

# Recursion of the Temporal Paradigm of the Digital Economy Accounting



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**Abstract** The article reviews the features of the transformation of accounting in the digital economy. The research results of foreign and domestic authors are considered. The regulatory analysis of the legal acts regulating the digital economy space of the Russian Federation and the Eurasian Economic Union was conducted. The main tasks, trends and regularities of development of digital features have been established. The research is aimed at systematization of elements of temporal accounting paradigm in conditions of digital economy. The results are the following: (1) The terminological apparatus of “temporal paradigm” concept is revealed. (2) The recursion of graphical model of temporal features of digital economy accounting is presented. (3) The elements of temporal features of exogenous format of action in digital economy are systematized.

**Keywords** Statement · Temporal paradigm · Accounting · Digital transformation · Digital economy · Digital features · Innovations · Education

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## 1 Introduction

Historically, accounting in the system of financial and economic management of business processes actively implements information, controlling, regulating and stimulating functions. Transformation of economy in conditions of digital transformations,

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recursive fluctuations of processes, including those connected with introduction of the digital unified platforms, blockchain technologies, use of the Big Data, cloud calculations changes a role of the accountant and coherence of his or her “classical” functions, requirements of the accounting and information environment of the organizations, properties and specificity of reflection of the facts of economic life. In his treatise “Treatise on Accounts and Records”, Luca Pacioli laid the foundation for accounting by describing the nature of double entry, the purpose of accounting, its postulates and main processes. Today, the format of digital transformation and the level of technology are rapidly approaching the time of change in the revision of the accounting concept. For example, the forms and processes for the generation of accounting information are simplified, accounting guidelines are unified in accordance with unified international accounting standards, a model chart of accounts was introduced in 2001, an electronic digital signature has been implemented since 2019, etc. There is a situation when it is necessary to simulate the proactive position of future accounting, as financial, social, tax, legal responsibility entrusted to the functional space of the functions of an accountant, demands so.

## **2 Reference Information and Methodology**

According to research by Skolkovo experts [1], the accounting profession is becoming obsolete intellectual profession, and by 2030, with the development of technology and transformation of digital economy, it will have disappeared from the nomenclature of jobs. In return, there will be designers, coordinators, eco-auditors, trend-watchers, etc. Therefore, it is necessary to study the temporal paradigm of accounting in the digital economy thoroughly, using the following methodological tool—systemic and complex approach to study the temporal characteristics of digital transformation of accounting in dialectical unity with the development of the world economy. In the work the general scientific and special methods were used, which allowed to define the components, processes and interaction of historical achievements and views of transformation of accounting paradigms and to highlight the essence of the temporal paradigm. Particularly, the system approach and institutional-evolutionary method were used in determining the features and problems of the core of the concept of accounting. The graphical method was used in the study of the recursion of the graphical model of temporal features of accounting for digital economy. Preparation of proposals and recommendations required the use of the systemic structural method.

## **3 Discussion and Results**

In response to the global financial and economic crisis of 2008, the G20 took over the task of finding and coordinating solutions to global economic problems. Since 2016, the G20 has been actively searching for global growth trends, international

legal regulation initiatives, overcoming problems and promoting the development of the digital economy to stimulate inclusive economic development [2].

At the international summit SDG (Sustainable Development Goals)—Challenge 2019, the head of the international network of companies “PricewaterhouseCoopers” Robert Moritz noted that by 2030 jobs will have become more and more automated, and new technologies, management models will transform production, and capital will displace people. Thus, he estimated that jobs in the UK (30%), USA (38%), Germany (35%) and Japan (21%) will fall into the zone of risk of such a transformation until 2030. In addition, 53% of workers who will face change (automation) will have their outdated competencies substantially rebuilt and new requirements created in their work [3]. The results of the presented initiatives of the World Economic Forum in Davos (WEF) in 2019, formed as part of the Strategic Intelligence Platform “Digital Economy and Society”, initiate six key features that influence the trends and prospects of the digital economy. In addition, experts from the World Economic Forum estimate that by 2022, 60% of the world’s GDP will have been digitized, and the world’s population does not believe it will make life easier [4].

