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Agile organisations in the BANI era: Case studies of companies utilising Scrum

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Abstract. Globalisation, technological breakthroughs, and unpredictable events have created an era in which traditional management approaches are losing effectiveness. Since 2020, businesses have been operating in a BANI world, where adaptability has become a key advantage. The aim of this study was to examine modern successful agile companies and determine the feasibility of implementing the Scrum methodology in the management processes of other organisations. The study employed several methods: theoretical generalisation and comparison (revealing the essence of SPOD, VUCA, and BANI worlds with a focus on key characteristics); analysis (examining global changes influenced by various factors and uncovering their specifics); statistical (data grouping to determine the percentage of companies worldwide using agile methodologies); and abstract-logical (formulating principles of Agile effectiveness, including its advantages and drawbacks). Agile methodologies were examined based on the experience of ten leading companies in flexibility, recognised for their significant achievements in innovation and high customer satisfaction. Current statistical data on the use of Agile, Scrum, and Kanban methodologies and their impact on company performance have been examined. The advantages of Agile approaches, the growing popularity of these methodologies among global companies, and the effectiveness of implementing flexible methodologies across various industries have been assessed. The practical experience of implementing flexible methodologies in the management processes of successful international companies has been analysed and systematised, along with a comparative assessment of different agile methodologies. Based on this, an effective tool for managing companies in the nonlinear BANI world has been proposed. It has been determined that achieving results requires an individualised approach, necessitating adaptation to the specific context. The practical value of the study lies in the systematisation and analysis of the modern, dynamic external and internal business environments of companies, providing management personnel with an effective tool for future navigation

Keywords: agile methodologies; adaptation; management process; team; framework

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INTRODUCTION

In the first half of the 20th century, the business environment appeared stable and predictable. The SPOD world (steady, predictable, ordinary, definite) allowed companies to develop long-term plans and achieve consistent results. However, with technological advancements, the emergence of the internet, and globalisation, the situation changed, which was reflected in the VUCA concept (volatility, uncertainty, complexity, ambiguity). The VUCA world concept has

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long served as a useful tool for describing the ever-changing business environment. However, even this concept cannot fully capture the scale of changes that companies face, and the term no longer entirely describes the modern reality. Since 2020, organisations have been operating in a BANI world (brittle, anxious, nonlinear, incomprehensible). The world has shifted from instability to fragility, from complexity to nonlinearity, and from uncertainty to anxiety, requiring organisations to adopt new approaches and tools. This is why the term BANI has replaced VUCA.

In the new business environment, companies that continue operating under outdated models risk falling behind competitors or even disappearing from the market. To thrive in the new environment, organisations must become more flexible and adaptive. That is why the requirements for employees are changing. Companies are looking for individuals who not only possess specific technical knowledge but also have a broad range of skills that enable them to adapt to constant changes. The widespread adoption of agile development methodologies, such as Scrum, in business highlights the need for professionals who can work effectively in teams and respond quickly to changes. University graduates must be prepared to work in an environment of constant transformation, requiring educational institutions to implement new learning approaches that develop teamwork and adaptability skills characteristic of Scrum teams (Qureshi & Amin, 2024).

To gain a deeper understanding of this issue, it is essential to refer to academic literature dedicated to studying the effectiveness of teamwork in dynamic environments. Researchers M. Salun & K. Zaslavska (2024) conducted an in-depth study on the evolution of the business environment and proposed five conceptual models – SPOD, VUCA, BANI, RUPT (rapid, unpredictable, paradoxical, tangled), and TUNA (turbulent, uncertain, novel, ambiguous) – to describe varying levels of dynamism and complexity in the surrounding world. Each model requires businesses to adopt different strategies to ensure resilience and success. The existence and operation of teams in chaotic and unstable environments have proven to be particularly complex issues. That is why this issue was studied by S. Bushuyev *et al*. (2024). The authors focused on studying the characteristics of collaboration in virtual teams, particularly in the context of the post-pandemic era. The importance of fostering learning, innovation, and change in virtual teams was emphasised, considering the complexity of the modern world. The authors of the study proposed a set of creative principles for effective management of innovative projects in the BANI environment, based on adaptive leadership, rapid prototyping, scenario planning, and cross-functional collaboration. Particular attention was given to the culture of continuous learning and innovation. It was also noted that traditional performance metrics for evaluating innovative projects in the BANI environment are insufficient, and more flexible and systemic approaches to assessing results were proposed.

G. Baskoro *et al*. (2024) noted that rapid changes will require highly skilled professionals to possess the ability to think critically and analyse large volumes of information. Only those who possess these skills will be able to successfully solve complex problems and make well-founded decisions in conditions of uncertainty. The study proposed the use of the multidisciplinary master's program (MDMP) model as an effective tool for developing higher-order thinking skills (HOTS) in the field of human resource management. Such a program will integrate theoretical knowledge from the academic environment with practical industry experience, fostering the development of essential competencies in future professionals.

The experience of well-known international companies demonstrates the effectiveness of using the Scrum methodology for team management. The study by D. McCreery (2024) confirmed that Google achieved significant success through the effective integration of business and technology, with Agile development methodology at the core of this success. The company did not simply use Agile but integrated its principles into its organisational culture, enabling it to quickly adapt to market changes and meet user needs. By utilising Agile, Google can efficiently manage a vast number of projects, from search engines to cloud services, while maintaining high product quality. A crucial factor in Google's success was its focus on users and teamwork. The corporation actively involves its audience in the development process, which has enabled the creation of products that truly meet their needs. Due to close collaboration between different teams, complex projects can be implemented quickly, and innovations can be introduced efficiently. In particular, the development of the Google Chrome web browser has become a striking example of how short iterations in development and close cooperation with the target audience have enabled the creation of one of the world's most popular web browsers. Continuous feedback from the target audience allowed the team to quickly refine the product and implement innovations. Google's entry into the cloud computing market with Google Cloud Platform was also the result of the successful application of Agile. Dynamic adaptation to changes enabled Google Cloud Platform to compete successfully with more experienced players.

These examples confirm that Agile development methodology has been a key factor in the corporation's success in creating innovative solutions. However, a systematic and comprehensive approach to the problem of companies' adaptation in conditions of uncertainty has hardly been identified. Therefore, the study highlighted the need for an analysis of world concepts during epochal changes, the search for new methodologies, and an examination of the characteristics of successful companies operating in the BANI environment, which was the main objective of this research.

MATERIALS AND METHODS

The theoretical foundation of this study was based on statistical data, scientific developments, and scholarly works. The following sources of information were used: survey data on organisational flexibility (Success rates…, 2017; Panditi, 2018), annual reports on the state of Agile (17th state…, 2022), and statistical data on Agile (Djurovic, 2023), which enabled an analysis of the effectiveness of companies' implementation of Agile methodologies. The study was largely based on analytical research of successful international companies regarding the application of Agile methodologies and approaches used for adaptation to a nonlinear world. The analysis is based on the experience of leading innovative leaders who apply Agile methodologies,

including Boa Vista, Vanguard, BBVA (The Banco Bilbao Vizcaya Argentaria), Bosch, SSOE Group, PayPal, Roche Korea, AstraZeneca, Amazon and Spotify.

Various methods were used to address the research objectives. The methods of generalisation and comparison in the article were used to examine the changes in the external and internal environment of the world. These methods helped to reveal the essence, summarise the results, and characterise the differences between SPOD, VUCA, and BANI worlds by comparing them and justifying the need for companies to adapt to such transitions. The comparison method was used to characterise and compare different methodologies: Scrum, Agile, and Kanban. This method was also applied in the comparative analysis of the use of the Scrum methodology in leading international companies such as Amazon and Spotify.

The analysis method was used to explore the transformation of the world under the influence of various factors and to reveal their specific characteristics. Additionally, an analysis was conducted on companies' use of Agile methodologies and the benefits derived from their application. The statistical method was used to categorise data, allowing for an understanding and analysis of the percentage of companies worldwide utilising Agile methodologies. The next method was synthesis. This method enabled a systematic review of scientific studies, synthesising their results to identify general trends, patterns, differences, and gaps in scientific knowledge regarding the use of Agile methodologies by international companies. The generalisation method was used in formulating key conclusions and main aspects of the study, emphasising the necessity of implementing Agile methodologies in the educational process. Based on the analysis of specific data, more general theoretical propositions have been formulated to explain the obtained results.

The abstract-logical method helped analyse a large number of Agile projects by abstracting from their specific details, allowing the identification of general trends and patterns. Based on this analysis, general provisions regarding the effectiveness of Agile, its advantages, and disadvantages were formulated. The tabular method served as a data visualisation tool that facilitated comparison, analysis, and generalisation of information. It enabled the presentation of complex concepts in a clear and structured manner. A comparative analysis of the SPOD, VUCA, and BANI concepts was conducted, focusing on their key characteristics and their impact on business.

For the study of the Scrum methodology, Amazon and Spotify were selected, as these companies are recognised leaders in the technology sector, successfully applying Scrum for the rapid development and delivery of innovative products, making them ideal case studies. The choice of companies for analysing Agile methodologies and assessing their benefits was driven by their leadership in flexibility, achievements in innovation, and high customer satisfaction. Furthermore, these companies have extensive experience in implementing Agile practices and are open to sharing their knowledge. To identify differences and similarities in the application of Scrum at Amazon and Spotify, a comparative analysis was conducted based on the following criteria: implementation strategy, team structure, Scrum distribution methods, team focus, success metrics, barriers, impact on corporate culture, and technical debt management.

RESULTS

Transition to the era of chaos and information overload

Further, the study analyses how the world has changed under the influence of various inherent factors, highlighting their unique characteristics and distinguishing features. The conducted analysis of the SPOD, VUCA, and BANI world models, as presented in Table 1, clearly demonstrated the evolution of the world from a stable and predictable environment to an unstable and highly dynamic one.

Table 1. Comparative analysis of SPOD, VUCA, and BANI worlds

Characteristics	SPOD	VUCA	BANI
Period of manifestation	The first half of the 20th century	Since 1980	Since 2020
Main idea	Stable, predictable, simple and defined world	A world of constant change, uncertainty, complexity and ambiguity	A world characterised by brittleness, anxiety, nonlinearity and incomprehensibility
1st Component	Steady: high stability, absence of significant changes	Volatility: rapid changes, turbulence, unpredictability	Brittle: possibility of sudden collapse, system instability
2nd Component	Predictable: ability to predict future events	Uncertainty: lack of information, uncertainty about the future	Anxious: a constant sense of anxiety and fear of the unknown
3rd Component	Ordinary: absence of complexity, clear rules and regulations	Complexity: many interconnected elements, system complexity	Nonlinear: absence of direct cause-and-effect relationships, unpredictable consequences of actions
4th Component	Definite: clear boundaries, clear answers to questions	Ambiguity: many interpretations, lack of clear answers	Incomprehensible: complexity of understanding the world, lack of a complete picture
Key differences	Stability, predictability, simplicity and definiteness	Instability, uncertainty, complexity, and ambiguity	Brittleness, anxiety, nonlinearity, and incomprehensibility
Consequences	Stability, long-term planning, linear processes	Need for adaptability, flexibility, and rapid decision-making	Need for resilience, emotional intelligence, and unconventional thinking

Table 1, Continued

Characteristics	SPOD	VUCA	BANI
Challenges for business	Lack of competition, slow changes	Rapid changes, need for adaptation, risk management	Constant instability, necessity for anti-fragility, focus on the future
Skills necessary for success	Specialisation, execution of routine tasks	Flexibility, adaptability, creativity	Anti-fragility, leadership, strategic thinking
Results	Industrial revolution, economic stability	Globalisation, information era	COVID-19 pandemic, climate change, war in Ukraine

Source: created by the authors

Each of these models represents a specific stage in societal development and presents unique challenges to society. The transition from SPOD to BANI indicates increasing complexity and uncertainty. While companies once relied on stable conditions and long-term planning, success in the modern world depends on the ability to quickly adapt to change, think creatively, and be prepared for unexpected events. Brittleness, anxiety, and nonlinearity, characteristic of the BANI world, require the development of new skills and competencies, such as stress resilience, emotional intelligence, and strategic thinking. Understanding these models enables more effective navigation in the modern world and the construction of one's future. Knowledge of each model's characteristics helps identify challenges, develop strategies, cultivate skills, and make more informed managerial decisions.

Statistical data on the use of Agile methodologies by companies worldwide

Various studies indicate that Agile remains the undisputed leader among software development methodologies. More than two-thirds of companies have chosen Agile, abandoning the traditional Waterfall approach. This decision is driven by clear advantages: Agile not only increases the likelihood of successful project completion by 16% compared to Waterfall but also contributes to significant revenue growth for companies (Djurovic, 2023). According to KPMG research, 81% of companies had implemented Agile in their workflows by 2019, starting from 2016 (Martini & Bosch, 2016; Agile transformation…, 2019). By 2020, statistics show a strong surge in Agile adoption with the onset of the pandemic.

A survey conducted in May 2020 showed that 43% of companies became more inclined toward flexible work schedules over the previous three months (February, March, April) (17th state…, 2022). This shift was driven by the COVID-19 pandemic, which accelerated the transition to remote work. Additionally, Agile approaches, which facilitated effective collaboration in distributed teams, contributed to the rise of flexible work models. Research conducted by Delta Matrix, analysing over 8,000 projects, found that flexible teams are, on average, 25% more productive than their industry counterparts (Kremic, n.d.).

In 2024, Agile firmly established itself as the most popular software development methodology. According to Capterra, 71% of companies have already adopted Agile (Success rates…, 2017), while Version One reports that 98% of companies observed positive changes after its implementation (The 11th annual…, 2017). Harvard Business Review confirms that Agile contributes to revenue and profit growth (Panditi, 2018). Compared to Waterfall, Agile delivers significantly better results: according to Standish Group Chaos, Agile's success rate is 60% higher. This indicates that flexibility has become the new standard in software development (What is Agile…, 2024). The most popular Agile frameworks include Scrum, Lean, XP, Kanban, and FDD.

Analysis of statistical data on the use of the Scrum methodology shows that it is a widely popular approach applied by many companies worldwide. Organisations utilise it both as a standalone agile methodology and as a hybrid model. In 2023, 66% of surveyed companies reported choosing the Scrum methodology (Schäfer, 2023a; 2023b). 81% of agile teams use a variant or hybrid version of Scrum. Teams that fully implement Scrum and estimate workloads for their tasks achieve 250% higher work quality compared to teams without such estimates. This improvement is largely due to a significant reduction in error density. On average, teams without estimates encountered more than 20 errors, whereas Scrum teams recorded less than 10 errors. Agile methodologies were primarily adopted by software development departments (86%) and IT teams (63%). Additionally, Scrum gained interest among HR departments (16%) and sales teams (11%). Regarding Agile adoption, statistical data remains consistent. Surveys and research confirm that Agile has become not only the most popular software development methodology but also a key success factor for modern companies, enhancing their efficiency, profitability and competitiveness

Analysis of differences between Scrum, Agile, and Kanban

In project management terminology, three similar concepts exist in the context of managing projects and teams: Scrum, Agile, and Kanban. To gain a deeper understanding and justify the use of the Scrum methodology, it is essential to recognise their differences. Scrum, Agile, and Kanban are popular project management methodologies, particularly in the IT industry. While they share a common goal – ensuring a flexible and efficient development process – they each have distinct characteristics and nuances. These models differ in various factors, such as project complexity, scope of work, time and budget constraints and the number of specialists in a team. As a result, management personnel must choose a model that considers these factors and optimises the product development process (Scrum vs Agile vs Kanban…, 2023). Table 2 compares the characteristics of Scrum, Agile, and Kanban to help understand their differences and determine which methodology companies should adopt in different situations.

Table 2. Comparative characteristics of different methodologies: Scrum, Agile, Kanban

Characteristics	Scrum	Agile	Kanban
Definition	A lightweight framework (concept) based on empiricism and lean thinking	A software development philosophy that emphasises flexibility, adaptability and meeting customer needs	A management method or approach that can be used independently or as an additional tool within an existing methodology
Key principles	Sprints, roles, daily meetings, retrospectives	Flexibility, adaptability, collaboration, self-organisation, continuous improvement	Visualisation, work-in-progress limits, flow, enhancement
Iterations	Sprints (usually 2-4 weeks) with fixed duration	Can vary in length depending on project needs	No fixed iterations, work is carried out continuously
Roles	Clearly defined: product owner, scrum master, team	Can be more flexible depending on the project	No clearly defined roles, focus on teamwork
Planning	Detailed planning for each sprint	Can be more flexible, focusing on priorities	Focuses on workflow visualisation and limiting the number of tasks in progress
Changes	Prioritised, can be introduced within the sprint but require discussion	Welcomed and can be quickly integrated into the development process	Can be introduced at any time, but their impact should be monitored
Focus	On delivering product increments at the end of each sprint	On meeting customer needs and continuously improving the product	On optimising workflow and removing obstacles
Suitability	For projects with clearly defined requirements and the need for regular incremental delivery	For projects with a high level of uncertainty and the need for rapid adaptation to changes	For any type of project where workflow visualisation and continuous process optimisation are essential
Common “core”		The need for facilitation or support in delivering a product with the highest value to the user	

Source: developed by the authors

In the real world, there are many projects that follow a hybrid approach, combining the best practices from various management models within a single project. This is evidenced by the annual report on the state of Agile technologies (17th state..., 2022). Agile encompasses a wide range of concepts and techniques, the most common of which include Scrum, Kanban, Scrumban, Lean, Extreme Programming (XP) and others. Organisations often use hybrid approaches, combining elements of Scrum, Kanban and other methodologies to find the optimal solution for their needs. The choice of methodology depends on various factors, such as the size and complexity of the project, the team’s experience, client requirements and the type of product. While Scrum, Agile, and Kanban share many similarities, they also have distinct characteristics. The best approach often depends on the specific context and the needs of the team and project. By understanding the strengths and weaknesses of each, organisations can make informed decisions about which methodology to adopt or adapt.

Company case studies on the use of Agile methodologies

A flexible company is a people-oriented organisation that quickly adapts and responds to new challenges and opportunities in the market or changes in customer behaviour. Its flexible nature ensures rapid adaptation and optimal employee productivity in a dynamic environment. The ultimate goal of a flexible organisation is to meet customer needs by continuously delivering valuable products (McCreery, 2024). Such companies respond to market changes, adapt quickly and have the willingness and drive for change, making them leaders in the use of agile methodologies. Case studies of well-known flexible companies and the methodologies they use in their operations have been examined (Table 3).

Table 3. Examples of companies using Agile methodologies and the benefits of their application

Company, Type of activity	Transformation goal	Applied methodologies	Benefits
Boa Vista Brazilian financial solutions provider	Accelerating delivery and rapid adaptation to customer needs	Kanban	- increased visibility of team and department operations - reduced project wait time - team flexibility in response to external factors
Vanguard investment management company	Increasing efficiency and transitioning to a truly Agile company	Scrum, Kanban	- fast learning process - quick feedback mechanism - comprehensive workflow visualisation - clear workload distribution
BBVA financial company	Stable value flow, rapid market adaptation, work prioritisation and continuous learning	Kanban, Portfolio Kanban	- quick feedback on the status of work items - data-driven decision-making - improved synchronisation and project prioritisation
Bosch automotive giant	Enhancing innovation and flexibility	Scrum	- faster adaptation to changes - more flexible company - problems are seen as obstacles for the entire company, not just individual groups

Table 3, Continued

SSOE Group global player in project implementation for architecture	Enhancing collaboration and optimising workflows	Kanban	- rapid implementation of workflow visualisation practices - improved collaboration between teams - increased transparency in operational activities
PayPal electronic payment system	Rapid delivery of value to customers	Scrum	- closer proximity of teams to customers - clear definition of product owners - optimised management of dependencies between projects - planning and execution at the project portfolio level
Roche Korea subsidiary of a global pharmaceutical giant Roche	More adaptive processes and patient-centred focus	Agile model (unspecified)	- 30% increase in sales - greater number of patients benefiting from medications and services - faster response to customer needs - simplified decision-making process
AstraZeneca scientific biopharmaceutical and pharmaceutical company	Enhancing project transparency and innovation	Agile methods (unspecified)	- establishing a centralised project management organisation - unified vision and mission - increased production levels - continuous improvement of process efficiency

Source: developed by the authors based on I. Krasteva (2022)

Data analysis reveals a clear trend among large companies shifting towards Agile methodologies, particularly Scrum and Kanban. Regardless of the industry – finance, pharmaceuticals, technology, automobile manufacturing – companies adopt these approaches to enhance efficiency, flexibility and customer orientation. Corporate experience demonstrates that Agile methodologies enable faster responses to market changes, adaptation to new conditions and quicker product delivery to customers. Workflow visualisation, as seen in Kanban, increases transparency, helping teams and managers better understand project status and make informed decisions. Agile methods also promote closer collaboration between teams, boost employee engagement and improve communication, allowing companies to focus on customer needs while ensuring rapid delivery and continuous product improvement. Regular iterations and feedback help identify and resolve issues at early stages, leading to improved product and service quality.

The data in Table 3 also shows that some companies use a combination of Scrum and Kanban, selecting the best elements from each methodology to address specific challenges. Companies are increasingly adopting Agile methods for project portfolio management, allowing them to better prioritise work and optimise resources. It is important to remember that successful Agile implementation requires changes in the company's organisational culture, creating an environment that fosters innovation, experimentation and continuous improvement. As a result, Agile methodologies are becoming the standard for many companies striving to remain competitive in a dynamic business environment. Implementing Agile demands considerable effort but yields tangible results in terms of increased efficiency, flexibility and customer orientation.

It is important to analyse cases of successful implementation of the Scrum methodology in two well-known international companies with distinct economic activities: Amazon, the world's largest company specialising in e-commerce and cloud computing and Spotify, one of the world's leading streaming services, enabling users to access millions of songs and podcasts online (Table 4). Amazon and Spotify are both market leaders recognised for their agility and technological expertise (How Amazon and Spotify..., n.d.).

Table 4. Comparative characteristics of Scrum methodology usage in Amazon and Spotify

Characteristics	Amazon	Spotify
Implementation strategy	Decentralised, bottom-up approach	Centralised, top-down approach
Team autonomy	High autonomy	High autonomy
Team structure	Stable, long-term teams	Flexible structure, teams can change
Approach to Scrum adoption	Flexible learning, communities, training programs	Systematic approach, mandatory training for Scrum Masters
Focus area	Knowledge sharing, long-term team structures	Rapid response to changes, team autonomy
Sprint duration	Typically 2-4 weeks	Flexible, project-dependent
Role of product owner	Often combined with other roles	Clearly defined, customer value-focused
Project management tools	Custom-built solutions, Jira	Jira, Trello
Success metrics	Release frequency, customer satisfaction, technical debt	Delivery speed, code quality, team satisfaction

Table 4, Continued

Characteristics	Amazon	Spotify
Barriers	Scaling complexity, cultural preservation	Maintaining focus on long-term goals
Level of test automation	High automation, investments in testing infrastructure	High automation, use of CI/CD (Continuous Integration / Continuous Delivery) tools
Retrospective frequency	Regular retrospectives, weekly or bi-monthly	Regular retrospectives, focused on continuous improvement
Impact on corporate culture	Encourages innovation and experimentation	Has shaped the company's unique culture
Relationship with other methodologies	Integration with Lean, DevOps (development and operations, hereafter DevOps)	Strong emphasis on Lean Startup
Role of technical debt	Actively managed, prioritised repayment	Recognised as inevitable but managed

Source: developed by the authors based on I. Krasteva (2022)

The data in Table 4 demonstrates that both companies have achieved success by employing different Scrum implementation strategies, highlighting the flexibility of the methodology and its ability to adapt to various organisational contexts. Both companies grant teams significant autonomy, which fosters initiative and enhances efficiency. Analysis shows that the successful implementation of Scrum largely depends on the company's overall corporate culture and leadership support. Role distribution within Scrum is crucial, with the Scrum Master playing a key role in ensuring the effective functioning of teams and the successful adoption of Scrum within the organisation. It is evident that the implementation of Scrum varies across companies, as Scrum is not a static methodology but a continuous improvement process requiring teams to engage in ongoing learning and development. Both companies facilitate this growth, though in different ways, depending on the specifics of their operations.

