

РОЗДІЛ 7. ГРОШІ, ФІНАНСИ І КРЕДИТ

DIGITAL TRANSFORMATION OF BUSINESS: APPROACHES TO EVALUATION OF PERFORMANCE, POTENTIAL, MANAGEMENT

ЦИФРОВА ТРАНСФОРМАЦІЯ БІЗНЕСУ: ПІДХОДИ ДО ОЦІНКИ ЕФЕКТИВНОСТІ, ПОТЕНЦІАЛУ, УПРАВЛІННЯ

The problems of digital transformation of business have been analyzed in the context of global trends. Relevant approaches throughout processes of digitalisation have been presented. In the paper the specific components for the modern phase of transformation have been presented, which should be review according to the potential of the new technologies appearance, especially in Deep Tech, and within innovation ecosystem development positive dynamics in the modern world. During last several years nearly all clusters have felt fostering of changes, caused by digitalization, and this has been defined in the paper. A lot of changes have not only been caused by customers "pains", but by the necessity of the companies to transform and to change their business-processes, and not only pivoting in revenue streams or costs, but each of the components of digital business-models, and, thus, to further force the companies to accelerate. The factors which are affecting digital transformation have been disclosed as well, and they are useful in tracking the impact of digital decision management for increasing performance of business processes. Each of the factors that have been presented for sure should be recognised within the specifics of business, because the development of the clusters itself has a strong influence on its. Mentioned, that all factors should be adopted or re-adopted for each cluster to validate or revalidate approaches to evaluation of performance of digital transformation of business. In the paper attention has been paid to the necessity of usage of clusters' functioning results to determinate evaluation criteria and its validation to disclose the real situation with digital transformation in companies, and data analysis results – to implement them to increase effectiveness of measuring of digital transformation. The proposed, generalised purposes, components and factors could be recognised as the foundations for further researched within decision management, and for analyses of the potential of digital transformation, choosing and implementing digital solutions for business. And, regarding digital markets need to pay attention not only to potential, but to capacity of the organisation to react (have overreaction) on fast changes on global markets.

Key words: digital transformation, business, performance, potential, decision management.

Проаналізовано проблеми цифрової трансформації бізнесу в контексті світових тенденцій. Представлено відповідні підходи в процесах діджиталізації. У статті висвітлено конкретні складові сучасного етапу трансформації, які слід розглядати з урахуванням потенціалу появи нових технологій, особливо в Deep Tech, та позитивної динаміки розвитку інноваційної екосистеми в сучасному світі. Протягом останніх кількох років майже всі кластери відчули на собі стимулювання змін, спричинених діджиталізацією, і це було розкрито в матеріалах. Багато змін були викликані не тільки «болями» клієнтів, але і необхідністю компанії трансформуватися і змінювати свої бізнес-процеси, причому не тільки щодо потоків доходів або витрат, але і в кожній зі складових цифрових бізнес-моделей, і, відтак, це більше змушувати компанії прискорюватися. Також було розкрито фактори, які впливають на цифрову трансформацію, і є корисними для відстеження впливу цифрового управління рішеннями на підвищення продуктивності бізнес-процесів. Кожен з представлених факторів обов'язково повинен бути врахований в рамках специфіки бізнесу, адже сам розвиток кластерів має сильний вплив на нього. Зазначено, що всі фактори повинні бути адаптовані або реадатовані для кожного кластера для валідації або ревалідації підходів до оцінки ефективності цифрової трансформації бізнесу. У статті приділено увагу необхідності використання результатів функціонування кластерів для коректності визначення критеріїв оцінювання та їх валідації для розкриття реальної ситуації щодо цифрової трансформації в компаніях, а результатів аналізу даних – для їх впровадження задля підвищення ефективності вимірювання цифрової трансформації. Запропоновані узагальнені цілі, компоненти та фактори можуть бути визнані основою для подальших досліджень у сфері управління рішеннями, а також для аналізу потенціалу цифрової трансформації, вибору та впровадження цифрових рішень для бізнесу. І, що стосується цифрових ринків, потрібно звертати увагу не тільки на потенціал, але і на здатність компанії реагувати (мати над-реакцію) на швидкі зміни на світових ринках.

Ключові слова: цифрова трансформація, бізнес, ефективність, потенціал, управління рішеннями.

УДК 330.3:338.1:339:336.7:005.4

DOI: <https://doi.org/10.32782/bses.84-25>

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¹ The paper has been developed within the framework of the project "DEEP InnoVation and ENTrepreneurship in HEIs project", supported by European Institute of Technology and Innovation. This project has been funded with support from the European Commission. This document reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained there in.