Since 2018, the Institute of Legislation and Comparative Law under the Government of the Russian Federation has been working on the development of a “Concept for the comprehensive regulation of relations arising from the development of the digital economy” with the enforcement of the foundations laid down by Federal Law No. 172-FZ of 28 June 2014 “On strategic planning in the Russian Federation” [5]. In addition, the actualization of the research direction is conditioned by the passport of the federal project of the Russian Federation “Normative regulation of the digital environment”, approved by the Presidium of the Government Commission on Digital Development of the Russian Federation [6], where, in particular, the tasks have been defined out of many directions:

- provision of access to data storage and processing services throughout Russia, storage and processing of information created by state authorities and local governments in a single cloud platform;
- development of functionality for intellectual support of accounting and registration actions.

Changes in the process information support system, in which accounting traditionally plays a significant role, are proposed by the regulations:

- Strategy for development of information society in the Russian Federation for 2017–2030, approved by Presidential Decree of 09.05.2017 No. 203 [7];
- Presidential Decree No. 204 of 7 May 2018 on national development goals and strategic objectives for the period up to 2024 [8, 9];
- National strategy for the development of artificial intelligence for the period until 2030, approved by Presidential Decree of 10.10.2019N 490 “On the development of artificial intelligence in the Russian Federation”.

According to estimates of experts from the National Research University ‘Higher School of Economics’, based on available statistics, gross domestic expenditures on the development of the digital economy in 2018 amounted to Rb 3795 billion rubles,

or 3.7% of GDP. Their volume in comparable prices increased by 3.5% as compared to the previous year [10].

The development of accounting paradigm theory is significantly influenced by philosophy, in particular, by T.S. Kun's scientific works, where he noted that scientific knowledge develops in a leapfrogging manner, through scientific revolutions. In addition, he singled out a "pre-paradigm" stage in the development of science, and then a chain of alternating periods of normal development and crises. In the scientist's opinion, a paradigm is a set of rules that guide the scientific community to set tasks. A paradigm is also a scheme or rule that is used to explain or interpret results [11].

The work of Australian scholar Murray Charles Wells on the formation of accounting history also pays considerable attention to the essence and properties of the accounting paradigm. Highlighting seven paradigms (anthropological, conjunctural, event, procedural, idealized, informational, and behavioural), M.C. Wells defined different criteria and attributes of their classification, ranging from the practice of an accountant, management processes, financial results, reflection of the facts of economic life and up to the study of behaviour, the final decision makers in the field of accounting policy [12].

The dualistic position with regard to the formation of content to the processes surrounding accounting is highlighted in Rene Savatier's scientific works, in particular his book "Theory of Obligations". Thus, in Chap. "[Blockchain Technologies as a Reflection of Modern Reality: Diversity of Opportunities Versus Security Risks](#)" 'Legal and economic viewpoints', the author notes: "In one and the same act, lawyers see mainly a legal action in the form of an agreed will, while economists see a movement of values" [13]. Hence, when forming an accounting paradigm, it is necessary to take into account both legal peculiarities of its implementation and economic aspects of efficiency.

E.I. Zuga's scientific view on the history of formation and evolution of accounting paradigms deserves attention. The six models proposed by her are worth considering and based on the derivative states of three methodological paradigms: unigraphic, digraphic and cameral. At the same time, the author has proposed, in our opinion, a rather narrow model of criteria of her paradigms, which cover not all objects of accounting [14].

Special attention should be paid to the approaches to the problems under consideration and to the review of the issues of accounting paradigm change in the discussion platform proposed by N. A. Kamordzhanova, Doctor of Economic Sciences, where the author examines changes in technology, digital economy, how they affect accounting and lead to a change in accounting paradigm [15].

Setting of scientific problems and elaboration of initiatives in the conditions of development of digital economy in the last decades are actively researched by domestic and foreign scientists, including questions of theoretical features of introduction and realization of economic and legal bases. Among them it is possible to highlight:

T. M. Odintsovo, here the author proposes a conceptual model of accounting, which includes a set of theoretical constructions that determine the logic, structure and principles of functioning of an accounting system in the digital economy [16];

R. H. Ilyasov in the study of spline-modeling and analysis of interrelations in the economy emphasizes the need to take into account the instability of forms of relationships, changes in the number of factors and the degree of their mutual impact. He also offers methods of “new econometrics”—for modeling systems with variable structure with connection of analysis of interrelationships of processes [17].

