

Digital Technologies as the Basis of the Financial and Economic System Sustainable Development

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Abstract: Nowadays, digital technologies are a main driver of strengthening and increasing the society welfare and achieving sustainable development goals. We are presenting our own vision of ways, areas and reasons why digital technologies have already changed the financial and economic society system and outline the prospects for further change. Challenges of sustainable development and directions of their solution with the help of digital technologies are determined. In particular, the greatest attention is paid to the application of Big Data and blockchain technologies for the financial and economic system modernization. The development of the IT industry in Ukraine in recent years is analyzed and a conclusion is made about the positive prospects for the future. The directions of using Big Data technology to solve problems that hinder the sustainable development of society are suggested. The likelihood of applying digital technologies to solve environmental problems is assessed. The prospects for cryptocurrencies and other virtual assets impact on the financial and economic system are identified. The possibilities of blockchain technology application for the formation of local payment systems within local communities or large corporations in order to obtain cash flows optimization and seigniorage from the issuance of cryptocurrencies are illustrated.


1 INTRODUCTION


The world has changed and transformations are still going on under the influence of digital technologies. There have never been so many global changes in human history within such a short time. Digital technologies have expanded the range of services for society, made them cheaper and far more accessible. Statistics indicate clearly that well-being and security are growing (Rosling, 2019). Nevertheless, there are still a lot of unresolved issues in the global world, which are outlined in the 17 Sustainable Development Goals (SDGs, UN, 2019). Ukraine has joined the concept of sustainable development and has made lots


of achievements in recent years to implement it. However, many issues still remain to be solved, such as environmental pollution, providing people with decent wages and salaries; increasing the availability of education and health care; improving the quality of public administration and legal support of public relations. The list of problems slowing down Ukraine's joining the global process of sustainable development is far from complete.


In spite of numerous challenges, the presence of a strong IT sector in the country is a decisive factor in competitive success, and Ukraine has made significant progress in this area. The quantity and quality of IT services is growing annually, as well as


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their exports. The concept of IT state support has been formed, a special ministry was created to implement state policy (Ministry of Digital Transformation (MinDigital), 2019), and the number of public services in digital format and exports of IT services abroad are growing (more than 8% of total exports in 2020). The country continues to develop basic legislation and regulations to provide legal support of the virtual assets circulation (the basic law has passed the 2nd reading and is being finalized). The legal field is being formed to ensure the development of the virtual assets sphere and give legitimacy to the current situation (4th place in the world rankings, establishment of MinDigital in 2021). Tax preferences were provided for the development of the IT industry (special legal framework Diya City introduction in December 2021).

Ukraine has a banking system which is not inferior in technology to the banking systems of developed countries. The National Bank of Ukraine was one of the first to conduct thorough research in the field of digital currency implementation of the central bank (e-hryvnia project, 2016-2018). In fact, the research identified the availability of technological opportunities for the application of the Central Election Commission, and for the transition to the cashless electronic payments, if it is economically feasible and urgent. Ukrainian private banks (Privat24, monobank) have very convenient and reliable mobile payment systems.

The most advanced digital technology today, which is already used to solve complex social problems, is Big Data technology. This technology is actively used by government organizations and financial companies in such important areas as assessment of environmental losses; optimization of defense spending; reduction of public administration costs; development of quality and affordable medicine; road safety; cost optimization in trade and finance; development of personalized services; fraud prevention in various fields.

Government agencies, the National Bank of Ukraine, Ukrainian fintech companies, and the academic community are exploring the opportunities and risks associated with cryptocurrencies and other virtual assets. The authors also studied this issue from different angles. Cryptocurrencies are an illustration of advancing the development of technology over the public relations development, which generates mixed reactions from government agencies and consumers of financial and other services. One cannot help mentioning possible negative consequences: unregulated spread of cryptocurrencies could increase the money supply in the economy in the long

run, destroy the traditional financial system based on credit money, and even cause world financial chaos. In addition, cryptocurrency mining entails high unproductive electricity costs and diverts money from the real to the speculative sector.

