# *ACCOUNTING IN THE DEVELOPMENT OF THE DIGITAL ECONOMY*

**Vasyl KUZ**
*Candidate of Economic Sciences (PhD),*
*Associate Professor,*
*Department of Accounting and Taxation,*
*Yuriy Fedkovych Chernivtsi National University,*
*Chernivtsi, Ukraine*
*ORCID ID: 0000-0002-6008-7203*
*v.kuz@chnu.edu.ua*

**Abstract**

*In the conditions of development of digital economy and use of information and communication technologies in accounting process the basic parameters of functioning of system of accounting change. The purpose of accounting does not lose its traditional meaning, but the requirements for the quality of accounting information increase, and due to the increase in the number of objects of accounting and information requests of users on the content and form of presentation, the studied information system should perform additional consolidation, creative and predictive functions. The system of methods of processing and disclosure of credentials is significantly expanded. The accounting system in the digital economy should provide real-time accounting data processing, electronic data exchange, application of software standards for reporting data, the use of «cloud technology» and artificial intelligence, econometric methods and methods of mathematical modeling to solve accounting and management tasks. With the help of information and communication technologies it is possible to ensure optimal disclosure of information in accordance with the information requests of users. The development of accounting in the context of digitalization of economic processes increases the list of necessary professional competencies of accountants aimed at studying the content and features of the use of information and communication technologies in economic processes.*

**Key words:** *Accounting, digital economy, information and communication technologies, purpose, tasks, functions, objects and methods of accounting, information disclosure, professional competencies of accountants.*

**JEL Classification:** *M21, M41.*

## Introduction

Effective operation and development of companies is impossible without the use of information and communication technologies in solving various economic and managerial problems. Informatization (digitalization) of economic processes provides an opportunity to gain competitive advantages associated with increasing productivity, optimizing the implementation of production programs, reducing costs, raising awareness of decision-makers and more. Along with the positive features of the introduction of information and communication technologies in the economic process, there is a set of risks that manifest themselves in rising unemployment, the need for retraining and additional training, incurring additional costs, increasing data processing, potential loss of information confidentiality. However, the identified dangers of the digital economy are not the dominant factors in its formation and development. Information and communication technologies produce new forms of economic relations, new approaches to data processing, new communication procedures that avoid external and internal threats to economic activity, including those formed under the quarantine restrictions caused by the COVID-19 pandemic. After all, the organization of remote work of workers, communication systems, growth of digital trade and other forms of e-commerce, the organization of logistics systems with the help of information and communication technologies have avoided severe crises in the economy.

Changes in business processes due to the use of information and communication technologies have a significant impact on the organization of the accounting system through the modification of goals and objectives, identification of new accounting objects, application of additional accounting methods, introduction of innovative technologies to perform accounting tasks.

## 1. Literature review

Review of the results of research conducted by Ukrainian scientists (Yershova, N.Iu., 2020; Spilnyk, I. and Paliukh, M., 2019; Shyshkova, N.L, 2019; Rohova, N.V, 2020; Sokolenko, L.F, 2019; Mazina, O.I, Oliinyk, V.S and Rohoznyi, S.A, 2019; Kulynych, M. and Zhylenko, L., 2019; Vysochan, O.S and Hrytseliak, U.I, 2020; Shendryhorenko, M.T and Liadska, V.V,

2020) to determine the basic parameters of the accounting system in conditions of digital economy development showed the lack of systematic and comprehensive scientific and practical results that would assess the changes in the studied information system at the theoretical level under the influence of information and communication technologies in business and accounting processes.

## 2. Research methodology, data and hypotheses

The main hypothesis of the study is the consideration of the management orientation of the development of the accounting system under the influence of the introduction of information and communication technologies in the economic and accounting process of the company. This statement implies an increase in the number of objects of accounting, methods of information processing, functions and tasks that must be performed by the accounting system.

