

ЕКОНОМІКА ПІДПРИЄМСТВА

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AS A CHANGE IN THE BUSINESS MODEL AND CORPORATE THINKING****ЦИФРОВА ТРАНСФОРМАЦІЯ ПРОМИСЛОВИХ ПІДПРИЄМСТВ
ЯК ЗМІНА БІЗНЕС-МОДЕЛІ ТА КОРПОРАТИВНОГО МИСЛЕННЯ**

The article considers the essence of digital transformation as a more complex and complex phenomenon than digitalization. The definition of digital transformation by foreign scientists is considered. The processes of digital transformation of the GE and John Deere companies were considered and it was found that they have quite similar stages. It was proved that digital transformation involves the use of digital technologies, which leads to rethinking of business, rethinking of products and services, providing them with additional value based on information and technologies, to changing the key elements of the business model or its complete transformation with the formation of a digital company. Examples of Ukrainian companies that correspond to the signs of digital transformation and reflect similar experience are considered. On the basis of the conducted research, it can be concluded that Ukrainian enterprises have the potential for digital transformation, but this requires not only resources, but also the presence of transformational thinking in management, awareness of the need for digital transformation, and the formation of an appropriate corporate culture for this purpose.

Keywords: digitalization, digital transformation, business model, digital technologies, digital values, digital product.

У статті розглядається сутність цифрової трансформації як процесу, що за своєю сутністю є більш складним та комплексним, ніж цифровізація. На основі дослідження зарубіжних публікацій виявлено, що цифрова трансформація передбачає вплив на бізнес-модель підприємства, який проявляється у зміні кількох елементів бізнес-моделі, у тому числі таких ключових як продукт, цінність, основні види діяльності. Розглянуто процеси цифрової трансформації компаній GE, John Deere виявлено, що вони мають досить схожі етапи, такі як цифровізація з метою підвищення ефективності використання власних активів; формування цифрової платформи для підвищення власної ефективності та надання цінності власним клієнтам; відкриття платформи для використання іншими підприємствами. За результатами розгляду трансформаційних проектів GE, John Deere доведено, що цифрова трансформація передбачає використання діджитал технологій, що призводить до переосмислення бізнесу, переосмислення продукції та послуг, надання їм додаткової цінності, заснованої на інформації та технологіях, до зміни ключових елементів бізнес-моделі або її повної трансформації з формуванням цифрової компанії. Розглянуто приклади українських компаній, що відповідають ознакам цифрової трансформації та відображають схожий досвід, зокрема, ДТЕК, МХП, Kernel. Проаналізовано статистичні дані щодо використання деяких цифрових технологій українськими підприємствами, зокрема 3D-друк та аналітика Великих даних, які свідчать про те, що цифрова трансформація не є масовим явищем для українського бізнесу, проте тенденції на ринку свідчать про інтенсифікацію процесів цифровізації. На основі проведеного дослідження можна зробити висновок, що незважаючи на складні умови господарювання, українські підприємства мають потенціал до цифрової трансформації, однак це потребує не лише ресурсів (які доступніші великим підприємствам), а й наявності трансформаційного мислення у керівництва, усвідомлення необхідності цифрової трансформації, формування з цією метою відповідної корпоративної культури.

Ключові слова: цифровізація, цифрова трансформація, бізнес-модель, цифрові технології, цифрові цінності, цифровий продукт.

Problem statement. Digital transformation is becoming an increasingly important topic from the point of view of scientific research due to the intensification of the development of technologies, the expansion of the possibilities of their application in business, the development of new digital business models that significantly affect industries, changing them. The world's leading companies, using Industry 4.0 technologies, are changing the rules of the game in the market, often changing the market itself and erasing the boundaries between industries. For many companies, digital transformation is becoming a necessary trend, creating an opportunity for them to compete in the market and for sustainable development. Deloitte pointed out that 70% of digital transformation projects were unsuccessful, and therefore it is important to consider the experience of those companies that were able to implement a successful digital transformation. This is also relevant for Ukrainian enterprises, because despite the difficult business conditions, they implement digital technologies and solutions. However, first of all, it is worth defining what exactly digital transformation is, because, according to the authors of this study, it often includes digitalization projects that are not as large-scale in terms of changes as digital transformation implies.

