FEATURES AND PERSPECTIVES OF THE MARKET OF INFORMATION AND COMMUNICATION TECHNOLOGIES’ FUNCTIONING IN DATA-DRIVEN SOCIETY

OSOBLIVOSTI TA PERСПЕКТИВИ ФУНКЦІОНАВАННЯ РИНКУ ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНИХ ТЕХНОЛОГІЙ У СУСПІЛЬСТВІ, КЕРОВАНОМУ ДАНИМИ

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The article is intended to define the conceptual prospects for the development of the information and communication technologies market in a data-driven society. According to the results of the study, it was established that the implementation of innovative technological startups for the reorganization of information and communication networks using modern switching equipment, characterized by high performance, remains a relevant and global task for the development of the target market. This will provide potential opportunities for providing a high level of service to several numbering zones at once and maintaining the availability of a wide range of information and communication services in the modern conditions of digitalization of society. It was determined that the sphere of communication and information occupies an important place in the economic and social revival of Ukraine. Broad access to significant amounts of information and database management ensures the efficiency of organization and management of state, production and non-production processes of economic activity, thereby expanding the possibilities of successful business, optimizing costs and ensuring a high level of economic and information security of the business entities. The information and telecommunications market were analyzed and the activity of participating operators was diagnosed. It has been studied that in a data-driven society, the success of achieving goals in the digital development of information and communication enterprises directly depends on global information influence. A significant reduction in the number of telecommunications operators and providers was analyzed. It was determined that small operators of the target market are not able to ensure the appropriate level of quality, availability and continuity of service, in connection with which a significant part of the target audience switches to the services of large providers. Based on the analysis of the main indicators of the development of the information and communication technologies market, the main promising directions of development based on the formation of income from a diverse pool of services are determined.

Key words: data-driven society; market of information and communication technologies; enterprise of information and communication technologies; telecommunication services; fixed telephone connection; mobile communication.
In today’s world conditions, information and communication technologies are developing rapidly, new ways of automating the production of various products and services are constantly appearing. The development of the ICT market plays a huge role in the activities of enterprises, as they contribute to increasing competitiveness, as well as maintaining an effective level of security, improvement and optimization of the production process. Constantly changing market conditions, the appearance of competitors, changes in laws and regulations, scientific and technological progress - all this affects the desire of entrepreneurs to automate many processes related not only to financial management, but also to everyday tasks and operations.

Global negative trends in economic development (the negative consequences caused by the COVID-19 pandemic) have a significant direct and indirect impact on the activities of domestic information and communication technology enterprises, which contributes to uncertainty in the development of key business processes, as well as the emergence of obstacles to the effective functioning and ensuring their economic security both at the state and global level. Taking into account the above, a necessary task to ensure the effective functioning of the information and communication technology market is a prompt response to the impact of various factors, which requires diagnosing the conceptual features of development in data-driven society.

LITERATURE REVIEW

The scientific papers of famous national scientists (V.O. Kulakov and V.O. Shchebelska) are devoted to the problems and prospects investigation in the field of telecommunications market development [3]. Y. I. Ostapenko in the scientific research «Tasks of legislative policy in the field of development of the telecommunications market of Ukraine» has been noted the valuable aspects of socio-economic and legal support for the national telecommunications market functioning [4]. Such well-known scientist as O. T. Patryak, in his study about telecommunications space functioning in in data-driven society, is defining the optimal ratio of indicators of the of the telecommunications industry functioning.

The defining result in the direction of intensity of competition in the telecommunications market and promotes innovative development and growth of market participants, is consistent with empirical findings, namely: David Bardey, Danilo Aristizábal, José Santiago Gómez, Bibiana Sáenz [6], Cecere G., Corrocher N., Battaglia R. [7], as well as such well-known foreign scientists as: Dastidar K. [8], Fransman M. [9], Karamti C., Kammou A. [11]. This is also consistent with the empirical findings of Lehr W. [13], Nekmahmud M., Rahman S. [14] and others.

Emphasizing the significant contribution of well-known domestic and foreign scientists to the research of the telecommunications industry, we consider it necessary to determine the conceptual features and perspectives of the market of information and communication technologies functioning in data-driven society.

AIMS AND OBJECTIVES

The main research task of the scientific materials is to identify the conceptual prospects of the market of information and communication technologies in data-driven society. As a result, it has been defined that the operators of the communication market are not able to provide the high level of service, while the majority of customers switch to using the services of providers, where a significant percentage share is allocated to wired Internet services.

