

Digitization as an innovative segment of enterprise financial security management

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Abstract

Today, the global trend of the digital world economy is entering an active phase of its development. In the leading countries of the world, the development of digital technologies, both at the state and corporate levels, has been begun to advance massively in government programs and business strategies. The substantiation of the role aspect of introduction of the process of digitization as an innovative element of improvement of the system of financial security management of representatives of the business sector of the economy is relevant. It is to investigate the impact of the digitalization system on improving the financial security management of enterprises in the process of improving the conceptual apparatus and develop an economic and mathematical model for evaluating financial security based on innovative proposals.

To achieve this goal, we used the method of theoretical generalization to determine the conceptual apparatus of digitization and economic-statistical methods to substantiate the economic and mathematical model of assessing the financial security of enterprises. It is proposed to expand the conceptual apparatus of the system of financial security management of enterprises by introducing such definitions as «digitization of financial security», «digital base of financial storage» and «regulator of financial security». The authors' position of the essential characteristic of the definitions is given and the advantages of their adaptation in the management cycle are stated. The feasibility of introducing the principle of «digitization of financial security» as one of the key elements of the innovative proposal of the system of financial security management of enterprises in the future is argued. An economic and mathematical model of financial security assessment based on the profitability criteria is developed and substantiated. A number of proposals have been made to improve the financial security management of enterprises based on individual segments of the digitization system.

Keywords: digital economy, digitization, financial security, enterprise sector, innovative approach, definition, mathematical function of financial security, profitability criterion, management segment.

Introduction

It is impossible to overestimate the role of the digital economy in the development of the modern business sector. The business sector is the basis of economic development in many countries. Its effectiveness enables the

development of strategic plans for the development of the economic segment, both in general and individually. The level of performance of the business sector depends on many factors, among which the financial security of each

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individual entity is quite prominent. At the same time, the existing elements of ensuring the financial security of business entities in today's economic space require not only the adaptation of new approaches, but above all, the rapid adaptation of segments of the digital economy, that is, digitization. Such a claim can be argued by the content of the key principle of the digital economy – «focus and complexity» – which guarantees, in the context of public administration, the correction of market failures and the maintenance of fair competition. In addition, addressing the digital economy, as «data revolution», shows that improving management processes should be a key element. Considering the aforesaid, the authors believe that improving the level of financial security for today's business sector should be closely linked to the processes of digitization. The problematic nature, interest of the scientific elite and practitioners in the research of various elements of digitization, especially in the management cycles, substantiates the relevance and modernity of the chosen direction of research.

Problems, discussions and scientific achievements in the field of digital economy and digitization have recently occupied a significant place in the writings of leading foreign and domestic scientists. In most cases, studies of individual segments of the digital economy are conducted from the point of view of macroeconomic processes, taking into account the positions of foreign scientists. Their research can be considered as a basis for the formation of a scientific platform on the study of the impact of the digital economy (digitization) on the life of modern society (W. Isaacson, S. Brand, J. Wales, E. Williams, B. Gates, B. Albrecht, D. Engelbart, J. Lickliger, J. von Neumann, E. Peters, and S. Huntington). At the same time, due consideration should be given to domestic scientific developments that reveal the relationship between the digital economy (digitization) from the macroeconomic point of view: (V. S. Milash [1], L.O. Matveychuk [2], Dzhusov O.A., Apalkov S.S. [3], N.M. Kraus, O.P. Holoborodko, K.M. Kraus [4], K.Y. Puhachevska and K.S. Puhachevska [5], V.K. Zahariy, T.G. Kovalchuk, V.V. Synilnyk [6] and

others) and the microeconomic level: (G.G. Chmeruk, V.R. Kralich and I.A. Burlakova [7], V.M. Sotnychenko [8], O.Ye.Hudz [9], I.V. Tokmakova, D.A. Shatokhina and S.V. Melnyk [10] and others. In most cases, domestic scientists point out that the business sector, regardless of the field of research, suffers from the unwillingness to embrace the full facet of the digital economy (digitization) in management cycles. Obviously, this phenomenon is due to the lack of sufficient cash to adapt modern innovative methods and methods of information processing with the tools of the digital economy (digitization). This phenomenon highlights the feasibility of the chosen research area, especially when it comes to adapting the innovative component of the enterprise financial security management system, i.e. digitization.

