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DIGITAL CAPITAL IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT OF INTELLIGENT NETWORK BUSINESS MODELS

The emergence of electronic markets with instant access to information causes a sharp increase in competition between both manufacturers and retail chains. Modern commercial organizations operate in conditions of uncertainty, which causes potential risks of not receiving added value and planned profits. Economic success is achieved by those entrepreneurial structures that fully utilize digital capital and promptly adapt to the requirements of the digital society. The article defines the category of «digital capital of an organization with intelligent network management models» and formulates a number of strategic initiatives for the formation of digital capital for trading enterprises of the Republic of Belarus.

***Keywords*:** *business, sustainable development, digitalization, digital capital, intelligence, digital network management models*

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ЦИФРОВОЙ КАПИТАЛ В КОНТЕКСТЕ УСТОЙЧИВОГО РАЗВИТИЯ ИНТЕЛЛЕКТУАЛЬНЫХ СЕТЕВЫХ БИЗНЕС-МОДЕЛЕЙ

Появление электронных рынков с мгновенным доступом к информации вызывает резкий рост конкуренции как между производителями, так и между торговыми сетями. Современные коммерческие организации функционируют в условиях неопределенности, обусловливающей потенциальные риски недополучения добавленной стоимости и запланированной прибыли. Экономического успеха добиваются те предпринимательские структуры, которые в полной мере используют цифровой капитал, своевременно адаптируются к требованиям цифрового общества. В статье определена категория «цифровой капитал организации с интеллектуальными сетевыми моделями управления» и сформулирован ряд стратегических инициатив по формированию цифрового капитала для торговых предприятий Республики Беларусь

***Ключевые слова*:** *бизнес, устойчивое развитие, цифровизация, цифровой капитал, интеллект, цифровые сетевые модели управления*

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Introduction

The context of digitalization in the concept of sustainable development of organizations is very broad. Achieving the needs of business entities without harming future generations should be based on the harmony and unity of man and nature, taking into account three aspects: economic, social and environmental, as well as three principles of their coordination: fair, viable and tolerant [1].

Large-scale digital transformation of all spheres and types of human activity provides society with undoubted social and economic benefits, but at the same time poses a number of fundamentally new challenges for researchers. In the Republic of Belarus, the introduction of modern digital technologies is one of the priority tasks of national innovative sustainable development. The country has a high level of access to Internet resources, the State Program "Digital Development of Belarus" for 2021–2025 is being successfully implemented. According to the "Global Innovation Index 2024" published by the World Intellectual Property Organization: our country among 133 states took 38th place in the indicator "Access to information computer technologies (ICT)" and 55th place in the indicator "ICT use". However, research supported by practical observations shows that even with the same level of Internet penetration and similar level of population access to new technologies, the effectiveness of using modern digital technologies varies significantly across regions and industries. Digital inequality is due to differential access and use depending on the socio-demographic status of citizens, geography and level of education of individuals [2].

Countries with developed economies are significantly ahead of post-Soviet countries in terms of innovation penetration. In the context of studying the problem of ensuring digital equality and building a more inclusive digital landscape, scientists put forward the concept of digital capital. Namely, the third stage of digital inequality is associated with different levels of digital capital and different levels of digital inclusion of citizens [3].

The relevance of the presented study lies in the need to expand the use of digital capital in the context of sustainable development of business entities with intelligent network management models.

The purpose of the scientific research is to determine the prerequisites for using digital capital as an information resource from the standpoint of general and systemic approaches, as well as patterns in the field of formation and use of digital capital. To achieve this goal, the following research objectives have been defined:

– to explore the development of the concept of digital capital in historical retrospect ;

– to determine the role of choosing a strategy for the formation of digital capital in the progression of digital inequality;

– formulate a definition of "digital capital of an organization with intelligent network management models";

– to develop strategic initiatives for the formation of digital capital for trading enterprises of the Republic of Belarus, allowing for sustainable development.

In the course of scientific research, along with general scientific methods of research, analysis, synthesis and generalization, methods of analogy, abstraction, monographic and statistical-economic methods were also used.

The practical significance of the study is determined by the fact that the methodological basis for determining patterns in the field of formation and use of digital capital will contribute to the expansion of the digital transformation process in the concept of sustainable development of business entities.

Results and discussion

Theoretical approaches to the study of digital capital

Digitalization of business processes brings significant changes not only to the technologies of production of goods and rendering of services, but also to the process of formation of added value, profit generation. Digital transformation has affected business processes, models, technologies, markets. Transformation (Latin transformatio – change) is usually understood as the transformation of structures,

forms and methods, change of the target orientation of activity, which as a result contributes to bringing the system to a new qualitative state. The intermediate stages of development of digital technologies assumed the following transformations:

– digitization – the transformation of information "from physical media into electronic form". Within the framework of digitization, there are no changes in the quality and content of information, it is simply transformed into digital form for subsequent processing in digital format, which allows improving existing business processes;

– digitalization – creation of a new innovative product with new functionality and consumer properties. And if digitization is primarily aimed at improving existing business models and changing business processes, then digitalization allows for a significant breakthrough in business and new competitive advantages [1].

