

UDC 658:338.2

JEL Classification: M21, O33

DOI: <https://doi.org/10.20535/2307-5651.29.2024.308833>**Kravchenko Maryna**Doctor of Economics, Professor
ORCID ID: 0000-0001-5405-0159**Salabai Vladyslav**Ph.D. Student
ORCID ID: 0000-0002-6369-7381National Technical University of Ukraine
"Igor Sikorsky Kyiv Polytechnic Institute"**Кравченко М. О., Салабай В. О.**Національний технічний університет України
«Київський політехнічний інститут імені Ігоря Сікорського»

MODELS AND PRACTICAL APPROACHES TO THE PROCESS OF DIGITAL TRANSFORMATION OF BUSINESS PROCESSES OF ENTERPRISES. THE EXPERIENCE OF UKRAINE

МОДЕЛІ ТА ПРАКТИЧНІ ПІДХОДИ ДО ПРОЦЕСУ ЦИФРОВОЇ ТРАНСФОРМАЦІЇ БІЗНЕС-ПРОЦЕСІВ ПІДПРИЄМСТВ. ДОСВІД УКРАЇНИ

Many organizations are dealing with the challenges of incorporating new digital tools into their daily operations as part of digital transformation. However, only a few have effectively managed their business processes to fully benefit from these technologies. To address this, using business process models can be helpful. These models make it easier to take a systematic approach to digital transformation, ensuring effective value realization. The article explores and analyzes contemporary methods and methodologies for leading a company through digital transformation. Additionally, a framework is constructed, enabling the journey of digital transformation from ideation to the achievement of set objectives. The article investigates key steps and provides a roadmap for aligning business processes with the requirements of digital transformation. It also discusses fundamental approaches to constructing modern business models or optimizing existing ones. The article examines the current state of digital transformation within Ukraine. Through a thorough exploration of the Global Innovation Index (GII), the article provides a comprehensive comparison of Ukraine's digital transformation efforts with those of other nations worldwide, offering insights into its global competitiveness. Additionally, the article identifies and discusses the prevailing development trends in digital transformations within Ukraine, elucidating key characteristics and implications associated with each trend. The article shows a deeper understanding of Ukraine's digital landscape and its trajectory toward greater innovation and competitiveness on the global stage.

Keywords: digital transformation, business process, business model, digital transformation process, digital technology.

Сьогодні більшість організацій стикаються з проблемами впровадження нових цифрових інструментів у свою щоденну діяльність у рамках цифрової трансформації. Однак, лише деякі з них ефективно управляють своїми бізнес-процесами, щоб отримати певну користь від впровадження цих технологій. Тому, щоб вирішити цю проблему, дослідження питання функціонування та оптимізація бізнес-процесів є одним з ключових напрямків в процесі цифрових перетворень. У статті досліджено та проаналізовано сучасні методи та інструменти управління компанією в умовах цифрової трансформації. Крім того, побудовано схему, яка забезпечує шлях цифрової трансформації від ідеї до досягнення поставлених цілей. У статті досліджено ключові кроки та описано дорожню карту щодо зміни бізнес-процесів відповідно до вимог цифрової трансформації. Також розглянуто фундаментальні підходи до побудови сучасних бізнес-моделей або оптимізації існуючих. У статті розглянуто поточний стан цифрової трансформації в Україні. Завдяки ретельному дослідженню Глобального індексу інновацій (GII) у статті представлено всебічне порівняння зусиль України щодо цифрової трансформації з зусиллями інших країн світу, досліджуючи перспективи збільшення її глобальної конкурентоспроможності. Крім того, у статті визначено та обґрунтовано переважаючі тенденції розвитку цифрової трансформації в Україні, включаючи ключові характеристики та наслідки, пов'язані з кожною тенденцією. Стаття демонструє глибоке розуміння цифрового ландшафту України та траєкторії до підвищення рівня діджиталізації та цифрової трансформації на глобальній арені.

Ключові слова: цифрова трансформація, бізнес-процес, бізнес-модель, процес цифрової трансформації, цифрові технології.