The problem statement. Digital and Deep Tech global trends development causes changes in managing companies, their development, and application of new approaches for ways of doing business. Business environment changes fast as well, fostering or adaptation or coming out from the markets. Processes of digital transformation are fostering by new technologies. Thus, it is necessary to define, are those ones could be innovations of processes, or innovations of products which should be delivered to the market. And, does the company has necessary capacity and are ready to manage situation? What approaches could be relevant approaches throughout processes of digitalisation? These questions are very actual more than ever for modern businesses.

As success in digital transformation is more than only competitive advantage. It's viability of the company. In case of digital visibility enterprise can forecasting increasing the revenue streams, because of involving and influencing new and existing customers.

Thus, the problem is to identify factors that can influence on digital transformation, and to define what those performance indicators are and how they could be evaluating for disclose success, or failure, in digital transformation. And, for each company is necessary to have the secured algorithm to succeed in these processes.

For Ukraine, for EU and non-EU countries, on the way of digital transformation, digital skills development, frameworks implementation the task of clarifying approaches to evaluation of performance, potential management are priority ones.

Analysis of the researches and publications. Digital transformation is one of the priorities of the EU policies. The Organisation for Economic Cooperation and Development (OECD) last ten years pays special attention for supporting digitalisation presenting main results in "Economic Outlook" and other resources [1; 2]. Fundamentals of digital economy presented by Don Tapscott are still actual nowadays [3], and of digital transformation by S. Nadkarni and R. Prügl [4], of digital business transformation by Donald A. Marchand and Michael R. Wade [5]. Ukrainian scientist paid attention on digital transformation assessment and on it's essence, features, requirements and technologies [6; 7]. In each EU-project aspects of ensuring of digital development are recognised as one of the criteria of further projects' realisations. Ukrainian national and regional programs, based on the world best practices [8], making real developing regional economic systems now, as well as innovation ecosystems. Thus, the publications on the problem are starting to appear, and need to be strength by new ones.

The objective is to present approaches to evaluation of performance, potential and management within the processes of digital transformation of business, as well as disclosing factors that can affect on digital transformation.

Main material of the research. Digital transformation reflects on ecosystems, global and local economies, and economic agents. Within the paper we're searching for solutions not for regulators but for business development. As, when we're analysing the recommendations of the World Bank for national digital transformation strategy the attention is paid on such characteristics as "coherent; comprehensive, holistic; inclusive, empowering and human-centered; collaborative; data-driven and evidence-based; ambitious but feasible; measurable; agile" [8]. Thus, we should take into account that this transformation causes as well disruptive as evolutionary changes for companies, and, yes, the management should react or forecasting needed over-reaction on issues that would become opportunities.

We define, that each changes in business-models in most of the clusters also is a reaction on process of digital transformation, especially when we're talking on communication channels, unit costs, revenue streams, and causing pivot ad the answer on improving value proposition to our customers. All changes are related to necessity to re-view and re-actualise business-processes in organisation.

Tomas Chamorro-Premuzic in Harvard Business Review recognises "the essence of digital transformation is to become a data-driven organization, ensuring that key decisions, actions, and processes are strongly influenced by data-driven insights, rather than by human institutions. In other words, you will only transform when you have managed to change how people behave and how things are done in your organisation" [9], and, thus, defines five essential component of digital transformation (Figure 1).

The company which are implementing the digital transformation should provide the measuring the results in each phase ("mark" the milestones – not to lose but increase revenue streams), monitoring of effectiveness of the processes. As an example, while decision managing regarding investments into the new software such indicators (key metrics) could be chosen to measure the effectiveness of digital transformation progress: "measure the number of users relative to the number of software licenses purchased", "analyze the breadth and limitations of usability", "count the number of processes performed on new software", "productivity indicators (analysis of performance indicators)", "amount of new revenues attributed to digital investments" [10]. And, after clarifying all "pros and cons" (also, needs, capacity, digital acceptance) reviewing business operations that should be done in the company.

But, at the same time, each transformation should be agreed with the business strategy of the company. In other words, the potential of the organisation should make possible "to do right things right". Thus, the decision should be made from the strategy objectives and priorities. In other case the performance

The 5 Essential Components of a Digital Transformation

Mapping the journey to becoming a data-centric organization.