Governments, however, have leverage to prevent the conversion of cryptocurrencies into fiat money, prohibit the payment of cryptocurrency taxes, and even impose penalties for mining or possession of cryptocurrencies. But due to globalization, the ban cannot be fully effective if at least one country exchanges cryptocurrencies for fiat money. Today, restraining cryptocurrency is more about government influence than the complexity of the tool itself and the lack of trust.

According to the authors, the focusing should not be made on cryptocurrencies as money. The real value lies in the blockchain technology that forms their core. It is a technology of distributed shared registers, which can completely change the financial and economic processes. Changes have already begun, but have not yet gained momentum. Scaling technology and its practical application can radically change the approaches to the formation of various property registers, the creation of transparent financial and non-financial agreements that cannot be falsified, change approaches to auditing and financial accounting. There are already examples when big cities (Miami, New York, 2021) have created their own cryptocurrencies and received a seigniorage from their implementation, which replenishes the local budget and provides an opportunity to finance infrastructure projects.

2 RESULT AND DISCUSSION

The contemporary way of living is ensured by a large number of achievements which have increased the level of human well-being as well as life duration and quality. Improvements in the quality of life all over the world are reflected in the United Nations statistics. A thorough analysis of this phenomenon was conducted by H. Rosling in the work «Factfulness» (Rosling, 2019). Basing on the UN statistics study, the author cites the following facts: availability and improving the quality of secondary education; increasing of the world's population expenses on leisure and recreation; literacy rates growing; reduction in number of famine and natural disasters victims; expanding access to modern medicine, including preventive vaccination.

However, the world is still far from becoming a completely safe place. On the contrary, there is an

increase in risks and problems accumulation. The world community is currently experiencing COVID-19 coronavirus pandemic. New strains of the virus are emerging, vaccinations and other preventive measures are being taken, and the global economic system is losing money and opportunities through restrictive measures. Moreover, the pandemic has shown the global health system and most national systems being ungroundedly complacent and dangerously unprepared for the situations like that. Climate change and related natural disasters are still incredibly serious global problem. The military-political situation is threateningly tense. The income gap between the wealthiest families and the rest of the community is widening sharply (while the number of those always referred to as the «middle class» is declining in parallel with total poverty decline). The desire of the world community for stability and improving the world population life quality in whole gave rise to the concept of sustainable development.

The concept of sustainable development, in general sense, contains requirements for environmental protection, social justice and the absence of racial, national and gender discrimination (Vasylychuk, 2015).

The concept of sustainable development quickly became a global blueprint. UN member states adopted and approved a paradigm of sustainable development, consisting of 17 goals in 2015. The Sustainable Development Goals or SDGs and the intermediate results of their achievement for Ukraine can be presented in the following format (Table 1).

Table 1: Sustainable development goals and challenges to their achievement in Ukraine.

Factors	Characteristics
Elimination of poverty	Ukrainian GDP per capita amounted to 3725.6 USD in 2020 (MFU, 2021), which is a low figure. Nevertheless, the share of the population that can be attributed to pure beggars (living on less than \$ 2 a day) is a small one.
Elimination of hunger	Virtually eliminated.
Good health and well-being	The COVID-19 pandemic has clearly shown a terrible state of Ukrainian health care system. The country has a very insignificant middle class share, which indicates well-being problems.
Quality education	There are numerous problems, but they are gradually being solved even in times of financial and economic crisis.