Analysis of recent research and publications. Digital transformation and digital strategies are the subject of research by many scholars. In particular, the formation of digital strategies and changes in business is considered by S. Gupta, V. Grover and R. Kohli; interpretation of digital transformation is offered by G. Vial, F. Imrana, K. Shahzad. Among Ukrainian scientists, the digital transformation of industrial enterprises is considered by I.V. Kryvyovvazyuk, V. V. Gurochkina, who, in particular, examines the digital transformation of the business model of industrial enterprises, O.E. Gudz, who pays attention to digital transformation and the digital economy. However, it is worth considering how digital transformation is reflected in business models, including by considering the experience of foreign and domestic enterprises.

Formulating the purposes of the article is to form a clear definition of the concept of "digital transformation" based on the consideration of specific examples of digital transformation projects by Ukrainian and foreign companies.

Presentation of the main research material. During the last 5 years, stable foundations for digitalization of business have been formed in Ukraine. The first impetus was the COVID-19 pandemic, which completely changed working conditions in all areas and contributed to the spread of such technologies and trends as contactless payments, remote work and training, e-commerce, electronic document flow, automation of work where it was possible to reduce the risk of contact with the sick workers and support the company's work at a normal pace in the presence of restrictions on the number of employees who can work in one room, etc. At the same time, companies that already used technologies such as automated warehouses and document exchange in electronic form immediately gained competitive advantages, because they did not have to urgently reorganize their work and adapt to strict restrictions.

The year 2022 has created many new challenges for Ukrainian enterprises: along with the relevance of remote work, there is an urgent need to ensure uninterrupted access

to data (by transferring it, for example, to cloud services); to ensure cyber security due to the growing number of hacker attacks; to use automated technologies where it is possible to reduce the risk to life and health of workers; to apply energy-saving technologies; to use technologies to reduce the cost of production in case of a sharp increase in prices. And all this against the background of significant risks and reluctance to invest in expensive technologies during martial law.

However, despite the spread of various digital technologies, it is currently too early to talk about the mass digital transformation of Ukrainian enterprises.

First of all, it should be recognized that the above provisions are more about digitization than digital transformation. It is not enough just to introduce any technology, even a complex one, into the activity. According to the conclusions of Gregory Vial [1], digital transformation includes, in addition to technology, strategy, changes in the organization (including changes in its structure), processes and culture, which are collectively required to generate new value.

According to other authors, digital transformation is an innovative behavior that can radically change the fundamental form of products, business practices and the business landscape [2].

Faisal Imrana, Khuram Shahzad and others in their research conclude that digital transformation uses a combination of advanced digital technologies (technical systems) and organizational practices (social system) to ensure major business improvements [3, p. 452].

Digital transformation refers to the combined effects of several digital innovations creating new actors (and groups of actors), structures, practices, values and beliefs that change, disrupt, replace or complement the existing rules of the game in organizations, ecosystems, industries or spheres [4]. Digital transformation can manifest itself as a result of the influence of digital technologies, when the cumulative effect of digital innovations leads to the emergence of new organizational forms, new institutional infrastructure [4].

In addition, digitalization focuses more on the applied technologies, while digital transformation considers the organization as a system that includes social, technological and managerial aspects.

Thus, if the organization is presented in the form of a business model, it can be argued that digitalization affects performance indicators, can form new sources of income, etc., but does not fundamentally change the elements of the business model. Whereas digital transformation causes changes in one key element of the business model (for example, value and product) or in several at once, or may cause a change in the business model altogether. In some cases, such a business model can become completely digital and branch off into a separate business line.

All these theoretical provisions regarding the definition of such a phenomenon as "digital transformation" make it possible to assert that it is not typical and widespread for Ukrainian industrial enterprises. Currently, we can talk about digitalization of business, but not its transformation.

To confirm this thesis, it is possible to consider the business models of General Electric and John Deere, which are examples of digital transformation, which made it possible to change the value of products offered by these companies and to form separate areas of activity.

General Electric (GE), digitalizing its own business processes in order to improve its own efficiency, has gradually formed a separate digital platform, Predix – a cloud platform as a service (PaaS) for the industrial Internet. Connecting machines, data, people and other assets, the Predix platform uses leading technologies for distributed computing, big data analytics, asset data management and machine-to-machine communication. The platform provides a wide range of industrial microservices that allow enterprises to increase productivity [5]. But digital transformations in companies initially took place to increase the productivity of their assets (Figure 1).

Thus, GE completely changed the value of the product they were offering. In addition to the equipment, the client gets the opportunity to use it effectively, perform analytics and forecasting, that is, along with the physical product, there is an information product that increases its value as an asset. Moreover, a separate line of business, the digital platform, was formed, and in accordance with GE's key areas of activity, those related to platform management, its scaling, etc., were added. The composition of partners also changed, as software developers were added to them. Customers have also expanded, as the Predix digital platform can be used not only by direct buyers of equipment manufactured by GE.