METHODOLOGY AND RESEARCH METHODS

The results of the theoretical generalization of scientific works and methodical approaches in the
field of information and communication technologies, highlighted in publications of a fundamental and applied nature, as well as analytical data of the State Statistics Service of Ukraine, Official web site of national commission that carries out government control in the field of connection and informatization, Report «On the work of the National Commission, which carries out state regulation in the field of communication and information. For solving the main tasks in the article have been used a set of methods, namely: methods of generalization and systematization, analytical diagnostics, methods of systemic, structural-logical, comparative, statistical analysis.

**DATA ANALYSIS AND RESULTS**

In the modern world, information and communication technology is developing exponentially, new ways to automate the production of various products and services are constantly emerging. The development of the ICT market plays great importance in the enterprises’ activity, as they contribute to increased competitiveness as well as support effective level of safety, improvement and optimization of the production process. Constantly changing market conditions, the emergence of competitors, changes in laws and rules, scientific and technological progress – everything these factors influence the desire of entrepreneurs to automate many processes related not only to management finances, but also with everyday tasks and operations. This may lead to fragmentation of the market and restriction of competition, which is unprofitable for both consumers, and sellers. The development of common standards and operating rules can help improving cooperation between enterprises and reducing integration costs and compatibility.

In general, the intensity of the dynamics of the telecommunications sector development is characterized by rapid technological progress, an increase in the volume of production and provision of services, their diversification, and ultra-fast data transfer processes. Today, telecommunications are positioned as an intensive and powerful component of the national telecommunications industry, which unites a set of network communications (technological systems) used to transmit various databases and types of information. This, in turn, plays an important role in the data-driven society formation and ensures the development of communication tools and methods and their availability for all segments of the population in order to ensure the socio-demographic effect - creating comfortable living conditions, increasing the level of access to various information flows, communication, which is the foundation of successful implementation of society intellectualization processes.

The experience of advanced ICT enterprises on a global scale indicates the presence of potential for the strategic development of domestic ICT enterprises, the effective implementation of which is determined by the degree of investment attractiveness of the industry, the positive dynamics of structural changes in industry segments, the growth of the profitability index of enterprises, the rate of spread of communication tools, information technologies, the dynamics development of processes of integration of internal communication systems with external communication operators, increasing the level of competitiveness with the simultaneous liberalization of the field of information and communication technologies (Fig. 1).

![Fig. 1. Dynamics of key participants of the communication market from 2016 to 2022](source: compiled by the authors based on source [1; 7])

The analysis of the trend data in Figure 1 is evidence of a significant reduction in the number of operators and providers in the information and telecommunications market during the studied period compared to 2020 (a period of positive dynamics). During the studied period from 2021 to 2023, the number of participants in the information and telecommunications market decreased by almost 47%, which is explained, first of all, by the high level of competition in the industry, the strengthening of market monopolization, the consequences of the COVID-19 pandemic, and the complexity of the political situation in conditions of the country’s martial law, which eventually led to the loss of a significant part of income. It should be emphasized that the consequences of the full-scale invasion of the Russian Federation are inevitable and such that they led to large-scale destruction and damage to electronic communications throughout the country, especially in areas and cities where active hostilities were taking place which caused a high level of evacuation of a large part of the population from the territories of hostilities [14].

Given that the use of information and communication tools and services is a necessary condition for achieving success in almost all areas of business, solving the issue of quantitative and qualitative characteristics of the provided communication services in the context of modern trends in their development is characterized by special importance.

Electrical communication, which is defined as the most powerful component of the country’s information and communication sector, unites a complex of networks (technological systems) used for the transmission of various types of information, which, thereby, plays an important role in the process of forming an information society with the main purpose - creating a significant social effect - creating comfortable living conditions in conditions of increasing awareness and sociability of data-driven society.

The importance of electronic communication in modern society can be determined by the many reasons, the most important role of them currently is played by telecommunications in the field of security and emergency situations. It is electronic communication networks of general use that are the basis for prompt notification of the population about threats and the occurrence of emergency situations with the aim of emergency response to threats to people’s lives and health, for communicating the decisions of the state leadership, military administrations and local self-government bodies to citizens throughout the territory of Ukraine.

Therefore, the use of communication instruments and methods is necessary in almost all spheres of human activity in data-driven society. Taking into account this fact, the issues of quantitative and qualitative characteristics of communication services and modern trends in their development become especially relevant in data-driven social environment.

Small operators in the market of telecom industry do not have the potential to ensure the appropriate level of quality and continuity of service, due to which the lion’s share of customers prefer the services of large providers. In addition, in 2021, mobile operators PJSC VF Ukraine, PJSC Kyivstar and LLC Lifecell obtained licenses to implement a new radio technology, International Mobile Telecommunications (IMT), in the 900 MHz radio frequency band, which allowed them to start deploying 4G networks in the designated band. As a result of these structural and organizational changes, the coverage area of 4G networks in Ukraine was significantly expanded, which led to a significant increase in the number of consumers able to receive broadband access to the Internet [11].