Gender equality	There are no clear signs of gender inequality, although hidden ones can be spotted out (for example, the share of women in politics or the large corporations top management).
Clear water and sanitation	The majority of the population has access to clear water. There is a sanitary inspection of average quality.
Inexpensive and clean energy	The cost of energy is growing and the trend will probably continue. A significant proportion of energy is produced from carbon. The share of «green» energy in the energy balance was 12.4% in 2020, which is an average percentage. The figure will have reached 25% by 2030, but this will probably happen sooner (ME, 2021).
Good work and economic growth	Ukraine has become a leader in labour migration in Europe since the events of 2014. 3.2 million Ukrainians worked abroad in 2020 (Demographic Yearbook, 2020). The process of deindustrialization has been going on in the country. Most young people dream of working abroad after graduation.
Industrialization, innovation, infrastructure	New industrial companies practically do not start up, there is the innovation sphere, but it is almost completely concentrated in the IT sector, the infrastructure (except telecommunications) is mostly outdated and problematic.
Reducing inequality	The problem of inequality in Ukraine is the paramount issue. Ukraine has a clean oligarchic economy nowadays. The share of the poor is large and amounts to 51%.
Stable cities and towns	Small towns and villages have extraordinary problems. Many residents find it difficult to get medical care. There are no schools, even primary education in villages quite often.
Responsible consumption and production	The lack of achievement in this area is clearly evidenced by deforestation and amber mines, which virtually destroy the landscape of entire areas.
Combating climate change	Ukraine has joined all international initiatives on this issue. Besides, and the country's deindustrialization has significantly reduced CO2 emissions.

Conservation of marine ecosystems	Ukraine virtually does not have serious business activity in sea basins and takes measures to preserve marine ecosystems
Conservation of terrestrial ecosystems	The country has serious problems in this area. They are as follows: large number of landfills (160 thousand hectares, 480 tons of garbage per capita (SSUFSCP, 2021)), lack of recycling, uncontrolled land use, which leads to land depletion, unlimited deforestation, unrestrained mining
Peace, justice, effective institutions	Military actions have been occurring in some parts of the country, both crime rates, and level of corruption in the judiciary are high. Besides, and many state institutions are inefficient and expensive to maintain. However, civil society is being formed, public administration reform is underway, access to public services is being simplified.
Partnership for Sustainable Development	Ukraine seeks and finds partners, participates in international organizations and events on sustainable development, conducts relevant educational work

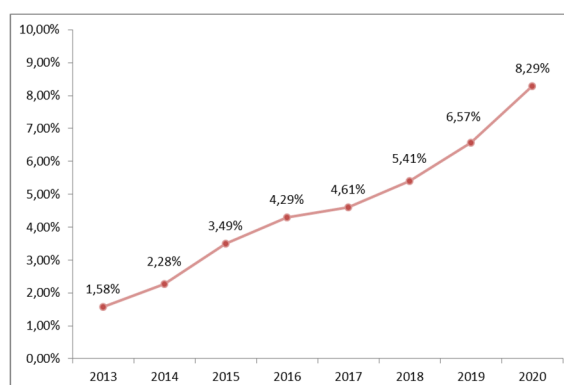
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The outlined range of problems shows that Ukraine is still far from meeting requirements in the field of sustainable development of developed countries, but there are both an aspiration and beginning of practical work.

The information (digital, fourth industrial) revolution which began in the early 21st century has certainly affected the vast majority of economic and financial processes, and it has had a positive influence in most cases. According to the authors study, a great many of today's achievements in education, health care and the quality of public services would be totally impossible without modern digital technologies. Despite a significant lag in various economic spheres, Ukraine is far from the last in the world in area of the information technology industry.

The potential of our country in the field of digital technologies is evidenced by statistical data, in particular, Ukrainian IT exports data. In 2020, for the first time in our history, this figure was at a record high of more than USD 5 billion, which is almost 20% (USD 853 million) higher than the previous year (USD 4.2 billion). In general, compared to 2013, the IT industry year by year showing a positive trend (Figure 1). Therefore, the share of IT in total exports has currently reached 8.3% (more than five times as

much as 1.58% in 2013) (DLF Attorneys-at-law, 2021).



Source: DLF Attorneys-at-law, 2021

Figure 1: The share of IT services in GDP of Ukraine in the period 2013-2020, %.

Exports of IT services have already outpaced the volume of chemical products, reached the level of mineral products exports and is approaching the exports of metallurgical products.