## 3. Digitization of Ukraine's economy

Among the management staff of companies there is a very pragmatic vision of strategic development goals focused on the introduction of information and communication technologies in business and management processes. In particular, according to a survey of executives (CEO) conducted by KPMG, more than a third of Ukrainian respondents report that the pandemic has accelerated the digital transformation. At the same time, the most successful was the digitalization of operating activities (39% of respondents) and the creation of new digital business models and revenue streams (36% of respondents). World progress has been much more intense: 80% of respondents report that the pandemic has accelerated the digital transformation. The digitalization of operational activities was also the most successful: 30% of respondents admit that progress in this issue has not just accelerated, but postponed them for years to come [1].

In the sectors of the Ukrainian economy there is an imbalance in the digitalization of economic processes. Although in the field of services there is a greater use of information and communication technologies than in industry or agriculture, but even this situation is not in line with global trends (e-commerce in retail (Ukraine – 4%; European Union – 7%); CRM-systems (Ukraine – 10%; European Union – 33%); people who buy online (Ukraine – 23%; European Union – 55%); people who receive services online (Ukraine

– 29%; European Union – 48 %); the share of companies that have a website (Ukraine – 43%; the European Union – 77%) [2]), which indicates the lag in the development of the digital economy in the national dimension. «In Ukraine, the concept of «digitalization» is focused exclusively on creating new types of services based on the collection and analysis of data from various physical objects (buildings and structures, vehicles, industrial equipment, etc.) and does not cover the issue of radical change in the production system, approaches to the design, production, marketing and operation of these physical objects, which is laid down in the concept of Industry 4.0» [3, p. 117]. Despite the lag of Ukrainian companies in the implementation of information and communication technologies in business processes, this process is irreversible, which requires the adaptation of related processes, in particular those related to the processing of economic information.

Thus, the adaptation of the accounting system to the requirements of the digital economy can be considered as the introduction of elements of information services digitalization of business processes, which requires accounting identification of new objects and qualitatively new use of information and communication technologies in accounting processes.

**4. The purpose of accounting**

The accounting system is an information system, the main purpose of which is to provide relevant information to interested users. Its specificity is a set of accounting rules by which the identified economic entities are subjected to appropriate accounting processing, as a result of which the array of external and internal data takes the necessary forms using methods of generalization and systematization. The system of accounting methods of information processing corresponds to a certain economic model, with the change of which not only the accounting procedures are modified, but also the very purpose of accounting needs to be clarified. «In the digital economy, the theory of accounting is designed to capture the possible emergence of new economic laws and principles in economic relations» [4, p. 56-57].

Given the increasing digitalization of business processes, the active use of information and communication technologies in management and accounting processes, accounting entities receive additional leverage to prepare information support for management decisions, which requires

clarification of the purpose of accounting in focus not only on providing users relevant information in accordance with their information requests, but also on the cost-effectiveness of such data. With the development of the digital economy, the accounting system is gaining more and more managerial features. «Global informatization of the economic space is dialectically interrelated with the need for adequate changes in the theory and practice of accounting, which is the most important element of information and analytical support for business management» [5].

The lack of practice of reviewing the organizational, methodological and methodological aspects of the accounting system under the influence of the development of information and communication technologies can lead to the loss of accounting status of the dominant information system that produces relevant information. It is correct to say that the use of information and communication technologies creates «prerequisites for building an accounting system that would meet the needs of users, contain information about internal business processes and the state of the environment, expressed in financial and non-financial indicators, taking into account socio-humanitarian priorities, provided for the use of alternative accounting methods, new objects of accounting, the results of the use of integrated types of accounting in real time using the latest information technology» [6, p. 86].

Thus, the purpose of accounting in the digital economy involves the prompt provision of users with relevant accounting information, which in its content includes financial and non-financial data from the internal and external socio-economic environment.