Introduction. In the era of rapid technological changes and the development of business models, digital transformation has emerged as a critical strategy for businesses seeking to thrive in today's competitive landscape. Integrating digital technologies into various

aspects of business processes and models has become a primary vector of development for enterprises across industries. Digital transformation reshapes how businesses operate and fundamentally redefines their relationships with customers, partners, and stakeholders.

The digital transformation of business processes provides profound opportunities for enhancing productivity, reducing costs, and improving customer experiences. However, the path to successful digital transformation is multifaceted and requires a comprehensive understanding of the underlying models and practical approaches. This article explores various models and practical strategies pivotal in enterprises' digital transformation journey.

It investigates the strategies that enable businesses to harness the full potential of digital technologies and remain agile in an ever-evolving business landscape.

Methods. The theoretical and methodological basis of the study is the scientific works of leading domestic and foreign scientists in the digital transformation of business processes. The solution to scientific problems was carried out using the following research methods:

- Analysis and synthesis (for research of domestic and foreign publications on the topic of study);
- system and integrated approaches (for analyzing different approaches to models of digital transformation business processes for companies);
- a modeling method (for creating diagrams of digital transformation business process models).

Result. The imperative for digital transformation extends across every facet of business, with an increasing number of companies recognizing the essential need to digitize their processes and operations to maintain competitiveness. As the business landscape continues to evolve, the adoption of digital strategies becomes not only advantageous but often indispensable for staying relevant in today's dynamic market environment [1].

Digital transformation has become a crucial aspect of modern businesses, shaping how they operate and stay competitive. In this section, we'll break down the different stages of this transformation journey, simplifying the complex processes involved. From discovering digital possibilities to planning and assessing, and finally implementing changes, organizations navigate these steps to align with the rapidly evolving digital landscape. This journey requires not only strategic thinking but also the seamless integration of new technologies, ensuring they fit with the overall corporate strategy and adapt to disruptive changes. Let's explore each phase to understand how they contribute to the overarching goal of Digital Transformation (DT) [2].

As Malak Baslyman notes, the process of digital transformation of business processes consists of three main stages, each of which includes a smaller step. Therefore, let's consider and build a detailed diagram of the process of digital changes in the organization and describe each of the steps.

Every organization that currently works and functions on market conditions sooner or later must go through the path of digital transformation, as without this their ability to compete in the market may be quite low. Therefore, let's consider each of the steps in more detail and describe what the organization should do in each of the steps to achieve leadership and optimize its business processes [3].

1) Discovery and exploration, also called realization: This phase can begin in two ways. Firstly, when an organization identifies performance issues or challenges and seeks to understand how similar businesses or competitors have tackled them. Secondly, when an organization

explores what competitors are offering to customers or utilizing internally to enhance their production processes. The objective is to learn from these experiences, adopt cutting-edge technologies, and outperform competitors. In both scenarios, the digital team plays a crucial role in comprehending existing digital solutions, shaping the digital vision, and defining goals and strategies to realize this vision. Subsequently, the digital vision and strategies are presented to top management for approval before progressing to the next phase. It is essential that the digital vision and strategies align with the corporate strategy.

2) Planning and assessment, also called optimization: Also known as the Optimization Phase, the digital team conducts a digital maturity assessment to identify the organization's digital capabilities and opportunities. The team then informs top management and departmental leaders about new technologies and the organization's digital capabilities. Each department proposes ways to optimize their current processes and enhance performance using disruptive technologies that align with the organization's digital capabilities. Proposals are selected and prioritized based on value realization, established goals, and vision, as well as measures such as return on investment and organizational capabilities. This phase is termed "optimization" because department heads seek digital opportunities to enhance their unit's business processes and production.

3) Implementation and evaluation, also called disruptive and execution: This phase, also known as Disruption and Execution, is characterized as disruptive because the implementation of the digital strategy introduces significant changes to an organization's functional areas (e.g., human resources, IT) and operational strategies (e.g., business processes, products). During this phase, each department identifies the digital operational model and business strategy, determining how services will be delivered. Additionally, they select appropriate change management strategies, including employee upskilling, identifying workflow and process changes, and devising strategies to minimize resistance to change. Some organizations may conduct pilot studies to obtain more accurate estimates of results before implementing changes on a larger scale. If the results are promising and meet the set criteria, the solutions are rolled out more widely, referred to as "replication." In this phase, the IT team plays a significant role by providing technical support to the entire organization or specific business units, depending on the organization's structure. Figure 1 provides an overview of the phases and processes of Digital Transformation.