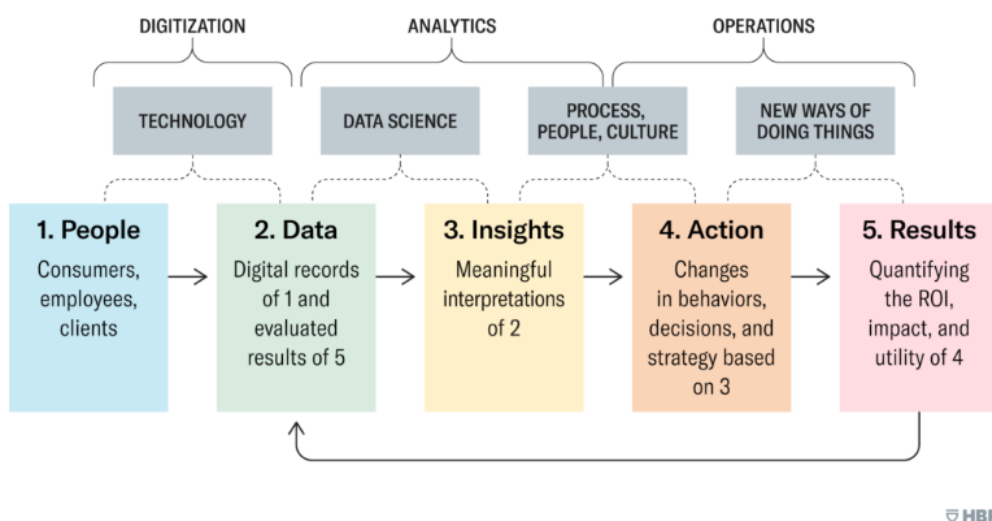


Figure 1. The essential component of digital transformation

Source: [9]

could not be reached, ROI will be lower than normative (according to the cluster), or returns of investments could not be, at all. This way we are recognising ROI as the performance indicator to evaluate the efficiency of investments into digital transformation of business. Moreover, we can use it to choose the best of different digital investments, even between processes inside the organisation, even on operational level (amount of return on a particular investment relative to investments costs). And, the components of business model [11] will help company to choose the best solution, depending of what type of the business-model we're using or going to implement – traditional, hybrid, digital. That's why digital investments and digital transformation couldn't be recognised as an "inside" or "something independent".

Another indicator for evaluation performance of digital transformation of business and its potential is productivity, which is also one of the KPI of the business-strategy, and the measure of efficiency of production of goods and services itself. It is related with volume or cost of products to the invested time and resources. And, in unit economy it is the producing of output per unit of input (invested time, resources). In digital economy one of the solutions for case is 'if you have invested in digital customer support tools, you can measure how much customer application processing has increased since the introduction of digital software'. The number of new revenues associated with digital investment and performance measurement can measure how much digital investment affects revenue. For example, if a company provides automation into a digital customer journey [12], it will

be able to track how many leads have interacted with the tools, and compare how many of them have become paid customers.

Lots of metrics are used by companies now, according to the level and cluster they are in. And, regardless of which of the metric is the most important, to receive ROI ones need to determine how digital transformation is measured (and, for sure, the capacity of the company to implement this changes). The mentioned above metrics can be the basis for any digital transformation effort, but they are not so key performance indicators. A number of other factors may affect the metrics of performance of digital transformation, namely:

- digital transformation purposes;
- external circumstances;
- technologies used, especially in Deep Tech.

Moreover, if we're in MilTech sector, last two factors will be leading drivers. Because the modern world is rapid changes, thus transformation programs must remain as adaptable and flexible as possible. This also means that the measurements themselves must be prepared to adapt to external circumstances if necessary, as example – full scale aggression of rf against Ukraine, 24.02.2022. Regarding technologies, they should use the innovational potential, work for increasing dynamics of financial markets and fostering economic development. Due uncertainty, which causes national security issues, and making risks for global economy, security technologies are leading, – states need to direct money of tax payers more to invest in researches and investigations to protect nations, citizens. This process is also cycle ones.

And, transformation purposes are the main ones to focus on when creating metrics; they should be quantitatively measurable, associated with improving business results. In most cases, digital transformation involves digital adaptation, so digital adaptation metrics should be prioritized. Measuring digital acceptance helps increase workforce production, software application, and increasing ROI in their technological innovations.

Digital transformations and Deep Tech development affect competitiveness of the economic agents in clusters, and the development of the economy. These transformations are the main force of the global economic evolution, despite they are caused by disruptive technologies or not. All factors should be adopted or re-adopted for each cluster to validate or re-validate approaches to evaluation of performance of digital transformation of business.

