean eliminating delays in the final detection of shippers moving through customs and improving compliance with inspection goals through greater data availability.

In a recent technology survey, the World Economic Forum estimated that 10 percent of the world's gross domestic product (GDP) will be stored using blockchain technology by 2027.

In order to understand how blockchain can improve existing mechanisms, let's look at existing government projects that already help save public funds:

Swedish real estate blockchain project-Esplex. The project was created to simplify operations with the purchase/sale of real estate and mortgage transactions. The project consists of two main components: a private blockchain platform and a smart contract that allows you to automatically process transactions. The result of implementation can be a reduction in transaction costs; a significant acceleration of the process; a reduction in the cost of insurance that protects the process of transferring real estate, which now reaches 10% of the purchase value; a reduction in the bureaucracy of the process and fraud.

Stadjerspaspas is a blockchain project in the Dutch city of Groningen, a fully functioning service that uses the blockchain infrastructure to provide vouchers to low-income citizens. The main value of the system is to increase the efficiency of the distribution of public funds, register their use and prevent their forgery

Register of land ownership rights in Georgia – Exonum. The National Agency for state registration (NAPR) of the Republic of Georgia uses blockchain technology to provide its citizens with a digital certificate of land ownership. Thanks to the introduction of the technology, it was possible to significantly reduce the time for registering and confirming land ownership rights from 13 days to several minutes; increase the transparency and reliability of transactions and reduce operating costs by up to 90% for property registration services.

Estonia has already implemented blockchain technology at the government level. This technology uses advanced encryption technology and includes two-factor

authentication, which allows people to control their own data and be sure of its security [174].

According to Gartner, by 2022, more than a billion people will have some data about them stored on the blockchain, but they may not know about it [178].

Conclusions

There are three types of blockchain technology. The first is a public blockchain. The name speaks for itself. Such a blockchain network is completely open to everyone. No one needs any permission to participate. Any transactional process through such a blockchain is approved for everyone. Everyone has every right to upload the code. Anyone can check their current status, as well as make a decision about adding any blocks to the network. In addition, you can easily join the network without any permissions, and the system or servers do not require any maintenance. The public blockchain system is decentralized. This means that transactions are processed by a large number of special participants in the system – miners. As a rule, they can be anyone who has the appropriate hardware and software.

Functions of miners in blockchain systems:

- saving copies of data that protect the system from data loss and information forgery;
- confirmation of transactions in the system;
- checking operations performed by other miners.

Usually, the motivation of miners to help blockchain systems register and conduct operations, despite the fact that mining equipment is not cheap, is the reward from the system for conducting the transaction, as well as the commissions that transaction participants pay miners for processing the transaction.

The second type is a unified blockchain. It is also called a "consortium blockchain". This is a kind of counterweight to the public blockchain network. This is because people don't get access to the system and any transaction verification process. No one has the right to read this blockchain just like that. A group of leaders manages all processes. With this blockchain network, no one has the right to log in and

participate just like that. Before you can participate in any process on this network, you need to get the appropriate permission. Such blockchains are considered exclusive and are created for the development of private businesses.

The third type is a private blockchain. The difference between a private and a consortium blockchain is that, unlike the latter, a private blockchain is controlled by only one user.

The most popular is the public blockchain, because of the very idea of a system beyond anyone's control. The key area in which blockchain technology is being implemented today is the financial sector, namely payment systems built on the use of cryptocurrencies as a specific payment tool. Cryptocurrency, in turn, is a type of digital currency, the accounting and issuance of which is based on mathematical and cryptographic methods. The total market capitalization of cryptocurrencies in the world as of November 1, 2020 reaches about 5 500 billion, as can be seen on the graph (fig. 1), and the total number of cryptocurrencies is approximately 4 thousand, it is difficult to say the exact figure, because from day-to-day new ones appear or old ones disappear.

The most popular, in turn, are Bitcoin with a market capitalization of 327 billion. Ethereum is worth 554 billion [181].

However, depending on the field, other types of blockchain technologies may also be appropriately used. So a private blockchain allows you to configure various processes in the company, when it is necessary that only a limited number of users have access to certain information or transactions. For example, this may be relevant for medicine: a particular doctor has access to the patient's card and can enter certain information about treatment, diagnosis, medication prescriptions, and do so for the entire duration of treatment. The patient will have access to this private blockchain throughout their life, and the doctor will have access to it for the duration of treatment.

In general, the blockchain will be used in a wide variety of areas, such as: money transfers, micropayments, smart contracts, identification of physical objects and assets, Public Administration, defense and security, international activities, and so on.

So, the blockchain is a distribution system with special encryption, in other words, a complex innovative cryptographic technology that exists in various forms, is

rapidly developing and has many advantages along with well-established economic and legal systems.

The first attempt to solve the problem of payment security on the internet was made in 1981. The main problems were that the user was forced to report too much information about themselves. Besides, there was always a third party. So there was a threat of data leakage and the need to pay a commission. Only in 1993 was the first digital payment system created, which was relatively secure and allowed anonymous payments to be made online – eCash. It was developed by mathematician David Chaum. Later, Microsoft included eCash in its products. However, after 5 years, the company went bankrupt, then users did not care much about the security and privacy of online payments.