Additionally, both companies recognise the importance of test automation in ensuring product quality and quickly identifying defects. Both companies integrate Scrum with other methodologies, such as Lean and DevOps, to maximise efficiency. The frequency of retrospectives varies between the companies, but both recognise that regular retrospectives help teams refine their processes and address challenges. Scrum fosters a more open, trusting, and innovative corporate culture. Amazon emphasises innovation and experimentation, while Spotify has used Scrum to shape a unique corporate culture. The data from Table 4 supports conclusions regarding Scrum usage at Amazon and Spotify. It has been established that both companies successfully apply Scrum while maintaining distinct approaches, underscoring the importance of adapting the methodology to a company's specific context.

The implementation of flexible methodologies such as Agile, Scrum, and Kanban is becoming increasingly relevant for Ukrainian companies. More and more businesses are recognising the advantages of this approach. Firstly, IT industry companies – including EPAM Systems, SoftServe, and MacPaw – are actively using Agile methods in their projects, making them known for innovative solutions and high-quality products (Riabchykov & Hanushchak-Yefimenko, 2024). Secondly, leading financial sector companies – such as one of Ukraine's largest banks, PrivatBank, and the dynamic Monobank – are gradually integrating Agile elements into their development processes, allowing them to respond rapidly to market changes and offer innovative financial products to their customers.

This trend is driven by the need for rapid adaptation to changing market conditions, increased operational efficiency, and improved customer satisfaction. Flexible methodologies enable teams to work more autonomously, focusing on outcomes rather than rigid planning. This approach enhances employee motivation, improves product quality, and reduces time to market, ultimately leading to successful business development in the modern BANI world. Based on the experience of successful global companies, it can be concluded that implementing flexible methodologies, particularly Scrum, is a viable strategy for organisations. For Ukrainian companies to transition effectively to agile management, they must conduct thorough preparation, engage all employees in the process, and ensure continuous support from company leadership.

DISCUSSION

Both global and Ukrainian scholars have examined the successful application of flexible methodologies. S. Povna (2020) conducted a detailed analysis of the features and effectiveness of flexible management methodologies, specifically Kaizen and Agile. The researcher emphasised that these methodologies are geared toward the continuous improvement of organisations and the enhancement of their competitiveness in a dynamic business environment. Agile, as a more modern methodology, demonstrates high effectiveness in project management, particularly within the IT industry. However, its successful implementation requires significant changes in organisational culture and readiness among employees to adapt. In contrast, Kaizen, as a more traditional Japanese concept, focuses on gradual improvements and involves all employees in the process of change. The study concludes that both methodologies can serve as effective tools for the development of Ukrainian enterprises, but their successful implementation necessitates a thorough analysis of each organisation's specific characteristics and its readiness for change.

Researchers, including W. Aghina *et al*. (2018) have demonstrated five key elements that are common to successful Agile organisations regardless of size or industry. These elements include a network of teams at the centre of a people-oriented culture that operates in cycles of rapid learning and decision-making. The work of these teams is supported by technologies, and the organisation's common

goal is to create value for all stakeholders. Organisations operating under the old paradigm are viewed as machines. This paradigm no longer functions under conditions of rapid change. In contrast, Agile organisations are more adaptive and better respond to continuous innovations and competitive pressure.

McKinsey & Company conducts numerous studies on the implementation of flexible methodologies by organisations. A study conducted by C. Handscomb *et al*. (2020) demonstrated that companies using Agile methods managed the impacts of the COVID-19 pandemic significantly more effectively than their competitors. This success is attributed to the integration of flexible practices into all aspects of company operations. Ukrainian companies can leverage the experience of global leaders by implementing Agile practices to enhance their competitiveness. This will allow them to adapt more quickly to changes, utilise resources more efficiently, and better meet customer needs.

The research by S. Hassani-Alaoui *et al*. (2020) revealed that, in practice, teams often deviate from the formal Scrum guidelines. This indicates that Scrum, like any other methodology, is adapted to meet the needs of specific projects and organisations. However, such deviations can have both positive and negative consequences. On the one hand, it allows teams to be more flexible and adapt to changes; on the other hand, it may result in the loss of certain Scrum advantages, such as transparency and predictability. Research has also shown that scaling Scrum is a complex task that requires careful planning and diligent oversight. Many organisations employ informal approaches to scaling, which may lead to the formation of silos and limited visibility between subgroups. This can adversely affect project success. Therefore, the study's findings underscore the importance of understanding that Scrum is not merely a set of rules, but a flexible methodology that must be adapted to the specific context. However, such adaptation should be undertaken cautiously to avoid losing Scrum's inherent benefits.

The research by M. Morandini *et al*. (2021) was dedicated to evaluating the effectiveness of applying the Scrum methodology in various organisations. It revealed that, although Scrum is a popular and widely adopted software development strategy, its implementation and effectiveness can vary significantly based on an organisation's specific conditions. Despite the existence of numerous "best practices" for Scrum, their application is not always straightforward and may require adaptation to the unique needs of a project and team. The study's results indicate the necessity of an individualised approach to implementing Scrum within each organisation. It is also important to consider factors such as team size, developers' experience, the nature of the project, and the overall organisational culture. Additionally, the research underscored the importance of regularly evaluating the effectiveness of employed Scrum practices and ensuring their alignment with the set objectives.

A. Bardas & O. Avramenko (2023), while investigating the use of agile methodology for project management in banking organisations, concluded that this methodology may become a key factor in the successful transformation of Ukraine's banking system by providing the necessary agility and rapid response to changing market conditions – a critical requirement for modern financial institutions. The authors rightly emphasised that for Agile to be implemented effectively, it is essential to invest in the development of qualified personnel, improve communication, and establish reliable project management processes. Agile will enable banks to quickly adapt their products to meet customer needs, thereby enhancing their competitiveness. Furthermore, the iterative development that is fundamental to agile will contribute to improving product quality and reducing risks by ensuring stakeholder expectations are met.

One of the key challenges in implementing Agile in Ukrainian companies is the cultural aspect, according to research by N. Kovalchuk & K. Komarova (2023). Traditional hierarchical structures and cultures, where priority is given to planning and control, can create resistance to change. For successful transformation, it is necessary to establish an environment where employees feel safe, can express their ideas, and assume responsibility. It is also important to ensure proper training for leaders who would play a key role in changing the organisation's culture.

S. Moscoso-Zuñe *et al*. (2024) found that the successful implementation of Agile methodologies significantly enhances key organisational performance indicators, such as project delivery speed, customer satisfaction, team effectiveness, productivity, and the development of an innovation culture. The analysis of data collected from 1,161 participants across various economic sectors revealed four key factors for successful Agile implementation: clarity and quality of work, alignment between business and IT departments, risk and cost reduction, as well as management optimisation. Agile effectiveness directly correlates with the evaluation of internal processes, organisational culture, the development methodologies employed, and the level of cross-functional teamwork. Among the advantages of Agile, the authors of the study highlighted increased employee motivation, improved product quality, higher productivity, and cost reduction.

Flexible methodologies are evolving to a higher level and are applied not only in the IT sector but also in manufacturing. In the research by S. AlHayek *et al*. (2024), it is shown that manufacturing organisations face a constant increase in customer demands, market instability, and various constraints. In order to remain competitive, they need to implement new methods, including the use of digital technologies. Agile principles and methods have also become widespread in the field of manufacturing. The authors examined the application of Agile methods in manufacturing enterprises and their impact on production speed, profitability, and quality. The analysis revealed an increase in interest in Agile production since 2019. The study defines Agile as the ability of manufacturing to conduct business under conditions of uncertainty and to flexibly respond to customer demand. The results reveal significant opportunities and challenges for enhancing Agile production, which will be useful for production and operations managers.

Research conducted by N. Nweder (2024) demonstrated that small companies that implemented Agile methodologies, such as Scrum and Kanban, achieved significant success in increasing development speed, product quality, and customer satisfaction. Due to regular sprints, daily meetings, and other Agile practices, the companies were able to adapt more quickly to market changes and collaborate more effectively with customers. However, the process

of implementing Agile was not always straightforward. Resistance to change and inadequate staff training were the main challenges. Nevertheless, the study confirms that Agile methodologies can be successfully applied in small companies, provided that proper preparation and management support are in place.

Researchers E. Chukwurah & S. Aderemi (2024) conducted a detailed analysis of the experience of implementing Scrum in leading American technology companies and demonstrated the significant positive impact of this methodology on team performance and overall business results. The study showed that Scrum transforms traditional ways of working, contributing to the creation of more cohesive and self-organised teams. The regular iterations provided by Scrum allow companies to quickly adapt to market changes, enhance product quality, and meet customer needs. In addition, Scrum fosters a culture of continuous improvement that enables teams to constantly develop and refine their processes. The key factors for successful Scrum implementation were the creation of cross-functional teams, delegation of authority, communication transparency, and leadership support. These elements contribute to increased employee motivation, enhanced accountability, and the creation of an atmosphere of trust within the team. The paper provides examples of successful Scrum application in companies such as Spotify, Google, and Amazon, demonstrating how this methodology helped them achieve significant results. Overall, the study confirms that Scrum is a powerful tool for enhancing efficiency and innovation in technology companies.

B.M. Mishra *et al*. (2024) stressed that the traditional Lean management approach, although effective, may be insufficient for navigating the modern BANI environment. The challenges associated with BANI require more flexible and adaptive approaches. The authors in their study focused on the impact of the transition from VUCA to BANI for IT professionals. They investigated how changes in the work environment affected employee behaviour and their perception of new working conditions. S.S. Vishwakarma & S.K. Pandey (2024) in their study emphasised that modern organisations operate in an environment characterised by VUCA, which is further complicated by BANI. However, to remain competitive and resilient, companies must implement strategies for agile transformation. According to the authors, an important aspect should be the proper selection and adaptation of flexible methodologies, such as Scrum and Lean, to the specific context of the organisation. The research showed that companies implementing flexible practices gained significant advantages, including increased operational efficiency, reduced time to market, and improved customer satisfaction. However, it is worth noting that the agile transformation process may face certain challenges, such as resistance to change and scaling issues. Therefore, it is crucial to carefully plan and manage this process.

Scrum is a key methodology for enhancing business efficiency and agility, especially in Ukraine's dynamic IT sector, as confirmed by T. Pavliuk & L. Polusmiak (2024). The study indicated that implementing Scrum will contribute to increasing companies' competitiveness, optimising team performance, and improving product quality. However, insufficient understanding of Scrum may hinder its effective use, which will require a higher level of knowledge and the sharing of experience. In the environment of rapid change and growing competition, Scrum can become an indispensable tool for effective personnel management and adaptation to market demands. The authors note that the adoption of the Scrum methodology significantly optimises work processes and improves interaction in companies across various sectors, from manufacturing to the public sector. This approach will ensure quick adaptation to changes, boost efficiency, and promote digitalisation. Successful integration of Scrum will require a systematic approach, including detailed analysis, staff training, and continuous process improvement. The key elements will involve forming cross-functional teams, holding regular meetings, monitoring performance, and involving leadership.

Researchers E. Chukwurah & S. Aderemi (2024) conducted a detailed analysis of the implementation of Scrum in leading American technology companies and demonstrated a significant positive impact of this methodology on team efficiency and overall business results. The study showed that Scrum transforms traditional working methods by fostering the creation of more cohesive and self-organising teams. The regular iterations provided by Scrum enable companies to quickly adapt to market changes, improve product quality, and meet customer needs. Additionally, Scrum cultivates a culture of continuous improvement, allowing teams to constantly evolve and refine their processes. The key factors for successful Scrum implementation include the formation of cross-functional teams, the delegation of authority, transparent communication, and leadership support. The use of modern management tools and continuous skills enhancement will contribute to reducing risks and improving team performance.

Researcher D.J.C. Sihombing (2024) proposed a different perspective on the use of the Agile Scrum methodology. The conducted study demonstrated the effectiveness of applying Agile Scrum for the development of Business Intelligence (BI) in a freight company. It was shown that clear planning and the identification of key BI functions are important at the initial stage. The use of Agile Scrum in development allowed for delivering value in stages, thereby enhancing the adaptability and quality of the BI solution. Testing played a decisive role in ensuring product quality and correcting errors. The scientific paper provided practical recommendations and empirical evidence of the benefits of using Agile Scrum to improve the efficiency of BI development.

J. De Souza Pinto & R. Da Silva Leme (2024) study showed that the partial and incorrect application of Scrum in a public organisation led to products that did not meet stakeholder expectations. Role overload, frequent redistribution of team members, and a lack of coordination between stakeholders and the Product Owner negatively affected efficiency. Failure to adhere to Scrum rules, such as continuing a sprint after its completion, also reduced the potential benefits of the methodology. Insufficient updating of project management tools complicated inspections and the collection of reliable reports. The study emphasised the importance of strictly adhering to Scrum roles and events, as well as the need to update management tools to ensure transparency and adaptability.

C. Mbonigaba *et al*. (2024) research once again emphasised that Agile project management is a dynamic approach that enhances collaboration, adaptability, and accelerates product development. However, companies face challenges in its implementation, such as resistance to change and insufficiently qualified personnel. For the successful implementation of Agile, it is recommended that companies invest in training, apply change management strategies, and adapt Agile for large projects. The recommendations also include investing in comprehensive Agile training programs, adopting change management strategies to overcome resistance, and adapting Agile for large-scale implementations, such as SAFe. Implementing these strategies will allow companies to effectively use Agile to drive innovation and improve efficiency.

Research by H. Shraddha & G. Nagaraj (2024) demonstrated that the Agile transformation of companies Spotify and Acme Software Solution led to increased agility and productivity, despite initial challenges such as resistance to change and communication issues. The success of their Agile implementation underscored its adaptability and advantages for organisations of various sizes. The Agile methodology transformed software development by emphasising adaptability, collaboration, and continuous improvement. This methodology contributed to the rapid release of products, enhanced product quality, and increased customer satisfaction. Agile enabled teams to quickly adapt to changing needs, prioritise value, and improve based on feedback. Clear communication and the empowerment for decision-making allowed these organisations to overcome challenges and succeed in complex business environment.

After reviewing the research of various scholars, the authors of the current study agree with them and consider their results valid regarding the effectiveness of applying Agile methodologies in various business sectors. Most researchers, like the authors of this study, have concluded that this methodology improves collaboration, adaptability, and accelerates product development. This indicates that the Agile approach has significant potential to enhance the operations of organisations across different economic sectors, but its implementation requires careful planning and adaptation to the specifics of each company. Agile is not a universal solution – it requires a flexible approach and consideration of individual characteristics.

CONCLUSIONS

Having analysed and contemplated various worldviews during transitions between eras, it has been determined that companies' understanding of these models will enable them to navigate the modern world more effectively and shape their future. Knowledge of the characteristics of these models will help identify challenges, develop strategies, enhance team skills, and better navigate the modern world in order to make more informed management decisions. The study conducted a comparative analysis of various agile project management methodologies. Key factors influencing the effectiveness of Agile were identified, and its advantages and disadvantages were examined. It was analysed and substantiated that the Agile methodology is an innovative tool for the effective management of companies in an unstable and unpredictable BANI world.

The research results showed that modern projects often use a hybrid approach that combines the best practices from various methodologies. The choice of a specific methodology depends on many factors, such as the size and complexity of the project, the team's level of experience, customer requirements, and the type of product. The optimal choice of methodology is determined by the individual characteristics of the project and the team implementing it. By analysing and systematising the practical experience of integrating flexible methodologies into the management processes of leading international companies, it was found that the vast majority of companies work with flexible methodologies. 81% of agile teams use a variant or a hybrid version of the Scrum methodology, with 66% using pure Scrum. Predominantly, these are software development departments (86%) and IT departments (63%) that implement flexible methodologies. However, this methodology is also gaining interest in other functional departments: manufacturing (29%), HR (16%), sales (11%), finance (10%), etc.

The characteristics of Scrum, Agile, and Kanban were reviewed, and an analysis of their differences was carried out. It was established that the vast majority of companies choose the flexible Scrum methodology – or its elements – for their needs. Therefore, it is proposed that companies use the flexible Scrum methodology in their management process as a tool to navigate the BANI world. The research findings indicate a significant lack of advancements in improving management theory and teamwork using flexible methodologies within the academic sphere, suggesting substantial potential for further scholarly research.

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REFERENCES

[1] 17th state of agile report. (2022). Retrieved from https://is.gd/hn3mT5.

[2] Aghina, W., Ahlback, K., De Smet, A., Lackey, G., Lurie, M., Murarka, M., & Handscomb, C. (2018). *The five trademarks of agile organizations*. Retrieved from https://www.mckinsey.com/capabilities/people-and-organizational-performance/our-insights/the-five-trademarks-of-agile-organizations.

[3] Agile transformation. From Agile experiments to operating model transformation: How do you compare to others? (2019). Retrieved from https://assets.kpmg.com/content/dam/kpmg/be/pdf/2019/11/agile-transformation.pdf.

[4] AlHayek, S., Souib, S., Meechang, K., & Medini, K. (2024). Exploring Agile methods application in manufacturing. In *Advances in production management systems. Production management systems for volatile, uncertain, complex, and ambiguous environments* (pp. 48-60). Cham: Springer. doi: 10.1007/978-3-031-71637-9_4.

[5] Bardas, A., & Avramenko, O. (2023). Use of agile methodology to manage projects in banking organizations. *Economic Bulletin of Dnipro University of Technology*, 2(82), 93-102. doi: 10.33271/ebdut/82.093.
[6] Baskoro, G., Sarwono, E., Handajani, E.T., & Hendriana, D. (2024). Graduate study with online education in the post-pandemic era: An experiential case study. In *International conference on engineering management and sustainable innovative technology* (pp. 165-180). Malang: National Institute of Technology Malang. doi: 10.18502/kss.v9i10.15723.
[7] Bushuyev, S., Tykchonovych, J., Chernysh, O., Sukhonos, N., & Khalilov, A. (2024). Creative principles for managing innovation projects in BANI environment. *Management of Development of Complex Systems*, 57, 6-11. doi: 10.32347/2412-9933.2024.57.6-11.
[8] Chukwurah, E., & Aderemi, S. (2024). Elevating team performance with Scrum: Insights from successful U.S. technology companies. *Engineering Science & Technology Journal*, 5(4), 1357-1371. doi: 10.51594/estj.v5i4.1038.
[9] De Souza Pinto, J., & Da Silva Leme, R. (2024). Analysis of project management principles with the Scrum framework in systems development: A case study in a public organization. *Brazilian Journal of Operations and Production Management*, 21(2), article number 1878. doi: 10.14488/BJOPM.1878.2024.
[10] Djurovic, A. (2023). *20+ astonishing Agile adoption statistics for 2023*. Retrieved from https://goremotely.net/blog/agile-adoption.
[11] Handscomb, C., Mahadevan, D., Schor, L., Sieberer, M., Naidoo, E., & Srinivasan, S. (2020). *An operating model for the next normal: Lessons from agile organizations in the crisis*. Retrieved from https://is.gd/SHVRuG.
[12] Hassani-Alaoui, S., Cameron, A.-F., & Giannelia, T. (2020). "We use Scrum, but ...": Agile modifications and project success. In *Proceedings of the 53rd Hawaii international conference on system sciences* (pp. 6257-6266). Maui: ScholarSpace. doi: 10.24251/HICSS.2020.765.
[13] How Amazon and Spotify used Scrum to change how they work. (n.d.). Retrieved from https://alctraining.com.au/amazon-spotify-used-scrum-change-work/.
[14] Kovalchuk, N., & Komarova, K. (2023). Agile methods in team management. *Economics and Society*, 47. doi: 10.32782/2524-0072/2023-47-20.
[15] Krasteva, I. (2022). *8 examples of successful Agile companies*. Retrieved from https://businessmap.io/blog/agile-companies.
[16] Kremic, N. (n.d.) *Why are Agile teams 25% more productive?* Retrieved from https://www.deltamatrix.com/why-are-agile-teams-25-more-productive/.
[17] Martini, A., & Bosch, J. (2016). A multiple case study of continuous architecting in large Agile companies: Current gaps and the CAFFEA framework. In *13th working IEEE/IFIP conference on software architecture (WICSA)*. Venice: IEEE. doi: 10.1109/WICSA.2016.3.
[18] Mbonigaba, C., Sujatha, S., Dinesh Kumar, A., & Vasuki, M. (2024). The rise of agile methodologies in managing complex business projects: Enhancing efficiency, collaboration, and adaptability. *Indo American Journal of Multidisciplinary Research and Review*, 8(2), 69-77. doi: 10.5281/zenodo.13871832.
[19] McCreery, D. (2024). *Google: Pioneering innovation with Agile methodologies*. Retrieved from https://www.linkedin.com/pulse/google-pioneering-innovation-agile-methodologies-david-mccreery-qax8e/.
[20] Mishra, B.M., Sahu, E., Bhuriya, K., & Dubey, T. (2024). Lean management intervention in BANI world with reference to IT industry (post COVID). *Educational Administration: Theory and Practice*, 30(5), 12819-12822. doi: 10.53555/kuey.v30i5.5389.
[21] Morandini, M., Coleti, T.-A., Oliveira, E., & Pizzigatti Corrêa, P.-L. (2021). Considerations about the efficiency and sufficiency of the utilization of the Scrum methodology: A survey for analyzing results for development teams. *Computer Science Review*, 39, article number 100314. doi: 10.1016/j.cosrev.2020.100314.
[22] Moscoso-Zuñe, C., Zuloaga-Luna, V., Collao-Diaz, M., & Del Solar-Vergara, E. (2024). Service model based on lean service and Agile methodology to increase the NPS index in a company in the security sector. *Industrial Engineering and Industrial Management* (pp. 170-182). Cham: Springer. doi: 10.1007/978-3-031-56373-7_14.
[23] Nweder, N. (2024). *Applying Agile management to small businesses across industries: A study on small business companies from a perspective of work-integrated learning*. Retrieved from https://www.diva-portal.org/smash/get/diva2:1904858/FULLTEXT01.pdf.
[24] Panditi, S. (2018). *Survey data shows that many companies are still not truly agile*. Retrieved from https://hbr.org/sponsored/2018/03/survey-data-shows-that-many-companies-are-still-not-truly-agile.
[25] Pavliuk, T., & Polusmiak, L. (2024). Development of universal measures to improve the efficiency of the enterprise's personnel management system through the implementation of scrum technologies. *Management and Entrepreneurship: Trends of Development*, 3(29), 94-103. doi: 10.26661/2522-1566/2024-3/29-09.
[26] Povna, S. (2020). World experience in introduction of flexible management methodologies of enterprises and organizations competitiveness. *Problems and Prospects of Economy and Management*, 1(21), 63-71. doi: 10.25140/2411-5215-2020-1(21)-63-71.
[27] Qureshi, T., & Amin, A. (2024). Dynamic teaching pedagogy in the post-Covid BANI environment: Redefining the versatile role of teachers for effective learning outcomes in higher education institutes. In *Higher education and sustainable development: Possibilities and challenges* (pp. 25-40). Jaipur: Sharda Global Research Publications.
[28] Riabchykov, O., & Hanushchak-Yefimenko, L. (2024). The impact of iteration risk coefficient on the volatility of Scrum team work in the Scrum methodology. *Journal of Strategic Economic Research*, 25(1), 94-99. doi: 10.30857/2786-5398.2024.1.10.