Digital transformations of business widening through European industrial and academic researches, and transformation metrics have been already recognized. Efforts of researchers' teams are now uniting to develop 'unification' methods of measuring the scale of digital transformations. For example, it could be argued that digital maturity [13] is a product of strategy, culture and leadership, and that an organization's culture has to pay attention on the importance of applying data and analytics to decision-making and business processes. Researches united in position that digital transformation has four main measures: technologies application, changes in value creation, structural changes, financial support. From their case studies about digital transformation, it was found that the motivation for digital transformation is significantly influenced by management's perception of digital transformation. "Deloitte" measured the scale of company's digital transformation by five key measures: clients, strategies, technology, operations, and corporate culture. The results show that business leaders should focus on the following specific tasks or projects willing to 'push' for digital transformation:

- hiring, involving and developing talents with digital and analytical capabilities;
- investing time and money;

- rapid changings in digital strategies in response to market changes;
- clearly defining employee / team roles, and empowering them.

The purpose of digital transformation is to help companies to adapt and thrive in the digital economy, so it makes sense that digital transformation itself is realising by the means of modern technologies as well that aim to support this purpose. In case of leaders of digital transformation will be adaptive and responsive within their initiatives, understanding how their programs are measured and evaluated, – the more successful their programs will be [14]. Of course, success depends not only on its implementation, but also on its scale and directions.

The IT modernization is an important part of the digital transformation puzzle, but this is only part of the overall purpose of digital transformation [6].

Transformations itself should be well forecasting and correctly planned by management, purposes and objectives should be clarified, and company's team would be following this strategy step by step. And, these steps must be created not 'copy – pasted'. Success stories of the cluster leaders it's their stories, but not each company's story. Even more, when it's going about startups 'fail fast' conception of the great Steve Blank is actual – to understand if team is on a correct way or not.

Thus, the valueless exploitation of technologies doesn't make company successful, digital or technological.

While implementing programs of transformation (with bases for metrics and measuring the success), companies identifying several general purposes [12], but not too much because of adequate view on the capacity (Figure 2).

1. Achieving digital maturity is about a scale that defines the overall digital capabilities of an company. It includes: digital tools, company's infrastructure, other important factors affecting these capabilities, such as employee / team skill level, integrated digital workplace, security applications used [13]. The most digitalised companies are at the top of the scale; they have greater digital abilities, with digital skilled teams / employees, integrated technologies, and use all these opportunities to achieve the purposes of the company. Since digital technologies are constantly developing, it can be argued that there is no such thing as 100% digital 'maturity', only constant digital development.

2. The agilibility and performance of a company means how quickly it can respond and adapt to changing circumstances. Many companies recognize the value of speed in todays and future economy: speed can help businesses get ahead of the competitors, quickly meet customer needs, 'pains', 'gains', and become successful. For these reasons digital transformation programs are often aimed at

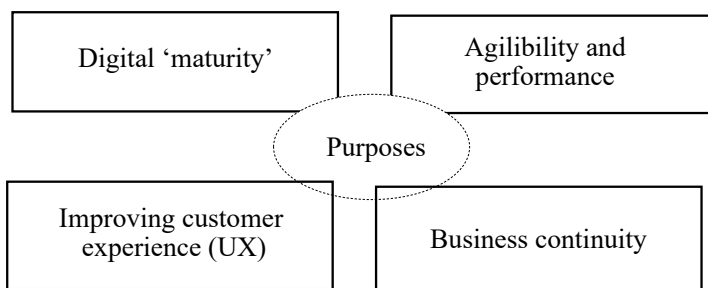


Figure 2. Purposes of companies, as part of their transformation programs

increasing organizational agilibility, while implementing organizational changes.

3. The customer experience (UX) has become a competitive strong position in the digital age. When businesses can develop the same types of products at the same cost, customer experience often differentiates those products or services. Statistics is proving this statement. According to research of "Merkle" two-thirds of customers care more about experience than price when making decisions of choosing a brand. "Adobe" (report, 2020) [15] and "Econsultancy" found that companies that prioritized and effectively managed interactions with customer were three times more likely to exceed their business purposes than similar enterprises in their cluster. Such reasons force many teams to make efforts for digital transformations aimed at improving and moderating the consumer experience (UX). Tactics may vary: some companies contribute to customers' success through improved personalization and tools that create common perceptions of the customer; others are focusing on improving product design or improving marketing programs. Regardless of the specifics, in the process of digital transformation, it is necessary to pay attention to the customer experience (UX) – thus, digital transformation metrics must monitoring the achieving this goal.