Of course, this is a conditional scheme that shows the process of digital transformation of the company's business processes and needs additional research in practice. But as a way to optimize and implement digital technologies in the company, it seems effective. Therefore, companies that now want to implement digital technologies in their own activities should rely on this roadmap.

As noted by The Microsoft 365 team, Digital transformation is not just adding digital solutions to your business, but the integration of these new technologies that can benefit the business, both internally and externally, when implemented correctly [4].

Numerous advantages come with embracing a digital transformation plan, applicable not only to large enterprises but also to small businesses. These benefits encompass [4]:

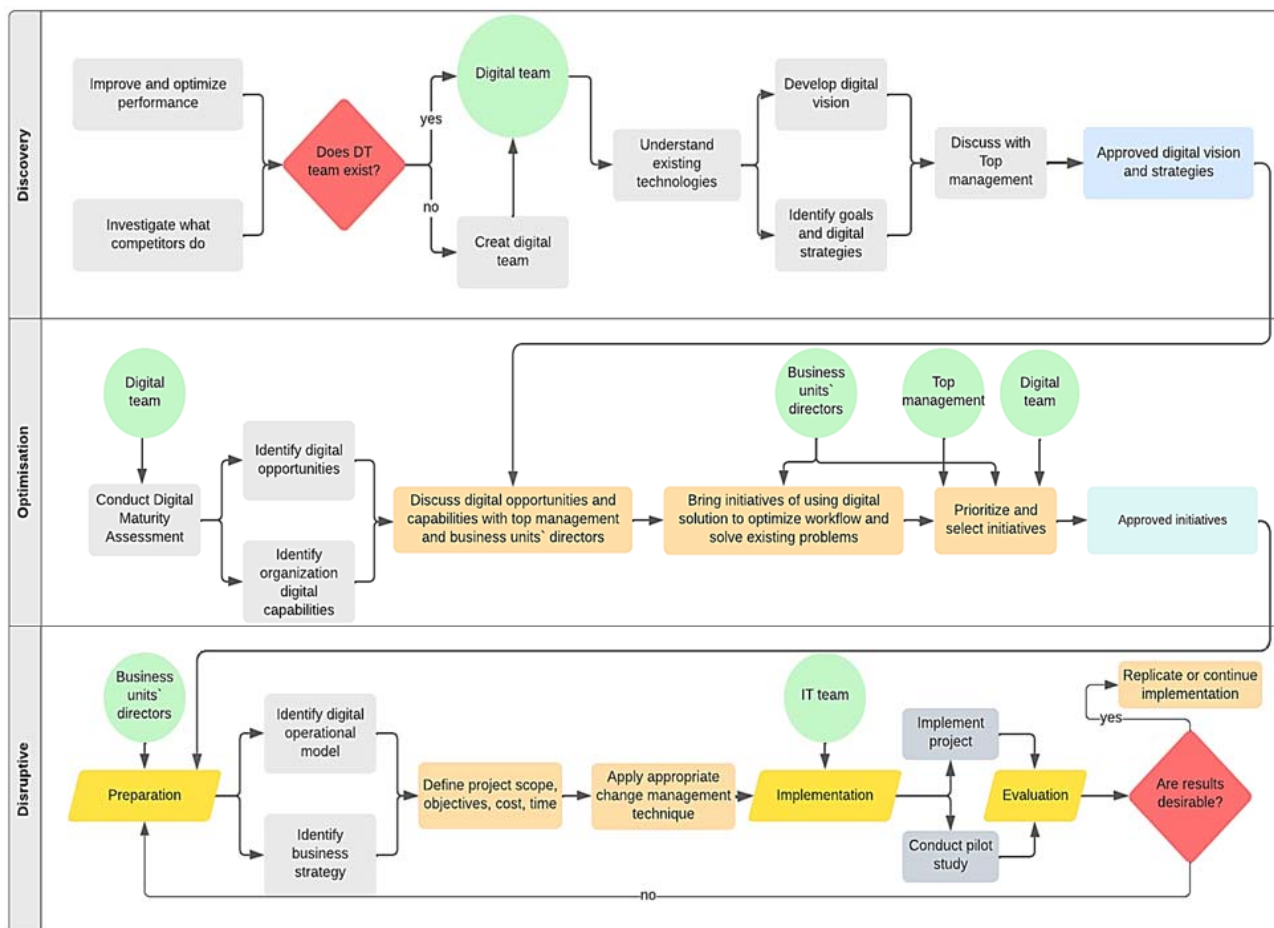


Figure 1. The stages and procedures involved in implementing digital transformation within organizations