Digital capital as a category that implies the ability to generate income, proposed Park in 2017 [4]. Since the term is new, there are various theoretical interpretations and conflicting interpretations of this category in the scientific literature. The question of the legitimacy of the existence of digital capital as a new fundamental type of capital is currently in the area of discussion. Thus, M. Ragnedda considers digital capital as a bridge capital between online and offline capabilities, which not only allows the effective use of previous capitals in the digital sphere, but also contributes to them by reproducing profits in the offline sphere. From the researcher's point of view, digital capital is closely related to the other five types: social, economic, personal, political and cultural capital [5]. G. A. Ermakova suggests studying digital capital as a promising type of intellectual capital of a corporation [6]. A number of foreign authors study it as a form of capital based on data, which, in particular, helps to increase the competitiveness of companies in various markets [7].

A number of studies discuss the synergy of different types of capital. In particular, A. N. Alekseev, A. V. Bogoviz, S. V. Lobova and J. V. Ragulina propose to introduce the term "Digital Human Capital", believing that it represents a relevant stock of knowledge, skills and abilities that are implemented in the labor market and are associated with the intensive use of ICT in creating consumer value [8].

V. V. Manuilenko and G. A. Ermakova consider intellectual digital capital as the value of a specific digital asset, manifested in relations with stakeholders – digital clients, from the more efficient use of which, with the help of special marketing activities, the corporation maximizes value, ensuring competitiveness [9].

R.Verwiebe and S. Hagemann consider digital capital as a product of interaction between individuals and social structures, which manifests itself in the form of built-in skills in working with digital technologies or in the form of objectified and material structures unevenly distributed between different social groups. In this case, the logical conclusion is made that certain aspects of digital cultural capital can be observed embodied both in the form of abilities, experience and skills, and in communication models [10].

It should be emphasized that the point of view on the nature and composition of digital capital is expanding and being clarified. Analysis of scientific sources of recent years shows that most researchers tend to understand digital capital as an integral set of user access to digital information technologies, digital communication environment (primarily to Internet resources) and the ability to use them to achieve social, professional and personal goals.

Table 1 presents definitions of the term "Digital capital", characterizing its content as new knowledge accumulates and expands, including in the narrow sense, as a type of commercial activity in the electronic space (e-commerce, e-banking, online services). In a broad sense, this definition refers to the transformation of the entire society, since ICT is being actively introduced into every sphere of human activity.

The interpretations of the category "Digital capital" presented in Table 1 can be generally agreed with. However, for the development directions of using this type of capital in the concept of sustainable development of business structures with intelligent network management models, it is important to

highlight among them the main features that are important for the subsequent formation of the definition of the economic category – "Digital Capital" conceptual features that characterize the sustainable development of the organization. Thus, the main and determining factor in any concept of sustainable development of business structures and business systems with intelligent network management models is the provision on the fundamental possibility of radically improving the work of each employee of the organization and stakeholders as a whole, using technical, human and digital potential and its organizational capabilities.

Table 1

Digital capital of the organization in modern science

Definition of the term, approach	Authors	Year of publication
Digital capital is a set of digital competencies (information, communication, security, content creation and problem solving) and digital technologies	M. Ragnedda [5]	2018
Digital capital is an integral set of user access to digital information technologies, digital communication environment and the ability to use them to achieve social, professional and personal goals	E. L. Vartanova, G. A. Gladkova [3]	2020
Digital capital is tangible and intangible identifiable assets and unidentifiable digital assets (digital business reputation and digital competencies of employees) that enable the implementation of digital technologies and contribute to increased labor productivity.	G. M. Merzlikina, N. Moghabel [11]	2022
Digital capital is a promising type of intellectual capital. Due to the transformation, it is legitimate to consider digital human capital, digital cultural capital, stakeholder digital capital, etc.	V. V. Manuilenko V.[9]	2023

S o u r c e : compiled by the authors.

It is important to take into account the most indicative features that characterize the organizational structure with intelligent network management models, where openness and a well-organized management system distributed in space are manifested; flexibility and autonomy, priority of horizontal connections, as well as resource-saving strategies, team training of personnel and a high level of knowledge of individual performers of business operations.

Thus, taking into account the specifics of the functioning of such business entities, the following formulation can be proposed:

The digital capital of an organization with intelligent network management models *is resources created as a result of investment, possessing the properties of synergy and emergence, having a factorial influence on the efficiency of business processes, consisting of competencies from various areas of the economy (digital business reputation and digital components of employees and all stakeholders), allowing for a fair distribution of digital resources and contributing to the receipt of added value.*

Digitalization of business processes and involvement of digital capital of business entities with intelligent network management models

The formation and movement of capital is related to the value of the competitive position of business structures and business systems, their investment attractiveness, and the level of management of operational sustainability. The efficiency of using digital capital depends on many factors: the level of use, software and hardware, user competencies, industry, and business management models. Here, significant differences between these areas are very clearly evident.