It is the IT industry that is gradually returning Ukraine to the club of high-tech countries, and growth of the share of this export item is much higher than the growth of any raw material exports (for example, exports of ferrous metallurgy or agriculture).

The Ministry of Digital Transformation of Ukraine (MinDigital), which is the central executive body, started operating in Ukraine in 2019.

MinDigital is the main executive body which represents the public policy in the field of digitalization. This policy defines the recently announced concept of «state in a smartphone» and represents the areas of digitalization of public administration, social security, public services, transparent paperwork, and the role of the state in creating digital infrastructure. Digital transformation should take place by combining digital infrastructure (broadband Internet, telecommunications infrastructure, development and functioning of Diia City legal framework) with the development of digital skills in citizens, the spread of e-commerce, the conversion of most public and private services into digital format (Cabinet of Ministers Resolution No. 856, 2019).

MinDigital has made significant achievements in the provision of public services through Diia digital application and educational services in the digital literacy field for two years of operation. The Ministry

of Digital Transformation has the following ambitious goals:

- to convert 100% of all public services for citizens and businesses into online version, to provide high-speed Internet almost throughout Ukraine, teach 6 million Ukrainians digital skills, increase the share of IT in the country's GDP to 10%;

- to conduct an electronic census in 2023 in cooperation with Apple;

- to launch the Unified Social Information System (UISS) in all regions, which is to help in carrying out the social sphere digital transformation, receiving quality data and providing prompt services to the Ukrainians. The introduction of a single system saves the budget up to UAH 11 billion annually (MDTU, 2021).

Ukraine has a high level of digital technologies penetration into the financial sphere. The Ukrainian banking system meets the best world standards in terms of technology. The National Bank of Ukraine began research in the field of digital currency development by central banks (CBDC) in 2016. Payment systems of commercial banks (including mobile mode) such as Privat24 (digital application of a state bank), monobank (digital application of a private bank), and other payment systems have been operating successfully.

Sustainable development projects financing as well as stable financial and economic system forming require long-term financing and cash flows optimization. This is exactly why the concept of sustainable financing was formed.

Sustainable financing is investment decision-making system in the financial area, taking into account environmental, social and governance considerations (ESG). Going forward, this should ensure that long-term investments are prioritized in projects that will provide the greatest benefit to society. The direction of the investment flow in projects aimed at solving the problems of climate mitigation or pollution of the planet's ecosystem is very important. Long-term financial investments should also be directed to social projects, such as the formation of human capital and the creation of quality jobs in problem regions, addressing issues related to any inequality and violation of human rights, and the development of inclusiveness. Sustainable financing should also contribute to the improvement of the management of subjects of public and private law, the formation of optimal labor relations, and the solution of the problem of fair wages in the public and private sectors of the economy (Overview of sustainable finance, 2019).

There is a fairly direct link between digital technologies, sustainable development and the sustainability of the financial and economic system. Digital technologies help optimize any process, including the processing of large data sets and the formation of management decisions on their basis. It can be vividly illustrated by the example of common technology Big Data (Table 2).

Table 2: Sustainable development challenges to be solved using Big Data technology.

Issue	Ways to solve, result
Road safety	Fast processing of data on road accidents, emergency sections of roads, payments of insurance companies and MTIBU, logistical problems. Proposals for optimizing and improving road safety are being formed. The results are increased security and reduced costs (for both public and private carriers).
Reducing public administration costs	Big Data analytics gives opportunity to optimize public administration costs at the state and local levels in virtually all areas. First of all, the costs of analytics are optimized totally, from procurement to evaluating the effectiveness of projects in the field of infrastructure, education, health care, social protection.
Optimization of defense spending	Processing of intelligence data and development of tactical and strategic response measures, analysis of new weapons parameters and defense technologies to determine the feasibility of spending money on their purchase or development
Estimation of ecological losses	Processing of data on pollution of air, water and land plots under dumps provides qualitative analysis of both reasons and consequences of pollution (for financial compensators definition)
Development of high-quality medicine	Big Data is successfully used to diagnose diseases, predict the epidemiological situation, assess the required medical capacity, the number of doctors and medical staff in the territorial context