According to experts and scientists, one of the priority areas of enterprise management is the possession of a methodological apparatus for assessing the level of financial security. However, as the experience of assessing financial security shows, it relies only on classical methods of information resource processing, which leads to a certain limitation of the database, which is used to make innovation approach decisions. We believe that the modern business community needs to take innovative actions that rely on the core attributes of the digital economy, such as digitization and tracking, hyper linking, sharing, personalization, and the absence of intermediaries. It is obvious, that the path of adaptation of key digitization tools for each enterprise will be individual in the absence of a single regulatory methodology for both the general management cycles and separately selected segments. From the point of view of financial security of the business sector, the problems of adaptation of those conceptual categories and principles that will contribute to more substantive understanding of the content of management cycles of this direction remain unresolved. In addition, the issues of developing an effective economic-mathematical model of assessing the financial security of enterprises remain relevant for solution.

The purpose of the article is to investigate the

impact of the digitization system on improving the financial security management of enterprises to improve the conceptual apparatus, determine the content of the basic principle of the management

cycle and develop an economic - mathematical model of financial security assessment based on innovative proposals.

Material and methods

In today's conditions, the business sector of the country is increasingly embedded in digital processes, and traditional economic methods of processing information resources are being sidelined. Strategic transformations, arising from the creation of real adaptive prerequisites for improving the financial security assessment system in the context of digitization, can be seen as an evolution of the orientations of SMEs caused by the search for ways to effectively manage this segment. As a ground for assessing the level of financial security of the business sector, representatives usually select information flows that are accumulated on the basis of annual reports. However, in the context of digitization, these boundaries of the information resource require adaptation of innovative approaches to the formation of a cumulative database, which should synthesize a quality managerial decision.

We believe, that one of the directions for solving this problem should be a number of theoretical and methodological segments, which we propose to lay on:

clarification of the conceptual apparatus of the financial security level management system for the representatives of the business sector;

updating and extension of the principles of the financial security management system for the representatives of the business sector in the conditions of digitization.

In the first stage of the study, it is advisable to reveal the content of the conceptual categories «digital economy» and «digitization». The appeal to the work by K. Y. Puhachevska and K. S. Puhachevska [5, p. 39] showed that «digital economy» should be understood as a modern type of business, characterized by the predominant role of data and methods of managing it as a determining resource in the field of production, distribution, exchange and consumption. Scientists believe that at present

for the representative of the business sector «... it is important not only the fact of ownership of any resource, but the availability of data about this resource and the ability to use them to plan their activities». It should be noted that the term «digital economy» was introduced in 1995 by Don Tapscott. According to the scientist this is a kind of economy that, on the one hand, is based on digital computer technologies, sometimes, called the Internet economy – the new economy – or the web economy – and on the other hand, it is an economic activity, that is unlike traditional economy, is defined by networked intelligence and dependence on virtual technologies [12]. We share the view of the scientist, that the main virtual platform is the virtual world of Internet networks in the digital economy, and the main one in the process of economic activity is the client. O. Ye. Husieva writes [13, p. 98], «... a characteristic feature of the digital economy is its on-demand economy, which does not require the sale of goods and services but access to them at the exact moment when it is needed». We propose to consider the content of the conceptual category of «digitization» from the point of view of already existing domestic legal provisions (Table 1).

Considering the subject of research, we propose to include in the conceptual apparatus of the financial security management system of representatives of the business sector in terms of digitization the definition of: «digitization of financial security» is a process of adaptation of digital technologies in the financial security management system of macroeconomic and microeconomic level. This approach to disclose the content of the proposed definition makes it possible; on the one hand, to adapt the process of digitization more substantially to the financial security management system at different levels, and, on the other, the process of digitization is narrowed within the solution of the problem.