An example where a system for engaging digital capital has been implemented and processes for digitalizing business processes with intelligent network management models have been established is Logic Way Solutions LLC and a network of retail trading companies. Logic Way LLC was registered in

2008 by the Minsk City Executive Committee in the Unified Register of Legal Entities and Individual Entrepreneurs. This business entity carries out entrepreneurial activity with a clearly expressed flat horizontal organizational structure, in which information flows permeate all services and departments. The company's architecture is determined by the principles of the most complete adaptation to changes in business environment factors, instant response to them and maximum flexibility of the organizational structure aimed at constant self-organization of business processes, compassion for partners and the most complete satisfaction of customer requests.

The company's areas of activity:

– fundamental and applied research on the generation of new ideas in the field of innovation of both products and services, as well as business processes themselves;

– formation of a nomenclature of software types;

– design, development, delivery and documentation of information systems and customized software that meet the needs of specific customers.

The company has extensive experience in the field of information technology for telecommunications and media, public administration and defense, oil and gas sector and healthcare – using Java/J2EE, .Net, C++, Oracle technologies. Logic Way experts offer a wide range of software development outsourcing services that cover various stages, such as business value assessment, requirements collection, knowledge transfer, system deployment, support services.

Thus, when developing individual software, the focus is on the following policies:

– careful analysis of the client's business requirements and conditions;
– performance and scalability of solutions;
– strictly economical approach;
– strict confidentiality;
– ongoing technical support and maintenance.

Logic Way Solutions LLC offers comprehensive IT consulting services to provide the customer with clear guidance on how to achieve their target objectives. The following step-by-step actions are performed to achieve a specific goal:

– evaluation of the industry domain for the client's website;
– definition of project requirements;
– analysis of business processes of the customer company;
– consulting on the choice of technology and methodology for project development;
– coordination of the work schedule for the project;
– audit of existing IT systems to identify opportunities for further modernization of business processes.

When studying the totality of completed projects of companies, the main directions of digitalization of business processes and the applied software solutions were established (Table 2).

Table 2

Software tools for digitalization of business processes for solving target problems

Direction of digitalization	Programs	Directions of target tasks
1. Internal business processes and communications	Google Meet, Zoom	Task planners, discussing weekly tasks
2. External business processes	Telegram	Chats with clients, registration of tasks in YoyTrack by clients
	Zabbix	Infrastructure monitoring
	Netbox	Storing infrastructure information
	SysPass	Storing passwords
	Wazoo	Scanning infrastructure for vulnerabilities

S o u r c e : compiled by the authors.

An analysis of the weakest points in the management of business processes of the organization's innovative activities showed that, first of all, it is necessary to ensure an increase in the level of use of

digital products and digital infrastructure. The company's acquisition of the YouTrack digital solution allows you to support search queries, perform auto-completion , manipulate task sets, configure task attributes, and create user workflows. Stimulating consumer activity, Logic Way Solutions LLC attracts significant financial resources, which allows further investment in the company's digital capital.

Retail chains and wholesale distributors in the EAEU member states have achieved significant success in using digital capital. In Belarus, from 2010 to the present, the format of discounters has been developing: Brusnichka, Dobronom, Svetofor and others, with increased competition, growth of commercial transactions, regional expansion, implementation of online projects, and creation of associations [12].

At present, it is safe to say that an independent segment has formed in the Belarusian retail market – chain retail, whose operators have significant market power. Retail supermarkets and wholesale distributors are adapting to new conditions, where sustainable development and digitalization are becoming key success factors. The formed digital capital and its integration into business processes allow the retail chain not only to increase operational efficiency, but also to reduce the negative impact on the environment, contributing to sustainable development.

Digital capital in a retail chain includes a set of digital technologies, cloud data, platforms and infrastructure facilities that are used to create value and achieve competitive advantages. Thus, in the conditions of fierce competition in retail, retail chains are actively implementing geotargeting, Beacon technologies, chat bots, voice assistants, barcode scanners and Digital advertising, etc. In addition to these technologies, digital capital helps to increase the efficiency of business processes, where the multidimensionality and complexity of solving this problem are clearly manifested:

– setting up a supporting management accounting system for individual stores;
– formation and practical implementation of multi-level budgeting of the company and its individual divisions;
– adaptation of the company's target asset management system;
– implementation of the resulting system for managing the company's economic efficiency.

Digital capital helps to increase the efficiency of business processes, improve customer interactions and optimize supply chains. The functioning of an integrated management system allows companies to study from your own experience, improve the practice of business process management, improve the regulatory framework and, ultimately, move to high forms of anti-crisis management adequate to a developing business in the context of increasing demands on its efficiency.

Conclusions

Digital capital, along with fixed, working and human capital, is the most important resource of an organization. Increasing the level of digital capital will allow to cope with the problem of the digital divide more quickly. Thus, the developed author's definition "Digital capital of an organization with intelligent network management models" characterizes this resource as the result of investment in business processes consisting of the competencies of the business reputation of employees operating in a particular area of the economy and having the ability to provide access to digital resources that contribute to the receipt of added value.

In the long term, companies that are successfully integrated into digital platforms will be able to achieve significant competitive advantages, improve operational efficiency and contribute to the sustainable development of their industry.

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