Table 1 presents an adaptive assessment approach to the content and structure of features that affect the development of the digital economy. Examining the peculiarities of transformation of accounting of the Russian Federation in the conditions of digital economy, it is necessary to note its close, integrative connection with the regulatory and legal space of the Eurasian Economic Union, under the aegis of which the unification of the process in the development of common approaches and rules of transformation in the field of digitalization among all participants of this union is carried out.

Thus, according to the decision of the Eurasian Economic Union of October 11, 2017 No. 12 “On the main directions of implementation of the digital agenda of the Eurasian Economic Union until 2025”, the main directions are the digital transformation of economic sectors and cross-industry transformation, digital transformation of markets for goods, services, capital and labour, digital transformation of integration management processes, development of digital infrastructure and security of digital processes.

The dynamics and trend of changes lead to the formation of uniform requirements for such accounting objects as “cross-industry processes”, “regulatory sandbox”, “digital platform”, “digital transformation”, “digital ecosystem”, “digital conversion”, “digital asset”. In Fig. 1, we present a graphical model of the temporal features of the accounting paradigm in the digital economy.

Along with defining the contours of international legal regulation of digitalization processes under the aegis of the EAEU, the Union’s members independently develop, form and implement national policies in the field of digitalization of the economy, including the implementation of national measures to develop the digital agenda.

The increasing speed of iterations that change further development of human anthropology in the context of the development of digital transformation of the economy and, above all, its information and legal part, will inevitably affect the general paradigm of accounting. Accounting methods, including its basis—double-entry bookkeeping, reporting forms, structure of accounting registers, qualitative parameters of reflection of some facts of economic life, principles, concepts of formation of accounting policy of subjects of economic activity will be subject to certain transformation. Against the background of changes in the forms of access, orderliness and structuring of information support and thinking, in the modern economy, the actual scientific problem of perspectives of development of accounting paradigm in conditions of growth of digital transformations, interstate integration processes of the Eurasian Economic Union, determination of the content of the term ‘temporal features’ is formed.

**Table 1** Content and structure of temporal development features of the digital economy

Title	Content	Structure
Digital specifics	Digital specifics require compromises between empowering users and protecting their freedoms	Inclusive design Digital identification Citizen participation Banks and capital markets Financial and currency systems Blockchain Flexible management Internet government
Data sharing and permissions	Unprecedented volumes of data require greater clarity in terms of confidentiality, rights and authorizations. Data provides important information, and we are witnessing a revolution in the way this information is collected, managed and shared	Information technology; International trade and investment Health and healthcare Personalized medicine Human rights Internet interaction of things
Security of people and processes	The growing amount of information represents an increased risk, requiring a comprehensive defence strategy. Cyber threats challenge our ability to take full advantage of the digital economy	Artificial intelligence and robotization Internet control Corporate governance The fourth industrial revolution Global risks Cyber security
Informed, flexible management	The global nature of digital communications requires a flexible and informed regulatory framework. The institutions that have traditionally been responsible for shaping the social impact of new technologies are struggling to keep pace. At the same time, there is a sharp decline in public trust worldwide, especially in key public, social and societal institutions	Flexible management Information technology International trade and investment Artificial Intelligence and robotization The fourth industrial revolution Global management
Stability of digital transformation	A new leadership approach is needed to create a sustainable digital business In every industry, digital transformation is pushing companies to re-evaluate their business models, and new market players focused on technological innovation are transforming the strategic landscape	Virtual and augmented reality Entrepreneurship Blockchain Innovation The future of economic progress Leadership in the fourth industrial revolution 3D printing

(continued)

**Table 1** (continued)

Title	Content	Structure
Access and implementation	Half a century after the invention of the Internet, only half the world is connected to the Internet. While the pace of technological development, adoption and transformation is accelerating for many people, the world is still far from achieving universal access to Internet services. According to the International Telecommunication Union, at the end of 2018, just over half of the world’s population—51.2%—was using the Internet	Digital communication Sustainable development 5G Education and skills Infrastructure Corruption Gender equality Behavioural sciences

## 4 Conclusion

Thus, the substantiation of scientific approaches in the solution of the above-defined problem is relevant both in the search for solutions that depend on the speed, dynamics of changes in endogenous factors, the regulatory framework of the corresponding regulator, and the interoperability of sections of the developed accounting policy of the subjects of economic activity.