[29] Salun, M., & Zaslavska, K. (2024). Strategies for resilience in a dynamic world: From VUCA to BANI. *Proceedings of Socratic Lectures*, 10, 185-189. doi: 10.55295/PSL.2024.I23.
[30] Schäfer, J. (2023a). *23 Agile statistics: How relevant are Agile frameworks?* Retrieved from https://echometerapp.com/en/agile-statistics/.
[31] Schäfer, J. (2023b). *The 20+ most important Scrum statistics for 2023*. Retrieved from https://echometerapp.com/en/scrum-statistics/.
[32] Scrum vs Agile vs Kanban: What to choose? (2023). Retrieved from https://campus.epam.ua/ua/blog/577.
[33] Shraddha, H., & Nagaraj, G. (2024). Adapting Agile methodology. *SSRN*. doi: 10.2139/ssrn.4945674.
[34] Sihombing, D.J.C. (2024). Development of business intelligence in a cargo company using the Agile Scrum. *Jurnal Ekonomi*, 13(1), 2495-2503.
[35] Success rates rise transforming the high cost of low performance. (2017). Retrieved from https://www.pmi.org/-/media/pmi/documents/public/pdf/learning/thought-leadership/pulse/pulse-of-the-profession-2017.pdf.
[36] The 11th annual state of agile report. (2017). Retrieved from https://www.agile247.pl/wp-content/uploads/2017/04/versionone-11th-annual-state-of-agile-report.pdf.
[37] Vishwakarma, S.S., & Pandey, S.K. (2024). Agile transformation: Business strategies and best practices for VUCA and BANI world. *IntechOpen*. doi: 10.5772/intechopen.1006870.
[38] What is Agile software development? Benefits of Agile. (2024). Retrieved from https://blog.techliance.com/agile-software-development/.
[39] Yakut, B., & Çerasi, C. (2024). The relationship between the Scrum method and employee satisfaction. *WSEAS Transactions on Business and Economics*, 21, 2277-2290. doi: 10.37394/23207.2024.21.187.

Гнучкі організації в епоху BANI: кейс-стаді компаній, що використовують Scrum

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Анотація. Глобалізація, технологічні прориви та непередбачувані події створили епоху, у якій традиційні підходи до управління втрачають ефективність. З 2020 року бізнес працює у світі BANI, де адаптивність стає ключовою перевагою. Метою даного дослідження було дослідити сучасні успішні гнучкі компанії та виявити доцільність запровадження методології Scrum в управлінський процес інших компаній. Під час проведення дослідження було використано методи: теоретичного узагальнення і порівняння (розкриття сутності SPOD, VUCA та BANI світів із фокусом на ключові характеристики), аналізу (зміни світу під впливом різних факторів, розкриття їх особливостей), статистичний (групування даних для знаходження відсотка використання гнучких методологій компаніями світу), абстрактно-логічний (сформульовано положення ефективності Agile, переваги та недоліки). Досліджено гнучкі методології на основі досвіду 10 компаній-лідерів у галузі гнучкості зі значними досягненнями в інноваціях та високою задоволеністю клієнтів. Розглянуто актуальні статистичні дані щодо використання методологій Agile, Scrum, Kanban та їх вплив на продуктивність компаній. Оцінено переваги Agile-підходів, зростання їхньої популярності серед світових компаній, а також ефективність впровадження гнучких методологій у різних галузях. Проаналізовано та систематизовано практичний досвід запровадження гнучких методологій в управлінський процес успішних міжнародних компаній, здійснено порівняльну характеристику різних гнучких методологій. На цій основі запропоновано ефективний інструмент для управління компаніями в нелінійному BANI-світі. Встановлено, що для досягнення результату компанії потрібен індивідуальний підхід, що потребує адаптації до конкретного контексту. Практичною цінністю дослідження стали систематизація та аналіз сучасного мінливого зовнішнього та внутрішнього бізнес-середовища компаній та надання на їх основі управлінському персоналу дієвого інструменту для подальшої навігації

Ключові слова: гнучкі методології; адаптація; управлінський процес; команда; фреймворк

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The impact of big data analytics on the effectiveness of management decisions

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Abstract. The aim of the study was to assess the impact of big data analytics on the quality of managerial decisions by analysing key technologies, data processing methods, and data interpretation in the modern business environment. The research methodology included the analysis and comparison of existing approaches to the use of big data analytics in various industries, as well as the application of case study and modelling methods to evaluate the impact of big data on the effectiveness of managerial decisions under conditions of unstable resource provision. The study also analysed the practical use of big data in finance, marketing, logistics, manufacturing, human resource management, and public administration based on real cases from companies such as Amazon, Uber, Walmart, General Electric, and Netflix. Types of machine learning algorithms (classification, clustering, regression, deep learning), examples of the application (customer segmentation, demand forecasting, anomaly detection), and the impact on the effectiveness of managerial decisions were described. Key technologies were outlined – Hadoop, Spark, and Tableau – which ensured the processing, analysis, and visualisation of big data. Emphasis was placed on the advantages of big data – improved forecasting accuracy, personalisation, automation, market adaptation – and the challenges of implementation, particularly the need for computational resources, qualified personnel, and data protection, which were critical for achieving managerial efficiency. The results obtained will allow enterprises to optimise operational processes, increase the efficiency of resource use, and adapt strategic decisions to specific market conditions and technological challenges. Furthermore, the study made it possible to improve the integration of big data analytics with other digital technologies, such as BIM and IoT, which contributed to more accurate forecasting and optimisation of business processes. The practical value of the study lies in identifying ways to effectively apply big data analytics to improve managerial decisions in various sectors

Keywords: information processing; forecasting; algorithmic approaches; process optimisation; artificial intelligence

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INTRODUCTION

The modern business environment was characterised by a rapid increase in data volumes and the necessity to make well-grounded managerial decisions in real time. In this context, big data analytics gained particular relevance as it enabled the identification of patterns, prediction of trends, and improvement of the efficiency of managerial processes. It contributed to the enhancement of strategic planning, reduction of risks, and increase in the competitiveness of organisations. At the same time, the implementation of big data was accompanied by a number of challenges – technical, personnel-related, and organisational. Insufficient integration of analytics into traditional management systems, data security issues, and a shortage of specialists complicated its effective use. Therefore, the study of the impact of big data analytics on decision-making processes remained an important and timely task.

Various studies indicated a significant impact of big data analytics on the effectiveness of managerial decisions. In the financial sector, G. Dicuonzo *et al*. (2019) drew attention to the use of big data to increase the accuracy of creditworthiness assessments of borrowers. In the view, a deep analysis of financial information reduced the risk of loan

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defaults and helped to avoid systemic failures. The authors also emphasised the importance of sound managerial decisions in risk management. Z.P. Dvulit & L.V. Maznyk (2024) analysed the impact of big data analytics on corporate strategic management. The authors noted that modern data analysis tools contributed to more accurate planning and provided flexibility in decision-making, allowing companies to respond quickly to market changes. The approach of H.N. Dai *et al*. (2020) focused on the optimisation of operational activities of manufacturing enterprises. The conclusions confirmed that the integration of data analysis tools into production processes promoted more rational use of resources and accelerated product manufacturing cycles.

S.R. Krishna *et al*. (2023), in turn, emphasised the improvement of marketing practices through detailed consumer behaviour analysis. Owing to analytical technologies, companies were able to formulate more precise advertising campaigns and predict changes in demand, which led to increased efficiency. Logistics issues were examined by S. Maheshwari *et al*. (2021), focusing on improving the transparency and speed of supply chains. The study showed that due to the use of big data, interaction among participants in the process improved, and delivery costs were optimised. R.D. Raut *et al*. (2019) analysed how government institutions could strengthen the capacity to respond promptly in emergencies. Using crisis scenarios, the authors demonstrated how analytics helped to make well-founded managerial decisions quickly.

V. Kovalchuk *et al*. (2018) focused on improving human resource (HR) management processes. Due to the collected data on employees, organisations were able to better plan staffing needs, reduce turnover, and increase overall team efficiency. The view of C. Liu *et al*. (2021) was directed at innovation processes. The authors showed how a deep understanding of consumer expectations and market trends through data analysis helped reduce the risk of failure when launching new products and simultaneously increased the likelihood of commercial success. The work of L. Hanuschak-Efimenko (2024) focused on the identification and minimisation of risks in the business environment. Through threat forecasting based on data, companies were able to adapt quickly to changes, minimising financial losses. In the medical field, K. Batko & A. Ślęzak (2022) investigated how digital analytics contributed to improving the quality of medical services. The authors argued that its use allowed doctors to make clinical decisions more quickly and accurately, optimising healthcare institution expenditures.

Previous studies primarily focused on individual aspects of the impact of big data analytics, such as financial risks, HR, and supply chain optimisation, whereas the issues of integration into traditional management systems, influence on corporate culture, transformation of strategic management, as well as ethical, legal, and governmental aspects remained insufficiently explored. The aim of this study was to determine how the use of big data analytics transformed managerial approaches, influenced decision-making structures, and contributed to improving the efficiency of organisational processes, taking into account the challenges of integrating such technologies into existing management models. The objectives of the study were to define key aspects of big data analytics integration into management processes, to assess the impact of big data analytics on strategic decision-making in various fields of activity, and to examine the ethical and legal issues arising from the use of big data in management.

MATERIALS AND METHODS

For the purpose of the study within the big data analysis, a combination of theoretical and practical approaches was used, aimed at assessing the effectiveness of machine learning (ML) and artificial intelligence (AI) technologies in the processes of analysing and managing large volumes of information. The study also included the identification of the key characteristics of big data, such as volume, processing speed, and variety, as well as an analysis of data processing methods and the application in management processes. The theoretical aspect of the study covered the examination of basic concepts characterising big data, including the "3V" concept (Volume, Velocity, Variety), and the identification of the role of ML and AI in optimising big data processing. The study used major works and publications in the fields of big data, ML, and AI, as well as the latest studies related to the application of these technologies in various sectors, such as business processes, finance, marketing, and logistics. An analysis of secondary data from public databases and company reports was also carried out, which allowed a comprehensive understanding of the use of big data in various fields (Govindan *et al*., 2018; Basu *et al*., 2024).

The study was based on the analysis of real-life examples of big data use in different fields of activity, such as financial management, strategic planning, marketing, and logistics. Data were collected from open sources, including articles, academic research, company reports, and publications on the implementation of ML and AI technologies in business processes. For the analysis, secondary data collected from public databases and industry reports were used, which enabled the development of a holistic view of big data application across different fields. In order to provide deeper insight into the managerial aspects of big data use, case studies of companies such as Amazon, General Electric, Uber, and Walmart were analysed (Kemal, 2023; Batte, 2025; Case study: Walmart, 2025; Edmondson, 2025).

The methodological basis of the study was built on a combination of qualitative analytical approaches focused on the examination of the practical application of big data analytics across sectors. The use of thematic grouping made it possible to structure the information by key fields – finance, marketing, logistics, production, HR, and public administration. This allowed cross-sector comparisons and the identification of common trends, differences in big data implementation goals, and different forms of analytical process organisation.

One of the main methods was the case study, which made it possible to analyse specific examples of big data use at the company level. A number of well-known organisations were selected – such as Amazon, Uber, JPMorgan Chase, General Electric, IBM, as well as examples from the US public sector. The case analysis allowed for detailing the mechanisms of big data application in strategic and operational management, particularly in terms of service personalisation, demand forecasting, process reliability improvement, cost optimisation, and enhancing customer interaction. In parallel, a functional-target analysis was used, which enabled

the systematisation of big data roles in management processes depending on industry specificity. Content analysis of reports, academic studies, and policy documents provided the empirical basis for identifying typical advantages and challenges during the implementation of big data analytics. Particular attention was given to aspects such as confidentiality, access to quality data, technical and personnel constraints, as well as institutional and regulatory barriers.

To create a comprehensive picture, a comparative-analytical approach was used, which allowed the analysis of differences in approaches to big data implementation across sectors, as well as the assessment of general trends and development prospects of analytical systems. The use of analytical generalisation made it possible to formulate conclusions regarding the role of big data in transforming management models, increasing business flexibility and adaptability, and enhancing the ability of organisations to proactively respond to change. Thus, the research methodology was based on a theoretical understanding of the role of big data in modern management, a combination of sectoral analysis with practical case study exploration, and a focus on the benefits, challenges, and strategic implications of implementing analytical solutions.

RESULTS

Big data analytics is the process of collecting, processing, and analysing large volumes of structured and unstructured information to identify patterns, trends, and useful insights for decision-making. A distinguishing feature of big data is its volume, processing speed, and variety (the "3V" concept). Volume refers to the enormous amount of information accumulated from different sources; velocity relates to the need for real-time or near real-time data processing; and variety means that the data can be represented in different formats – from text files to videos and streaming data. Additional characteristics include veracity, which defines the reliability of the obtained information, and value, which is the ultimate goal of big data analysis for making effective managerial decisions.

The big data analytics process includes several key stages: collecting information from various sources, processing and storing data using distributed computing systems, analysing, and visualising results. Modern technologies such as ML and AI enable efficient processing of large volumes of information and forecasting, which significantly improves the quality of managerial decisions (Guler *et al.*, 2024). Big data analytics plays a key role in modern management, as it provides managers with the ability to make well-grounded decisions based on factual data. It is actively used in strategic planning, enabling the analysis of market trends and competitive environments, thereby contributing to the development of effective long-term strategies. In operational management, big data enables real-time process monitoring, allowing for quick responses to changes in the business environment, while in resource planning it helps optimise the use of material and human resources.

The impact of big data analytics on the personalisation of decisions is also noteworthy, enabling companies to adapt products and services to individual customer needs. Furthermore, in automation and forecasting, AI and ML algorithms allow the prediction of future scenarios. Under modern conditions of high competition, companies that actively implement big data analytics gain significant advantages, especially in areas such as retail, finance, logistics, and public administration. In retail, big data helps forecast demand, optimise pricing, and manage inventory, while in the financial sector, it is used for credit risk assessment and fraud detection.

Thus, big data analytics becomes an integral part of modern management, enabling faster, more accurate, and more adaptive decision-making. It provides managers with up-to-date information necessary for effective responses to dynamic changes in the environment and contributes to improving organisational competitiveness (Badshah *et al.*, 2024). However, its effective use requires not only technological infrastructure but also proper personnel training, integration with traditional management methods, and consideration of ethical and legal aspects related to the use of large volumes of data. ML and AI are key technologies for processing big data, as these technologies enable automated analysis, identification of hidden patterns, and highly accurate forecasting of future events. The use of these technologies significantly improves the quality of managerial decisions, as it allows for fast processing of large data volumes, detection of trends, and adaptation of business strategies in real time. ML is a subset of AI that enables computer systems to learn from existing data without explicit programming. It operates through algorithms that analyse large data sets, identify patterns, and use the algorithms to make predictive decisions. The most common ML methods are supervised learning, unsupervised learning, and reinforcement learning.

Supervised learning involves using labelled data, where the algorithm learns to find relationships between input parameters and expected outcomes. This approach is widely used in financial analytics to forecast market price changes, in banking to assess customer creditworthiness, and in marketing for audience segmentation. Unsupervised learning is used when data lacks clear labels, and the algorithm independently searches for structure within large data sets. This method is effective for detecting fraudulent activities, optimising logistics processes, and building recommendation systems. Reinforcement learning is based on reward and penalty mechanisms, enabling the creation of complex decision-making models, for example in robotics or automated production control (Shetty *et al.*, 2022).

AI combines various technologies, including neural networks, deep learning, natural language processing, and cognitive computing, allowing computer systems to imitate human thinking. In the field of big data processing, AI is used for automating analytics, forecasting risks, analysing user behaviour, and improving the effectiveness of managerial decisions. For example, in manufacturing, AI helps predict equipment failures, preventing unplanned downtimes, and in healthcare, it analyses large volumes of patient data for early disease diagnosis.

The key advantage of ML and AI in big data analytics is the ability to process information quickly without losing accuracy. Traditional statistical analysis methods often fail to work effectively with dynamic, distributed, and unstructured data, whereas AI algorithms adapt to new conditions and improve the forecasts during operation. Such systems are widely used in the financial sector for detecting fraud, in retail for personalising customer offers, and in industry for optimising supply chains (Iqbal *et al.*, 2020).

The use of ML and AI for processing big data also faces challenges. Chief among these challenges is the need for high-quality training data, as models can yield incorrect results due to inaccurate or insufficient data. Another aspect is computing resources, since complex AI algorithms require significant computational power for training models. In addition, ethical and privacy issues remain relevant, as ML algorithms can use sensitive personal data, necessitating compliance with appropriate regulatory standards.

Thus, ML and AI significantly improve the efficiency of big data processing, enabling faster and better-informed managerial decisions. These technologies open new opportunities for analysing complex processes and forecasting trends, which is particularly important for business, public administration, the financial sector, healthcare, and many other fields (Sen *et al.*, 2020). Despite certain implementation challenges, the development prospects of AI and ML in the big data field remain exceptionally large, and the influence on decision-making will only increase in the future.

Big data analytics plays a critical role in business process optimisation and effective resource planning, allowing companies to obtain valuable insights, increase productivity, and reduce operational costs. The use of big data helps businesses not only analyse previous events but also forecast future trends, enabling the implementation of more effective resource management strategies. Business processes cover all aspects of a company's operations – from production to customer service. Big data analytics significantly improves the efficiency of these processes, automates routine tasks, and reduces costs.

One of the main areas of optimisation is the automation of workflows. Due to ML algorithms, companies can reduce the need for manual data processing, implement robotic management systems, and reduce the likelihood of human error. For example, in finance, big data helps automate transaction processing, assess customer creditworthiness, and detect fraud schemes. Another important aspect is the optimisation of customer interaction. Big data analytics enables companies to analyse consumer behaviour, personalise services, and forecast customer needs. For example, retail companies use big data to create recommendation systems that suggest the most relevant products based on previous purchases and customer behaviour.

In the manufacturing sector, big data is used to monitor equipment, predict possible malfunctions, and provide timely maintenance. The use of IoT sensors in combination with big data analytics enables real-time diagnostics and helps prevent emergency situations. One of the key areas of big data impact is improved resource planning. Big data analytics helps companies accurately forecast needs for material, financial, and human resources, allowing for reduced excess costs and increased resource efficiency (Yu *et al.*, 2019; Koshchii, 2023). Demand forecasting is one of the most important aspects of resource planning. Analysing large datasets allows companies to predict market changes, taking into account seasonality, economic trends, social factors, and consumer behaviour. For example, logistics and retail companies use big data for inventory planning to avoid shortages or surpluses.

Supply chain optimisation also largely depends on big data analytics. By analysing logistics data in real time, companies can adjust delivery routes, optimise warehouse storage, and minimise delays. For example, transport companies use big data to analyse traffic, weather conditions, and road status, enabling optimised transport and reduced fuel costs (Gopal *et al.*, 2024). HR is another important area where big data provides significant advantages. Analytics helps forecast workforce needs, optimise work schedules, and improve employee performance. For example, companies analyse employee productivity and identify optimal motivation methods or workload distribution. Financial planning also benefits, with big data analytics helping organisations analyse cash flows, forecast revenues and expenses, and make more informed investment decisions. Banks and financial institutions use big data to identify risks, prevent financial fraud, and improve customer service (Ayvaz & Alpay, 2021).

Amazon uses big data analytics to forecast product demand, optimise supply chains, and personalise offers for customers (Edmondson, 2025). General Electric implements big data to monitor industrial equipment and predict maintenance needs, reducing repair costs (Batte, 2025). Uber uses big data analysis to optimise driver allocation, reduce customer wait times, and improve dynamic pricing algorithms (Kemal, 2023). Walmart analyses billions of transactions daily to manage inventory, forecast sales, and enhance customer service (Case study: Walmart, 2025). Thus, big data analytics plays a decisive role in enhancing business process efficiency and resource planning. It enables companies to make more accurate managerial decisions, boost productivity, cut costs, and adapt more quickly to market changes. Big data opens new opportunities for supply chain optimisation, demand forecasting, process automation, and improved customer interaction. Despite some challenges, such as the need for substantial computing power and highly skilled specialists, companies actively using big data analytics gain significant competitive advantages and increase long-term effectiveness.

Big data analytics has a significant impact on the effectiveness of managerial decisions across various areas of activity. The use of modern data analysis methods not only simplifies decision-making processes but also makes such processes more accurate, adaptive, and effective. Big data facilitates business process automation, productivity increases, risk minimisation, and improved strategic planning. One of the key areas of big data implementation is financial management, where transaction analysis helps prevent fraud, and predictive analytics allows for more informed investment decisions. In marketing, big data is used for advertising personalisation and more effective customer segmentation, increasing sales and customer loyalty. Logistics and supply chains also actively use analytics to optimise routes and reduce transport costs.

In HR, big data analytics enables forecasting staff turnover, analysing employee performance, and optimising personnel processes. In the manufacturing sector, big data supports equipment monitoring and maintenance forecasting, reducing downtime risks. Big data is also actively used in healthcare for disease diagnosis, epidemic forecasting, and personalised treatment. Public administration also benefits from big data analytics. Through the

analysis of social and economic indicators, public authorities are able to plan policies more effectively, respond to crisis situations, and deliver higher quality services to citizens. Table 1 presents the main areas of big data use in management, the expected effects, and implementation challenges.

