

*Invited lecture/Review*

Digital Transformations: Trends and Perspectives Worldwide

Vlasenko Tetiana^{1,*}, Nemashkalo Karina¹, Shapovalova Inga¹¹ Simon Kuznets Kharkiv National University of Economics, Ukraine* Correspondence: Vlasenko Tetiana; t.vlasenko@hneu.net

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Abstract:

An analysis of the structure of keywords that form the concept of digital transformation was carried out using the VOSviewer software based on the generalization of information from journals that are indexed in the Web of Science and Scopus scientific metric databases. The author's vision of the concept of "digital transformations" is presented. The growth trends of the digital transformation market are considered. The main characteristics of the digital transformation market are considered: key drivers, restraints, opportunities, and challenges are highlighted. The analysis of states by the level of implementation of digital transformation is presented. The volume of global spending for implementing digital transformation with a forecast for the future has been studied. The dimensions of the global e-learning market by segment are considered. The main gains from the implementation of the digital model are presented. The understanding of digital business from the managers' point of view is considered. The most developed industries in the context of digital transformation have been identified.

The relationship between the levels of environmental responsibility of business and digital transformation has been established. The leading technologies of digital transformation are analyzed. Consider the impact of digital transformation on human capital and the workforce. The level of digital transformation in Ukraine, features of its implementation, further prospects, and difficulties are provided. Strategies for intensifying the digital transformation of business and society in Ukraine are proposed.

Keywords: digital transformation; global spending; environmental responsibility; human capital; global e-learning market.



1. An analysis of the structure of keywords «digital transformation»

The analysis of the concept of digital transformation should begin with a consideration of the set of keywords that form this concept, the relationship of which is presented in **Figure 1**. The frequency of selected concepts and their general connection, which are presented most often among the keywords of the structure of this category, are given in **Figure 2**. As we can see, this concept is most often associated with metadata, digital technologies, and digital storage. The first block of the most frequently used words ends with Industry 4.0. An essential role in this category is played by the immediate person and, in parallel with it, the concept of artificial intelligence, which, by the number of mentions, almost doubles the human factor. The concept of mathematical transformations should be added to the same cluster of keywords. The next block of concepts combines e-learning, Internet of Things decision-making, and digitalization.

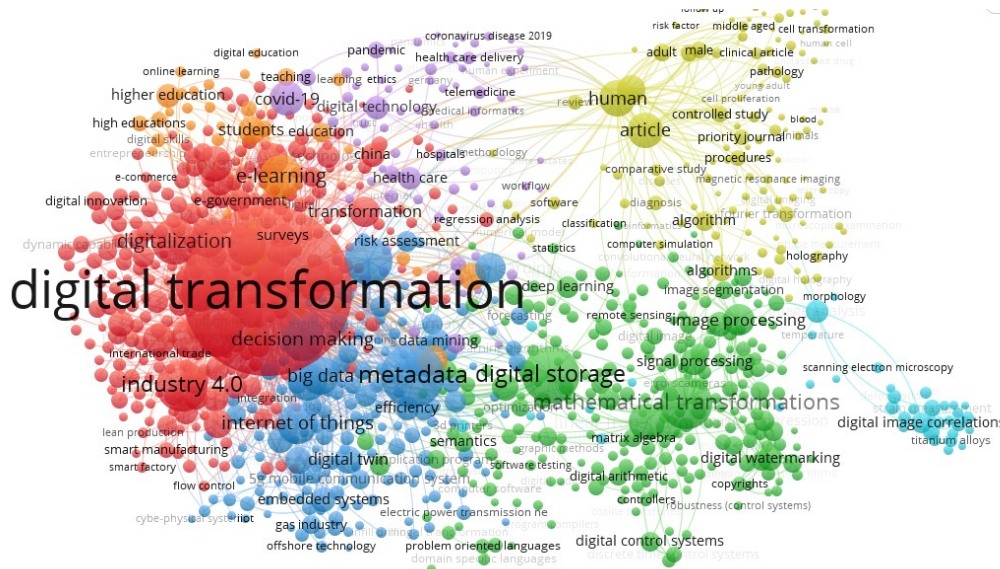


Figure 1. The structure of the concept of digital transformations by key words (built in VOSviewer).