Cost optimization in trade	Technology allows to track consumer preferences in almost any trade segment. Sellers can reduce the cost of unnecessary advertising, form targeted proposals, and develop e-commerce. As a result, prices for consumers decrease.
Fraud prevention of in various areas	With the help of Big Data information can be process and financial abuse can be detected in the following public and private spheres: misuse of public funds or local budgets; abuse in the field of public procurement; manipulation of financial statements; insider information trading.

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The abovementioned list is far from exhaustive, still, illustrates the versatility of technology to solve applied problems of sustainable development.

The ecological approach should be considered separately. Six of the seventeen sustainable development goals are directly related to the environment. Establishment of environmental standards, their observance, allocation of funds and their intended use, analysis of data on the state of the environment in various areas, assessment of the effectiveness of environmental projects, analysis of compliance of environmental projects with established criteria, assessment of financial losses due to environmental damage cannot be solved without digital technologies (Table 3).

Table 3: Application of digital technologies in the management of environmental projects financing.

Technology	Characteristics
Big Data	Large data sets analyzing and identifying the causal links between pollution and climate change, assessing the impact of pollution factors on air quality, groundwater, land resources and their impact on human health.
Artificial Intelligence	Building accurate forecasts of climate change, the impact of climate change on the economy and the environment, developing measures to prevent natural disasters and measures to slow global warming. Estimating the amount of financial resources necessary for solving environmental problems at the global and local levels.
Blockchain	Technology application of to track the targeted use of funds allocated for the

	environmental projects implementation. Improving the work with green bonds. Use of virtual assets to finance local or global environmental problems solution.
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Both nowadays and in the future, the most controversial issue in ensuring the sustainable development of the financial and economic system is the virtual assets usage, which in most cases are associated with the use of digital currencies. Digital currencies were created on the basis of blockchain technology. Later, it became clear that the technology is universal and can be applied to change and optimize many management processes. Today, governments and private companies are conducting research on the blockchain functionality. The question of the expediency (inexpediency, danger) of using decentralized money is sure to remain on the surface.

It is both a technical and a fundamental issue. The emergence of decentralized digital currencies is a clear example of technology being ahead of public institutions in its development. Cryptocurrencies are used almost all over the global world, having a legal basis only in a small number of countries. There is still no single socio-economic paradigm for treating this phenomenon. At the same time, opinions are radically different (from a complete ban on circulation to granting the status of the second national currency). The authors have previously studied this issue (Suprun, 2021) and came to the following conclusions:

the money supply grows if digital currencies are not controlled by the state, spread rapidly and are widely used in circulation. The state can probably try to regulate and control the circulation of digital currencies, but the big question is whether it will succeed;

the rapid growth in demand for digital currencies both as a means of circulation and as a medium of accumulation seems quite dubious as new digital money, which has no real basis, has already been the subject of speculation. Further growth of digital currency mass and the possibility of its transferring to fiat money can lead to financial system chaos in the long run;

the introduction of new digital technologies can change neither tax rates nor the mechanism of their payment, therefore, cryptocurrencies will not be able to fully perform the functions of money either in the near or in the medium term, unless governments allow their using to pay taxes.

Ukraine has made significant progress in the use of digital currencies, applying advance technologies in this area and in the legal framework formation. The following facts support this concept:

the National Bank of Ukraine completed a pilot project on the digital currency introduction by central bank (CBDC) in 2018;

according to the Ministry of Digital Transformation of Ukraine, the country has been on the 4th place in the ranking of the global index of cryptocurrency use in 2021 (MDTU, 2021); the regulator conducted a survey of financial market experts and identified three areas of possible use of e-hryvnia in 2021 (NBU, 2021).