John Deere is a well-known manufacturer of agricultural machinery and equipment. His transformation is somewhat reminiscent of GE's path: the company collected and processed the data obtained from their machinery and provided farmers with the necessary information that can optimize their work, such as weather maps, weather forecasts, crop optimization applications and more. Today, their digital platform Open Platform is available in Ukraine, the John Deere control center is a platform based on open data for an agricultural enterprise, which uses a fleet of John Deere equipment or various manufacturers (Case, New Holland, TopCon, AgLeader). Here it is possible to import and analyze agronomic data recorded on different displays and in different formats [7]. Thus, the company does not just offer technologies

for agriculture, but technologies for precision agriculture, their products also received added value in the form of the ability to improve their own efficiency through the use of information. This similarly involves changing the key elements of the business model – product, value, key activities.

Thus, we see that digital transformation does not simply involve increasing efficiency, automation, or the use of digital technologies, but involves rethinking business and the possibilities of using available information through the application and integration of digital technologies into business processes. Of course, this may involve a change in the company's structure, and a change in management, in strategy, i.e. transformation of management, change of products or services by providing them with new value, or development and offering of new products based on modern technologies.

Such transformation is based on such technologies as the Internet of Things (in particular, the Industrial Internet of Things), digital twins, cloud services, Big Data and their processing technologies, including machine learning and artificial intelligence.

Such technologies are used in Ukraine, but it is not large-scale. However, there are companies that are in the process of digital transformation. Among them, it is worth mentioning DTEK, which is undergoing a transformation very similar to GE. In 2019, the company launched a digital transformation program called MODUS by implementing digital changes in 13 areas [8]:

- 1) digital energy – projects for digitalization of processes in the field of coal mining, generation, end-to-end integrated planning and efficiency of production operations;
- 2) digital networks – to ensure reliability and high-quality customer service, perform network repairs, optimize network mode and configuration;
- 3) digital HR – projects to provide business with personnel, improve customer service;
- 4) digital field – projects on digital management of production, digitalization, drilling and capital construction during gas production;

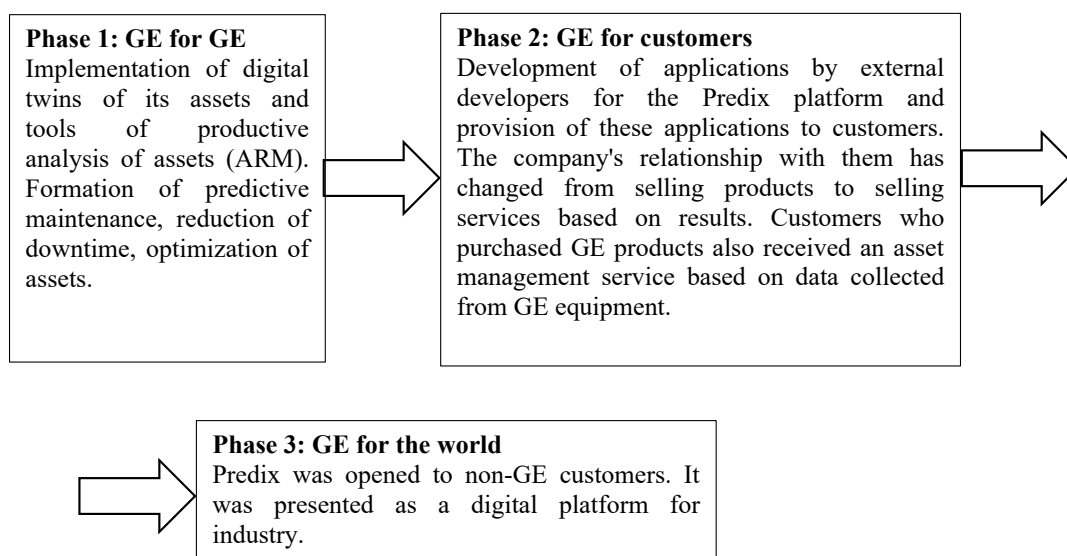


Figure 1. Phases of the formation of the Predix platform

Source: formed by the authors based on [6, p. 89–92]

5) digital procurement – projects on analytics and demand forecasting, operational procurement, supplier selection, inventory and warehouse management, to improve customer orientation;

6) digital analytics for the unification of data storage and processing processes, data-based decision-making;

7) digital office for robotization of routine processes, improvement of working conditions;

8) digital client – aimed at increasing the comfort of clients, ensuring ease of use of the company's services, automation and digitization of business;

9) digital renewable energy sources (RES) – module projects are focused on the application of the best global practices to ensure the effective development of RES. The implementation of projects contributes to the achievement of the strategic goal of the entire DTEK – to become a carbon-neutral company by 2040;

10) digital finance for the automation and digitization of the financial function, improving the quality of data array processing;

11) information security for the safety of all information flows, its reliable and effective protection;

12) digital infrastructure aimed at building a modern, flexible, secure and stable infrastructure for business processes;

13) digital trading for the efficiency of operations in the reformed markets of energy products.

