DOI: https://doi.org/10.59503/29538009-2025.1.15-121

THE ISSUES OF ASSESSING BUSINESS DIGITIZATION FINANCIAL RESULTS

Armen Hakobyan
Armenian State University of Economics,
Sc.D. in Economics, Professor
armen_hakobyan@hotmail.com
ORCID ID: https://orcid.org/0000-0001-9884-5404

Hayk Melkumyan*
Yerevan State Unversity, MSc Financial Mathematics, student
hayk.melqumyan@edu.ysu.am
ORCID ID: https://orcid.org/0009-0003-2011-7716

Abstract: The process of introducing digital innovations in business functions is currently showing unprecedented activity. As a result of digital transformations, organizations improve their competitiveness in the market, present management decisions with systematic network information and speed, which are based on advanced digital technologies. However, on the other hand, there is a problem of measuring the financial return of the application of digital innovations, since the digitalization of business functions requires huge financial resources and the efficiency of their spending is often questioned. The article presents methodological approaches to assessing the financial return of digital innovations

in business functions of organizations and proposals for measuring the economic efficiency of digitalization.

Keywords: digital economy, digital transformation in business, financial results of digitalization, digitalization opportunities

JEL codes: G14, M15

Research aims: identify opportunities to assess the financial results of digitizing business functions of organizations

Research novelty: recommendations are made on the measurability for financial results of business functions digitization and financial effectiveness assessments of the digital technologies implementation.

Introduction

Digitalized functions in business open up new competitive opportunities for organizations. By making the transition to digitalization and using large-scale information technologies, organizations dramatically increase the speed of collecting management information, make a systematic transition to network management, apply software models and even artificial intelligence elements, make comprehensive and effective decisions.

At the same time, digital transformations of business functions make organizations competitive, but at the same time, with their advantages, they also form financial risks related not only to the availability of financial resources for the investment of digital technologies, but also to the required cost-effectiveness of digitalization. In this regard, currently, the measurement of the financial results of business digitization and the comparison of the

costs and revenues of digitalized functions in the electronic management system of organizations are of great importance.

Literature review

Widespread digitalization plays a decisive role in economic competitiveness. The core of the latter is the intensive introduction of information and communication technologies (ICT), new results developed on their basis and constantly updated solutions. These fundamental transformations, which have been collectively called the “fourth industrial revolution” (or “Industry 4.0”), are a logical continuation of the previous stages of technological development, but they differ significantly from the latter both in their nature, the scale of changes, and their results (Plotnikov V.A., Babkin A.V. 2022). As a result of the first industrial revolution, production was mechanized, and the opportunity to move faster in space was created. The mass transition from manufactures to factories was essential in terms of increasing productivity. The achievement of the second industrial revolution was electricity. As a result of the active use of the assembly line, productivity increased significantly. Large companies mass production played a decisive role in saturating the market with average quality products for the majority of consumers (Silkina G.Yu., Shaban A.P. 2023).

The achievement of the second industrial revolution was electricity. As a result of the active use of the assembly line, productivity increased significantly. The organization of mass production by large companies played a decisive role in saturating the market with average quality products for the majority of consumers. The third industrial revolution heralded the widespread

transition of production to ICTs. The main achievements were semiconductors, electronic calculators, personal computers, the Internet, and the automation of individual production processes. Industry 4.0 is a new level of production organization and value chain management compared to previous stages of technological achievements. It involves the digitization of all physical assets and their integration with all participants in the value chain in a digital ecosystem. a phenomenon that became possible exclusively in the era of digitalization. The fourth industrial or digital revolution is characterized by the active spread of the Internet, ICTs, cloud technologies, the creation of digital platforms, the availability of stable sources of communication, and the use of artificial intelligence.

Digitization contributes to the progressive improvement of all business processes in the economy and related social sectors. This improvement is based on increasing the speed, accessibility and level of protection of information exchange, as well as automation (Andreyeva N.V., Yermosh Ye.V., Nabatchikova S.B., Ogorodnikova Ye.P. 2020). The revolutionary nature of today's digital transformations is associated with the widespread penetration of information technologies into various sectors, as well as the comprehensive impact of digitalization on many processes carried out in modern business (Kokujceva T.V., Ovchinnikova O.P. 2021).