4. Business continuity is very important for national practices (war, security, blackouts), and global one after lockdown challenges. Business should be ready to maintain critical functions after disruptions or emergency. The focus should be on guaranteeing a continuing business functioning despite of disruptive trends in digital era, – disruptive could be technologies changing the market landscape, pivoting modern business. Changes in internal culture are happening as well. For example, during lockdown while working from home [14] the shift from 'office' culture to a 'close to working from home' culture has been as well defocusing management as creating 'new normal' into many companies. Digital transformation programs designed to ensure business continuity, and are often aimed at improving the digital skills of employees / teams, increasing their ability to work from home and modernizing business operations in accordance with changing business conditions.

This list of digital transformation purposes is not limited and fixed, but it does provide insight into how metrics are assigned and followed. Thus, companies which want to measure their digital transformation performative need to clarify metrics, to use data and provide data analysis, to understand tasks to drive successful digital changes.

Practical cases show, that one of the biggest challenges of digital transformation is that some management and boards of directors feel 'comfortable' without knowing what will be in the future. Essentially, it may be necessary to manage the company in such a way

as to deal not only with the speed, but also with the uncertainty that arises from innovations, Deep Tech solutions, and technological progress. There are key characteristics of companies that thrive in this new world, and it's not because they can better predict the future, – they created themselves to better navigate, respond and influence to these changes. They know what potential do they have, and what is the best way for its performative usage. "Deloitte" while searching some of the most successful businesses on the market found that there are almost always five characteristics that support the competitiveness advantages of the business:

1. General business value management. Does the organization have an approach that allows it to constantly create business value while promoting its innovative agenda? Can it demonstrate a PNL and an improved balance (financial potential)?

2. Digital workforce. Does the organization have a strategy to build a strong digital talent pool and help it do its job in a new way (labour potential, people and talent management)?

3. Cross-functional cooperation. Does the organization working on improving cooperation between business units (organisational potential)?

4. Innovative culture. Does "fast success" follow an approach of innovation (known and unknown opportunities)? Is the focus on human needs? Does this allow initiatives to fail (innovation potential)?

5. Ecosystems. Is this used for external partners (e.g. startups, tech companies, academia, etc.) to improve digital opportunities and inspire new ways of thinking (economy potential)?

These characteristics are interrelated, and its most effective combinations depend of the cluster where company is. Clusters' results are necessary to validate and underline evaluation criteria to disclose the real situation with digital transformation in the companies, and data analysis results – to implement them to increase effectiveness of measuring of digital transformation. And, as lot of managers and researches mentioning, five important indicators for the evaluation performance of digital transformation in business should be analysed as well: the number of users in terms of the number of software licenses purchased, analysis of the breadth and limitations of ease of use, the number of processes performed on new software, the analysis of productivity, new revenues from digital investments. And, regarding digital markets need to pay attention not only to potential, but to capacity of the organisation to react (have over-reaction) on fast changes on global markets.

Conclusions. There are many methodics to evaluate the progress and effectiveness of fostering transformational changes within global trends. The attention should be paid on components, factors, and purposes of digital transformation of business. The most important is to analyse the capacity of the

company to implement such changes, to measure its potential (especially in case of transforming challenges into opportunities), to plan digital change initiative, to be ready to provide decision management, to implement the best Deep Tech solutions. The correct approaches may increase performance in business in clusters, and digital performance of economics in general.

Purposes, components and factors should be reviewing according to the potential of the new technologies appearance, especially in Deep Tech, and within innovation ecosystem development positive dynamics in the modern world. And, it could be recognised as the foundations for further researched within decision management, and for analyses of the potential of digital transformation, choosing and implementing digital solutions for business.