Table 1. Big data impact on the effectiveness of management decisions in various areas of activity

Management sphere	Examples of using big data	Expected effect	Implementation challenges
Financial management	Transaction analysis to detect fraud, predict investment risks	Reducing financial risks, improving profitability	Data protection, regulatory compliance
Strategic planning	Analysis of market trends, competitive environment, consumer behaviour	Making informed strategic decisions	Large amount of data, complexity of integration
Marketing	Advertising personalisation, customer segmentation, social media feedback analysis	Increasing customer loyalty, campaign effectiveness	Privacy issues, the need for AI analytics
Logistics and supply	Optimisation of delivery routes, inventory management	Reducing costs, increasing delivery speed	Lack of qualified specialists, difficulty of integration
HR	Employee productivity analysis, staff turnover forecasting	Optimisation of personnel policy, increase in productivity	Personal data protection, ethical issues
Production	Equipment condition monitoring, predictive maintenance	Reduced downtime, reduced repair costs	Investments in IoT and analytics
Public administration	Analysis of social and economic indicators, crisis forecasting	Improving public administration, policy effectiveness	The need for open data, information security

Source: developed by the author based on M. Seyedan & F. Mafakheri (2020), Y. Zhang *et al*. (2021), S. Bilohur (2025)

As seen in Table 1, big data analytics significantly improves the quality of managerial decisions across various fields. It enables the optimisation of business processes, cost reduction, productivity growth, and the adoption of more reasoned decisions. However, the implementation of big data also raises certain challenges, particularly concerning security, privacy, the need for highly qualified specialists, and integration with existing systems. Therefore, the use of big data analytics in modern management is essential for enhancing the competitiveness of companies and organisations. Given the rapid pace of technological development, the effective application of big data allows not only adaptation to changes but also proactive development of strategies in the digital economy.

Big data plays a key role in improving managerial decisions by providing companies with the ability to adapt more quickly to market changes, optimise processes, and increase operational efficiency. The use of modern data analysis technologies allows executives to make more informed decisions, reduce risks, and improve productivity. One of the main areas for enhancing decision-making based on big data is the automation of the decision-making process. The use of ML and AI minimises the influence of the human factor, as automated systems can process vast amounts of information and provide managers with ready-made analytical reports or recommendations on optimal actions. An important aspect is the personalisation of management strategies, as the analysis of behavioural patterns of employees, clients, and partners makes it possible to develop individual approaches to motivation, staff development, and customer service.

Big data analytics also contributes to more effective resource planning, allowing for forecasting of needs in materials, equipment, personnel, and finances. This helps reduce costs related to excessive stock and minimise downtime in production processes. Additionally, the use of predictive analytics algorithms enables the anticipation of changes in demand, financial risks, market fluctuations, and potential supply chain issues, allowing companies to develop effective response strategies. Moreover, big data helps improve risk management processes, as analysis of historical and current data enables real-time risk assessments. This is particularly important in finance, insurance, logistics, and HR.

The use of big data also improves operational efficiency, as companies can identify bottlenecks in business processes and eliminate inefficiencies. For instance, data analysis allows the optimisation of logistics routes, enhancement of employee productivity, and automation of repetitive tasks. The improvement of marketing strategies is another key area of big data application (Lehenchuk & Zavalii, 2023). Data on consumer behaviour, social media, website analytics, and CRM systems help companies tailor advertising campaigns, personalise offers for each client, and boost marketing effectiveness.

A significant contribution to improved decision-making comes from the development of real-time decision-making systems. The use of streaming data processing technologies, such as Apache Kafka and Apache Flink, enables instant analytical insights, which are critical in fields where decisions have to be made quickly, such as financial markets, transportation, or security. Furthermore, the integration of IoT and big data into management processes provides detailed information about production operations, equipment status, and logistics processes, helping reduce downtime, improve equipment efficiency, and lower repair and maintenance costs.

Finally, big data promotes the development of a corporate culture based on data-driven decision-making rather than intuition. This fosters more transparent and effective management at all levels of the organisation. The implementation of big data becomes a strategic priority for companies striving for digital transformation and enables significant cost reduction, improved business decision-making efficiency, and competitive advantages. Companies capable of overcoming the challenges related to big data implementation can not only improve operational efficiency but also ensure long-term growth in a dynamic business environment. Despite the considerable advantages of big data analytics, its integration into

business processes involves a range of challenges. Companies face high infrastructure and software costs, data privacy issues, a shortage of qualified professionals, and difficulties integrating with existing management systems. Additionally, data quality and structure remain a major concern. Many organisations operate with fragmented information sources, complicating data processing and analysis. Low processing speed of large volumes of data can also negatively affect the effectiveness of managerial decisions. Table 2 presents the main challenges of big data implementation, the causes of their emergence, potential solutions, and real-life examples from practice.

Table 2. Challenges of implementing big data in business processes and ways to overcome the challenges

Challenge	Cause of occurrence	Possible ways to overcome	Practical examples
High implementation cost	The need for powerful equipment, software, and specialists	Use of cloud technologies, server rental, phased implementation	Small and medium businesses often choose AWS, Google Cloud
Lack of qualified personnel	Demand for data analysis professionals exceeds supply	Staff training, engagement of external consultants	Large corporations create internal educational programs
Data privacy issues	Regulatory requirements, threat of information leaks	Use of encryption, compliance with standards General Data Protection Regulation, ISO 27001	Banks are implementing multi-layered data protection
Difficulty in integrating with legacy systems	Traditional IT systems are not adapted to processing big data	Using APIs, gradual modernisation of IT infrastructure	Many companies are implementing hybrid systems
Data quality and structure	Data may be incomplete, unstructured, outdated	Using data cleaning and normalisation algorithms	AI helps improve data quality
Difficulty in interpreting results	Large amounts of data require specialised analytical skills	Using visualisations, BI systems, simplifying interfaces	Popular BI tools: Power BI, Tableau
Data processing speed	The constant growth of information creates delays in analysis	Using stream processing (Spark, Kafka), optimising algorithms	Payment processing companies are using real analytics

Source: developed by the author based on S. Bag *et al*. (2020), A. Bozkurt *et al*. (2023), Z.P. Dvulit & L.V. Maznyk (2024)

For the effective implementation of big data in business, it is necessary not only to invest in technology but also to ensure adequate staff training, the implementation of security standards, and the adaptation of organisational processes. The use of cloud services and automated analytical systems significantly reduces costs and improves data management efficiency. An important direction is also the development of AI and ML, which help enhance data processing quality, interpretation, and managerial decision-making. Companies that successfully integrate big data into the business processes gain a competitive advantage due to the ability to rapidly analyse the market, personalise customer offers, and optimise resources. Thus, despite the existing challenges, the use of big data becomes a necessary tool for companies striving for digital transformation and greater operational efficiency.

During the research, examples of big data application in six key sectors are systematised, with a real-life case provided for each, describing specific technologies, tasks, models, parameters, and achieved results. In the financial sector, JPMorgan Chase uses supervised learning algorithms, particularly logistic regression and decision trees, to detect fraudulent transactions and assess credit scores. Hadoop is used for storing historical transactions, Spark for stream data processing, and Tableau for visualising risky customer segments (How JPMorgan uses Hadoop…, 2024).

In logistics, Uber applies reinforcement learning algorithms combined with the Spark platform for adaptive demand management and dynamic pricing (How Uber uses data science…, 2024; Verma, 2024). Models account for factors such as traffic, weather, demand history, and user behavioural patterns. In the manufacturing sector, General Electric, via the Predix platform, implements analytics of telemetry data for predictive maintenance (Mistry, 2025). Results are displayed through interactive dashboards in Tableau. In HR, IBM introduces analytics based on unsupervised learning (principal component analysis, density-based spatial clustering of applications with noise) to identify key factors of employee turnover (Maloku & Maloku, 2024; Nfise, 2025). In public administration, exemplified by the US government (notably the SEC), big data is used to analyse public comments on regulatory acts using topic modelling and clustering (Eggers *et al.*, 2019).

In retail, Amazon uses TensorFlow, Spark, and Hadoop to analyse user behaviour, build recommendation systems, and forecast demand (Chung, 2016). The main implementation challenges of big data are ethical risks related to the use of personal data without informed consent – especially relevant in HR and finance; resource constraints due to the high cost of infrastructure for data storage, processing, and security, posing a major barrier for mid-sized companies; a lack of qualified data analytics, data science, and ML specialists; data fragmentation across incompatible formats in many industries; and institutional resistance, where management structures are not always ready for process changes.

Among practical recommendations are the formation of interdisciplinary teams combining technical, ethical, and managerial competencies; the introduction of responsible big data usage standards, including algorithmic transparency; the selection of tools aligned with sectoral needs – Spark for stream computing, Hadoop for storage, TensorFlow for model building, and Tableau for visualisation; a modular approach to integrating analytics platforms into company architecture; and gradual solution scaling with a focus on results rather than data volume.

The research presents examples of big data applications in five key areas. In retail, Walmart processes over 2.5 petabytes of data per hour using Hadoop for data storage and analytics. The company applies predictive analytics based on historical sales, weather, and social media data, allowing for stock optimisation and improved customer

service, especially ahead of natural disasters. In transport, Uber analyses more than 100 petabytes of data daily using Spark and reinforcement learning algorithms to predict demand, pricing, and driver distribution. This results in optimised customer wait times and improved service efficiency. In manufacturing, General Electric uses the Predix platform to collect telemetry data from industrial equipment. Clustering and time-series analysis enable predictive maintenance, reducing downtime by 25% and cutting costs. In HR, IBM uses unsupervised learning algorithms to analyse employee turnover, reducing staff losses and accelerating hiring. In public administration, the US government applies topic modelling to analyse public comments, enhancing decision-making quality and civic feedback.

At the same time, a number of challenges are identified. Firstly, privacy concerns – large volumes of personal data can be misused without proper safeguards. Secondly, a shortage of qualified specialists hinders complex analytics system implementation. The third challenge is technical constraints, particularly real-time unstructured data processing, which requires high computing power. Finally, institutional resistance remains a significant barrier, as traditional management structures are often unprepared for the integration of advanced digital approaches.

In response to these challenges, several practical recommendations are formulated. These include the integration of interdisciplinary teams to ensure a comprehensive view in data-related work; the development of clear ethical standards for data collection and use; investments in infrastructure for data storage and processing; increasing employees' digital literacy and implementing training in analytics tools. The presented cases demonstrate the effectiveness of big data in decision-making, productivity improvement, and adaptation to rapid environmental changes, while also highlighting the importance of conscious and ethically responsible technology implementation.

In the financial sector, an example is JPMorgan Chase (Sonica, 2025), which uses big data for detecting fraudulent transactions and analysing credit risk through supervised learning algorithms such as decision trees and logistic regression. In marketing, Amazon effectively uses Hadoop, Spark, and TensorFlow to analyse user behaviour, personalise recommendations, forecast demand, and implement dynamic pricing (Chimi, 2025). In logistics, Uber serves as an example of a company applying big data for real-time driver allocation, reducing customer wait times, and enabling dynamic pricing (Tambuskar, 2025). The system analyses over 100 petabytes of data using Spark and reinforcement learning for adaptive demand management. In manufacturing, General Electric introduces the Predix platform to analyse sensor data from equipment for predictive maintenance (How GE uses AI…, 2024). With ML algorithms, Predix identifies anomalies and predicts potential failures, reducing unplanned downtime and repair costs.

Big data implementation involves several challenges. The first is data privacy, particularly pressing in healthcare, banking, and public governance. Solutions involve restricted access policies, anonymisation and pseudonymisation methods, and adherence to international data protection standards (e.g., GDPR). The second challenge is data quality – missing, noisy, or inconsistent records hinder analysis and model training. The response includes preprocessing, data validation, and filtering algorithms. The third challenge is technical limitations – processing large data volumes requires significant computing resources and specialised tools (Ridzuan & Wan Zainon, 2019). Solutions include Hadoop (distributed storage and processing), Spark (real-time computing), TensorFlow (deep learning modelling), Tableau (interactive visualisation), and Matplotlib (scientific plotting in Python).

With regard to ML algorithms, supervised learning (e.g., support vector machines, decision trees, gradient boosting) is used for demand forecasting, risk assessment, and recommendation systems; unsupervised learning (k-means, DBSCAN, PCA) is used for customer segmentation and anomaly detection; and reinforcement learning (Q-learning, Deep Q-networks) is used for logistics route optimisation, dynamic pricing, and autonomous decision-making in changing environments. Each approach delivers managerial benefits – from cost reduction and improved forecasting accuracy to real-time decision adaptability. Thus, the application of big data demonstrates substantial potential for transforming management processes in finance, marketing, logistics, manufacturing, HR, and the public sector. However, to fully realise this potential, technical solutions need to be complemented by addressing issues of ethics, data quality, scalability, and tool adaptation to sectoral specifics.

DISCUSSION

Big data analytics plays a critically important role in modern management, enabling the processing of large volumes of information for informed decision-making. V. Marinakis *et al*. (2020) studied the use of big data analytics in the context of energy infrastructure, focusing on consumption forecasting and anomaly detection in the operation of technical systems based on data from IoT devices. The authors applied ML algorithms for real-time stream data processing, which significantly improved decision-making efficiency in energy management. One of the main advantages of big data is its ability to rapidly analyse large data sets in real time, allowing companies to respond quickly to market changes, forecast demand, reduce costs, and improve strategic planning. S. Talwar *et al*. (2021) examined the use of big data for operational supply chain management in retail, which led to a 20% reduction in excess inventory and a 25% improvement in demand forecasting. Both approaches demonstrated the advantages of big data in quick decision-making.

Big data analytics contribute to personalisation of decisions, allowing companies such as Amazon, Netflix, and banks to better understand consumer needs and offer products and services tailored to individual preferences, significantly improving customer experience and business efficiency. V.M. Reddy & L.N. Nalla (2024) investigated the impact of big data on customer experience personalisation in e-commerce, particularly recommendation algorithms, which increased purchase conversion by 30%. While both approaches demonstrated the effectiveness of personalised solutions, the authors emphasised consumer interaction.

ML and AI algorithms play a significant role in big data development, enabling automation of analysis and more accurate forecasting. The use of these technologies in finance, manufacturing, healthcare, and other sectors

substantially improves the quality of managerial decisions. For instance, in manufacturing, ML helps identify potential equipment failures, preventing breakdowns and reducing maintenance costs. S.R. Krishna *et al*. (2023) explored ML algorithms in the financial sector, focusing on automating credit scoring and forecasting market risks. The results showed that using big data and AI reduced the share of non-performing loans by 15% and improved client solvency assessment accuracy. The key difference was in the subject area: the authors explored big data analytics in finance for risk reduction.

However, despite significant advantages, the implementation of big data faces several challenges. One of the main issues is the need to process massive volumes of information, which requires powerful computing resources and specialised software. Companies lacking the appropriate infrastructure might struggle with big data implementation, slowing down digital transformation. H.N. Dai *et al*. (2020) studied the challenges of big data implementation in manufacturing logistics, focusing on data integration from heterogeneous sources, insufficient data quality, and difficulty in building efficient real-time analytical models. Unlike the current study, which emphasised strategic planning and forecasting in resource management, the authors highlighted operational barriers arising during the adaptation of analytics to dynamic manufacturing and supply chain conditions. This comparison underlined the importance of a comprehensive approach addressing both strategic and tactical aspects of big data application in industrial environments.

D.K. Nguyen *et al*. (2023) studied how big data and AI algorithms could be used to detect and assess financial risks in the banking sector. It was found that big data analytics allowed banks to significantly reduce the likelihood of credit errors, detect potentially fraudulent operations, and better forecast changes in financial markets. The authors also noted that AI integration enables banks not only to detect anomalies in a timely manner, but also to automatically adapt the risk management strategies in real time. The current study also focused on using big data and AI to improve management decision efficiency, but the authors placed greater emphasis on financial aspects and risks. Additionally, the authors devoted more attention to automation and optimisation based on AI.

Another important issue is data privacy and protection. The use of large volumes of information, especially personal user data, poses risks of confidentiality breaches and requires strict regulatory compliance. This is particularly relevant amid increasing data protection legislation, such as the General Data Protection Regulation in the EU. A.T. Oyewole *et al*. (2024) investigated privacy challenges in the financial sector and found that the main problem was not only GDPR compliance but also the growing risk of data leaks due to targeted cyberattacks, increasingly aimed at banks and financial institutions. The authors analysed cryptographic protection mechanisms and approaches to monitoring anomalous activity to prevent compromise of sensitive financial information. The main difference was that the work focused primarily on protecting client financial data and ensuring regulatory compliance.

Data quality is also a critical issue. Poorly structured or noisy data can distort analysis results, leading to incorrect management decisions. Therefore, developing effective methods of data cleansing, normalisation, and verification is essential before analysis. K.O. Park (2020) investigated the problem of data quality in logistics, where poor or noisy data could lead to incorrect demand forecasting, thereby increasing storage and transportation costs. The author stressed the importance of implementing effective data cleansing and normalisation methods at the collection and processing stage to avoid such issues.

M. Ghasemaghaei & H. Calic (2020) also explored the use of big data to improve management decision-making but focused more on applying these technologies in the financial sector, particularly to improve credit risk assessment and detect financial anomalies. The authors noted that big data analytics made it possible to identify trends invisible to traditional analysis methods, thus improving the accuracy of predictive models. In contrast to the current results, the authors concentrated on the financial sphere, especially the need to dynamically update analytical algorithms to adapt to changing financial instruments. This highlighted the sector-specific nature of big data use and differing approaches to solving analytical tasks.

M.A. Khan *et al*. (2020) analysed the use of ML for demand forecasting in retail through big data analysis. The authors found that using ML for demand prediction enabled more accurate real-time forecasting of product demand, reducing inventory storage costs. Big data use in retail helped develop new models for optimising product placement in warehouses and stores, improving delivery efficiency and reducing logistics costs. However, the authors noted that such models require high data quality, and problems with incomplete or noisy data can seriously affect forecasting accuracy. Comparison with current results showed that both studies focused on using big data for business process forecasting and optimisation in retail. However, the authors' work emphasised offer personalisation for end consumers, whereas the current study placed greater focus on inventory and logistics process optimisation. The research findings indicate that using big data significantly improves decision-making efficiency, optimises resource management, and enables personalised services for consumers. However, implementing this technology is not without challenges, including data volume processing, data privacy assurance, and the need for clean, structured input data.

CONCLUSIONS

In the course of the conducted study, key approaches to the implementation of big data analytics across various management domains – including finance, marketing, logistics, manufacturing, HR, and public administration – were analysed. The findings confirmed that the use of big data in combination with ML algorithms, stream data processing, and distributed computing systems delivered significant effects in each of the examined sectors. In the financial sector (e.g., JPMorgan Chase), the implementation of fraud detection and credit risk assessment systems using supervised learning (gradient boosting) improved forecasting accuracy and reduced financial losses. At the same time, the study highlighted key challenges in the implementation of big data. The most significant of these included: low data quality, which reduced the reliability of analytics; limited

computing resources for processing stream or large data volumes in real time; and confidentiality risks associated with the storage and analysis of personalised information.

Additionally, the research addressed the institutional and organisational conditions under which the implementation of big data technologies demonstrated the highest efficiency. Consideration was given to the level of digital maturity within organisations, employee readiness to work with new tools, and the existence of regulatory frameworks for data protection. The practical significance of the study lay in forming a systemic understanding of the role of big data analytics in transforming managerial decisions, enhancing operational efficiency, and adapting to dynamic environmental conditions. The summarised findings could be used to develop digital transformation strategies at both company and industry levels. Further research should focus on comparative analysis of the effectiveness of big data solutions in specific sectors – particularly in finance, logistics, and public administration – by incorporating up-to-date data, assessing the impact of implemented technologies on key performance indicators, and analysing barriers to the scaling. The main limitation of the study was its reliance on secondary sources and the absence of empirical validation of the models in practice. Future studies are planned to conduct an in-depth analysis of the effectiveness of big data solutions in selected sectors using primary data and quantitative metrics.

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REFERENCES

[1] Ayvaz, S., & Alpay, K. (2021). Predictive maintenance system for production lines in manufacturing: A machine learning approach using IoT data in real-time. *Expert Systems with Applications*, 173, article number 114598. doi: 10.1016/j.eswa.2021.114598.

[2] Badshah, A., Daud, A., Alharbey, R., Banjar, A., Bukhari, A., & Alshemaimri, B. (2024). Big data applications: Overview, challenges and future. *Artificial Intelligence Review*, 57(11), article number 290. doi: 10.1007/s10462-024-10938-5.

[3] Bag, S., Wood, L.C., Xu, L., Dhamija, P., & Kayikci, Y. (2020). Big data analytics as an operational excellence approach to enhance sustainable supply chain performance. *Resources, Conservation and Recycling*, 153, article number 104559. doi: 10.1016/j.resconrec.2019.104559.

[4] Basu, R., Aktar, M.N., & Kumar, S. (2024). The interplay of artificial intelligence, machine learning, and data analytics in digital marketing and promotions: A review and research agenda. *Journal of Marketing Analytics*, 13, 267-287. doi: 10.1057/s41270-024-00355-6.

[5] Batko, K., & Ślęzak, A. (2022). The use of big data analytics in healthcare. *Journal of Big Data*, 9(1), article number 3. doi: 10.1186/s40537-021-00553-4.

[6] Batte, B. (2025). Business process redesign: A case study of General Electric (GE). *SSRN*. doi: 10.2139/ssrn.5126465.

[7] Bilohur, S. (2025). The concept of the big data economy and the digital economy: Challenges and directions of development. *Humanities Studies*, 22(99), 236-247. doi: 10.32782/hst-2025-22-99-26.

[8] Bozkurt, A., Ekici, F., & Yetiskul, H. (2023). Utilizing Flink and Kafka technologies for real-time data processing: A case study. *The Eurasia Proceedings of Science Technology Engineering and Mathematics*, 24, 177-183. doi: 10.55549/epstem.1406274.

[9] Case study: Walmart. (2025). Retrieved from https://www.digitalproductanalytics.com/cases/walmart/.

[10] Chimi, C. (2025). *Amazon e-commerce analytics with PySpark*. Retrieved from https://github.com/ChristianChimi/PySpark-Amazon-Analytics.

[11] Chung, K. (2016). *Generating recommendations at Amazon scale with Apache Spark and Amazon DSSTNE*. Retrieved from https://aws.amazon.com/blogs/big-data/generating-recommendations-at-amazon-scale-with-apache-spark-and-amazon-dsstne.

[12] Dai, H.N., Wang, H., Xu, G., Wan, J., & Imran, M. (2020). Big data analytics for manufacturing internet of things: Opportunities, challenges and enabling technologies. *Enterprise Information Systems*, 14(9-10), 1279-1303. doi: 10.1080/17517575.2019.1633689.

[13] Dicuonzo, G., Galeone, G., Zappimbulso, E., & Dell'Atti, V. (2019). Risk management 4.0: The role of big data analytics in the bank sector. *International Journal of Economics and Financial Issues*, 9(6), 40-47. doi: 10.32479/ijefi.8556.

[14] Dvulit, Z.P., & Maznyk, L.V. (2024). The role of business analytics in the era of big data: New opportunities for managerial decision-making. *Management and Entrepreneurship in Ukraine: Stages of Formation and Problems of Development*, 6(2), 152-165. doi: 10.23939/smeu2024.02.152.

[15] Edmondson, J. (2025). *Big data use case: How Amazon uses big data to drive ecommerce revenue*. Retrieved from https://www.businesstechweekly.com/operational-efficiency/data-management/big-data-use-case.

[16] Eggers, W.D., Mallk, N., & Gracle, M. (2019). *Using AI to unleash the power of unstructured government data*. Retrieved from https://www2.deloitte.com/us/en/insights/focus/cognitive-technologies/natural-language-processing-examples-in-government-data.html.

[17] Ghasemaghaei, M., & Calic, G. (2020). Assessing the impact of big data on firm innovation performance: Big data is not always better data. *Journal of Business Research*, 108, 147-162. doi: 10.1016/j.jbusres.2019.09.062.