The Republic of Armenia cannot remain aloof from the processes of digital transformation. The enterprise's can significantly benefit from the opportunities provided by the general digitalization of the economy, thus overcoming the restraining effect of such fundamental factors, that traditionally hinder the

development of the national economy, such as weak competitiveness and limited economic potential due to a small domestic market and lack of scale effects, economic blockade, limited transport and logistics networks and other circumstances (Hinings B., Gegenhuber T., Greenwood, R. 2018). Digital business allows for the elimination of traditional borders between markets, providing all participants in the global economy with equal opportunities to benefit from entrepreneurship (Merzlikina G.S., Babkin A.V. 2022).

Digital transformation can reduce costs, reduce the number of intermediaries, reduce barriers to entry into new markets, and create new opportunities for businesses and citizens to receive services through the Internet (Kohli R., Melville N. 2019). However, at the same time, digital transformation requires large-scale resources for the use of information technologies, which are often not available to small and medium-sized businesses. Moreover, it is often not possible to assess the economic return on these resources in practice, since organizations do not clearly separate the additional benefit obtained as a result of digitalization from their profits. In such a condition, difficulties arise in assessing the financial results of business digitalization (Gault F. 2019).

Research results

The Global Digitalization Index (GDI) is designed to quantify the digital transformation progress of each country, and help countries solve key challenges in implementing digitalization strategies and accelerate the development of their digital economies.

Countries worldwide are racing to make the move to the digital

economy. However, as these countries implement national digitalization strategies, they all need to address the following questions.

How do we measure the ROI of digital infrastructure investment?

How do we plan the best roadmap for and pace of ICT development?

How do we evaluate the readiness of an ICT industry ecosystem?

The GDI 2024 report measured and scored 77 countries, representing 93% of the world's GDP and 80% of the global population, meaning it gives a good indication of the general progress global digital transformation. The report grouped these countries into three clusters: Frontrunners, Adopters, and Starters, based on authoritative third-party data regarding each country's performance in digital transformation. It also provided each country cluster with specific recommendations on how to accelerate digital (Global Digitalization Index 2024).

The maturity of the ICT industry is strongly correlated with GDP per capita growth, but the extent of economic benefits varies by country due to their different levels of ICT development. In Frontrunner countries, for example, a one-point increase in GDI score produces 5.4 times the economic value, than a one-point increase in Starter countries. The GDI research examines the correlation between digital transformation spending and digital economic output, finding that a one-US-dollar investment in digital transformation results in an 8.3-US-dollar return in a country's digital economy (Global Digitalization Index 2024). As digital transformation accelerates across industries, the digital economy is

also expected to grow faster. Research also shows, that the GDI strongly correlates to the AI Preparedness Index of the International Monetary Fund (see Figure 1).

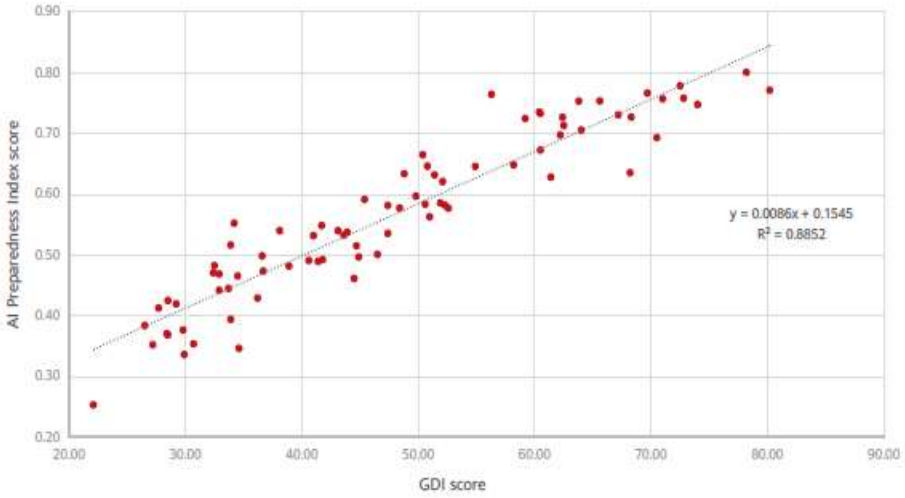

Figure 1. Correlation between GDI and AI Preparedness Index (77 countries)
Source: *AI Preparedness Index 2024*

The potential benefits of digitization are great. Under them, first of all, the formation of new sources of income and the expansion of business opportunities are considered. It should be noted, however, that the digital transformation of the economy has a dual nature. On the one hand, it generates potential risks in the form of qualitative changes in society, the structure of production and the economy in general, which require economic entities to take effective measures to reduce costs, and on the other hand, it

creates a mechanism for reducing these risks, the basis of which is the progressive opportunities provided by the digitalization process.