REFERENCES:

1. Digitalisation and productivity: A story of complementarities (June 14, 2019) *OECD Economic Outlook*, vol. 2019, issue 1, pp. 55–83. Available at: https://www.oecd-ilibrary.org/economics/oecd-economic-outlook-volume-2019-issue-1_5713bd7d-en DOI: <https://doi.org/10.1787/5713bd7d-en> (in English)
2. Information and communication technology and its impact on the economy (September 14, 2014) *Addressing the Tax Challenges of the Digital Economy*, pp. 51–67. Available at: https://www.oecd-ilibrary.org/taxation/addressing-the-tax-challenges-of-the-digital-economy/information-and-communication-technology-and-its-impact-on-the-economy_9789264218789-6-en DOI: <https://doi.org/10.1787/9789264218789-6-en> (in English)
3. Tapscott, D. (1995) *The digital economy: promise and peril in the age of networked intelligence*. New York; Monreal: McGraw Hill, 368 p. (in English)
4. Nadkarni, S. & Prüggl, R. (2020) Digital Transformation: a Review, Synthesis and Opportunities for Future Research. *Management Review Quarterly*, pp. 233–341. Available at: <https://link.springer.com/article/10.1007/s11301-020-00185-7> DOI: <https://doi.org/10.1007/s11301-020-00185-7> (in English)
5. Marchand, D. A. & Wade M.R. (April, 2014) *Digital Business Transformation: Where Is Your Company On the Journey*, no. 187. Available at: <https://imd.widen.net/view/pdf/mqxdldky0c/digital-business-transformation-pfm-final.pdf> (in English)
6. Chesnokova N.V. (2020) Methodologchni pidchody do otsinky tasyfrovoi transformatii ekonomiky [Methodological approaches to assessment the digital transformation of the economy]. *Rynkova ekonomika: suchasna teoriia i praktyka upravlinnia* [Market Economy: Modern Theory and Practice of Management], vol. 19, no. 2(45), pp. 413–427. Available at: <http://rinek.onu.edu.ua/article/view/201932> DOI: [https://doi.org/10.18524/2413-9998.2020.2\(45\).201932](https://doi.org/10.18524/2413-9998.2020.2(45).201932) (in Ukrainian)
7. Dergacheva, G. M., Koleshnyia, Ya. O. (2020) Tsyfrova transformatsiia biznesu: sutnist, oznaky, vymogy ta technologii [Digital transformation of business: the essence, features, requirements and technologies]. *Ekonomichnyi Visnyk Natsionalnoho Technichnoho Universytetu Ukrainy "Kyivskii Politechnichniy Institute"* [Economic Bulletin of the National Technical University of Ukraine "Kyiv Polytechnic Institute"], vol. 1, no. 17, pp. 280–290. Available at: https://ela.kpi.ua/bitstream/123456789/47557/1/EV-2020-17_p280-290.pdf DOI: <https://doi.org/10.20535/2307-5651.17.2020.216367> (in Ukrainian)
8. National digital transformation strategy – mapping the digital journey (July 6, 2023) *Digital Regulation Platform. The World Bank*. Available at: <https://digitalregulation.org/national-digital-transformation-strategy-mapping-the-digital-journey> (in English)
9. Chamorro-Premuzic, T. (November 23, 2021) The essential component of digital transformation. *Harvard Business Review*. Available at: <https://hbr.org/2021/11/the-essential-components-of-digital-transformation> (in English)
10. How Do You Measure Digital Transformation? 5 Metrics to Know (May 16, 2023) *WalkMe Blog*. Available at: <https://www.walkme.com/blog/measure-digital-transformation/> (in English)
11. Linde, L., Sjodin, D., Parida V. & Gebauer H. (January 04, 2021) Evaluation of Digital Business Model Opportunities: A Framework for Avoiding Digitalization Traps. *Research-Technology Management*, vol. 64, issue 1, pp. 43–53. Available at: <https://www.tandfonline.com/doi/full/10.1080/08956308.2021.1842664> DOI: <https://doi.org/10.1080/08956308.2021.1842664> (in English)
12. The Experience Impact. Understanding How Experiences Affects Where Consumers Spend Their Dollars (2019) *Merkle*. Available at: https://merkleinc.com/thought-leadership/white-papers/experience-impact?zd_source=mta&zd_campaign=14427&zd_term=tjclaridge (in English)
13. What comes after digital maturity? (May 2, 2023) *WalkMe Blog*. Available at: <https://www.walkme.com/blog/what-is-digital-maturity/> (in English)
14. Starita, L. (February 19, 2021) How to Sustain the Accelerated Pace of Digital Business Transformation. *Gartner*. Available at: <https://www.gartner.com/smart-erwithgartner/how-to-sustain-the-accelerated-pace-of-digital-business-transformation> (in English)
15. Abramovich, G. (August 02, 2020) Digital Trends Study: 2020 Is The Year Of CX-Centric Business Transformation. *Adobe Blog*. Available at: <https://blog.adobe.com/en/publish/2020/02/08/digital-trends-study-2020-is-the-year-of-cx-centric-business-tr> (in English)