Source: compiled by the authors based on [3]

1) *Enhanced efficiency*: Organizations with a well-defined digital strategy roadmap comprehend the complexities of various challenges and how to overcome them. Streamlining workflows results in quicker product launches, fewer errors, increased productivity, and enhanced security.

2) *Increased revenue*: Gathering comprehensive, contextual, and accurate data informs all aspects of business operations, particularly aiding decision-making in product or solution sales.

3) *Faster time to market*: Addressing challenges in areas like manufacturing and supply chain management accelerates product development and execution.

4) *Improved customer engagement and experience*: Mapping the customer journey, identifying selling opportunities, and troubleshooting potential issues contribute to overall positive customer experiences, attracting new customers and maintaining satisfaction among existing ones.

5) *Enhanced collaboration*: Utilizing tools for more frequent and agile communication and eliminating inefficiencies prevents teams from becoming isolated. Adoption of cloud-based tools further promotes flexible company-wide collaboration.

6) *Marketplace differentiation*: Pursuing digital transformation allows businesses to stay ahead of the curve, plan for new disruptive technologies, and promptly respond to evolving business needs.

Infoxchange CEO David Spriggs and his team offer the following 10 steps that can also help companies get on the digital transformation journey. Let's consider them in more detail Table 1 [5].

As noted by McKinsey researchers Tanguy Catlin, Johannes-Tobias Lorenz, Bob Sternfels and Paul Willmott no one company has yet completed a digital transformation – one that fully harnesses the power of digital technology to rethink every aspect of the organization [6].

Digital transformation, a relatively recent concept, remains somewhat ambiguous. What we do know is that it involves navigating through blind spots. Many company executives struggle to grasp the full scope of digital transformation, uncertain about the extent of changes and their specific implications.

At its core, digital transformation goes beyond merely using digital technologies to alter business models; it's a comprehensive journey involving a cultural shift, structural adjustments, and process realignment to align with IT architecture. As Deloitte researchers note the journey of digital transformation is not yet well known. There are various approaches to this overwhelming endeavor, but they usually do not take into account the business architecture as a foundational framework [7].

David Rogers says that in the present day, digital transformation is a prevalent topic in every business conversation. As new technologies advance rapidly, organizations recognize the imperative need to adapt for

Table 1

The Digital Transformation Roadmap

Step number	Category	Content
1	Business Assessment	Strategic goals Key business challenges Potential grows opportunities
2	Starting with Why	Why do you need to transform?
3	Evaluate current capabilities	Digital capability assessment Staff feedbacks (survey and workshop) Requirement analysis and process map
4	Get the right buy-in	The executive The board
5	Identify courses of action	List of actions to bridge the capability gaps. Identify future capabilities (people, process, platform/system)
6	Formulate and priorities	Group the related courses of action into packages as initiatives. Priorities the initiatives based on impact of effort
7	Develop a roadmap/plan	Develop the sequence of initiatives. Resource plan Budget plan
8	Find partners to accompany the organization on the journey	Assessing Internal Expertise Engaging External Resources
9	Communication and stakeholder engagement	Ensuring Understanding and Support Expansion of communication channels
10	Start initiatives	Implementation of developed solutions

Source: compiled by the authors based on [5]

survival. However, self-reportedly, 70 percent of businesses acknowledge their struggle to undergo this transformation. Within various industries, well-established companies find themselves hindered by bureaucratic hurdles, inertia, and entrenched traditional practices.

Consider these steps in more detail [5]:

Step 1: Clarify strategic goals and potential growth opportunities.