[18] Gopal, P.R., Rana, N.P., Krishna, T.V., & Ramkumar, M. (2024). Impact of big data analytics on supply chain performance: An analysis of influencing factors. *Annals of Operations Research*, 333(2), 769-797. doi: 10.1007/s10479-022-04749-6.

[19] Govindan, K., Cheng, T.E., Mishra, N., & Shukla, N. (2018). Big data analytics and application for logistics and supply chain management. *Transportation Research Part E: Logistics and Transportation Review*, 114, 343-349. doi: 10.1016/j.tre.2018.03.011.
[20] Guler, N., Kirshner, S.N., & Vidgen, R. (2024). A literature review of artificial intelligence research in business and management using machine learning and ChatGPT. *Data and Information Management*, 8(3), article number 100076. doi: 10.1016/j.dim.2024.100076.
[21] Hanuschak-Efimenko, L. (2024). Efficiency of innovative business management based on big data: Changing the role of managers. *Herald of Khmelnytskyi National University. Economic Sciences*, 336(6), 335-342. doi: 10.31891/2307-5740-2024-336-54.
[22] How GE uses AI for predictive maintenance to reduce downtime and increase efficiency. (2024). Retrieved from https://profeshh.com/2024/11/12/how-ge-uses-ai-for-predictive-maintenance-to-reduce-downtime-and-increase-efficiency.
[23] How JPMorgan uses Hadoop to leverage big data analytics? (2024). Retrieved from https://www.projectpro.io/article/how-jpmorgan-uses-hadoop-to-leverage-big-data-analytics/142.
[24] How Uber uses data science to reinvent transportation? (2024). Retrieved from https://www.projectpro.io/article/how-uber-uses-data-science-to-reinvent-transportation/290.
[25] Iqbal, R., Doctor, F., More, B., Mahmud, S., & Yousuf, U. (2020). Big data analytics: Computational intelligence techniques and application areas. *Technological Forecasting and Social Change*, 153, article number 119253. doi: 10.1016/j.techfore.2018.03.024.
[26] Kemal, E. (2023). *Uber's data-driven transformation: Solving challenges, achieving success, and inspiring innovation*. Retrieved from https://is.gd/yTo3c0.
[27] Khan, M.A., Saqib, S., Alyas, T., Rehman, A.U., Saeed, Y., Zeb, A., Zareei, M., & Mohamed, E.M. (2020). Effective demand forecasting model using business intelligence empowered with machine learning. *IEEE Access*, 8, 116013-116023. doi: 10.1109/ACCESS.2020.3003790.
[28] Koshchii, O. (2023). Activities of domestic organizations in the conditions of digitalization. *Economic Forum*, 13(4), 94-101. doi: 10.36910/6775-2308-8559-2023-4-12.
[29] Kovalchuk, V., Ruda, D.Ya., & Yaremchuk, D.Ya. (2018). Modern approaches to strategic personnel management in ensuring the competitiveness of the organization. *Economic Discourse*, 3, 135-140.
[30] Krishna, S.R., Rathor, K., Ranga, J., Soni, A., & Kumar, A. (2023). Artificial intelligence integrated with big data analytics for enhanced marketing. In *Proceedings of the international conference on inventive computation technologies* (pp. 1073-1077). Lalitpur: IEEE. doi: 10.1109/ICICT57646.2023.10134043.
[31] Lehenchuk, S., & Zavalii, T. (2023). Big data in marketing analytics: Opportunities and problems of use. *Problems of Theory and Methodology of Accounting, Control and Analysis*, 54(1), 52-58. doi: 10.26642/pbo-2023-1(54)-52-58.
[32] Liu, C., Peng, G., Kong, Y., Li, S., & Chen, S. (2021). Data quality affecting big data analytics in smart factories: Research themes, issues and methods. *Symmetry*, 13(8), article number 1440. doi: 10.3390/sym13081440.
[33] Maheshwari, S., Gautam, P., & Jaggi, C.K. (2021). Role of big data analytics in supply chain management: Current trends and future perspectives. *International Journal of Production Research*, 59(6), 1875-1900. doi: 10.1080/00207543.2020.1793011.
[34] Maloku, F., & Maloku, B. (2024). Analyzing IBM HR data: Employee attrition and performance insights. *Journal of Engineering and Applied Sciences Technology*, 6(8). doi: 10.47363/JEAST/2024(6)268.
[35] Marinakis, V., Doukas, H., Tsapelas, J., Mouzakitis, S., Sicilia, Á., Madrazo, L., & Sgouridis, S. (2020). From big data to smart energy services: An application for intelligent energy management. *Future Generation Computer Systems*, 110, 572-586. doi: 10.1016/j.future.2018.04.062.
[36] Mistry, M. (2025). *An in-depth predictive analytics guide to boost business growth with smarter, data-driven decisions*. Retrieved from https://kodytechnolab.com/blog/predictive-analytics-guide/.
[37] Nfise, M. (2025). *IBM HR analytics: Employee turnover analysis*. Retrieved from https://www.kaggle.com/code/miraclenifise/ibm-hr-analytics-employee-turnover-analysis.
[38] Nguyen, D.K., Sermpinis, G., & Stasinakis, C. (2023). Big data, artificial intelligence and machine learning: A transformative symbiosis in favour of financial technology. *European Financial Management*, 29(2), 517-548. doi: 10.1111/eufm.12365.
[39] Oyewole, A.T., Oguejiofor, B.B., Eneh, N.E., Akpuokwe, C.U., & Bakare, S.S. (2024). Data privacy laws and their impact on financial technology companies: A review. *Computer Science & IT Research Journal*, 5(3), 628-650. doi: 10.51594/csitrj.v5i3.911.
[40] Park, K.O. (2020). A study on sustainable usage intention of blockchain in the big data era: Logistics and supply chain management companies. *Sustainability*, 12(24), article number 10670. doi: 10.3390/su122410670.
[41] Raut, R.D., Mangla, S.K., Narwane, V.S., Gardas, B.B., Priyadarshinee, P., & Narkhede, B.E. (2019). Linking big data analytics and operational sustainability practices for sustainable business management. *Journal of Cleaner Production*, 224, 10-24. doi: 10.1016/j.jclepro.2019.03.181.
[42] Reddy, V.M., & Nalla, L.N. (2024). Personalization in e-commerce marketing: Leveraging big data for tailored consumer engagement. *Revista de Inteligencia Artificial en Medicina*, 15(1), 691-725.
[43] Ridzuan, F., & Wan Zainon, W.M. (2019). A review on data cleansing methods for big data. *Procedia Computer Science*, 161, 731-738. doi: 10.1016/j.procs.2019.11.177.

[44] Sen, P.C., Hajra, M., & Ghosh, M. (2020). Supervised classification algorithms in machine learning: A survey and review. In J. Kumar Mandal & D. Bhattacharya (Eds.), *Emerging technology in modelling and graphics: Proceedings of IEM graph 2018* (pp. 99-111). Singapore: Springer. doi: 10.1007/978-981-13-7403-6_11.
[45] Seyedan, M., & Mafakheri, F. (2020). Predictive big data analytics for supply chain demand forecasting: Methods, applications, and research opportunities. *Journal of Big Data*, 7(1), article number 53. doi: 10.1186/s40537-020-00329-2.
[46] Shetty, S.H., Shetty, S., Singh, C., & Rao, A. (2022). Supervised machine learning: Algorithms and applications. In P. Singh (Ed.), *Fundamentals and methods of machine and deep learning: Algorithms, tools and applications* (pp. 1-16). London: Scrivener Publishing LLC. doi: 10.1002/9781119821908.ch1.
[47] Sonica, B. (2025). *Case study: JP Morgan's AI risk assessment & fraud detection tools*. Retrieved from https://gamereviews.co.in/case-study-jp-morgans-ai-risk-assessment-fraud-detection-tools.
[48] Talwar, S., Kaur, P., Fosso Wamba, S., & Dhir, A. (2021). Big data in operations and supply chain management: A systematic literature review and future research agenda. *International Journal of Production Research*, 59(11), 3509-3534. doi: 10.1080/00207543.2020.1868599.
[49] Tambuskar, C. (2025). *Inside Uber's dynamic pricing system: A comprehensive case study*. Retrieved from https://www.linkedin.com/pulse/inside-ubers-dynamic-pricing-system-comprehensive-case-tambuskar-xtxef.
[50] Verma, A. (2024). *Use of data analytics by Uber to enhance supply efficiency and service quality*. Retrieved from https://www.pickl.ai/blog/use-of-data-analytics-by-uber-to-enhance-supply-efficiency-and-service-quality/.
[51] Yu, W., Dillon, T., Mostafa, F., Rahayu, W., & Liu, Y. (2019). A global manufacturing big data ecosystem for fault detection in predictive maintenance. *IEEE Transactions on Industrial Informatics*, 16(1), 183-192. doi: 10.1109/TII.2019.2915846.
[52] Zhang, Y., Xu, S., Zhang, L., & Yang, M. (2021). Big data and human resource management research: An integrative review and new directions for future research. *Journal of Business Research*, 133, 34-50. doi: 10.1016/j.jbusres.2021.04.019.

Вплив аналітики великих даних на ефективність управлінських рішень

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Анотація. Метою дослідження було оцінити вплив аналітики великих даних на якість управлінських рішень шляхом аналізу ключових технологій, методів обробки та інтерпретації даних у сучасному бізнес-середовищі. Методологія дослідження включала аналіз та порівняння існуючих підходів до використання аналітики великих даних у різних галузях, а також застосування методів кейс-стаді та моделювання для оцінки впливу Big Data на ефективність управлінських рішень в умовах нестабільного ресурсозабезпечення. Також у дослідженні було проаналізовано прикладне використання Big Data у фінансах, маркетингу, логістиці, виробництві, управлінні персоналом та державному управлінні з опорою на реальні кейси таких компаній, як Amazon, Uber, Walmart, General Electric та Netflix. Описано типи алгоритмів машинного навчання (класифікація, кластеризація, регресія, глибоке навчання), приклади їх застосування (сегментація клієнтів, прогноз попиту, виявлення аномалій) і їхній вплив на ефективність управлінських рішень. Зазначено ключові технології – Hadoop, Spark і Tableau, які забезпечують обробку, аналіз і візуалізацію великих даних. Акцент зроблено на перевагах Big Data – підвищення точності прогнозування, персоналізація, автоматизація, адаптація до ринку – та викликах впровадження, зокрема потребі в обчислювальних ресурсах, кваліфікованих кадрах і захисті даних, що є критичними для досягнення управлінської ефективності. Отримані результати дозволять підприємствам оптимізувати операційні процеси, підвищити ефективність використання ресурсів, а також адаптувати стратегічні рішення під специфічні умови ринку та технологічні виклики. Крім того, дослідження дає змогу вдосконалити інтеграцію аналітики великих даних з іншими цифровими технологіями, такими як BIM та IoT, що сприяє більш точному прогнозуванню та оптимізації бізнес-процесів. Практичне значення дослідження полягає у визначенні способів ефективного застосування аналітики великих даних для покращення управлінських рішень у різних галузях

Ключові слова: обробка інформації; прогнозування; алгоритмічні підходи; оптимізація процесів; штучний інтелект

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Management of organisations guided by the principles of social corporate responsibility, taking into account international experience

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Abstract. The relevance of the study is determined by the need to study the socio-economic effects of implementing corporate social responsibility strategies in the transformational conditions of a market economy. The aim of the study was to conduct an empirical assessment of the impact of socially responsible strategies on the financial performance of companies in a sectoral and institutional context. The methodological basis was the analysis of secondary statistical data from international organisations and companies, as well as the use of a comparative approach to assess financial indicators in dynamics. The study found that the share of expenditures on the implementation of socially responsible strategies in the structure of operating expenses in industry averaged 2.1%, in the financial sector and information technology – 1.2%, and in agriculture – 0.9%. Companies with a high level of corporate social responsibility implementation demonstrated an average return on assets of 7.4%, return on equity of 13.1%, net profitability of 9.8%, and capitalisation growth rate of 5.3%, which exceeded the similar indicators of companies with a low level of social responsibility. A comparative analysis of the levels of institutional support for corporate social responsibility strategies in the Netherlands, Switzerland, Turkey and Ukraine revealed that the effective implementation of socially responsible approaches directly depends on the level of regulatory support, government incentives and the development of civil control mechanisms. Case studies of Unilever, Nestlé, Arçelik, the Private Joint-Stock Company Myronivskyi Hliboproduct and the logistics company Nova Poshta identified effective organisational models for managing corporate social responsibility areas

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based on strategic planning, performance monitoring and active stakeholder engagement. It was found that the structural integration of socially responsible practices into corporate governance was accompanied by an increase in the efficiency of management processes, an increase in investment attractiveness and a strengthening of reputational capital. The practical significance of the study lies in the possibility of using its results in the formation of state policy on sustainable development, the development of corporate strategies for responsible management, and the implementation of international standards of non-financial reporting in corporate practice in Ukraine

Keywords: enterprise; development strategies; generally accepted standards; ethical principles; foreign enterprises

INTRODUCTION

The dynamics of global economic development and the shift in the focus of investment activity towards sustainable development have created a need for in-depth analysis of the role of corporate social responsibility (CSR) in ensuring the economic efficiency of companies. In modern conditions, the integration of social responsibility into corporate strategies is seen not only as an ethical obligation, but also as a factor in increasing competitiveness, optimising operating costs and expanding access to financial resources. The research problem was determined by the need to systematise the mechanisms of influence of CSR practices on the financial results of enterprises and to identify the institutional prerequisites for improving the effectiveness of implementing sustainable development principles in corporate governance. The lack of uniform approaches to the quantitative measurement of the effectiveness of CSR initiatives, the gap between declared and actual responsibility indicators, and the limited state support for responsible business in a number of countries left open questions about the practical improvement of corporate strategies in the direction of sustainable development.

The study by O.P. Koval (2024) highlighted the transformation of CSR practices in the context of military crisis and reconstruction. It was found that CSR initiatives contributed to maintaining social stability at the micro and meso levels, reducing tension among internal and external stakeholders. However, the relationship between the implemented responsibility strategies and the financial performance of enterprises remained on the periphery of the author's attention. In turn, H.M. Zavadskykh *et al*. (2023) focused on the regulatory and organisational prerequisites for the formation of CSR practices in Ukraine. The researchers identified the main mechanisms for companies to adapt to new regulatory conditions, particularly in the area of non-financial reporting, but did not provide a quantitative assessment of the impact of CSR on the financial stability of economic entities. A similar focus was demonstrated in the work of E.P. Bury & G.P. Zhaldak (2023), which thoroughly revealed the humanitarian and social initiatives of businesses in crisis conditions, but did not track the impact of these initiatives on the long-term performance of companies.

The specifics of implementing socially responsible strategies in countries with transitional economies were the subject of a study by L.O. Cezarino *et al*. (2022). The analysis revealed that the key constraints to sustainable development are institutional weakness, a lack of financial resources, and limited consumer interest in socially responsible business behaviour. These factors reduce the effectiveness of comprehensive sustainable development initiatives, especially in the context of weak regulatory support and insufficient public control. I. Kitsyuk (2022) emphasised the importance of internal sustainability mechanisms for companies, proving that the implementation of environmental, social, and governance (ESG) approaches contributes to the stabilisation of corporate governance in crisis conditions. It has been established that such practices reduce the level of internal turbulence, increase organisational stability and form a positive corporate image. However, the question of the quantitative measurement of the impact of these practices on the long-term financial performance of enterprises remains open, which limits the possibilities of scaling such strategies to the level of state policy.

The aspect of interaction with stakeholders is discussed in the work of M.N. Khuong *et al*. (2021), which proves that effective communication with stakeholders significantly increases the level of trust in the company and forms stable consumer loyalty. Such interaction creates the conditions for building reputation capital and strengthening partnerships, but the mechanisms for transforming this influence into economic performance need further development. Similar emphases can be found in the work of J. Siltaloppi *et al*. (2021), which found that harmonising socially responsible goals with internal company values minimises organisational conflicts, improves management decision-making processes and contributes to the overall effectiveness of strategic planning.

A study by M. Adib *et al*. (2021) found that the development of management control systems, in particular internal monitoring and formalisation of procedures, contributes to the effectiveness of social initiatives. The authors emphasised the importance of clear structural support for such processes, which ensures their sustainability and manageability. However, external factors were not taken into account, in particular the regulatory environment and public pressure, which can significantly change the trajectory of responsible practices. The important role of ethical leadership as a determinant of internal social mobilisation is emphasised in the work of Z. Azhar *et al*. (2025). It was found that the presence of value-oriented management approaches directly correlates with the level of implementation of social initiatives, staff activity in corporate programmes and the strengthening of the moral cohesion of the organisation. At the same time, factors of external legitimisation of such approaches, in particular regulatory support mechanisms and public participation in the formation of responsibility standards, remained outside the focus of the study.

An analysis of the above sources showed that one of the main gaps was the insufficient development of issues related to the empirical assessment of the financial performance of CSR strategies. The problem of structural integration of social responsibility into the internal business processes of companies was also insufficiently covered.

The impact of institutional and regional contexts on the effectiveness of implementing sustainable development principles has been studied to a limited extent. The identified limitations justified the need for further comprehensive research aimed at integrating theoretical approaches and practical tools for assessing the effectiveness of CSR initiatives. The aim of the study was to conduct a quantitative and qualitative assessment of the impact of CSR strategies on the economic efficiency of companies in various sectors of the economy in the context of the development of global standards for non-financial reporting and strengthening institutional regulation.

MATERIALS AND METHODS

The study was defined as applied empirical research focused on identifying practical dependencies between the level of CSR strategy implementation and the economic performance indicators of enterprises. The analysis covered the period from 2020 to 2024, which made it possible to track the dynamics of changes in the context of tightening regulatory requirements for non-financial reporting, the growing importance of global initiatives in the field of sustainable development, and the adaptation of corporate governance systems to the integration of ESG components.

The data collection process was based on the use of secondary sources of information, represented by open arrays of statistical, regulatory and corporate data. The information base was based on official resources of international organisations, in particular the statistical platforms of the European Commission (n.d.) EUROSTAT (n.d.) database and World Bank Open Data (n.d.), as well as analytical materials from LobbyFacts (n.d.). Data from the open access portal Sustainalytics (n.d.) was used to characterise non-financial risks and company ratings. In order to analyse approaches to non-financial reporting and assess compliance with sustainable development standards, materials from the official websites of organisations such as the Global Reporting Initiative (n.d.), the Sustainability Accounting Standards Board (n.d.) and the International Integrated Reporting Council (2021) were taken into account. In addition, the provisions of the Task Force on Climate-related Financial Disclosures (n.d.) and the International Organization for Standardization (n.d.), which outline requirements for transparency, climate risks and integrated management, were analysed. The institutional context of the study was supplemented by information published on the websites of the European Commission (n.d.), the Organisation for Economic Co-operation and Development (n.d.) and Transparency International (n.d.). The assessment of companies' non-financial performance was carried out using Corporate Sustainability Assessment data available on the S&P Global (n.d.) platform.

As part of the study, a primary information base was formed, which included both generalised financial indicators (in particular, return on assets (ROA), return on equity (ROE), net profitability indicators and capitalisation growth rates) and non-financial characteristics of companies' activities – CO_2 emission reduction volumes, the extent of social programme coverage of local communities, quantitative parameters of implemented social initiatives, and compliance with international standards in the field of sustainable development. The data obtained served as the basis for a comprehensive quantitative and qualitative assessment of the degree of implementation of CSR approaches in the industry, as well as their impact on the financial performance of enterprises.

To ensure the generalisation of results and integration of information, methods of systematic and comparative analysis were used, which made it possible to structurally characterise the key elements of CSR strategy implementation in corporate governance systems. In particular, the organisational models for implementing social responsibility, mechanisms for interacting with stakeholder groups, approaches to non-financial reporting, and the types of socio-economic effects achieved as a result of the implementation of relevant initiatives in various sectors of the economy were analysed. A separate area of systematic analysis was the case study of five companies: Unilever (The Netherlands), Nestlé (Switzerland), Arçelik (Turkey), Private Joint Stock Company Myronivskyi Hliboproduct (MHP) (Ukraine) and logistics company Nova Poshta (Ukraine). The choice of these companies was determined by the need to cover both transnational corporations with developed models of CSR policy implementation and national companies that adapt sustainable development standards in a specific regulatory environment, which ensured the representativeness of sectoral and institutional differentiation in the implementation of socially responsible strategies. For each of them, the structure of social responsibility management, the content of non-financial reporting, the level of stakeholder engagement, and typical mechanisms for implementing social and environmental projects were examined. For the purpose of empirical content of the case analysis, open non-financial reports published on the official resources of Unilever (n.d.), Nestlé (2024) and Arçelik (2024) were used. The reporting materials of the Private Joint-Stock Company MHP (n.d.) and the logistics company Nova Poshta (n.d.) were analysed separately. Additional verification of the information was provided by data from the Corporate Knights (n.d.) rating, which contains summarised indicators of the environmental and social performance of the world's largest companies.

Based on international experience, a comparative analysis method was used to identify regional differences in the level of institutional support for the implementation of social responsibility strategies. The study covered countries with different approaches to the formation of a regulatory framework, the promotion of sustainable initiatives and the development of public control mechanisms. The analysis included a comparison of the mandatory nature of non-financial reporting, the availability of tax incentives, co-financing instruments, social audit practices and methods of assessing corporate performance in the field of social responsibility. Taking into account examples from the Netherlands, Switzerland, Turkey, and Ukraine made it possible to substantiate regional differences in the integration of sustainable development principles into strategic corporate management.

The empirical analysis method enabled the processing of numerical indicators for a quantitative assessment of the impact of the level of CSR implementation on the main financial results of companies. Based on the grouping of companies by the level of integration of socially responsible practices, a comparison of the average values of

ROA, ROE, net profitability and market capitalisation was carried out. A comprehensive approach combining quantitative and qualitative parameters was used to interpret the results, taking into account the characteristics of the corporate structure, the role of stakeholders and the depth of ESG principle implementation. This approach provided a comprehensive assessment of the impact of CSR on socio-economic indicators and served as a basis for formulating recommendations for improving the regulatory and management environment in accordance with the specifics of national conditions.

RESULTS

Comparative characteristics of the implementation of social corporate responsibility strategies in economic sectors

During 2020-2024, there was a gradual strengthening of the role of CSR principles in the strategic management systems of companies operating in various sectors of the economy. The response to the growth of regulatory requirements, increased stakeholder expectations and the growing importance of non-financial indicators was the gradual inclusion of social responsibility components in the corporate strategies of companies such as Unilever (n.d.), Nestlé (2024) and Arçelik (2024). Among Ukrainian companies, social responsibility components were gradually incorporated into MHP (n.d.) and Nova Poshta (n.d.). Responsibility was integrated at the level of general management policy, as well as in production, operational and communication practices. The most active implementation of relevant strategies was observed in structures involved in global value chains, controlled by international audit systems, or those with access to external financial markets.

An industry analysis revealed significant variability in approaches to implementing CSR strategies. In industrial companies, initiatives aimed at modernising environmental safety systems, reducing man-made pollution and improving occupational safety prevailed. In the financial sector, the focus was on ensuring transparency in management decisions, preventing conflicts of interest, introducing ethical lending standards, and expanding access to financial services for vulnerable groups. In the field of information technology, CSR strategies covered ensuring digital equality, protecting user privacy, transparency of algorithmic management, and the development of energy-efficient infrastructure. In agriculture, programmes were implemented for responsible land use, soil and biodiversity protection, and support for communities involved in production processes.