Temporal features of the paradigm of accounting in the digital economy is an interoperable system of temporary (transitional) principles, approaches and priorities related to economic, legal and informational and technical relations of the implementation of accounting, which are recursively changed under the influence of the development of digital economy, and directed to the development of economic agent’s environment, with a digital way of regulation and institutionalization of processes.

In the proposed field of scientific rhetoric of the iterative approach to the development of the Concept, there is a shred of forming an integral core of research to further disclose such scientific tasks as:

- defining the economic and legal framework for government regulation of accounting based on the use of big data, cloud computing at the stages of monitoring, goal setting, decision making, and evaluation of management results;
- creation of principles for building accounting policies aimed at improving the effectiveness of the digital communications system, digital literacy of economic entities in connection with the development of digital technologies;
- formation of conceptual and categorical objects favourably influencing information and technical conditions of stimulation of development and introduction of new digital technologies in the process of competitive interaction, and creation of information platforms for interested subjects of economic activity.

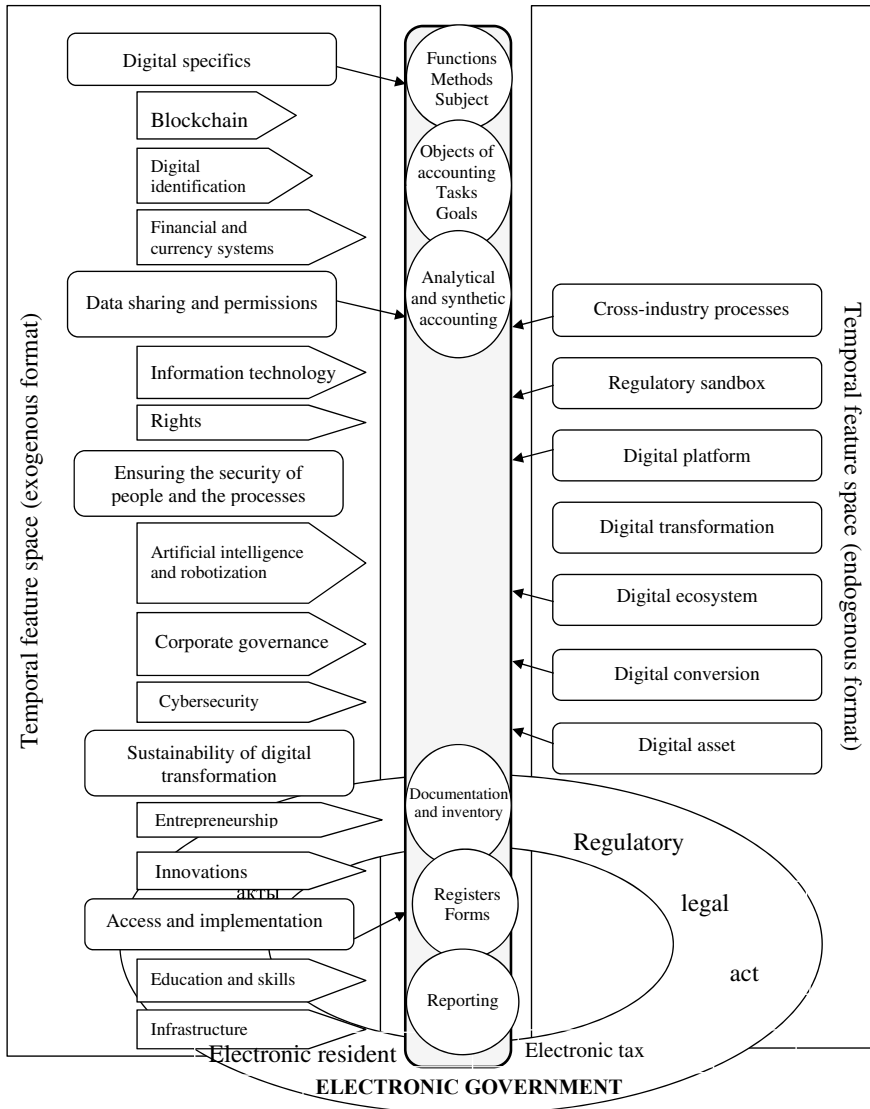


Fig. 1 Graphical model of temporal features

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