This step involves identifying the strategic goals of the organization and potential growth opportunities that can be achieved through digital transformation. This can be done by conducting a digital capability survey, analyzing the results, and identifying areas that need improvement. This step can be implemented by using tools such as a digital capability survey and conducting a SWOT analysis to identify potential growth opportunities.

Step 2: Assess current digital capabilities

This step involves assessing the current digital capabilities of the organization across five technology domains: tech foundations, information systems, digital marketing, IT management, and cyber security. This can be done by using a digital capability survey and analyzing the results. This step can be implemented by using a digital capability survey and conducting a gap analysis to identify areas that need improvement.

Step 3: Identify key challenges and gaps

This step involves identifying the key challenges and gaps that need to be addressed to achieve the strategic goals of the organization. This can be done by analyzing the results of the digital capability survey and conducting a gap analysis. This step can be implemented by conducting a gap analysis and identifying the key challenges and gaps that need to be addressed.

Step 4: Get the right buy-in

This step involves getting the buy-in of the leadership team to ensure the success of the digital transformation

project. This can be done by identifying a champion for the project, anticipating sources of resistance, and pitching the idea using research and in terms of value to the organization. This step can be implemented by identifying a champion for the project and pitching the idea to the leadership team.

Step 5: Identify courses of action

This step involves identifying the courses of action that need to be taken to address the key challenges and gaps identified in step 3. This can be done by identifying potential future capabilities and grouping related actions together into packages of work. This step can be implemented by identifying potential future capabilities and grouping related actions together into packages of work.

Step 6: Formulate and prioritize initiatives

This step involves formulating and prioritizing initiatives based on their impact and estimated effort. This can be done by grouping related actions together into initiatives, projects, or programs and prioritizing them based on their impact and estimated effort. This step can be implemented by grouping related actions together into initiatives and prioritizing them based on their impact and estimated effort.

Step 7: Develop a roadmap and plan

This step involves developing a roadmap and plan for the initiatives identified in step 6. This can be done by determining the sequence and delivery schedule of the initiatives and ensuring they are adequately resourced. This step can be implemented by developing a roadmap and plan for the initiatives identified in step 6.

Step 8: Find partners to accompany the organization on the journey

This step involves finding partners to accompany the organization on the digital transformation journey. This can be done by engaging with volunteers for small technology projects or working with consultants for bigger projects. This step can be implemented by engaging with volunteers

or working with consultants to accompany the organization on the digital transformation journey.

Step 9: Communication and stakeholder engagement

This step involves communicating the digital transformation journey to staff and stakeholders to ensure their support. This can be done by deciding what to say, who to say it to, and identifying the best channels and tone of language to use. This step can be implemented by deciding what to say, who to say it to, and identifying the best channels and tone of language to use.

Step 10: Start executing initiatives

This step involves executing the initiatives identified in step 6 and reviewing them regularly to ensure they are on track. This can be done by testing ideas as you go through the process and aligning requests with the appropriate schedule. This step can be implemented by executing the initiatives identified in step 6 and reviewing them regularly to ensure they are on track.

So, the digital transformation journey involves a series of steps that organizations can follow to achieve their strategic goals and potential growth opportunities. These steps include assessing current digital capabilities, identifying key challenges and gaps, formulating and prioritizing initiatives, developing a roadmap and plan, finding partners to accompany the organization on the journey, and communicating the digital transformation journey to staff and stakeholders. By following these steps, organizations can successfully implement digital transformation initiatives and achieve their desired outcomes [8].

For example, in recent years, Ukraine has emerged as a hub for digital innovation, with enterprises across various industries embracing digital transformation as a strategic direction. This shift towards digital transformation is reshaping the business landscape, empowering organizations to streamline operations, enhance customer experiences, and drive sustainable growth in an increasingly competitive market.

At the heart of this transformation lies the adoption of cutting-edge technologies such as cloud computing, artificial intelligence, data analytics, and Internet of Things (IoT). Ukrainian enterprises are leveraging these technologies to change traditional business models, unlock new revenue streams, and stay ahead of the curve in an ever-evolving digital ecosystem.