Funding for CSR initiatives was determined by sector-specific characteristics, financial capabilities, and the institutional maturity of companies. The proportion of expenditure depended on the nature of core business activities, the cost of implementing environmental and social standards, and the presence of non-financial reporting systems. In capital-intensive sectors with a higher environmental impact, such as manufacturing, the share of expenditure on CSR approaches significantly exceeded that in sectors dominated by intangible assets, like information technology. To quantify the involvement of businesses across different sectors in adopting CSR practices, a comparative analysis was conducted on the average share of relevant costs within the structure of operating expenses for the period 2020-2024. The summarised findings, illustrating inter-sectoral differences in financing socially responsible practices, are presented in Figure 1.

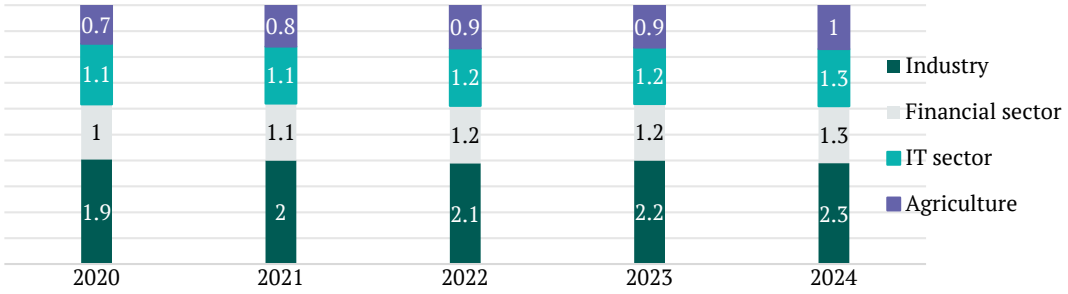

Figure 1. Average share of expenses (%) for implementing CSR strategies in the overall structure of companies' operating expenses in 2020-2024

Source: compiled by the authors based on Global Reporting Initiative (n.d.), Organisation for Economic Co-operation and Development (n.d.), S&P Global (n.d.)

Figure 1 shows the dynamics of the average share of CSR strategy implementation costs in the structure of companies' operating costs for the period 2020-2024 in four industries. The industrial sector maintained its leading position in terms of funding, increasing its share from 1.9% in 2020 to 2.3% in 2024, which indicates the priority of environmental modernisation and social protection in capital-intensive industries. In the financial and IT sectors, spending grew synchronously: both industries showed an increase of up to 1.3% over the period under review. At the same time, the lowest values were characteristic of agriculture, where the share of expenditure increased only from 0.7% to 1%, reflecting the limited financial capacity of agricultural enterprises to implement systematic CSR approaches. The data presented shows the gradual integration of social responsibility into management strategies, taking into account industry specifics and the level of institutional burden.

The forms of non-financial reporting used by Unilever (n.d.), Nestlé (2024) and Arçelik (2024) demonstrated industry-specific characteristics due to the nature of operations, transparency requirements and the level of institutionalisation of CSR approaches. In the industrial sector, reporting models based on the standards of the Global Reporting

Initiative (n.d.) and the Sustainability Accounting Standards Board (n.d.) were used, covering parameters of environmental impact, resource consumption intensity and compliance with occupational health and safety standards. Financial institutions predominantly used an integrated reporting model based on the approach of the International Integrated Reporting Council (2021), which combined financial and non-financial indicators in a single report. Information technology companies used adaptive models based on data protection policies, digital ethics, and the responsible use of artificial intelligence technologies. In agriculture, simplified non-financial reporting practices prevailed, focusing on local social initiatives and environmental responsibility. The trend towards the unification of non-financial reporting formats contributed to the adaptation of companies in various sectors of the economy to international standards for assessing ESG aspects. The harmonisation of approaches ensured greater comparability, transparency and verifiability of non-financial information. Table 1 summarises the main standards and tools of non-financial reporting used by the companies analysed in the industry context within the framework of CSR strategies.

Table 1. Key standards and tools for non-financial reporting used by companies in different sectors of the economy

Sector of the economy	Reporting standards and initiatives
Industry	Global Reporting Initiative Standards, Sustainability Accounting Standards Board, Task Force on Climate-related Financial Disclosures, energy efficiency certification (International Organization for Standardization (ISO) 50001, Energy Star)
Financial sector	Task Force on Climate-related Financial Disclosures, EU Non-Financial Reporting Directive, International Integrated Reporting Council, climate and social risk analytics
IT sector	Global Reporting Initiative, AI Ethics policies, CO_2 reporting, Green IT initiatives, voluntary ESG disclosure
Agriculture	Rainforest Alliance, Fair Trade, ISO 14001, biodiversity impact reporting

Source: compiled by the authors based on Global Reporting Initiative (n.d.), Sustainability Accounting Standards Board (n.d.), International Integrated Reporting Council (2021), Task Force on Climate-related Financial Disclosures (n.d.), International Organization for Standardization (n.d.), European Commission (n.d.)

An analysis of the data in Table 1 showed that the non-financial reporting standards applied by companies in different sectors of the economy had a clear industry focus. In industry, there was widespread adoption of combined approaches that combined universal reporting standards, such as the Global Reporting Initiative (n.d.) standards and the Sustainability Accounting Standards Board (n.d.), with mandatory regulatory requirements, such as the Task Force on Climate-related Financial Disclosures (n.d.), as well as energy efficiency certification systems. The application of these approaches reflected the need for comprehensive consideration of the environmental impact of production activities and enhanced risk management. In the financial sector, non-financial reporting was developed in accordance with an integrated approach based on the International Integrated Reporting Council (2021) model. The main focus was on assessing and managing climate and social risks, ensuring compliance with transparency policies, supervisory control requirements and international practices for disclosing non-financial information. In the field of information technology, voluntary initiatives prevailed, focused on disclosing issues of digital ethics, assessing environmental impact through CO_2 emissions, and implementing energy-saving technologies within the concept of green IT.

In the agricultural sector, non-financial reporting was based on internationally recognised sustainable development standards, including recommendations from the Global Reporting Initiative (n.d.), the Sustainability Accounting Standards Board (n.d.) and the International Organization for Standardization (n.d.) guidelines on sustainable development goals. The content of the reporting reflected the specifics of the production activities of agricultural enterprises, including measures to protect land resources, support biodiversity and social interaction with local communities. The differentiation of approaches to the preparation of non-financial reporting depending on the sectoral affiliation of companies confirmed a high degree of variability in the implementation of CSR strategies. The identified differences highlighted the need for further harmonisation of the criteria for assessing the effectiveness of CSR strategies, taking into account industry specifics and international standards of sustainable development.

Quantitative analysis of the relationship between the implementation of CSR strategies and the economic efficiency of companies

Increased regulatory pressure regarding mandatory disclosure of non-financial information, the development of global initiatives to include ESG criteria in investment strategies, as well as increased attention from rating agencies to non-financial characteristics of businesses have led to a review of established approaches to assessing the economic performance of companies. In such conditions, the implementation of social responsibility strategies began to be interpreted not only as a tool for reputational positioning, but also as a factor capable of shaping long-term financial stability. This, in turn, has increased the need for quantitative analysis of the relationship between the level of integration of CSR practices and the dynamics of key financial indicators, such as profitability, return on investment and market capitalisation of companies.

In this context, the results of the analysis include a comparison of the financial indicators of the companies studied with different levels of CSR strategy integration in the period 2020-2024. The summarised values showed differences in parameters such as ROA, ROE, net profitability and market capitalisation growth rates. As a result of the analysis, the average values of key financial indicators were presented depending on the level of integration of CSR approaches (Fig. 2).

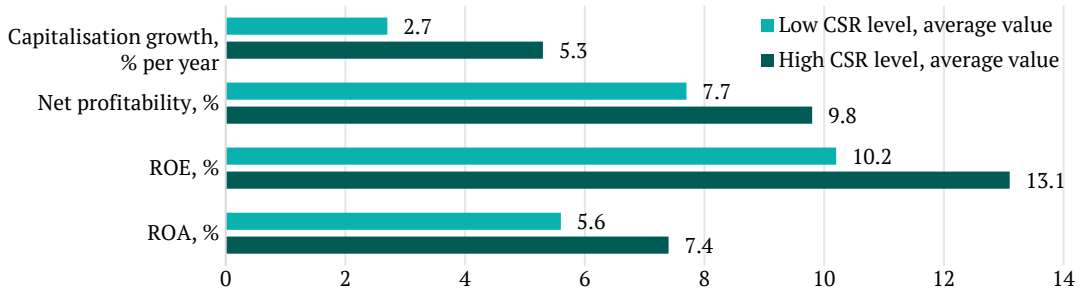

Figure 2. Comparative analysis of financial indicators of companies with high and low levels of CSR strategy implementation for 2020-2024

Note: ROA – ratio of net profit to average asset value; ROE – ratio of net profit to equity; net profitability – share of net profit in revenue; capitalisation growth rate – average annual increase in the market value of the company

Source: compiled by the authors based on Sustainalytics (n.d.), Global Reporting Initiative (n.d.), S&P Global (n.d.), Unilever (n.d.), MHP (n.d.), Nova Poshta (n.d.), Corporate Knights (n.d.), Nestlé (2024), Arçelik (2024)

The analysis of the data showed that companies with a high level of integration of CSR approaches (Unilever, Nestlé, Arçelik) demonstrated higher values of all financial indicators studied compared to companies where social responsibility was not systematically integrated into corporate strategy (MHP, Nova Poshta). The results of the analysis showed that ROA and ROE in companies with a high level of integration of CSR strategies exceeded the corresponding indicators of the control group by 1.8 and 2.9% points, respectively. This indicated a more efficient use of both the general resource base and internal capital in the process of implementing socially responsible approaches. In addition, a positive trend in the growth of net profitability was observed, which strengthened the argument in favour of implementing ESG-oriented management practices.

The market capitalisation growth indicator proved to be particularly significant: for companies with a systematic CSR policy, its value was almost twice as high as that of companies that only partially implemented sustainable development principles. This dynamic demonstrated the strengthening of the market position of socially oriented companies, as well as an increase in the level of trust on the part of investors and financial institutions. Taken together, the differences identified confirmed the economic validity of CSR as a strategic factor capable of ensuring the growth of efficiency and sustainability of corporate models in transformational conditions. Further stages of the analysis involved refining the channels of influence of individual components of social responsibility on the financial performance of companies, taking into account industry and regional characteristics.

Analysis of corporate management models in companies with a high level of CSR strategy implementation

In order to systematise the results obtained, the key characteristics of organisational models for managing CSR areas were summarised using the examples of Unilever (n.d.), Nestlé (2024) and Arçelik (2024). Special attention was also paid to Ukrainian companies – MHP (n.d.) and Nova Poshta (n.d.), which demonstrated steady dynamics in the development of responsible practices in the national context. Particular emphasis is placed on the analysis of internal structures responsible for coordinating CSR strategies, forms of interaction with stakeholder groups, approaches used to evaluate the effectiveness of implemented programmes, and methods for measuring their social and economic impact.

Table 2 presents a comparative description of the selected companies according to the criteria of the organisational structure of CSR management systems, mechanisms for engaging stakeholders, assessment approaches to implemented initiatives, and recorded socio-economic results. The analytical base that was built made it possible to identify the determining factors for the effective implementation of socially responsible strategies, form a comprehensive understanding of the specifics of sustainable development management in the corporate sector, and lay the foundation for further analysis of the economic effectiveness of relevant practices.

Table 2. Organisational approaches to CSR strategy management in the companies analysed

Company	Organisational management structure	Stakeholder engagement	Assessment of effectiveness	Socio-economic impact
Unilever (The Netherlands)	Sustainable Business and Communications Division, integration into corporate strategy	Regular consultations with communities, investors, non-governmental organisations	Key performance indicators for sustainable development goals	Increased stakeholder trust, improved reputation
Nestlé (Switzerland)	Creating Shared Value, Sustainable Development Committee under the Board of Directors	Consultations with local communities, consumers, partners	Social impact, economic added value	Development of local communities, improved quality of life
Arçelik (Turkey)	Sustainable Development Programme, specialised committees	Public discussions, partnership initiatives	Internal environmental and social indicators (Global Reporting Initiative)	Reduced carbon footprint, employee engagement

Table 2, Continued

Company	Organisational management structure	Stakeholder engagement	Assessment of effectiveness	Socio-economic impact
MHP (Ukraine)	Sustainable Development Department, coordination through corporate divisions	Consultations with communities, participation in development programmes	Non-financial reporting (Global Reporting Initiative), national ratings	Support for rural communities, human capital development
Nova Poshta (Ukraine)	Sustainable Development Division, integration into internal business processes	Discussions with communities, cooperation with non-governmental organisations	Assessment of environmental modernisation, corporate surveys	Environmental modernisation, support for inclusivity

Source: compiled by the authors based on Sustainalytics (n.d.), Global Reporting Initiative (n.d.), S&P Global (n.d.), Unilever (n.d.), Nestlé (2024), Arçelik (2024), MHP (n.d.), Nova Poshta (n.d.)

An analysis of the materials summarised in Table 2 showed that the companies analysed viewed CSR initiative management as an element of strategic management. The formation of separate departments or committees for sustainable development ensured specialisation in the implementation of responsibility and created conditions for continuous monitoring of the programmes implemented in accordance with the defined goals. A defining feature of organisational models was the direct subordination of bodies responsible for CSR to senior management or the supervisory board, which strengthened the position of responsibility in the corporate hierarchy.

The case analysis also took into account data from relevant studies. In particular, the study of Nestlé's CSR approaches was based on the findings of H.A. Hassiba & T. Atika (2025), which showed that the strategic integration of social responsibility principles through planning, institutional support and interaction with key stakeholders contributed to the long-term effectiveness of the initiatives implemented. In the case of Unilever, the conclusions of C. Narikiyo *et al*. (2025) reflected a transition from fragmented environmental measures to a comprehensive decarbonisation strategy that included digital control tools, institutionalisation of environmental goals and active participation of external stakeholders. This approach proved effective both in achieving sustainable environmental results and in ensuring financial stability.

With regard to the Ukrainian companies MHP and Nova Poshta, the approaches outlined in the work of V.O. Bondar (2025) were taken into account, where CSR strategies in wartime were seen as a tool for supporting social stability, maintaining economic activity and trust in business during a crisis. All the companies studied demonstrated activity in the field of stakeholder management, using consultation mechanisms, public discussions and cross-sector partnerships. Stakeholder opinions were taken into account at the stages of programme development, implementation and evaluation, which made it possible to adapt CSR approaches to current socio-economic challenges.

Based on international experience, the effectiveness of CSR strategy implementation was assessed using a combination of quantitative and qualitative indicators, in particular in accordance with the Global Reporting Initiative (n.d.) standard and integrated social and economic impact indices. The results indicated a positive impact of CSR initiatives on local infrastructure development, employment, environmental responsibility and service inclusiveness. Improvements in global sustainability rankings, in particular Corporate Knights (n.d.), further confirmed the link between the systematic implementation of socially responsible strategies and increased investment attractiveness, as well as the formation of sustainable reputational capital. The identified features of organisational management models and approaches to performance evaluation became the basis for further analysis of the relationships between the level of CSR practice implementation and the financial and economic indicators of companies (Table 3). The generalised conclusions proved the expediency of developing a unified system of criteria for evaluating the effectiveness of CSR strategies, taking into account the components of sustainable development – environmental, social and economic.

Table 3. Key indicators for evaluating the effectiveness of CSR strategy implementation in companies with high CSR compliance levels

Evaluation category	Typical indicators
Environmental indicators	Reduction in CO_2 emissions; improvement in energy efficiency; ISO 14001 certification
Social indicators	Level of local community involvement; number of social projects implemented; employment indicators
Economic indicators	Growth in revenue from socially oriented products; resource efficiency
Integrated indices	Ranking in Sustainalytics, Corporate Knights, ESG compliance indicators
Monitoring procedures	Regularity of non-financial reporting (Global Reporting Initiative, Task Force on Climate-related Financial Disclosures); data verification by independent auditors

Source: compiled by the authors based on Sustainalytics (n.d.), Global Reporting Initiative (n.d.), S&P Global (n.d.), Unilever (n.d.), Nestlé (2024), Arçelik (2024), MHP (n.d.), Nova Poshta (n.d.)

A summary of the results presented in Table 3 showed that companies with a high level of compliance with CSR management principles used a comprehensive system for evaluating the effectiveness of implemented strategies. This approach involved the integration of environmental, social and economic indicators and aggregate indices reflecting qualitative and quantitative changes in the relevant areas of sustainable development. The availability of clearly measurable environmental indicators, in particular data on CO_2 emission reductions, energy efficiency improvements and the implementation of eco-innovations, made it possible to objectively quantify the environmental impact of CSR initiatives.

Social criteria made it possible to record changes in employment levels, expanded access to social services, and the degree of involvement of local communities in the implementation of corporate programmes. The comprehensive assessment was supported by the use of integrated indices, including positions in international sustainable development rankings, such as Sustainalytics (n.d.) and Corporate Knights (n.d.), which made it possible to conduct a comparative analysis of performance between companies and industries. The availability of external monitoring tools, independent audit verification of non-financial reporting, and its regular updating increased the level of transparency and reliability of reporting data. This, in turn, contributed to strengthening the reputational capital of economic entities, increasing trust on the part of investors and stakeholders, and improving competitive positions in global commodity and financial markets.

Institutional and regional factors determining the effectiveness of CSR strategies: A comparative analysis of the Netherlands, Switzerland, Turkey and Ukraine

Institutional support for the implementation of CSR strategies was determined by the level of complexity of the regulatory environment, the degree of state participation in promoting responsible business and the effectiveness of civil control mechanisms. A systematic comparison of practices in the Netherlands, Switzerland, Turkey and Ukraine revealed key differences in the integration of social responsibility principles into regulatory policy and corporate strategies for sustainable development management. To systematise the results of the comparative analysis, the main characteristics of institutional support for the implementation of CSR strategies in these countries were summarised. Table 4 presents the key elements of regulatory support, instruments of state stimulation of socially responsible practices, as well as features of civil control over the implementation of sustainable development principles in the corporate sector.

Table 4. Comparative characteristics of institutional support for the implementation of CSR strategies in the countries analysed

Country	Regulatory framework for non-financial reporting	Government support	Level of civic control
The Netherlands	Mandatory disclosure under the EU Non-Financial Reporting Directive and Global Reporting Initiative	Tax incentives; government sustainable development programmes	High; active public involvement
Switzerland	Mandatory disclosure for large corporations; voluntary integration of sustainable development goals	Tax incentives for sustainable projects	High; developed social audit mechanisms
Turkey	Voluntary implementation of Global Reporting Initiative standards; adaptation to the European Green Deal	Co-financing of environmental initiatives	Medium; development of oversight mechanisms at the formation stage
Ukraine	Voluntary disclosure under the Global Reporting Initiative by individual companies	Limited incentives; individual support initiatives	Low; institutionalisation of public control

Source: compiled by the authors based on EUROSTAT (n.d.), LobbyFacts (n.d.), Sustainalytics (n.d.), World Bank Open Data (n.d.), Transparency International (n.d.)

An analysis of the data systematised in Table 4 revealed that the Netherlands and Switzerland have a high level of institutional support for the implementation of CSR strategies. These countries have introduced mandatory requirements for the disclosure of non-financial information, which contributes to greater transparency in corporate activities and creates conditions for regular monitoring of the social and environmental impact of business. State support is mainly provided in the form of tax incentives for companies that invest in sustainable development projects, introduce innovative technologies or raise social standards. In Turkey, the institutionalisation of CSR is taking place gradually, with the voluntary application of international standards for non-financial reporting predominating. The main focus is on mechanisms for state co-financing of environmental and social projects, particularly in the infrastructure sector. At the same time, elements of civic control are only just emerging, which reduces the overall effectiveness of CSR integration and requires further regulatory improvement.

The Ukrainian context is characterised by the initiative of individual companies that voluntarily implement non-financial disclosure practices in accordance with Global Reporting Initiative standards and partially integrate elements of social and environmental responsibility into their internal management processes. At the same time, the institutional environment remains underdeveloped: there are no mandatory regulatory requirements for reporting, government incentives are limited, and public control instruments are poorly institutionalised. A comparative analysis has shown that Ukraine lags significantly behind the practices implemented in the Netherlands, Switzerland and Turkey, which highlights the need to develop a comprehensive regulatory framework to support responsible business and increase the transparency of the corporate sector.

Positive examples of institutional support for CSR strategies in European countries and Turkey have made it possible to identify key elements that determine the effectiveness of integrating social responsibility into corporate

practice. Taking into account the results of the comparative analysis, it became necessary to define recommendations for improving the institutional environment in Ukraine in order to stimulate the sustainable development of the corporate sector. To ensure a logical transition to the formation of practical conclusions, the main directions for improving institutional support for the implementation of CSR strategies in Ukraine were summarised. Table 5 presents the recommended measures developed taking into account international experience and the specifics of the national economy.

Table 5. Recommended areas for improving institutional support for the implementation of CSR strategies in Ukraine

Area for improvement	Recommendation
Regulatory control	Introduction of mandatory disclosure of non-financial information in accordance with Global Reporting Initiative and CSRD standards
Government incentives	Introduction of tax incentives for companies implementing sustainable development projects
Institutional monitoring	Creation of an independent body to monitor CSR reporting and assess social impact
Public oversight	Development of mechanisms for public participation in verifying the implementation of CSR initiatives
Support for voluntary initiatives	Encouraging certification according to international standards (ISO 14001, SA8000, Fair Trade)
Education and awareness programmes	Introducing educational projects on sustainable development goals for businesses and the public

Source: compiled by the authors based on a comparative analysis of practices in the Netherlands, Switzerland and Turkey

The proposed areas for improvement of the institutional environment are focused on integrating internationally recognised standards in the field of non-financial reporting and activating state support for socially responsible business. The introduction of mandatory disclosure of non-financial information in accordance with CSR (LobbyFacts, n.d.) and Global Reporting Initiative (n.d.) standards will contribute to greater transparency in corporate activities, improved comparability of reporting data, and the development of business accountability to stakeholder groups. The introduction of a system of fiscal incentives can stimulate investment in sustainable development projects, environmental modernisation and inclusive initiatives, bringing national practices closer to European Union models. An important element in strengthening the institutional framework for the implementation of CSR strategies is the creation of independent external monitoring structures and the development of tools for public control over the implementation of socially oriented programmes. The spread of voluntary certification according to international sustainable development standards, as well as the development of educational initiatives aimed at promoting environmental, social and managerial responsibility among businesses, play an additional role. Such measures will contribute to the formation of a responsible corporate culture and lay the foundation for long-term economic growth.