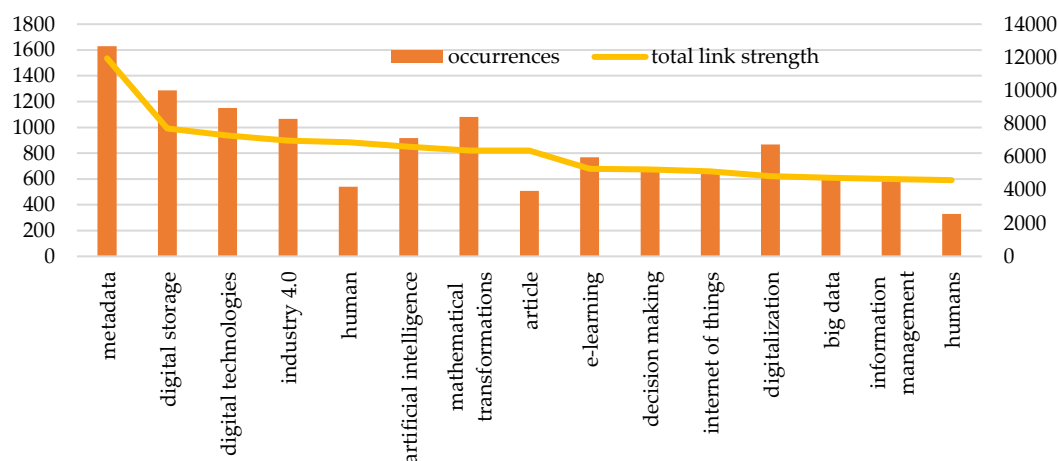


Figure 2. Selected keyword's analysis (from VOSviewer).



Well, the last block combines big data management and information that includes the human factor. The human factor in this category plays a rather important role, but not the main one. The digital transformation category is firmly associated with digital technologies, digitalization, digital preservation, artificial intelligence, mathematical transformations, and modern achievements in this field, represented by the Internet of Things and artificial intelligence. It is worth noting that e-learning is included in the group of concepts, which indicates the urgency of solving issues of sustainable competence formation in this field for further deepening the penetration of digital technologies in all areas of human life, which indicates the urgency of solving issues of sustainable competence formation in this field for further deepening the penetration of digital technologies in all areas of human life, which are actually united by the complex concept of digital transformation.

The generalized concept of digital transformation in various aspects of social life allows us to establish that it is considered a cultural, organizational, operational change in the structures of the industry or the entire ecosystem through the integration of digital technologies, processes and competencies at all levels of functioning (Digital transformation), the evolution of relations and in society under the influence of implementation information and communication technologies (Tymoshenko & Shabanova, 2021; Kruhlov, 2021), improving business by improving relationships with various stakeholder groups through digital technologies to change the culture and mindset of the organization and accelerate the development of technology (Holovachov & Nifatova, 2021; Novak, 2021), the influence of the state on society as a whole and its institutions, including business for implementation of information and communication technologies (Marchenko, 2019).

We see that the fundamental concept of digital transformation is most closely related to such categories as:

- From the point of view of scientists, the concept of digital transformation is a process of evolution of economic, social, industrial, technical, and technological relations in society caused by the development of information and communication technologies.
- From a business point of view, this is a mechanism for changing business models to improve the efficiency of its operation.
- About the state, this is the saturation of the physical world with electronic and digital devices, means, systems, and the establishment of electronic communication exchange between them.
- From the public's point of view, this is a new paradigm for the development of life processes, the basis of which are digital technologies.

In general, we can identify the concept of digital transformation as the process of building new systems of interaction between various participants in social relations, socio-economic systems of states and the world as a whole, where the main elements of interaction are information and communication technologies and achievements of the modern digital world, including artificial intelligence, the Internet of Things, big data. In cooperation with the key characteristics of Industry 4, within which the complete automation of activities, the construction of cyber-physical systems, and the implementation of Internet technologies for the interaction of personnel and machines are foreseen. Digital transformations include creating added value in business and the interaction of the state, society, and business in a new digital communication format to improve the interaction of a fundamentally new ecosystem of cooperation in the socio-economic system.

Digital transformations should be understood as the comprehensive and large-scale implementation of modern digital technologies, which are oriented towards the final specific consumer, considering the nature of the interaction of various stakeholders in business. These transformations involve new procedures for implementing classical business processes using software, a variety of new electronic devices, and information and communication technologies.