The Law of Ukraine «On Virtual Assets» was adopted On September 8, 2021 (The Law of Ukraine №3637, 2021). The law provides for a comprehensive settlement of legal issues arising in connection with the circulation of virtual assets in Ukraine, defines the rights and obligations of the virtual asset market participants, the principles of state policy in virtual assets circulation.

The facts show a high level of activity in the use of virtual assets, including digital currencies, both at the private sector and at the state levels.

Digital currencies today have a number of disadvantages, including the difficulty of application, the risk associated with volatility in their exchange rate and lack of legal status in many jurisdictions, as well as unproductive costs. Cryptocurrency mining requires large amounts of electricity, which is accompanied by an essential increase in heat emissions. These are unproductive costs of society and great environmental burden, which is completely inconsistent with the sustainable development goals. To illustrate this point, let us give some indicative figures regarding the costs of electricity and CO₂ emissions associated with the mining of cryptocurrencies. Scientists at the University of Cambridge have calculated that about 121.36 terawatt-hours per year are spent on cryptocurrency mining. This exceeds electricity consumption in countries such as: Argentina (121 TWh), the Netherlands (108.8 TWh), almost equal to the consumption of Norway (122.2 TWh) (Chikishev, 2021).

As for the cost of electricity, this is probably, a problem that would be resolved sooner or later. After the energy crisis of 2021-2022, associated with rising gas prices, we can expect investments in the field of alternative energy sources. A technical solution will be found and energy will get cheaper in the future.

In our view, the carbon emissions associated with cryptocurrency mining are a big problem.

Bank of America Global Research analysts in their report «Bitcoin's dirty little secrets» presented a number of disadvantages of bitcoin, among which are:

- the inability to use it as a means of storing funds or making payments;

- the formation of a certain centralization (as of mid-2021, 95% of bitcoins were controlled by the owners of 2.4% of wallets (recall, the initial idea lay precisely in decentralization);

- low speed of payment processing (1400 transactions per hour against 236 million transactions processed by the payment system Visa);

- negative impacts on the environment.

Regarding the latter disadvantage, the report provides figures from current research: each purchase of cryptocurrency for 1 billion dollars is equivalent to annual carbon emissions from 1.2 million cars; mining and operations emit about 60 million tons of carbon annually, which is comparable to carbon emissions from a country like Greece (Winter, 2021).

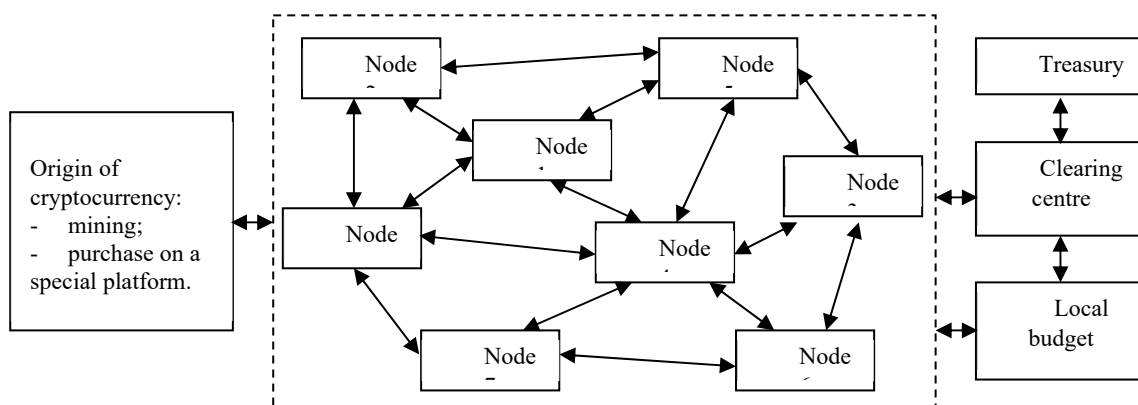
However, there are cases when cryptocurrencies are used for the needs of society. It concerns a new phenomenon such as cryptocurrencies, issued by municipalities to finance the community needs. The City of Miami launched its own cryptocurrency, MiamiCoin On June 8, 2021. The current value of the currency at the beginning of December 2021 was about 2.3 USD (at the initial rate of 0.02 USD), and the volume of trades per day was almost 500 thousand USD. MiamiCoin can be extracted using the Stacks protocol or purchased on the open market. The city has already received more than \$ 20 million from the MiamiCoin project, and its market capitalization has reached 2.9 billion USD (Kim, 2021). The city revenues are essentially pure seigniorage and can be used to finance infrastructure projects, develop small and medium-sized businesses, and improve the functioning of municipal education and health care facilities.