The results of the analysis of the dynamics of CSR implementation in the sectoral context in 2020-2024 confirmed the existence of significant variability in the models of implementation of socially responsible practices. Industrial sector enterprises demonstrated a relatively higher intensity of funding for environmental and social programmes. At the same time, financial institutions, information technology companies and agricultural producers implemented CSR strategies taking into account the specifics of their respective operating environments. The standardisation of non-financial reporting forms in accordance with international standards has increased the transparency of companies' activities and created the institutional prerequisites for systematic monitoring of the impact of business on the social environment and ecosystems. Empirical results showed a positive correlation between the degree of integration of CSR strategies and the financial and economic performance of companies. Entities with a high level of compliance with CSR principles demonstrated higher ROA, ROE, net profit and market capitalisation growth rates. The identified dependencies confirmed the advisability of considering CSR not only as an instrument of social influence, but also as a factor in strengthening financial stability, increasing investment attractiveness and ensuring the long-term competitiveness of enterprises.

Based on international experience, a comparative analysis of the institutional framework for implementing CSR approaches in the Netherlands, Switzerland, Turkey and Ukraine showed that the key elements of effectiveness are the existence of a regulatory framework, systems of state incentives and institutionalised forms of civil control. The experience of the countries analysed confirms the effectiveness of mandatory non-financial reporting and comprehensive state support policies. At the same time, Ukraine still faces the task of regulatory unification, expanding tools to support responsible business and introducing mechanisms to ensure transparency and accountability in the corporate sector in accordance with international sustainable development standards.

DISCUSSION

Empirical data analysis confirmed that integrating CSR strategies into corporate governance systems has a positive impact on key financial and economic indicators of companies operating in various sectors of the economy in 2020-2024. The growth of ROA and ROE in companies with a high level of CSR initiatives demonstrates the feasibility of implementing sustainable development principles in management decisions. From a regional perspective, it has been established that countries with a developed institutional infrastructure for supporting socially responsible business ensure a higher level of systemic integration of CSR approaches, which, in turn, has a positive impact on the financial stability of the corporate sector. The results confirm the need to improve the mechanisms for regulating non-financial reporting, as well as to develop unified tools for assessing the effectiveness of CSR strategies, taking into account long-term social and economic effects.

In the field of information technology, voluntary approaches to disclosure of non-financial aspects prevailed,

particularly in the areas of digital ethics, environmental impact assessment through CO_2 emissions, and the implementation of energy-efficient technologies within the concept of green IT. These features were consistent with the findings of a study by J. Xu *et al*. (2025), according to which the development of IT infrastructure and knowledge management systems increased the ability of companies to integrate sustainable development principles into their strategies. It was proven that a high level of technological adaptability contributed to better management of the environmental footprint, transparency of algorithmic processes and increased stakeholder confidence, which in turn had a positive impact on market capitalisation. The significance of researching the relationship between the level of CSR policy implementation and the financial performance of companies was confirmed in a comparative case study by A. Athanasopoulou *et al*. (2025). The authors argued that the ability of companies to minimise the gap between their stated social responsibility goals and actual practices fostered a high level of investor confidence and contributed to the sustainability of business models. Empirical observations also confirmed the effectiveness of systematic integration of CSR into corporate governance as a means of reducing the risk of decoupling and ensuring objectivity in the evaluation of both financial and non-financial performance.

The study confirmed that the integration of CSR principles had a positive impact on both the financial and economic results and the environmental performance of companies. The relevance of these findings was confirmed in a study by Y. Hussain *et al*. (2022), which analysed the impact of CSR on the environmental performance of industrial companies in Pakistan through the development of green innovations, environmental strategies and transformational leadership. The data obtained by the authors showed that the implementation of CSR initiatives indirectly improved environmental performance by strengthening internal organisational competencies, which was consistent with the conclusions of the study regarding the need for a comprehensive approach to CSR implementation in corporate governance. The results of the study showed that the integration of CSR strategies into corporate governance contributed to strengthening the sustainability of business models by enhancing the environmental and social components of companies' strategic development. Similar conclusions were consistent with the results of the study by J.G. Vargas-Hernández *et al*. (2023), which emphasised the importance of developing investment, trade and institutional strategies within the concept of a green economy. A comparison of the results confirmed that taking institutional factors into account was a key condition for the development of comprehensive measures to support sustainable development at various levels of corporate governance.

Further analysis showed that the implementation of CSR strategies ensured the formation of business models focused on long-term social and environmental efficiency. In this context, the study by M.G. Edwards (2021) remained relevant, in which the problem of the economic growth paradox was considered through the prism of the transition from traditional expansion strategies to models of socio-environmental prosperity. The concepts of multi-dexterity, resilience thinking and inclusive balance proposed by the author were consistent with the conclusions regarding the need for changes in the strategic orientations of corporate governance. The assessment of the impact of CSR strategies on the financial and economic performance of companies was consistent with the conceptual changes identified in the study by C. Wickert (2021). The author highlighted the evolution of CSR research from a business-oriented approach to a socially-oriented one, accompanied by greater consideration of social and environmental aspects in corporate activities. A comparison of the results showed that enhancing the effectiveness of CSR strategies requires moving beyond solely evaluating financial efficiency and considering the comprehensive socio-economic and environmental impact.

The analysis confirmed that digital transformation was one of the factors contributing to the effectiveness of CSR strategies. This was consistent with the findings of V.V. Muthuswamy & B. Sudhakar (2023), which established a positive statistical relationship between the level of digitalisation and the quality of environmental management in the non-financial sector of Saudi Arabia. The data obtained was consistent with the trend identified in the study towards strengthening the role of information and technology capabilities in improving the effectiveness of implementing sustainable development principles. The results of the analysis of the integration of CSR corporate strategies into business processes also corresponded to the conclusions of T.C. Matieș (2023), which examined the impact of digitalisation and non-financial reporting on stakeholder engagement. It was found that the combination of active use of digital technologies with regular disclosure of non-financial information contributed to an increase in the level of stakeholder trust and strengthened the competitive position of companies. A comparison of the results obtained confirmed the importance of a comprehensive approach to the digitalisation of corporate governance processes in the implementation of socially responsible strategies.

The study, which analysed the relationship between the implementation of CSR strategies and the non-financial performance of companies, took into account the findings of C. Dai & J. Fang (2024). The authors found that the digital transformation of manufacturing enterprises had a positive impact on innovation activity, environmental, social and managerial responsibility, working capital management efficiency, organisational stability and market competitiveness. A comparison of the data obtained confirmed that the growth of companies' digital maturity contributed to improving the quality of non-financial reporting and increasing overall economic stability in the process of implementing CSR strategies. The results of the analysis of the importance of non-financial reporting for the effective implementation of CSR strategies were consistent with the conclusions of L. Sobczak (2023). The study found that the shift in corporate priorities from maximising shareholder value to taking into account the interests of a wide range of stakeholders was accompanied by active disclosure of non-financial information. A comparison of the results showed that the growth in the volume of non-financial reporting increased the transparency of companies' activities, strengthened their accountability and trust on the part of stakeholders.

The analysis also confirmed the importance of institutional and digital support for non-financial information disclosure processes, which was consistent with the conclusions of L.E. Barna *et al*. (2021). The authors pointed to the important role of ERP systems in increasing the transparency of management processes, the efficiency of information flow processing, and the quality of corporate reporting. A comparison of the results showed that the digitalisation of non-financial reporting processes contributed to strengthening stakeholder confidence and ensured the sustainability of implemented CSR strategies. The results of the study of the relationship between the implementation of CSR initiatives and the financial and economic performance of companies were consistent with the conclusions of R. Coelho *et al*. (2023), who conducted a systematic review of the literature on this topic. It was found that an increase in ESG ratings correlated positively with the financial performance of companies, confirming the findings of the study on the growth of ROA and capital in companies that actively implemented social responsibility principles. The analysis of the research results also corresponded with the conclusions of A. Okafor *et al*. (2021), which investigated the impact of CSR initiative costs on the financial performance of US technology companies. It was found that an increase in funding for socially responsible programmes was accompanied by an increase in the revenues and profitability of enterprises, which was consistent with the data obtained in the study on the increase in ROA and ROE in companies with a high level of integration of CSR strategies.

The results of the study on the impact of CSR strategies on the long-term financial performance of companies were consistent with the findings of G. Zhou *et al*. (2021), who analysed the role of CSR in shaping the financial performance of Chinese banks under the moderating influence of green lending. It was found that CSR initiatives caused a temporary decline in financial performance in the short term, but in the long term contributed to its improvement, provided that green financing mechanisms were integrated. Similar results in Ukraine were obtained by V. Nahornii *et al*. (2024). A comparison of the results confirmed that the systematic implementation of CSR strategies was associated with increased sustainability and profitability of companies, which justified the need to take into account medium- and long-term effects in strategic financial planning.

The study of the relationship between the implementation of CSR strategies and the financial and economic performance of companies was consistent with the conclusions of G. Barauskaite & D. Streimikiene (2021), who systematised the main approaches to assessing the impact of CSR on the financial performance of enterprises. The results of the generalisation showed that the vast majority of scientific studies confirmed the positive or neutral nature of this relationship, although in isolated cases negative or alternative dependencies were recorded. A comparison of the results confirmed that assessing the effectiveness of socially responsible strategies requires a comprehensive approach that includes both direct and indirect effects. The results obtained were also consistent with the conclusions of S. Bag & A. Omrane (2022), who conducted an empirical analysis of the relationship between the implementation of CSR strategies and the financial performance of Indian companies. A statistically significant, albeit moderately positive, impact of CSR activities on corporate financial performance was found. A comparison of the results showed a similar trend within the study, where the integration of CSR strategies was accompanied by an increase in ROA and ROE, which justified the need for the strategic implementation of socially responsible practices to achieve long-term financial benefits.

A summary of the analysis showed that the integration of CSR strategies led to an improvement in the financial and economic performance of companies in various sectors of the economy during 2020-2024. The positive impact was reflected in an increase in ROA, ROE, net profitability and market capitalisation. A comparison of the findings with current scientific research confirmed a strong correlation between the level of CSR strategy implementation, institutional support for sustainable development, the digital maturity of companies and their economic stability, which justified the need for further harmonisation of non-financial reporting and improvement of methodological approaches to the evaluation of the effectiveness of socially responsible business.

CONCLUSIONS

The study showed that industrial enterprises demonstrated the highest intensity of CSR initiative funding: on average, 2.1% of total operating expenses were allocated to them. In the financial and IT sectors, this indicator remained stable at 1.2%, while agricultural companies spent only 0.9%, indicating a lower level of resource mobilisation for the implementation of socially responsible approaches. Companies with a high level of CSR implementation (Unilever, Nestlé, Arçelik) demonstrated an average ROA of 7.4%, ROE of 13.1%, net profitability of 9.8%, and capitalisation growth rate of 5.3%, which significantly exceeded the similar indicators of companies with a low level of social responsibility (MHP, Nova Poshta). The results obtained confirm the existence of a positive relationship between the intensity of CSR strategy implementation and the financial and economic dynamics of companies within the analysed period.

The case study revealed that companies with a high level of systematic CSR implementation (Unilever, Nestlé, Arçelik) were characterised not only by higher financial indicators, but also by a higher level of institutional maturity in managing the relevant areas. This was manifested in the existence of specialised structures for coordinating CSR strategies, the development of separate reporting documents, regular updates of internal policies, and the implementation of procedures for monitoring the implementation of socially responsible initiatives. The application of a comprehensive approach to CSR ensured greater consistency between management decisions and sustainable development goals and contributed to increased transparency and accountability of companies.

A comparative analysis of institutional factors showed that in the Netherlands and Switzerland, the implementation of CSR strategies was based on mandatory non-financial reporting, tax incentives and a high level of civic control, which created a stable regulatory environment. In Turkey, development took place in the form of voluntary adaptation to international requirements, while in Ukraine, regulatory fragmentation, limited state support and insufficient

institutional support for CSR persisted. Further research should focus on expanding the empirical analysis of the impact of individual components of ESG strategies on the financial performance of companies in different regional and sectoral contexts, as well as on studying the relationship between the level of institutional development of the state and the effectiveness of implementing sustainable development principles in the corporate sector.

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REFERENCES
[1] Adib, M., Zhang, X., Zaid, M., & Sahyouni, A. (2021). Management control system for corporate social responsibility implementation – a stakeholder perspective. *Corporate Governance: The International Journal of Business in Society*, 21(3), 410-432. doi: 10.1108/CG-06-2020-0247.
[2] Arçelik. (2024). *Sustainability reports 2024*. Retrieved from https://www.arcelikglobal.com/media/bovh23pl/arcelik_2024-eng.pdf.
[3] Athanasopoulou, A., Marti, E., Risi, D., & Schlindwein, E. (2025). How companies restrain means-ends decoupling: A comparative case study of CSR implementation. *Journal of Management Studies*, 62(1), 214-245. doi: 10.1111/joms.13043.
[4] Azhar, Z., Iqbal, T., & Imran, M. (2025). The role of ethical leadership in HRM-driven corporate social responsibility (CSR). *Journal of Management & Social Science*, 2(1), 158-176. doi: 10.63075/ze47qb74.
[5] Bag, S., & Omrane, A. (2022). Corporate social responsibility and its overall effects on financial performance: Empirical evidence from Indian companies. *Journal of African Business*, 23(1), 264-280. doi: 10.1080/15228916.2020.1826884.
[6] Barauskaite, G., & Streimikiene, D. (2021). Corporate social responsibility and financial performance of companies: The puzzle of concepts, definitions and assessment methods. *Corporate Social Responsibility and Environmental Management*, 28(1), 278-287. doi: 10.1002/csr.2048.
[7] Barna, L.E., Ionescu, B.Ș., & Ionescu-Feleagă, L. (2021). The relationship between the implementation of ERP systems and the financial and non-financial reporting of organizations. *Sustainability*, 13(21), article number 11566. doi: 10.3390/su132111566.
[8] Bondar, V.O. (2025). Social responsibility of Ukrainian companies in the conditions of war. In *Proceedings of the XI international scientific and practical conference "Socio-political, economic and humanitarian dimensions of Ukraine's European integration"* (pp. 104-112). Vinnytsia: Vinnytsia Trade and Economic Institute.
[9] Bury, E.P., & Zhaldak, G.P. (2023). Corporate social responsibility in times of war. In *Collection of theses international scientific-practical conference "Business, innovation, management: Problems and perspectives"* (pp. 23-24). Kyiv: National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute".
[10] Cezarino, L.O., Liboni, L.B., Hunter, T., Pacheco, L.M., & Martins, F.P. (2022). Corporate social responsibility in emerging markets: Opportunities and challenges for sustainability integration. *Journal of Cleaner Production*, 362, article number 132224. doi: 10.1016/j.jclepro.2022.132224.
[11] Coelho, R., Jayantilal, S., & Ferreira, J.J. (2023). The impact of social responsibility on corporate financial performance: A systematic literature review. *Corporate Social Responsibility and Environmental Management*, 30(4), 1535-1560. doi: 10.1002/csr.2446.
[12] Corporate Knights. (n.d.). *Global 100 rankings*. Retrieved from https://www.corporateknights.com/rankings/global-100-rankings/.
[13] Dai, C., & Fang, J. (2024). Digital transformation and non-financial performance in manufacturing. *Sustainability*, 16(12), article number 5099. doi: 10.3390/su16125099.
[14] Edwards, M.G. (2021). The growth paradox, sustainable development, and business strategy. *Business Strategy and the Environment*, 30(7), 3079-3094. doi: 10.1002/bse.2790.
[15] European Commission. (n.d.). *Corporate sustainability reporting*. Retrieved from https://ec.europa.eu/info/business-economy-euro/company-reporting-and-auditing/company-reporting/non-financial-reporting_en.
[16] EUROSTAT. (n.d.). Retrieved from https://ec.europa.eu/eurostat.
[17] Global Reporting Initiative. (n.d.). *GRI standards and sustainability reporting framework*. Retrieved from https://www.globalreporting.org/standards/.
[18] Hassiba, H.A., & Atika, T. (2025). Analysis of Nestlé's corporate social responsibility. *Journal of Innovation and Marketing*, 12(1), 68-85.
[19] Hussain, Y., Abbass, K., Usman, M., Rehan, M., & Asif, M. (2022). Exploring the mediating role of environmental strategy, green innovations, and transformational leadership: The impact of corporate social responsibility on environmental performance. *Environmental Science and Pollution Research*, 29(51), 76864-76880. doi: 10.1007/s11356-022-20922-7.
[20] International Integrated Reporting Council. (2021). *International <IR> framework*. Retrieved from https://integratedreporting.ifrs.org/wp-content/uploads/2024/08/IntegratedReporting_Framework_061024.pdf.
[21] International Organization for Standardization. (n.d.). *Sustainable development goals*. Retrieved from https://www.iso.org/sdgs.html.

[22] Khuong, M.N., Truong An, N.K., & Thanh Hang, T.T. (2021). Stakeholders and corporate social responsibility (CSR) programme as key sustainable development strategies to promote corporate reputation – evidence from Vietnam. *Cogent Business & Management*, 8(1), article number 1917333. doi: 10.1080/23311975.2021.1917333.
[23] Kitsyuk, I. (2022). Corporate social responsibility and ESG in the context of war. In *Proceedings of the II international scientific and practical conference "Problems of rational use of socio-economic, ecological, energy, regulatory and legal potential of Ukraine and its regions"* (pp. 132-133). Lutsk: Volynpoligraf.
[24] Koval, O.P. (2024). *Corporate social responsibility during war and post-war reconstruction*. Retrieved from https://niss.gov.ua/sites/default/files/2024-05/az_ksv-oglyad_10052024.pdf.
[25] LobbyFacts. (n.d.). *CSR Europe, the business network for corporate social responsibility.* Retrieved from https://www.lobbyfacts.eu/datacard/csr-europe-the-business-network-for-corporate-social-responsibility?rid=56502415122-32#:~:text=CSR%20Europe%20is%20the%20leading,local%2C%20European%20and%20global%20level.
[26] Matieş, T.C. (2023). Non-financial reporting and digitalization, key factors in stakeholder engagement. *Revista de Studii Financiare*, 8, 46-66.
[27] MHP. (n.d.). *Annual reports*. Retrieved from https://mhpgromadi.org.ua/fund/annual-reports/.
[28] Muthuswamy, V.V., & Sudhakar, B. (2023). Role of industrial digital transformation in improving environmental governance: A study on the non-financial sector of Saudi Arabia. *Cuadernos de Economía*, 46(130), 207-216. doi: 10.32826/cude.v1i130.1020.
[29] Nahornii, V., Ruban, O., & Tymoshenko, M. (2024). Mechanism for adapting the social orientation of agrarian business under martial law. *Economics and Business Management*, 15(4), 103-117. doi: 10.31548/economics/4.2024.103.
[30] Narikiyo, C., Harris, E., & Elmassri, M. (2025). Strategies for carbon reduction maturity: A longitudinal case study of unilever PLC. *Business Strategy and the Environment*, 34, 5419-5434. doi: 10.1002/bse.4258.
[31] Nestlé. (2024). *Creating shared value at Nestlé*. Retrieved from https://www.nestle.com/sites/default/files/2025-02/creating-shared-value-nestle-2024.pdf.
[32] Nova Poshta. (n.d.). *To investors*. Retrieved from https://novaposhta.ua/partners/id/11730.
[33] Okafor, A., Adeleye, B.N., & Adusei, M. (2021). Corporate social responsibility and financial performance: Evidence from US tech firms. *Journal of Cleaner Production*, 292, article number 126078. doi: 10.1016/j.jclepro.2021.126078.
[34] Organisation for Economic Co-operation and Development. (n.d.). *Investment*. Retrieved from https://www.oecd.org/investment/responsible-business-conduct/.
[35] S&P Global. (n.d.). *Corporate sustainability assessment*. Retrieved from https://www.spglobal.com/esg/csa/.
[36] Siltaloppi, J., Rajala, R., & Hietala, H. (2021). Integrating CSR with business strategy: A tension management perspective. *Journal of Business Ethics*, 174, 507-527. doi: 10.1007/s10551-020-04569-3.
[37] Sobczak, L. (2023). The growing role of non-financial reporting in the age of digital finance. In L. Gąsiorkiewicz & J. Monkiewicz (Eds.), *The digital revolution in banking, insurance and capital markets* (pp. 252-269). London: Routledge. doi: 10.4324/9781003310082.
[38] Sustainability Accounting Standards Board. (n.d.). *SASB standards overview*. Retrieved from https://www.sasb.org/standards/.
[39] Sustainalytics. (n.d.). *ESG risk ratings and rankings*. Retrieved from https://www.sustainalytics.com/esg-ratings.
[40] Task Force on Climate-related Financial Disclosures. (n.d.). *TCFD recommendations*. Retrieved from https://www.fsb-tcfd.org/recommendations/.
[41] Transparency International. (n.d.). *Corruption perceptions index*. Retrieved from https://www.transparency.org/en/cpi/2024.
[42] Unilever. (n.d.). *Sustainability report*. Retrieved from https://www.unilever.co.id/en/investors/annual-financial-and-sustainability-report/sustainability-reports/.
[43] Vargas-Hernández, J.G., Rodriguez-Maillard, C., & Vargas-Gonzàlez, O.C. (2023). Strategic transformational transition of green economy, green growth, and sustainable development: An institutional approach. In B. Marco-Lajara, J. Martínez-Falcó & L.A. Millán-Tudela (Eds.), *Corporate sustainability as a tool for improving economic, social, and environmental performance* (pp. 197-221). London: IGI Global. doi: 10.4018/978-1-6684-7422-8.ch011.
[44] Wickert, C. (2021). Corporate social responsibility research in the Journal of Management Studies: A shift from a business-centric to a society-centric focus. *Journal of Management Studies*, 58(8), 1-17. doi: 10.1111/joms.12775.
[45] World Bank Open Data. (n.d.). Retrieved from https://data.worldbank.org/.
[46] Xu, J., Leung, A.C., Yue, W.T., & Su, Q. (2025). Corporate social responsibility and firm value: Exploring the moderating effects of information technology-enabled knowledge capabilities. *Internet Research*, 35(2), 546-566. doi: 10.1108/INTR-03-2023-0202.
[47] Zavadskykh, H.M., Lysak, O.I., & Tebenko, V.M. (2023). Corporate social distance: Formation and implementation in Ukraine. *Scientific Papers of Dmytro Motornyi Tavria State Agrotechnological University (Economic Sciences)*, 2(48), 129-139. doi: 10.31388/2519-884X-2023-48-129-139.
[48] Zhou, G., Sun, Y., Luo, S., & Liao, J. (2021). Corporate social responsibility and bank financial performance in China: The moderating role of green credit. *Energy Economics*, 97, article number 105190. doi: 10.1016/j.eneco.2021.105190.