As we can see, such a transformation is very large-scale and involves significant changes in the company's business model. In addition, due to consumer-oriented projects, the latter also benefit from digital values.

A separate company MODUS X was formed, which presented an industrial IoT platform (Internet of Things) for the businesses of the DTEK Group. It is a complex orchestra of servers and cloud computing services that reliably integrates and processes power plant data (TES, SES, WPP) [9].

Today, despite the difficult operating conditions created by Russia's military aggression, the company continues to develop. MODUS X offers services for various companies, accompanying them on the way to digital transformation. Even in the current environment, they cooperate with Microsoft, Check Point, etc.

All this changes the traditional approach to power generation and distribution, and therefore the digital changes of DTEK are a digital transformation.

In addition to DTEK, the companies following this path include Kernel (they have an Open Agribusiness

ecosystem project where you can use the company's experience to improve your own business), MHP (a Smart Technologist Assistant that works on the basis of artificial intelligence).

In general, digital transformation often involves the blurring of boundaries between industries, due to which technologies from one field can be used in another. For example, drones have been successfully used both in agriculture (control of crops, maps of fields) and in energy (in particular, DTEK used them to control power grids). Among foreign companies, such an example is Amazon, which itself has become a company that has gone beyond the scope of "its" industry and is currently a provider of cloud services, video content, the developer of the Alexa virtual assistant, the manufacturer of the Amazon Kindle e-book – that is, technologies that are not typical for online stores or trade in general. The examples presented here also correspond to this principle of "going beyond the limits", because John Deere went beyond the limits of the manufacturer of agricultural machinery and equipment, entering at the same time the sphere of collecting, processing and using information, providing services in the form of a digital platform. Therefore, domestic enterprises should also consider this approach in the transformation of their own activities.

Official statistics show that currently in Ukraine, the use of technology by enterprises is not at a very high level. Basically, these are relatively simple technologies that do not involve large-scale transformation (Table 1).

As you can see, the use of these technologies is more typical for large enterprises (those with more than 250 employees).

According to official statistics, in Ukraine as of 2022, 85.1% of enterprises had access to the Internet, 29.1% of enterprises used social media [10].

Therefore, we can talk about some contrast in the development of Ukrainian enterprises from the point of view of digitalization. This causes certain digital divides, where it is difficult for companies to interact due to the difference in the level of technology used. According to the same statistics, in 2020, 32.3% of enterprises sent invoices in electronic form, unsuitable for automated processing [10].

Conclusions. So, it can be concluded that digital transformation is a process different from digitalization, more complex and involves more complex changes. An analysis of the experience of large foreign companies and Ukrainian enterprises in this area shows that Ukrainian enterprises still have a long way to go before digital

Table 1

Application of some technologies by Ukrainian enterprises (excluding those with less than 10 employees)

Technology and method of application	The share of enterprises in the total number, %, using this technology in		
	2018	2019	2020
Analysis of Big Data	12,5	11,9	12,7
including by the number of employees:			
- from 10 to 49 people	10,4	10,1	10,1
- from 50 to 249 people	17,8	16,3	20,6
- from 250 or more people	26,5	26,3	27,7
3D printing	2,0	2,3	2,3
including by the number of employees:			
- from 10 to 49 people	1,7	2,0	2,1
- from 50 to 249 people	2,6	2,9	3,4
- from 250 or more people	3,9	4,5	4,6

Source: compiled by the authors based on data from the State Statistics Service of Ukraine

transformation. But in general, the development of digital technologies in the country is at a high level, and despite the war, we are rising in the "digital" ratings. Of course, the transformational projects that were described in the study are complex, require time and financial resources, which is why, from this point of view, large enterprises

can be the most ready for their implementation. However, it is necessary for the company to be flexible enough to adapt to new digital solutions. An appropriate culture of transformation must be formed, there must be a leader and appropriate strategic transformational thinking in management at all levels of management.

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