2. The characteristics of the digital transformation market

The volume of the digital transformation market in 2022 was \$594.4 billion, in 2023 this market grew to \$ 695.5 billion, and the forecast until 2030 is \$3144.91. Global spending on digital transformation technologies and services worldwide (2017 to 2026) (Fig. 3.)

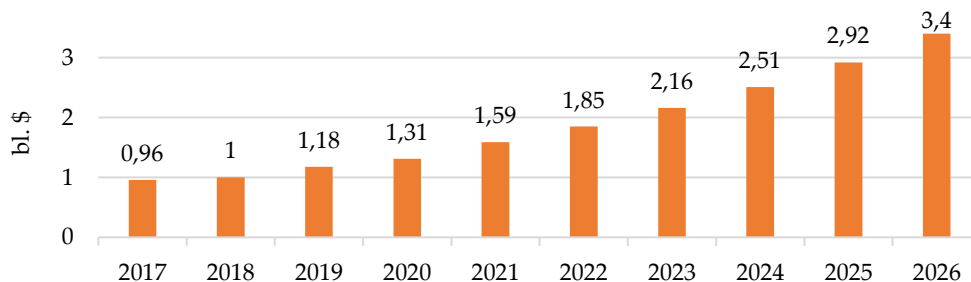


Figure 3. Global spending on digital transformation technologies and services worldwide.

The global e-learning market size was worth around USD 194.25 billion in 2022 and is predicted to grow to around USD 545.38 billion by 2030 with a compound annual growth rate (CAGR) of roughly 13.81% between 2023 and 2030. It is worth noting that the global e-learning market will only benefit from growing investments in the development of employees. Adapting employees to changing business conditions is critical to business survival and gaining competitive digital advantages. Currently, American companies spend more than \$100 billion on employee development. E-learning consists of the lack of a living environment for engaging students in the process, which can be solved using modern e-learning tools: interactive whiteboards, virtual reality (VR) & augmented reality (AR) systems, extensive and comprehensive learning management systems (LMS), artificial intelligence (AI) powered tools (E-Learning Market, 2023). Obstacles to the further implementation of e-learning are the need for more access for all interested parties due to the lack of devices and robust Internet networks. In the competitive market, there will be a deepening of interaction between significant competitors to enter world markets and further deepen integration.

Priority strategies, management processes, and solutions that CIOs plan for 2023: 1. Cybersecurity and risk management; 2. Digital government and digital services; 3. Ready workforce for the future; 4. Legacy modernization; 5. Identity and access management; 6. Cloud services; 7. Consolidation/Optimization of operations; 8. Data and information management; 9. Broadband and wireless connectivity; 10. Customer relationship management (Top 10 policy, 2023). The leading technologies of digital transformation include mobile technology, internet of things (IoT), robotics, artificial intelligence and machine learning, augmented reality, big data and real-time analytics, digital twin, API-based integrations, robotic process automation (RPA), cloud-based technology (Top 10 Digital Transformation Technologies, 2023). These technologies are characterized by high complexity and cost for their implementation. Accordingly, in parallel with the convergence of various socio-economic systems during the digital transformation, the digital gap in the context of ultra-sophisticated technologies will only grow due to the need for more investment fun.

3. The main characteristics of the digital transformation market can be considered as key drivers, restraints, opportunities, and challenges

Let's consider the qualitative characteristics of the digital transformation market.

3.1. Drivers. One of the drivers of increasing these processes is the increase in the use of mobile phones and applications. Mobile devices allow you to quickly access the Internet, be constantly connected, and receive various digital services anywhere at any time. This has changed how people interact and use information and services, creating new business models and organizational opportunities. Mobile devices provide tools and applications that increase productivity and efficiency. Employees can be more productive with the ability to access business applications and manage tasks.



3.2. *Key obstacles.* Key obstacles to the development of digital transformation are the need for more protection of private data and compliance with security. The need to process a large amount of data creates difficulties in ensuring its security. One of the risks remains unauthorized access and inappropriate use of personal information among consumers, state authorities, and businesses directly.