Table 1 – Content of the conceptual category of «digitization»

Content of the conceptual category of «digitization»	Source
Digitization is saturation of the physical world with electronic-digital devices, means, systems and establishment of electronic-communication exchange between them, which actually enables integrated interaction of virtual and physical, i.e. creates cyber physical space	Ordinance of the Cabinet of Ministers of Ukraine of January 17, 2018 No. 67-p. «Concept of development of digital economy and society of Ukraine for 2018-2020» [14]
Digitization is the introduction of digital technologies in all spheres of life: from interaction between people to industrial production, from household items to toys, clothing and etc.	Report of the Ukrainian Institute of the Future «Ukraine 2030E - a country with advanced digital economy» [15]
Digitization is the saturation of the physical world with electronic-digital devices, tools, systems and the establishment of electronic-communication interaction between them.	
Digital transformation (digitization) is the transformation of existing analog (sometimes electronic) products, processes, and business models of an organization that underlies the effective use of digital technologies.	

Being defined the meaning of the terms «digital economy» and «digitization» and given the chosen direction of the study, we will give the most substantive interpretation of the category «financial security». According to the Ukrainian scientist-economist V.M. Heiets «... financial security is the protection of the financial interests of economic entities at all levels of financial relations, the provision of ... financial resources sufficient to meet their needs and fulfill their obligations» [16]. In most cases the financial security process should include: assessing the reality and monitoring the current level of financial security; analysis of the effectiveness of the prevention of negative consequences; comprehensive planning of financial security measures and development of implementation recommendations; planning of corporate resources and implementation of planned measures in the process of financial and economic activity by economic entities.

Extending the research to improve the quality level of the microeconomic financial

security management system through the digitization process, we propose to adapt the following definitions:

«digital database of financial storage» (formation of financial database by the method of processing, systematization and generalization of information resource on the basis of digital technologies);

«financial security regulator» (making a managerial decision in the context of determining the limit of the level of financial security, based on the data of the digital database of the financial drive).

In our view, the justification for adapting these definitions in the financial security management system of the business sector can be considered: reflecting the relationship between the financial security management system and digital technologies; specification of stages of formation of the financial base for the management cycle; there is a close relationship between the selected definitions within a specific management unit.

Results and discussion

The next step in the study is the general principles that affect the digitization process. In particular, rather detailed description of the principles of the digitization process was provided by scientists in the report of the Ukrainian Institute

of the Future «Ukraine 2030E – a country with advanced digital economy» [15]. Among them there are the principles of accessibility, standardization, information security, integration, competitiveness and innovation. Legislators and

scientists justify the fact that adherence to these principles is crucial for the creation and realization of the benefits of digital technologies and the benefits they enjoy. However, the interpretation of essence of the conceptual category «principles of digitization of the economy» is not revealed.

Rudenko M. V. [17, p. 63] proposes to interpret the conceptual category of «principles of digitization of the economy» as follows: basic laws, regulations and driving forces for the promotion of information and communication technologies in daily life of the state, enterprises and society. The scientist holds the following position: the only fundamental principle of digitization is the idea of improving the processes of human life through the use of modern technologies in various spheres of public life. We share the position of M.V. Rudenko and in view of the subject of research; we propose to consider the principle of «digitization of financial security» as the basic principle of the system of financial security management for representatives of the business sector. This principle meaning must be interpreted from two positions:

idea of improving the quality level of the enterprise financial security management system based on the adaptation of the innovative approach in the light of digital technologies;

introduction of the process of formation of digital base of the financial drive, which will provide conditions for the effectiveness of the financial security regulator.

It is understandable, that the insufficient amount of digital storage of the financial drive will lead to a decrease in the quality of the adopted management decision concerning financial security. In addition, representatives of the business sector should have a model of financial security assessment based on the management decision.

In support of the above, the authors propose to the representatives of the business sector the application of the economic-mathematical model of financial security assessment. In this case, the effective indicator of financial security

assessment is to select the profitability criterion, as well as to include the function of financial security as a basis for which to depend on the amount of net sales revenue and the amount of net profit, i.e.:

$$\Psi_t = f(Q_t \cdot P_t) \quad (1)$$

Where: Ψ_t – is the financial security function; Q_t – is the amount of net sales revenue; P_t – is the value of net profit.