Being able to have a local means of payment speeds up the exchange of values within the community, especially providing municipal and private property is also tokenized (Figure 2).

According to the concept, you can get local cryptocurrencies in two ways by mining or purchasing on a specialized platform, which was created with the participation of the municipality (you can use existing platforms under the contract). Within the community economy, coins can be used to obtain goods and services from local producers. Thus, transactions are carried out almost instantly in the distributed system and without participation of intermediaries (with the minimum commission or without the commission at

all). The distributed system provides both circulation and control over transactions, which makes financial fraud impossible (the content of each transaction is reflected for all the participants and making any changes retrospectively is out of the question). The system is impossible without the mechanism of

converting cryptocurrencies into fiat money. Besides, the scheme provides a special clearing center for the operation, which is in charge of providing communication with the state treasury. In addition, the clearing house provides a link between private owners and the local budget.



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Figure 2: Scheme of regional (local) cryptocurrency functioning.

According to the project, cryptocurrencies can be used to pay local taxes. If the scheme works, there is an increase in its functionality. For example, microinsurance, microcredit for small businesses and households (without commissions and with low interest rates compared to banks). It contributes to the development of small business, which is always the mainstay of the local community, as well as employment and consumption, improving business activity. The local government, which is the initiator and the first issuer, receives seigniorage, which can be used for the urgent community needs in the field of health care, education, infrastructure projects. Conditions for the implementation and operation of such a scheme are as follows:

positive credit rating of the city (coins issued into circulation should be considered both as a means of payment and as an investment);

regulatory framework governing such transactions;

citizens' trust in the city (involvement of as many local entrepreneurs as possible in the project, households are a factor without which the project cannot be implemented).

It is the combination of these conditions that ensured the success of such a project in Miami.

Such a project is non-feasible for Ukrainian cities currently, due to low credit rating (or lack thereof) in Ukrainian cities, imperfect legal framework (draft law was not signed by the President after the first reading and sent for revision) together with distrust

and low level of financial and digital literacy. But the situation is changing rapidly and this experience should be taken into account in the medium term.

The Central Bank's Digital Currency (CBDC) project is most likely to be initially implemented in Ukraine. The pilot project showed that there are no technical obstacles to the e-hryvnia introduction. The survey on market experts' vision of e-hryvnia suggested the following areas of its use:

usage in the field of retail payments, targeted social benefits, the formation of the functionality of programmed money (for example, today support program of UAH 1,000 for every fully vaccinated person could be paid directly by the National Bank through the Diya without the commercial banks participation);

applying e-hryvnia in transactions together with other virtual assets having subsequent ability to transfer funds to other forms of fiat money (after the adoption of the relevant laws and regulations, the virtual asset market can develop rapidly and require convenient, comprehensible monetary support for transactions);

making cross-border payments from the Central Securities Depository of other countries (primarily it can be implemented for settlements in the international system of liability insurance of vehicle owners «Green Card»).

In addition to cryptocurrencies, the blockchain provides many opportunities to optimize financial and economic processes and improve people's lives.

In the future, it is to be a main mechanism to transfer any values.

The problem of property registration is very acute in many developing countries, especially when it comes to real estate and land. The facts of fraud, falsification of registers take place very often. At the same time, the judiciary is often too corrupt to consider approaches to solving the problem. A very in-depth study of this issue was conducted by Hernando de Soto, who concluded that lack of property legalization, proper registration, easy and inexpensive registration of property rights are perhaps the main factors of long-term poverty in most developing countries (De Soto Hernando, 2017). It is already clear that the blockchain is solving this problem completely for the benefit of society and at minimal cost.