Thanks to the cumulative cooperation and joint efforts of the leading operators of the electronic communications market (PJSC «Kyivstar», PJSC «VF Ukraine», LLC «Lifecell», JSC «Ukrtelecom», PJSC «Datagroup», LLC «Atracom», LLC «Evrotranstelecom») it was possible to increase the level of provision of switching units and mobile base stations, backup autonomous power sources [4; 9], which, therefore, looks as follows in terms of percentage (Fig. 2).

![Fig. 2. The percentage ratio of shares of services provision in the structure of the information and telecommunications register (2023)](source: compiled by the authors based on sources [1; 9; 12])
In today’s conditions, about 0.7 thousand economic entities are characterized by the possession of potential opportunities for providing Internet access services, while 0.66 thousand market participants provide services for the maintenance and operation of communication enterprises; more than 6% (0.4 thousand enterprises) provide wireless Internet access services and almost 6% provide telecommunication services [9; 15].

In turn, the significant consequences of the destruction of the electronic communication infrastructure led to the emergence of global problems of disappearance and long-term lack of communication for subscribers, who are forced to bear significant losses and financial costs for the elimination of these obstacles. As a result, a relatively significant increase in the cost of fixed-line telephone services almost to the cost of mobile services has led to an advantage in the target market of such a communication network as mobile communication.

As a potential direction of the successful development of the industry, it is worth emphasizing the increase in the number of the target audience (subscribers of fixed Internet access), since recently there has been such a tendency to decrease (at the end of 2023, it reached 7,191 units, which is 5% less than in 2022), which, first of all, is explained by the lack of full reporting in the conditions of martial law.

It should be noted that the following indicators should be noted as key indicators for communication companies:
- revenue per subscriber (ARPU) measures the average revenue a company receives from one user over a certain period of time;
- churn rate is an indicator that measures the number of subscribers the company has lost;
- subscriber base growth measures how many new customers a company adds over time.

Summing up, it is worth to figure out the key factors that caused a general decrease in the number of mobile subscribers in a data-driven society (Fig. 3).

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**Fig. 3. Factors influencing the overall decline in the number of mobile subscribers in a data-driven society**

Source: formed by the authors

In any case, the development of the telecom industry in the socio-economic growth of society is invaluable not only in Ukraine, but also in the whole world. A clear example of such positive development is the provision and expansion of access to financial, medical, consumer services, digital technologies for small businesses, innovative systems of education and science, as well as access to an ever-growing number of electronic government services.

DISCUSSION

In the data-driven society, processes of digitalization directly affect the acceleration of all spheres of the development of society. Taking into account that the primary requirement of the modern information society is the constant and dynamic growth of consumer needs in the direction of using high-quality, safe, high-speed information and communication services, the analysis of the development trends of the targeted market during the last period allows us to trace the presence of geospatial and industry structuring, which is accompanied by complex transformational and structural changes.

Taking into account the above, there are enough prospects for development for participants in the market of information and communication technologies, among which the priority is to maintain sufficient topics for the implementation and development of information and communication technologies in the conditions of rapid adaptation to the constantly changing circumstances of the external environment, constructive analysis of potential opportunities and advantages for the timely adoption of optimal management decisions taking into account the possible degree of influence and possible negative consequences of the high dynamics of the development of global information processes.

CONCLUSIONS

Taking into account the current trends of the data-driven society, the success of achieving the goals of digital development of information and communication enterprises directly depends on the global information influence. The effectiveness of domestic telecommunications enterprises also depends on the influence of positive and negative global and local obstacles, which today are positioned as one of the key strategic vectors of national socio-economic development in the long term.

The information and telecommunications market were analyzed and the activity of participating operators was diagnosed. A significant reduction in the number of telecommunications operators and providers was revealed. It was determined that small operators of the target market are not able to ensure the appropriate level of quality, availability and continuity of service, in connection with which a significant part of the target audience switches to the services of large providers.

In the context of analyzing the trends in the development of the information and telecommunications market in Ukraine, an important issue for telecommunications operators now is the implementation of projects for the reconstruction, modernization and optimization of telecommunications networks, which should include the transition to the use of modern high-performance switching equipment capable of serving several numbering zones and providing a wide range of services.

It was determined that mobile communication was, is and remains a priority direction of information and communication development, gradually increasing the volume of services, improving their quality, diversifying and making them more safety, massive, public, available and adapted to the individual needs of each potential user.

Based on the analysis of the key indicators of the development of the information and communication technologies market, the main promising directions of development were identified based on the formation of income from a diverse pool of services, namely: fixed telephone communication, mobile telephone communication, fixed Internet access services, services for providing channels and infrastructure facilities for use.

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