The 2023 release of the Global Innovation Index provides insight into worldwide innovation patterns amidst a backdrop of economic uncertainty. It reveals the rankings of the most innovative economies out of 132 nations, alongside showcasing the top 100 clusters for science and technology innovation. In 2023, Ukraine improved its position in the Global Innovation Index (GII), reflecting its ongoing commitment to fostering innovation despite various challenges. The GII is a widely recognized

annual report published by the World Intellectual Property Organization (WIPO), which evaluates the innovation performance of countries worldwide (Table 2) [9].

The table shows the rankings of Ukraine over the past four years. Data availability and changes to the GII model framework influence year-on-year comparisons of the GII rankings. The statistical confidence interval for the ranking of Ukraine in the GII 2023 is between ranks 48 and 56. Based on the data in the table, Ukraine is in a good position in implementing digital transformations. Even despite the economic and political factors, the COVID-19 pandemic and the war, an increase in the GII can be observed over the previous year. Of course, there are many enterprises in Ukraine that need digital changes, but at the same time, the country has the potential to implement technologies and is one of the pioneers in some areas.

One of the key drivers of digital transformation in Ukraine is the rapid advancement of cloud technologies. Cloud computing offers Ukrainian enterprises the flexibility and scalability needed to adapt to changing market conditions, optimize resource utilization, and drive operational efficiency. By migrating their infrastructure and applications to the cloud, businesses can reduce IT costs, improve collaboration, and accelerate innovation.

Moreover, the proliferation of artificial intelligence and Big Data is transforming how Ukrainian enterprises operate and compete. By harnessing the power of AI and big data, businesses can gain valuable insights into customer behavior, market trends, and operational inefficiencies. This enables them to make data-driven decisions, personalize customer experiences, and drive innovation across the organization [11].

Another significant trend in the digital transformation landscape of Ukraine is Integration of Internet of Things (IoT). IoT technologies are gaining traction among Ukrainian enterprises, enabling them to enhance operational efficiency, optimize resource utilization, and deliver personalized services. From smart manufacturing to connected logistics, IoT solutions are revolutionizing traditional business models and unlocking new avenues for growth.

Furthermore, cybersecurity has emerged as a top priority for Ukrainian enterprises amidst the rising threat of cyber-attacks and data breaches. Organizations are investing in robust cybersecurity measures to safeguard sensitive data, protect against emerging threats, and ensure business continuity in an increasingly interconnected digital environment. By prioritizing cybersecurity, businesses can build trust with customers, mitigate risks, and safeguard their reputation [10].

According to research conducted by the Ukrainian Institute for the Future, the total volume of investments in the digitization of industry, business, and production by 2030 could reach up to \$70 billion, while investments

Table 2

Ukraine GII Ranking (2020–2023)

Year	GII Position	Innovation Inputs	Innovation Outputs
2020	45th	71st	37th
2021	49th	76th	37th
2022	57th	75th	48th
2023	55th	78th	42nd

Source: compiled by the authors based on [9]

in digital infrastructure could amount to up to \$16 billion (with 80% of which being funds from private companies). Consequently, the consumption of products and services in the information and communication technology (ICT) sector by the local market could range from \$86 to \$100 billion, excluding the public segment (excluding private consumption in households) [11].

Based on this, let's compare Ukraine with other countries in the implementation of digital transformations. As noted by WIPO (World Intellectual Property Organization), Ukraine is in a fairly good position because it invests in and implements digital transformations faster than other countries. Of course, there is a correlation between the war and the decrease in most programs for implementing digital transformation and receiving funding from our partners. However, even despite this, we are showing good results and, according to Figure 2, we are in a favorable position.

Based on the Figure 2, the «Performing above expectations for level of development» group includes India, Brazil, Vietnam, Indonesia and Thailand together with Ukraine. Regarding the group of technological leaders, which are highlighted in bright green, it can be noted that it includes the leading countries of the world and Europe.

However, comparing where Ukraine is and how quickly it develops in the implementation of digital transformations, we have a chance to improve our position. Let's benchmark of Ukraine against other country groupings for each of the seven areas of the GII Index (Table 3) [9].

Based on Table 3, it can be observed that Ukraine is close to European countries in all indicators. This is primarily related to the European integration policy of our country, as well as the implementation of legislation in accordance with the requirements of the European Union. These actions provide more opportunities for the development of many spheres of activity. Therefore, the implementation of digital solutions serves as the driving force in the process of digital transformation for most companies in Ukraine. As businesses adapt to these changes, they are better positioned to compete domestically and internationally, fostering economic growth and innovation.