3.3. *Growth opportunities.* Growth opportunities are the introduction of digital services and technologies. Digital transformations create significant opportunities for businesses in the context of revolutionary changes in their operations by introducing digital tools and technologies. Implementation of such innovative solutions as data storage, artificial intelligence, analysis of large volumes of data, and company automation can activate processes, increase efficiency, and achieve new competitive advantages. Digital tools enable soft collaboration. Digital tools enable soft collaboration, remote work, and constant access to real-time data, inspiring employees to work more productively from anywhere. In the future, digital transformations will open the door to improved consumer experiences through personalized interaction, faster response to requests, and individual solutions.

3.4. *Challenges.* Challenges for digital transformation are legacy in the form of inefficient systems and outdated technologies. Many organizations still use old systems that were implemented many years ago. These technologies are often characterized by a need for more compatibility with modern technologies, which prevents integration into new digital solutions. Upgrading or replacing these legacy systems requires careful planning, significant investment, and potential disruption to current operations.

The impact of Digital Transformation on human capital consists of the formation of new fundamental competencies that employees will require. The need for constant learning, self-improvement, and compliance with the principles of digital security remains critical due to the widespread use of personal and commercial information in various sources, applications, and databases.

4. The level of digital transformation in Ukraine further prospects, difficulties are strategies for intensifying

The problem of digital transformation in Ukraine is the immaturity of digital culture and the perception of digitalization of business. For a long time, it has been essential to understand that digitalization can be implemented through the development of companies and individuals, confirming the integrity of e-learning. Difficulties still need to be addressed with the access of the entire population to a high-quality Internet network and the use of modern applications. It also inhibits the implementation of the concept of an inclusive economy as one that creates equal opportunities for the participation of every citizen in the creation of added value. Ukraine can boast of significant successes in digital transformation, such as the widely popular application "Дія", which acts as a full-fledged substitute for the vital identity documents of a citizen in Ukraine and creates opportunities for him to conduct full-fledged activities. Ukraine has also achieved significant success in the digitalization of banking services. Most leading banks have mobile applications that allow you to carry out virtually all financial transactions through a mobile application. In state-building, digital transformation can be represented by successes in public procurement, which has been carried out for many years through electronic transparent platforms.

Investing in the development of Industry 4.0 technologies, which requires the development of a modern innovation ecosystem that ensures the implementation and development of these technologies in business activities, is a promising strategy for deepening the digital transformation processes of education.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Digital transformation: online guide to digital business transformation. Available from <https://www.iscoop.eu/digital-transformation>
2. Tymoshenko N, Shabanova, M. Development of innovative activity in conditions of digitalization. *Економіка та суспільство*. 2021,29. Available from <https://doi.org/10.32782/2524-0072/2021-29-30>



3. Holovachov IA, Nifatova OM. Drivers of digital business transformation in Ukraine: opportunities and obstacles. Проблеми інтеграції освіти, науки та бізнесу в умовах глобалізації. 2021. Available from https://er.knutd.edu.ua/bitstream/123456789/18915/1/PIONBUG_2021_P105-106.pdf
4. Marchenko VB. Concept and legal support of digital transformation in Ukraine. Юридичний науковий електронний журнал 2019. Available from http://www.lsej.org.ua/6_2019/68.pdf
5. Kruhlov V. State policy of labor market transformation: challenges of the digital era. Науковий вісник: Державне управління. 2021. Available from [https://doi.org/10.32689/2618-0065-2021-1\(7\)-140-161](https://doi.org/10.32689/2618-0065-2021-1(7)-140-161).
6. Novak IM. Transformation of personnel management in the organization's digital ecosystem. Соціально-трудова сфера в координатах нової економіки та глобальної соціоекономічної реальності: виклики, шляхи розвитку. 2021. Available from https://ir.kneu.edu.ua/bitstream/handle/2010/35210/Sts_11_20_51.pdf?sequence=1
7. E-Learning Market Size, Share, Trends, Growth and Forecast 2030. 2023. Available from <https://www.zionmarket-research.com/report/e-learning-market>
8. Top 10 policy and technology priorities for state CIOs in 2023. 2023. Available from <https://wire19.com/policy-and-technology-priorities-for-state-cios/>
9. Top 10 Digital Transformation Technologies for Member-based Organizations [with definition and examples] Available from <https://www.glueup.com/blog/digital-transformation-technologies>