**5. Tasks and functions of accounting**

The main task of accounting in the application of information and communication technologies in business and accounting processes is to accelerate the processing and provision of information to users. Yershova N.Iu. argues that the informatization and globalization of economic processes leads to the need to consider information as a key factor in production, identification of intangible forms of capital, virtualization of assets and liabilities, internationalization of socio-economic activities. These aspects lead to changes in the methodological principles and practical aspects of the functioning of the accounting system, namely: «expanding the reflection of the scope of the company in accounting; increasing the efficiency of accounting; identification and increase in the number of new objects of

accounting; development of innovative methods of assessment of new objects of accounting; formation of approaches to the integration of different types of accounting; improvement of technology of accumulation of the necessary information, its storage, transfer to users; increasing the risk protection of enterprise information; complicating the requirements for the professional competencies of an accountant» [5].

IT-modernization of accounting procedures solves the following tasks: collection, grouping and streamlining of information flows (accounting of business transactions in real time); fast access and issuance of information (exchange of electronic data – from primary to reporting); reducing the interval between obtaining information and entering it into the database (Big Data); reducing the risk of errors in accounting and decision-making processes, which allows the company to avoid misrepresentation of information in accounting; integration of all levels of accounting to create a single information base (expanded language of financial, management, tax reporting of various business areas); automatic generation of reports («cloud technology» calculations, accounting operations based on clouds); ensuring effective operational control (artificial intelligence, modernization of mathematical modeling by modern innovations) [7, p. 150-151].

The use of information and communication technologies in the organization and maintenance of accounting significantly expands the possibilities of accounting information processing, which leads to the implementation of the studied information system more not only accounting but also management tasks. In this context, N.V. Rohova's opinion is relevant: «in the long run, digital technologies create the conditions and open new opportunities for rethinking and radically improving the solution of accounting problems» [8, p. 105].

An expanded list of tasks that can potentially be performed by the accounting system in terms of the use of information and communication technologies leads to the emergence of new functions. In addition to such basic functions as information, analytical, control, evaluation and social accounting system can perform others. «The need to consolidate management processes and IT services is added to the usual functions of accounting and reporting. As a result, the quality of information support of individual departments and users, united by a single digital platform will increase» [7, p. 148].

According to L.F. Sokolenko «accounting acquires new functions – the predictive function is strengthened, as new databases on business processes of the company contribute to the formation of functions for forecasting phenomena and processes, revealing their patterns that can be used by all subsystems of company management» [9, p. 173].

Given the impact of globalization processes on the prospects for the introduction of artificial intelligence in the accounting process, it is appropriate to introduce a new function of accounting – a creative function. The essence of the creative function is revealed in the application of a creative approach in the introduction and use of artificial intelligence technologies in accounting and solving certain issues in management decisions through the flexible use of information [10].

Thus, the use of information and communication technologies in the accounting system leads to increased performance of its basic functions, as well as to the possibility of implementing qualitatively new functions (consolidation function, creative function, prognostic function). In addition, the range of tasks that can be performed by the accounting system in the areas of meeting the information needs of users is significantly expanded.

**6. Objects of accounting обліку**

Digitization of business and accounting processes leads both to the modification of traditional accounting objects, and to the emergence of qualitatively new, without accounting which financial statements of companies will not accurately reflect its financial condition and performance, which will inevitably reduce the relevance of accounting information. Digitization of the accounting system defines a new concept of data generation and use, allows you to digitize and parameterize a number of objects that are not classically objects of accounting [9].

Under the influence of modern information and, first of all, digital technologies the change of methodology and methods of accounting, definition of changes in elements of a method, specification of their typology, possibilities of expansion and modernization is carried out. Particular attention is paid to: definition and systematization of the range of objects of accounting in the conditions of crypto-economy and digitalization of socio-economic processes; creation of virtual units of value; capitalization of intangible factors of economic and social growth, social responsibility and environmental safety of business; identification of features and important for

stakeholders information characteristics of the objects of accounting, clarification of the criteria for their recognition [11, p. 132-133].

The fact of active use of information and communication technologies in economic processes increases their importance as factors of production and as objects of accounting: «technologies have become important as important assets that can make diverse processes more efficient and productive. They have become key factors of production along with the traditional – land, capital and labour» [12, p. 9]. This situation leads to the identification of new asset objects and the revision of approaches to the classification of existing asset objects.