In total, Ukraine's commitment to digital transformation, coupled with its alignment with European standards and ongoing advancements in technology, positions the country as a promising player in the global innovation landscape. As Ukrainian businesses continue to adapt and innovate, they are poised to drive economic growth, foster

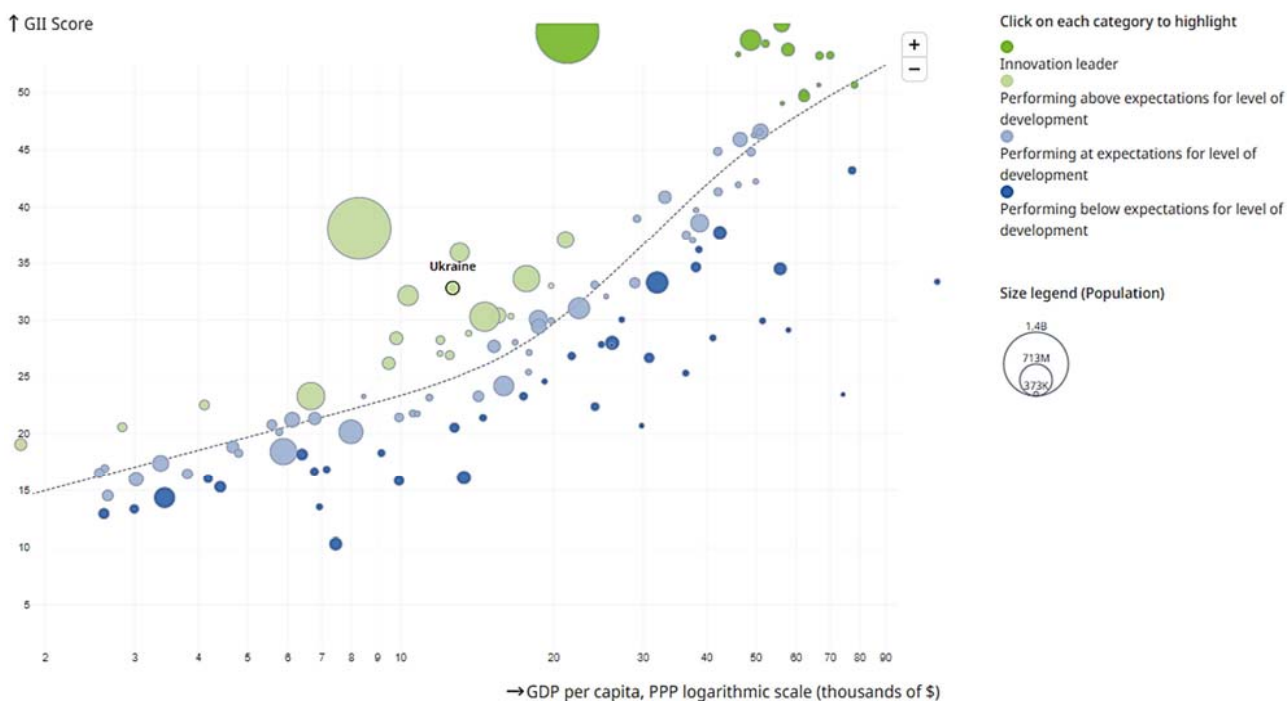


Figure 2. Innovation overperformers relative to their economic development

Source: compiled by the authors based on [9]

Table 3

Benchmark of Ukraine against other country of the GII Index 2023

Score/areas	Knowledge and technology outputs	Creative outputs	Business sophistication	Market sophistication	Human capital and research	Infrastructure	Institutions
TOP 10	58.96	56.09	64.39	61.39	60.28	63.83	79.85
Europe	38.8	39.87	44.61	43.65	44.05	54.69	61.69
Ukraine	30.1	34.63	32.14	28.01	35.65	36.94	38.45
lower-middle-income	17.12	16.35	22.41	23.18	21.73	27.83	39.43

Source: compiled by the authors based on [9]

innovation, and compete effectively both domestically and internationally.