Owing to blockchain technology you can create property registers invulnerable to hacks and fraud, which can be used to prove the right of owning a house, car and other assets (Vigna, 2018).

The land market is currently being launched in Ukraine. One of the reasons which is certain to hinder its development can be the factor of distrust on the part of investors in securing property rights to the acquired land. The formation of transparent registers which can be neither changed nor corrected retrospectively is a crucial point in the success of the reform and a decisive factor in ensuring the growth of its value.

Future increasing of the technology availability will give opportunity to form the ownership registers of housing, cars, cottages, garages and other properties. The factor of unquestionable registration is to be of paramount importance in increasing the value of the objects being registered. In the long run, it must lead to an increase in nationwide capitalization.

Blockchain technology has the potential to change the financial and economic system, ensure its future stability and support sustainable development (Table 4).

Table 4: Blockchain technologies application in financial transactions.

Institution, country, technology	The content of the operation
Creating local quasi-money systems	Large corporations can create «internal money» systems for payments within the corporation. It speeds up and optimizes money circulation and makes transfer pricing more transparent.

Optimization and transparency of financial accounting	The technology gives opportunity to link financial assets reported in companies' balance sheets to their fair value on the open market. This makes it impossible to manipulate the revaluation of assets in order to ensure fictitious capitalization and other falsifications.
Confirmation of both agreements authenticity and parties to contract identity	Consolidation of information in the blockchain system gives opportunity for carrying out quick necessary checks in real time. In this case, the blockchain system protects information from retrospective data changes.
Automatic business transactions recording by stakeholders	Either financial or non-financial transactions are automatically recorded for all the stakeholders. Simultaneous access to information of all participants provides transparency in calculations, impossibility of falsifications and fraudulent actions
Blockchain registers creation	For example, creating a blockchain register of specialists in a certain field (banking, insurance, stock exchange) including educational institutions, self-government organizations, state regulators. Thus, formation of an independent and true qualification rating is provided.

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The authors of the article share the opinion of a great many financial analysts, researchers and practitioners forecasting next decade to be a period of economic and financial processes transition to blockchain technology as a universal technology of value exchange.

4 CONCLUSIONS

Mankind has no alternative to sustainable development; therefore, the sustainability of local and global financial and economic systems is both a prerequisite and a product of sustainable development. The financial sector is rapidly digitalizing and becoming a generator of new opportunities. The IT industry is becoming a major factor in shaping the potential for success in the sustainable development of the financial and economic system.

In recent years, both front and back office of financial companies and government regulators have changed radically. More and more services are

provided in digital format, which saves time and money. It is time to form total access to financial services in a mobile format and transition from standardized services to personalized ones.

Ukraine has a strong IT industry and banking system, which is not inferior in technology to the banking systems of developed countries. The state supports the IT industry through tax preferences, promoting the development of IT education, digital literacy. Among digital technologies that have the greatest impact on the financial and economic system today, Big Data technology is the most mastered, and the blockchain has the greatest potential for development.

The main applied research in the use of digital technologies to ensure a sustainable financial and economic system in public and private spheres should be the following:

analysis of large data sets in the fields of ecology, health care, industry, finance, public administration in order to identify necessary financial resources for their implementation;

evaluation of the potential and already implemented projects effectiveness;

formation of blockchain schemes within corporations, public institutions, including with the use of quasi-payment instruments within systems;

assessment of the consequences of the central banks digital currency's introduction;

formation of accounting, financial and management accounting systems based on blockchain and connected with the fair value of assets in the markets.

Owing to digital technologies, the goals of sustainable development of the financial and economic system can be achieved in the historical perspective in a relatively short period of time. Blockchain technology has the capacity to change the financial and economic system, ensure its stability in the future and support sustainable development.

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