Thus, the use of information and communication technologies in business processes leads to the modification of traditional objects of accounting and the emergence of new ones (digital data, cryptocurrencies, intangible assets, new types of payments, social and environmental assets, etc.). It should be noted that the identification of new objects of accounting first of all requires the regulation of the process of their functioning in economic processes through the formation of a system of economic legislation.

**7. Accounting methods**

Modification of the purpose of accounting, the emergence of qualitatively new accounting objects and increase the number of tasks that must be performed by the accounting system in the digital economy lead to the need to expand the methodological framework for processing accounting information. «In the digital economy, the importance of methodology increases due to the emergence of new areas of the accounting process related to the environment, non-financial assets, intangible factors of production» [4, p. 57].

The advanced development of economic processes in the digital economy and accounting tools in comparison with accounting methods can be traced. This imbalance is pointed out by some researchers. Kozlova T.V. and E.S. Zambrzhitskaya focuses on the faster pace of accounting in practice than its methodology, which is primarily due to the improvement of accounting tools, namely the use of new digital technologies of forms of transmission and storage of information, the development of other sciences other than accounting [13].

The development of digital technologies will allow to develop a new approach to the fundamental aspect of the accounting system – determining the reliable and reliable value of accounting objects [4, p. 59]. Therefore, new accounting methods should provide users with information that best describes the processes and objects at a given point in time. In this context, it is advisable to consider valuation methods, approaches to quality assurance and protection of accounting information, procedures to accelerate the accounting processing of economic information, and so on.

The accounting system requires professional judgment of specialists, as it allows a multivariate approach to the choice of a particular method of evaluation and presentation of information. The choice of optimal parameters of accounting estimates is possible in the presence of highly intelligent tools, which are modern information systems [10]. The development of information and communication technologies allows to use more actively the method of valuation of objects and processes, which are based on establishing their fair (market) value at a certain date or stage of the economic process.

The development of end-to-end digital technologies, such as big data and distributed registry systems (in particular, Blockchain), has a breakthrough innovative potential in the search and accumulation of relevant data to determine fair value, which will not only increase the reliability of such estimates, but also in the long run significantly reduce the cost of this type of information [4, p. 59]. The use of Blockchain technology in the accounting process determines the formation of a register of data recording of business objects and processes in the digital environment, and therefore allows you to create an information environment with a high level of data protection against falsification or destruction.

Further development of information and communication technologies involves the inclusion in the methodological framework of accounting new methods of information processing, including those that include real-time business transactions (RTA), electronic data interchange (EDI), application of software standards for reporting XBRL), the use of «cloud technology», artificial intelligence, econometric methods and methods of mathematical modeling to solve accounting problems.

In addition to the application of new methods of accounting data processing, traditional methods are also subject to modification, in particular documentation: «to reduce paper arrays of accounting information, it is possible to implement technologies of close action, contactless identification

of information, such as card, biometric technologies, bar coding technologies, radio frequency identification, speech data entry, machine vision, including QR-codes and devices for reading them» [14, p. 133-135].

Thus, the use of information and communication technologies in business and accounting processes leads to the expansion of the methodological base of accounting information processing and to the modification of traditional accounting methods. The use of digital technologies not only helps to increase the efficiency of information processing, but also ensures its reliability, because it facilitates the procedures for determining fair value, allows management to operate with large amounts of data in management decisions.

**8. Disclosure of accounting information**

The use of information and communication technologies in the accounting process allows not only to detail data on objects and processes into analytical types, to carry out their operational information processing, but to effectively disclose information on the content of indicators, form and format, according to identified information needs of users.

The development of the accounting system is increasingly focused on the digitization of all processes, including the presentation of financial statements in XBRL format [10]. The system based on the XBRL standard has many advantages - it is the speed and automatic generation of the report, including consolidated; simplified search of financial reporting data on the Internet, the ability to process and analyze data; more efficient regulatory process and more. The XBRL format is equally convenient for submitting mandatory reporting to state regulatory authorities, and for submitting reports on the websites of enterprises [6, p. 87].