Digital transformation brings maximum results when working in an interdisciplinary manner: when using multidisciplinary knowledge about needs, developing a digital infrastructure for streamlining cross-sectorial processes, creating digital cross-sectorial platforms and creating new economic models based on them.

At the level of organizations, the digitization of business functions is not an end in itself and is applied in organizations during management decisions (see Figure 2). Moreover, these decisions are also made when assessing the feasibility of digital transformations, comparing the costs of digitalization and their results. In this regard, we consider the payback period of business digitalization important, for which the costs of introducing and further servicing digital technologies (respectively (R_0 and $\sum R_1$) with the additional benefits generated as a result of digitalization ($\sum E$) are transferred to the field of comparison.

If determining the costs associated with business digitalization does not present any difficulties, then measuring the additional benefits generated as a result of digitalization in practice encounters great difficulties. In this regard, we propose to assess the coefficient of closeness of the relationship between the increase in turnover volume realized by the organization and the actual costs of digitalization of business functions by means of correlation research.

Considering that the costs of digitalization of the organization's business functions and the volume of sales between the indicators,

a significant relationship (R) is observed, a determination will be calculated that will show (R2) the effect of the unit cost on the volume growth of sales. Thus, the share of the impact of digitalization will be separated from the total amount of sales (∑E).

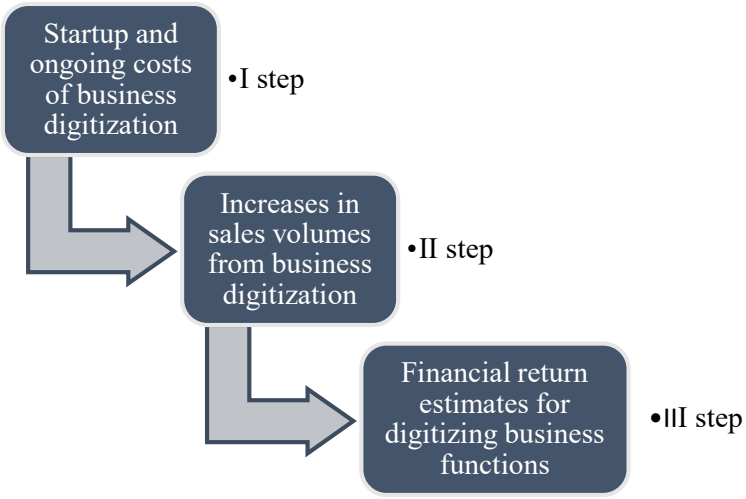

Figure 2. The process of assessing the financial results of digitizing business functions in organizations[9]

As a result, the cost-effectiveness of digitalization of business functions will be presented by the following formula:

(present value of additional sales volumes generated by digitalization of business functions) / initial investment costs of digitalization + present value of current operating costs of digital transformations)

or

$$\sum k^*E / (R_0 + \sum k^*R_1)$$

[9] Composed by authors

where k is the coefficient of present value.

The shorter the payback period of digital transformation costs in a business, the higher the financial efficiency of digitalization.

Conclusion

The advantages of digitalization of business functions are obvious in the current competitive market. With innovative solutions for digital transformation of the management system, organizations strive for new markets, reduction of operating costs and flexible management decision-making using information technologies. However, on the other hand, electronic management, requiring large-scale financial resources, simultaneously sets itself the task of assessing their economic return. And this is especially important from the point of view of building flexible information and communication ecosystems, since the need for the distribution of information technologies and effective investment policies is being formed in the business environment.

Consequently, the current problem is to recognize and measure the financial return of digitalization of business functions and to clearly assess the financial consequences of digital transformations in the system of economic activities of organizations. And in our opinion, the formation of opportunities for financial measurements of both investment and emerging consequences of digital transformations in business can significantly contribute to this.