Given the fact that the financial security of the enterprise is not only the probability of occurrence of unpredictable events, the severity of the factors of influence, but also what managerial decisions of the top management of the enterprise fall into the area (zone) of negative influence in the financial activity. It is this factor that determines the scope of events that lead to a decrease in the criterion of financial security.

In this case, the level of financial security from making the wrong management decision, which led to negative consequences, the authors propose to determine by the formula:

$$F_b = f(I; I_t) \quad (2)$$

Where: F_b – is the level of financial security of the enterprise;

I – is the probability of reducing the criterion of profitability of the enterprise based on the wrong management decision;

I_t – is the factor of gravity of consequences of wrong management decision.

In addition, the probability of reducing the criterion of profitability of the enterprise based on the wrong managerial decision (I), the authors propose to determine using the following formula:

$$I = 1 - \sum_{i=1}^n [1 - I_t(Q_t; P_t)] \quad (3)$$

Where: I_t – is the probability of lowering the profitability criterion on the basis of making the wrong managerial decision in i –an enterprise;

Q_t, P_t – respectively the volume of net sales revenue and the amount of net profit;

$i = 1, 2, 3, \dots, n$ – is the area (zone) of declining profitability criterion from the wrong managerial decision.

The authors believe that the adaptation of the economic and mathematical model of financial security assessment should occur with the simultaneous involvement of digital technologies that will contribute to the formation of a financial drive base. If this condition is met, representatives of the business sector will receive a better information flow to make a quality managerial decision. From authors' point of view, such a phenomenon may be a justification for the feasibility of implementing the proposed principle of "digitization of financial security", which should be the basis for managerial decisions.

Against this background, we believe that there is a strong correlation between the information base of the digitalization process, the process of accumulating a database for the comprehensive study of financial security and how it is evaluated. Due to the process of digitization of the system of financial security management of enterprises, the qualitative level of database formation for real assessment of the existing border of security increases. It is

at this stage that representatives of the business sector should have a methodology for assessing financial security on the basis of an already established database.

Of course, every representative of the business sector independently chooses innovative approaches to improve the management system of this area, but state intervention is required to achieve effective results. It implies the development of regulatory acts package that would act as a regulator of the development of the financial security management system for representatives of the business sector in the conditions of adaptation of the process of digitization. By choosing the digitization system of financial security management, entrepreneurs are given the additional opportunity not only to meet the modern requirements of the competitive environment, but above all, to accumulate arguments for the feasibility of adapting the most suitable information technologies. Considering current realities of the development of the business sector representatives, we think, this approach is quite logical.

Conclusions

Summarizing, it should be noted that the relevance of strengthening the financial security of representatives of the business sector is due to the existing shortcomings in the management system, namely because of the lack of an effective methodological platform approved at the macroeconomic level, will be manifested in the imperfection of the formation of information flow for making informed managerial decisions. The authors believe, that the business sector, in order to solve this problem, needs not only a legal instrument to implement a financial security management system, but above all, it must rely on key segments of the digitization process in the part that is the carrier of information resource formation on the basis of the latest digital technologies; which in turn will have a positive impact on the performance of the model of its evaluation. In this case, the authors' position on the content of the economic-mathematical

thematic model of financial security assessment is presented. In total, this approach will contribute to the accumulation of better-quality information resources, close to the real conditions of development of the business sector, and as consequence, the identification of problematic aspects that negatively affect their financial security in the future, will become more substantive and meaningful. The conceptual apparatus of the system of financial security management of enterprises should be modernized in case of actual adaptation of the process of digitization. In addition, in the system of general principles of financial security management, it is advisable to single out the principle of «digitization of financial security», which will outline the clear position of the intentions of representatives of the business sector to strengthen it in the future, and create conditions for improving the process of assessing its level.

In the direction of further research, the authors consider carrying out applied calculations in the system of assessing the

financial security of enterprises on the basis of digital technologies, which will be selected for adaptation of the process of digitization.

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