Conclusions. In conclusion, the exploration of models and practical approaches to the digital transformation of business processes for enterprises underscores the dynamic nature of contemporary organizational landscapes. As businesses navigate the ever-evolving digital realm, it is evident that successful transformation requires a strategic blend of innovative models and pragmatic methodologies. The comprehensive analysis presented in this article highlights the multifaceted nature of digital transformation, emphasizing the need for a tailored approach that aligns with the unique requirements of each enterprise.

The models discussed, ranging from agile frameworks to digital maturity models, provide valuable insights into the diverse strategies available for organizations seeking to embrace digital transformation. Furthermore, the emphasis on practical approaches underscores the importance of

implementation strategies that bridge the gap between theory and execution. Successful digital transformation necessitates a holistic understanding of technology, organizational culture, and customer expectations. As organizations continue to evolve, embracing and adapting to digital transformation will remain a cornerstone for sustainable growth and success in the ever-changing global marketplace.

Finally, the article examines Ukraine's digital transformation, emphasizing its emergence as an innovation hub. Despite challenges, such as economic uncertainty and geopolitical tensions, Ukraine demonstrates resilience, reflected in improved rankings on the Global Innovation Index. Proximity to European standards enhances its digital potential, fostering economic growth and innovation. Overall, Ukraine's commitment to digital transformation positions it as a promising player in the global innovation landscape, driving competitiveness and growth.

References:

1. Lovsin A. 6 digital transformation models you can choose from. *Business Optimization*. Available at: <https://www.easy.bi/business-optimization/6-digital-transformation-models-you-can-choose-from> (accessed 16 February 2024)
2. David L. Roger. (2023) The Digital Transformation Roadmap. *Columbia Business School Publishing*, 328 p.
3. Baslyman M. Digital Transformation from the Industry Perspective: Definitions, Goals, Conceptual Model, and Processes. *IEEE Access*. 2022. P. 1. DOI: <https://doi.org/10.1109/access.2022.3166937> (accessed 18 December 2023).
4. Microsoft 365 Team. Creating your digital transformation roadmap: A comprehensive 10-step strategy guide. *Business Productivity*. Available at: <https://www.microsoft.com/en-us/microsoft-365/business-insights-ideas/resources/creating-your-digital-transformation-roadmap-a-comprehensive-10-step-guide> (accessed 15 November 2023).
5. 10 steps to create a digital transformation strategy roadmap. *Digital Transformation Hub*. Available at: <https://digitaltransformation.org.au/guides/it-management/10-steps-create-digital-transformation-strategy-roadmap> (accessed 09 February 2024)
6. Catlin T., Lorenz J., Sternfels B., Willmont P. A roadmap for a digital transformation. *McKinsey & Company*. Available at: <https://www.mckinsey.com/industries/financial-services/our-insights/a-roadmap-for-a-digital-transformation> (accessed 30 January 2024)
7. A Brief Roadmap for Digital Transformation: Leveraging Business Architecture to Achieve Superb Results. *Deloitte*. available at: <https://www2.deloitte.com/rs/en/pages/strategy-operations/articles/brief-roadmap-for-digital-transformation-leveraging-business-architecture-to-achieve-superb-results.html> (accessed 25 February 2024)
8. Angevine C., Keomany J., Thomsen J., and Zimmel R. Implementing a digital transformation at industrial companies. *McKinsey & Company*. Available at: <https://www.mckinsey.com/industries/industrials-and-electronics/our-insights/implementing-a-digital-transformation-at-industrial-companies> (accessed 22 December 2024)
9. Ukraine ranking in the Global Innovation Index 2023. 2024. *World Intellectual Property Organization*. Available at: <https://www.wipo.int/gii-ranking/en/ukraine> (accessed 12 February 2024).
10. Salabai V., Savytska O. Digital transformations in the conditions of Industry 4.0 development. *Financial and credit activity: problems of theory and practice*. 2021. Vol. 3, no. 38. P. 420–426. DOI: <https://doi.org/10.18371/fcaptop.v3i38.237472> (accessed 02 February 2024).
11. Ukraine Digital strategy 2030. *Ukrainian Institute for the Future*. Available at: <https://strategy.uifuture.org/kraina-z-rozvinutoyu-cifrovoyu-ekonomikoyu.html> (accessed 03 February 2024)