In addition to the benefits of using information and communication technologies to provide reporting data to external users, the digitalization of the process of disclosure of accounting information is no less important for the organization of internal communication. The use of accounting software allows to determine the access of management staff of different levels within the competences provided to them to the accounting information, as well as to determine the most acceptable formats for the disclosure of accounting data. If we characterize the development of the accounting system in the active use of information and communication technologies, it is advisable to

note its management component. Digitization of accounting processes makes it possible to identify the objects of management accounting, to process not only financial and internal data, but also non-financial information from the external environment, to carry out operational preparation of management reporting.

Thus, the process of disclosure of information in the reporting format as the final stage of the accounting process is also actively influenced by the use of information and communication technologies, which allows to increase the efficiency of systematization and generalization of data, provides the ability to process and analyze data by users, creates prospects for acquainting interested users with the results of the company.

**9. Professional competencies of accountants**

Digitization of economic processes leads to a revision of professional competencies that should be endowed with participants in the economic process. There is a discussion about the future of the accounting profession. Some researchers emphasize the loss of accounting positions of dominant positions in the processing of economic information, indicate that these functions will be performed by special software. Other researchers, on the other hand, emphasize the need for qualitative changes in the training of accountants. The development of digital technologies increases the value of competencies in the field of accounting, as well as related fields. This is due to the factors of development of the digital economy, as well as the growing role of descriptive accounting methodology and the spread of professional judgment [4, p. 60].

Changes in the accounting system, which are determined by the introduction of information and communication technologies in the accounting process, have a significant impact on the list of professional competencies that accounting staff should have. Accounting in the digital economy requires flexibility of the accounting process and relevant knowledge from accounting staff in the implementation and use of information systems and technologies of the new generation in order to form timely, reliable information about the enterprise [15].

In the conditions of digitalization of economic and accounting processes the possibilities of the accounting personnel considerably expand, thus the list of the competences necessary for it for the decision of accounting and administrative tasks increases. This requires strengthening the orientation

of the training of accounting staff to address current issues of accounting, analysis, taxation, control, audit. Professional competencies of specialists in these areas, in addition to traditional, should include knowledge and competencies in modern organizational, technical and technological solutions related to Internet technologies, modern IT-infrastructure, analytical platforms, communication systems, remote documentation for successful implementation professional functions, etc.

Thus, the digitalization of the economy is characterized by large-scale introduction of information and communication technologies in accounting, control and analytical processes, which in no way reduces the importance of the accounting profession, but puts forward new requirements for professional competencies of accountants: flexibility in learning, innovation in information processing approaches. and maintenance of business communications, innovative methods of data processing of accounting, control and analysis with the help of software products.

**Conclusions**

The digitalization of economic processes and the introduction of information and communication technologies in the accounting process leads to the need to clarify the purpose, objectives, functions, objects and methods of accounting. Modification of the basic concepts of accounting is due to the emergence of new objects of the digital economy and the possibility of increasing the efficiency of processing not only financial but also non-financial information using information and communication technologies. Regarding the purpose of accounting, in the development of the digital economy, its basic content is preserved - providing users with information, but the requirements for the qualitative characteristics of accounting data, in particular regarding their efficiency and relevance. The use of digital technologies in the accounting process indicates the transformation of the accounting system into a larger accounting and analytical system designed to perform more tasks, which gives grounds to argue about the implementation of accounting consolidation, creative and forecasting functions. Changes in the combination of factors of production that perform a supporting function in economic processes lead to an increase in the value of such objects of accounting as digital data, cryptocurrencies, intangible assets, new types of settlements, social and environmental assets, etc. Certain factors determine

the growth of accounting information processing methods that provide real-time processing of accounting data, electronic data exchange, application of software standards for reporting data, the use of «cloud technology» and artificial intelligence, econometric methods and methods of mathematical modeling to solve accounting tasks. The use of information and communication technologies makes it possible to choose the optimal format for the disclosure of accounting information, but leads to an increase in the set of professional competencies that accountants must have.

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