References:

1. ***Andreyeva, N., V., Yermosh, Ye., V., Nabatchikova, S., B., Ogorodnikova, Ye., P.*** (2020). *Application of digital technologies in*

the banking sector of the economy. Vestnik Akademii znaniy, 2 (37), pp. 415–419. DOI: 10.24411/2304-6139-2020-10201

2. AI Preparedness Index 2024 www.imf.org/external/datamapper/datasets/AIPI
3. ***Hinings B., Gegenhuber T., Greenwood, R.*** (2018). *Digital innovation and transformation: An institutional perspective*. Information and Organization, 28 (1), pp. 52–61. DOI: 10.1016/j.infoandorg.2018.02.004
4. ***Kohli, R., Melville, N.*** (2019). *Digital innovation: A review and synthesis*. Information Systems Journal, 29 (3). DOI: 10.1111/isj.12193
5. ***Kokujceva, T., V., Ovchinnikova, O., P.*** (2021). Methodological approaches to evaluating the effectiveness of digital transformation of enterprises of high-tech industries. Creative economy. 15(6), pp. 2413-2430. DOI: 10.18334/ce.15.6.112192.
6. ***Merzlikina, G., S., Babkin, A., V.*** (2022). Development of innovation partnerships: from collaboration to joint innovation. π-Economy, 15 (3), pp. 64–80. DOI: 10.18721/JE.15305
7. ***Gault F.*** (2019) *User Innovation in the Digital Economy*. Foresight and STI Governance, 13 (3), 6–12. DOI: 10.17323/2500-2597.2019.3.6.12
8. Global Digitalization Index 2024. https://www.huawei.com/en/gdi
9. ***Silkina, G., Yu., Shaban, A., P.*** (2023). *Digital innovation: essential characteristics and features*. π-Economy. 2023, Vol. 16, No. 5. pp. 51–62. DOI: 10.18721/JE.16504
10. ***Plotnikov, V., A., Babkin, A., V.*** (2022). *Approaches to assessing the level of digitalization of the economy*. Ekonomika i Industriya 5.0 v usloviyakh novoy realnosti (INPROM-2022), pp. 112–115. DOI: 10.18720/IEP/2022.1/28

ԲԻԶՆԵՍԻ ԹՎԱՅՆԱՑՄԱՆ ՖԻՆԱՆՍԱԿԱՆ ԱԴՅՈՒՆՔՆԵՐԻ ԳՆԱՀԱՏՄԱՆ ՀԻՄՆԱԽՆԴԻՐՆԵՐԸ

Արմեն Հակոբյան
Հայաստանի պետական տնտեսագիտական համալսարան,
տնտեսագիտության դոկտոր, պրոֆեսոր

Հայկ Մելքումյան
Երևանի պետական համալսարան, Ֆինանսական
մաթեմատիկա, ուսանող

Բանալի բառեր - թվային տնտեսություն, թվային փոխակերպումները բիզնեսում, թվայնացման ֆինանսական արդյունք, թվայնանացման հնարավորություններ

Թվայնացված գործառույթները բիզնեսում մրցակցային նոր հնարավորություններ են բացում կազմակերպությունների համար: Անցում կատարելով թվայնացման և կիրառելով լայնամասշտաբ տեղեկատվական տեխնոլոգիաներ, կազմակերպությունները կտրուկ մեծացնում են կառավարչական տեղեկատվության հավաքագրման արագությունը, համակարգային անցում են կատարում ցանցային կառավարմանը, կիրառելով ծրագրային մոդելներ և անգամ արհեստական բանակության էլեմենտներ, համապարփակ և արդյունավետ որոշումներ են կայացնում:

Դրանով հանդերձ, բիզնես գործառույթների թվային փոխակերպումները մրցակցային են դարձնում կազմակերպություններին, սակայն իրենց առավելություններով միաժամանակ ձևավորում են նաև ֆինանսական ռիսկեր,

կապված ոչ միայն թվային տեխնոլոգիաների ներդրման ֆինանսական ռեսուրսների հասանելիության, այլև թվայնացման պահանջվող ծախսահատույցի հետ: Այս առումով, ներկայումս կարևորվում է բիզնեսի թվայնացման ֆինանսական արդյունքների չափումը և թվայնացված գործառույթների ծախսերի և եկամուտների համադրումը կազմակերպությունների էլեկտրոնային կառավարման համակարգում:

Հոդվածում կոնկրետ առաջարկություններ են արվում բիզնես գործառույթների թվայնացման ֆինանսական արդյունքների չափելիության և թվային տեխնոլոգիաների կիրառման ֆինանսական արդյունավետության գնահատումների գծով:

Submitted: 03.03.2025; Revised: 18.03.2025; Accepted: 02.04.2025