Менеджмент організацій, що керуються принципами соціальної корпоративної відповідальності з врахуванням міжнародного досвіду

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Анотація. Актуальність дослідження зумовлена необхідністю вивчення соціально-економічних ефектів реалізації стратегій корпоративної соціальної відповідальності в трансформаційних умовах ринкової економіки. Метою дослідження було здійснити емпіричну оцінку впливу соціально відповідальних стратегій на фінансову результативність компаній у секторальному та інституційному розрізі. Методологічну основу становили аналіз вторинних статистичних даних міжнародних організацій та компаній, а також використання порівняльного підходу для оцінювання фінансових показників у динаміці. У результаті дослідження встановлено, що частка витрат на реалізацію соціально відповідальних стратегій у структурі операційних витрат у промисловості становила в середньому 2,1 %, у фінансовому секторі та сфері інформаційних технологій – 1,2 %, а у сільському господарстві – 0,9 %. Компанії з високим рівнем реалізації корпоративної соціальної відповідальності продемонстрували середнє значення рентабельності активів 7,4 %, рентабельності власного капіталу – 13,1 %, чистої прибутковості – 9,8 %, темпу зростання капіталізації – 5,3 %, що перевищило аналогічні показники компаній із низьким рівнем соціальної відповідальності. Порівняльний аналіз між рівнями інституційної підтримки стратегій корпоративної соціальної відповідальності в Нідерландах, Швейцарії, Туреччині та Україні виявив, що ефективна реалізація соціально відповідальних підходів безпосередньо залежить від рівня нормативного забезпечення, державних стимулів і розвиненості механізмів громадянського контролю. Кейс-аналіз компаній Unilever, Nestlé, Arçelik, Приватного акціонерного товариства «Миронівський хлібпродукт» та логістичної компанії «Нова пошта» дозволив ідентифікувати ефективні організаційні моделі управління напрямами корпоративної соціальної відповідальності, що базуються на стратегічному плануванні, моніторингу результативності та активному залученні зацікавлених сторін. Встановлено, що структурна інтеграція соціально відповідальних практик у корпоративне управління супроводжувалася зростанням ефективності управлінських процесів, підвищенням інвестиційної привабливості та зміцненням репутаційного капіталу. Практичне значення дослідження полягає у можливості використання його результатів при формуванні державної політики сталого розвитку, розробці корпоративних стратегій відповідального управління та впровадженні міжнародних стандартів нефінансової звітності у корпоративну практику в Україні

Ключові слова: підприємство; стратегії розвитку; загальноприйняті стандарти; етичні засади; закордонні підприємства

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Planning of business processes of the enterprise within the framework of sustainable development

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Abstract. Modern challenges require businesses to rethink their business models by integrating sustainability principles into management processes. The goal of the study was to identify methods and tools that will help companies plan their activities in accordance with the principles of sustainable development, as well as provide practical tools for their implementation. Considering the complexity and multifaceted nature of the subject matter, a comprehensive approach was applied, which included the following methods: analysis of literary sources – a review of scientific publications and corporate strategies was conducted to identify key trends in business process planning in accordance with the principles of sustainable development. A comparative analysis was used to examine and compare the main methods and approaches to business process planning. A case study method was applied to analyse the practical implementation of sustainable development principles using the examples of Unilever, Tesla, and IKEA. Their business strategies, environmental initiatives, and social responsibility were examined to identify effective approaches to integrating sustainable development into business process planning. The method of environmental assessment was used to consider the application of environmental auditing, product life cycle assessment, implementation of environmental management systems ISO 14001:2015/Amd 1:2024 and circular economy principles. The method of systematisation was utilised for the compilation of key aspects that together formed the basis of the concept of corporate social responsibility; methods for the effective combination of economic, environmental and social sustainability were summarised and the main approaches to business process planning were streamlined. An analytical method was applied to examine the impact of sustainable development on business process planning. The examples of approaches and strategies used in the publication contribute to the formation of long-term strategic management, consolidation of environmental focuses and values, and increase of business competitiveness in modern conditions

Keywords: innovations; economic, environmental and social sustainability; strategies; corporate social responsibility; digital technologies

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INTRODUCTION

In the face of global environmental and social challenges, businesses are facing the need to restructure their business models to reflect the principles of sustainable development. Increasing demands on the part of government authorities, consumers and investors are driving companies to look for new ways of running business that combine economic efficiency with a responsible attitude towards society and the environment. This actually means avoiding the traditional approach to planning in favour of a unified management process that takes into account the inherent economic, social and environmental factors. This requires a comprehensive analysis of all business processes and strategies, with consideration of the long-term consequences of decisions. As a result, companies are required both to comply with changing conditions and to anticipate potential challenges, that is, to create sustainable competitive advantages.

Scholars studied business process planning in the context of sustainable development, the researches were

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focused on strategies for integrating economic, environmental and social aspects into the enterprises' activities, emphasising the importance of a systematic approach to management to achieve long-term efficiency and competitiveness. Planning plays a leading role in the economic aspect of the concept of sustainable development of an enterprise since it ensures rational management of resources, risk reduction, integration of environmental and social components into business strategies and stimulation of innovation, which in turn contributes to the achievement of stability and success in the long term. The adaptability of strategic planning to dynamic changes in the external environment, in particular, in the context of global challenges related to climate threats, market volatility and increasing demands imposed by stakeholders is also important. Along with this, the impact of digital technologies on the effectiveness of sustainable development planning has remained underexplored, particularly in relation to the automation of monitoring processes, data collection, performance analysis of implemented measures, and the development of integrated reporting in accordance with environmental, social and governance (ESG) management principles.

O.V. Manuilov (2024) interpreted the sustainable development of an enterprise as an integral socio-ecological and economic system in which all components are interconnected and mutually influence each other. In author's viewpoint, the integration of strategic and innovative approaches with sustainability principles creates the conditions for enhancing enterprise efficiency across all three dimensions of sustainable development, increasing competitiveness, and ensuring long-term viability. The author paid particular attention to the role of strategic thinking and innovative potential in the formation of a comprehensive management system that meets modern challenges. However, the study did not disclose the mechanisms for integrating environmental audit into the management system of the enterprise's socio-ecological and economic strategy, which is relevant for increasing the transparency of management decisions and strengthening stakeholders' trust.

The study by S.M. Bondarenko (2023) proposed a model of a business process quality management system based on the principles of sustainable development and the international standard ISO 9001:2015. The system incorporates elements of quality management, lean manufacturing and the Six Sigma methodology, integrated through shared objectives and the PDCA (Plan – Do – Check – Act) and DMAIC (Define, Measure, Analyse, Improve and Control) cycles. This integration is aimed at improving product quality, meeting the needs of all stakeholders, optimising resource utilisation, minimising waste, and protecting the environment – thereby contributing to the achievement of sustainable development goals (SDGs) and the implementation of the UN Global Compact principles in light industry enterprises. The research also emphasised the importance of cultural transformation of the enterprise and the involvement of employees in continuous improvement processes. At the same time, the study does not address the risks and barriers to implementing an integrated quality management system in small and medium-sized enterprises (SMEs), which is especially crucial given the limited resources, human resources and financial capabilities of these entities.

I.M. Makovets'ka & M.V. Yarhin (2021) investigated how strategic planning affects the long-term competitiveness of enterprises. The authors noted that this process is associated with a certain level of uncertainty; it has a time orientation and a certain planning horizon, which should be taken into account when formulating strategies. Researchers focused on the need to take into account environmental factors, market trends, changes in legislation, and the internal potential of the enterprise. However, the scientific work has not studied the impact of strategic planning with regard to ESG criteria on long-term competitiveness, which makes it impossible to comprehensively assess the effectiveness of modern strategic management in the context of sustainable development. Thus, the studies outlined demonstrate an integrated approach to managing sustainable development and digital transformation of enterprises in the dynamic conditions of the modern business environment. The primary objective of the research was to identify methods and tools that will allow companies to plan their activities in accordance with the principles of sustainable development and to offer practical tools for implementing these methods.

MATERIALS AND METHODS

The research used a wide range of scientific methods to evaluate approaches to planning business processes in the context of sustainable development, which allowed to comprehensively cover the economic, environmental and social aspects of sustainable development. Taking into account the multifaceted and systemic nature of the issues under study, the following methodological approaches were applied. The methods of analysis, synthesis, comparison and generalisation provided a structured processing of both theoretical material and empirical data. Analysis helped identify the key factors influencing sustainable development in business process planning, while synthesis helped integrate these elements into a holistic concept. Comparison made it possible to compare different approaches, and generalisation provided conclusions and recommendations for their adaptation to the realities of a modern enterprise. The systematisation method was used to rationalise the conceptual field of the research. As a result, a systematic vision of corporate social responsibility (CSR) as an integral part of sustainable development was formed; tools for combining economic efficiency, environmental safety and social responsibility were brought together into a single structure; the main approaches to planning business processes were classified and the possibilities of their adaptation to the principles of sustainable development were considered. The analytical method allowed for a deeper analysis of the nature of changes that occur in the process planning of enterprises under the influence of the concept of sustainable development. In particular, the formation of long-term financial sustainability strategies was investigated; risk management mechanisms in an unstable environment were studied; the impact of innovative technologies on the ecological modernisation of production was identified; the implementation of CSR principles in human resources policy and interaction with stakeholders was analysed.

The analysis of literature sources included a critical review of scientific papers, reports of international organisations, and corporate sustainability strategies.

This made it possible to identify the leading approaches to business process planning in different countries and industries; identify global trends such as digitalisation, ESG factoring, and the circular economy; and form a scientific and practical basis for further conclusions. Comparative analysis – comparison of traditional and modern approaches to planning was conducted, in particular: classical strategic planning; agile planning; Deming cycle (PDCA); Lean and Six Sigma. All of these approaches were adapted to meet the requirements of sustainable development, which ensured a systematic comparison of their relevance. The case study method was used to study the practical experience of implementing sustainable development in international companies: Unilever; Tesla; IKEA. The analysis of the cases made it possible to identify effective models for integrating sustainable development into business process planning.

Methods of environmental assessment – tools for assessing the environmental impact of business processes were studied: environmental audit as a tool for monitoring environmental compliance; life cycle assessment (LCA) to analyse the environmental performance of products at all stages of their existence; implementation of ISO 14001:2015/Amd 1:2024 (2024) as a standard for environmental management systems; principles of circular economy as a guide to waste-free production. Analysis of digital technologies – the role of digital tools in supporting sustainable development was considered: big data; Internet of Things (IoT); artificial intelligence (AI).

RESULTS

In the face of global challenges such as climate change, depletion of natural resources, and growing social inequality, sustainable development is becoming not just a trend but a necessity for the long-term existence of businesses. The concept of sustainable development involves a harmonious combination of economic, environmental and social goals. This means that companies should not only strive to make a profit but also try to reduce their negative impact on the environment and even improve society's life quality. Planning business processes based on the principles of sustainable development requires a review of traditional management models. It includes the integration of green technologies, efficient use of resources, waste minimisation, and ethical treatment of staff and partners. In this context, strategic and operational processes should be focused on long-term value rather than short-term profit.

Business processes become sustainable when they support: environmental sustainability: reducing emissions, energy efficiency, reuse of resources; social sustainability: respect for employee rights, gender equality, contribution to the development of local communities; economic sustainability: sustainable growth, innovation, resilience to crises and external risks. Sustainable development is a platform for corporate transformation and competitive advantage strengthening rather than an external limitation. Companies that promptly incorporate these ideas into business process planning not only preserve their standing and adhere to legal obligations but also open up new markets, sources of funding, and talent. Sustainable development requires companies to consider three key aspects – economic, environmental and social sustainability – which together form the basis of the concept CSR (Fig. 1). Each of these aspects is an essential component of a long-term business strategy aimed at sustainable development, resource conservation, and value creation for all stakeholders.

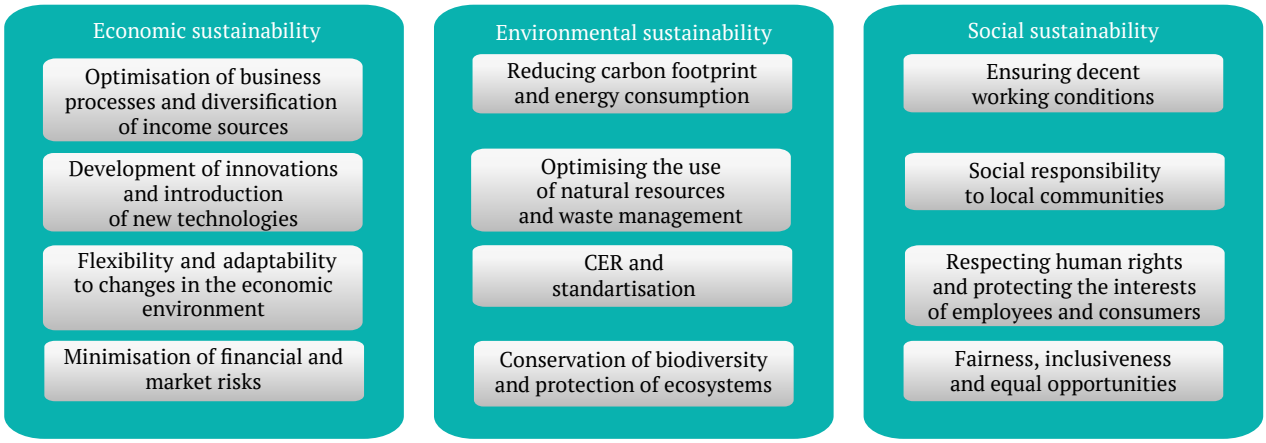

Figure 1. Key aspects of sustainable development

Source: created by the author

Economic sustainability is the essence of the strategic development of any company, providing the ability to exist, respond to changes and develop in the long-term perspective. Under conditions of global competition, market volatility and innovative changes, businesses seek stability through profit generation, risk management and innovation. Economic stability is impossible without effective management and utilisation of new opportunities. Companies are increasingly adopting automation, digitalisation and cost-reduction processes to increase productivity, reduce costs and improve control. The introduction of technologies such as AI, IoT, and big data in real-time allows companies to make quick decisions and analyse their financial performance indicators. Diversification of income sources by entering new markets, expanding the product range, and creating new lines of business is ensured. Companies that have been operating in manufacturing for a long time decide to create departmental services or

introduce models for customers to subscribe to mailing lists, which will become an additional source of income. Improving the efficiency of operational processes involves analysing and optimising supply or logistics chains, managing inventory, and reducing manufacturing costs.

Innovation and technological development are crucial factors in ensuring the company's economic sustainability. In the current conditions, technological transformation of business means: development and implementation of advanced technologies, such as the use of AI for forecasting and decision-making, price optimisation and personnel control, financial transactions, etc.; investing in research and development (R&D). Supporters of long-term investment in their future allocate funds to create new products and services that increase their competitiveness; digitalisation and productivity increase through the use of Enterprise Resource Planning (ERP)/Customer Relationship Management (CRM) systems in the company, business management for control and analytics, sales management, etc. In addition, companies face economic threats, such as currency fluctuations, market downturns, inflation, changes in interest rates, etc. Anti-crisis strategies are developed to minimise these risks, which means creating an organisational structure that can easily switch without the stability of the environment through scenario planning and stress testing of business models. They provide a financial cushion: creating reserve funds and conducting scrupulous accounting and financial allocation help clone the company's problems in a time of crisis. They diversify by markets and suppliers: the same action helps reduce risk by obtaining more orders and balancing goods and services in terms of the ratio.

Planning business processes is a crucial activity aimed at achieving goals, developing an action plan and optimising available resources. Within the framework of this task, the current state of affairs in the business is analysed, key goals are determined, tactical and strategic plans are developed, roles and places in the organisation are distributed, and the process is monitored and adjusted depending on changes in the external and internal environment. Successful strategic planning of effective business processes will help improve productivity, reduce costs, effectively manage risks and ensure the company's long-term development.

Strategic planning in the classical sense is the study of the prospects for the external and internal environment of an enterprise, the development of a long-term strategy and goals, as well as the determination of the company's place on the market map and the identification of its risks. Such plans usually include an analysis of the state of affairs at the enterprise, definition of its mission and goals, an analysis of strengths and weaknesses, threats and opportunities (SWOT analysis), an elaboration of the development scenario, an assessment of risks, competitiveness, an identification of competitive advantages, key areas of work, etc. Strategic planning also includes the adaptation of strategies. Strategic planning of a successful enterprise leads to sustainable growth, increased competitiveness, and increased profits in the long run.

Flexible planning is a dynamic process that enables enterprises to adapt their business processes to the changing environment, thereby allowing them to respond to new challenges and opportunities. It is based on ongoing monitoring of the market conditions, analysis of the competitive environment, tracking amendments in legislation and changes in purchasing habits. As opposed to traditional strategic planning, its basic principles are adaptability, interactivity, and the ability to quickly adjust strategies depending on the current state of the market.

The major tools of this approach include scenario modelling, Agile methodology, Lean principles, and the use of modern digital technologies for real-time data processing. This enables reducing risks, increases resource management, speeds up decision-making and creates competitive advantages. As a result, enterprises can successfully adapt to changing business environments and increase their resilience to business stress, while maintaining a high level of innovation. PDCA is a methodology for ongoing business process improvement that includes four stages: planning, execution, control, and adjustment. This approach is used when working with product quality, strategic management of the enterprise, operational management, as well as processes for optimising the enterprise's activities.

At the Plan Stage, the current state of the process is analysed, strengths and weaknesses are identified, goals are formulated, and the strategy for achieving the goals is developed. The planning tool takes into account internal and external factors (resources, staff competencies, market trends, competition, legislation). At the Do Stage (execution stage), plans are realised and the developed solutions are implemented in work processes. Test launches and pilot projects can be used during implementation, which makes it possible to reduce risks before full participation. At the Check Stage, the results are analysed, the effectiveness of the implemented changes is evaluated, and deviations from the expected indicators are tracked. Quality control methods, data analysis, and feedback are applied, which provides an objective picture of the results. At the Act Stage, decisions are made on the following actions based on the information received: successful methods are incorporated into processes, and identified problems are eliminated by adjustments. After that, the cycle repeats, and it keeps on repeating until constant improvement is achieved. Using the full range of PDCAs makes it possible to improve the quality of products and services, optimise work processes, reduce costs, and conquer new markets. PDCA is widely used in various fields, such as manufacturing, project management, IT development, and service.

Lean and Six Sigma are two ways to optimise enterprise processes aimed at minimising losses and increasing efficiency in production. A lot of companies successfully apply both methods simultaneously and combine them into the Lean Six Sigma methodology, with Lean focusing on improving the flow and in-depth optimisation of production, and Six Sigma emphasising in-depth qualitative analysis of production processes and the services or goods they result in. Collectively, they establish the basis for process management in the improvement process, which should lead to a permanent increase in the activities conducted and significant optimisation of each process performed in the enterprise.

Modern markets are characterised by high dynamism. Competitors may suddenly enter the market with a new hot topic, or a new audience may emerge that you may also want to win over. Flexibility, the ability to change quickly and adapt to new situations, is required to keep the

company's operations running and remain profitable. It is necessary to be able to react quickly, adapt production, and revise logistics. Scalability of the business model: it is necessary to be able to quickly change production volumes depending on the current market situation. Flexible management techniques and an innovative corporate culture: the adoption of Agile management techniques enables businesses to respond to new issues promptly.

Economic sustainability is the foundation for the development of other forms of sustainability, including environmental and social sustainability. Without financial stability and resilience, investments in environmental projects – such as reducing CO_2 emissions, increasing the share of renewable energy sources, and transitioning to a circular economy – become unfeasible. It is not advisable to invest in social programmes that encompass increasing job satisfaction and quality of work, participation in community affairs and activities, or contributions to charitable foundations. Environmental sustainability is an integral component of the strategic development of modern organisations aiming for long-term competitiveness. Amidst global climate change, depletion of natural resources, and increasingly stringent environmental regulations, organisations must minimise their negative impact on the environment while enhancing the efficiency of business processes. Achieving this requires the implementation of innovative technologies, optimisation of resource utilisation, and adherence to international environmental standards.

Fighting climate change by reducing greenhouse gas emissions and switching to more ecologically friendly energy sources is one of the main focuses of environmental sustainability. Businesses can use energy-efficient technologies like thermal insulation, LED lighting, and intelligent energy management systems to accomplish this goal. These actions help significantly lower overall operating expenses and energy consumption. The adoption of renewable energy sources, such as solar panels, wind turbines, and biogas plants, is a crucial strategy for enhancing environmental sustainability. For example, since 2017, Google has been offsetting 100% of its global electricity consumption annually by purchasing renewable energy (Hölzle, 2021). Apple has set a goal of achieving carbon neutrality across its entire value chain, including manufacturing, by 2030 (Apple and global suppliers…, 2023). Optimising transport and logistics systems through the use of electric vehicles, hybrid transport, and alternative fuel-powered transportation, combined with digital technologies for route optimisation and mileage reduction, is a critical step toward sustainability. Additionally, companies can offset greenhouse gas emissions by participating in afforestation and soil conservation programmes, engaging in carbon credit initiatives, and investing in carbon capture and storage technologies.

The active and responsible utilisation of natural resources is a crucial aspect of sustainable commercial activity aimed at reducing harmful environmental impacts and extending the lifespan of materials. This can be achieved through the principles of the circular economy, where the by-products or excess materials of one company serve as valuable resources for another. For example, in the textile industry, fabric recycling methods are actively being developed, while bioplastics are increasingly used in packaging production. Reducing water consumption through efficient water supply systems, industrial water reuse, and advanced water purification technologies helps alleviate pressure on natural water sources. For instance, Coca-Cola HBC is implementing the Mission 2025 initiative, which aims to reduce water consumption by 20% in production facilities located in regions with a high risk of water shortages compared to 2017 (Water reduction and stewardship, 2025). Nestlé is actively implementing sustainable water management programmes, including investments in more than 100 projects by 2025 aimed at restoring local water cycles in the areas where their businesses are located (Nestlé Waters targets…, 2021). Effective waste management, from segregation and processing to the disposal of harmful substances, is crucial. Many companies are adopting zero-waste strategies, aiming for 100% waste utilisation and striving to eliminate landfill waste through recycling, reuse, and other sustainable practices.

Commercial activities of enterprises are a significant factor influencing ecosystems, and many companies are focused on reducing their harmful impact on the environment. This can be achieved by using environmentally safe materials in products, such as biodegradable packaging and organic dyes, which help reduce the content of toxic waste. Additionally, the organisation of reforestation programmes and the protection of water sources, particularly in agricultural and industrial sectors, plays a crucial role in sustainability efforts. For example, in 2024, Ingka Investments, the investment subsidiary of the Ingka Group, which is the largest retailer of IKEA, acquired 23,883 hectares of forest land in Finland, Estonia and Latvia (Ingka Group, 2024a). These efforts contribute to reducing the environmental footprint of their operations and promoting sustainability.

For successful implementation of planned environmental conservation practices, enterprises develop corporate environmental responsibility (CER) strategies and undergo certification procedures in accordance with international standards as follows: The ISO 14001:2015/Amd 1:2024 (2024) environmental management standard, which regulates the process of monitoring and reducing the impact of enterprises on the environment; The Leadership in Energy and Environmental Design standard for green building design (LEED certification, n.d.), focused on ensuring the energy efficiency of building structures; The Building Research Establishment Environmental Assessment Method (BREEAM, n.d.) for assessing the environmental performance of buildings and structures; The Global Reporting Initiative (GRI, n.d.), a global initiative in the field of sustainability reporting, which involves the disclosure and identification of information regarding the environmental impact of an enterprise.

Enterprises actively participating in the implementation of environmentally sustainable conservation practices contribute to the protection of the environment and gain competitive advantages in the market, namely: resource efficiency – the consumption of water, electricity, and raw materials is optimised; increased investment attractiveness – many investment funds and investors focus on so-called ESG criteria when selecting investment targets); enhancing reputation – consumers are increasingly focused on environmental protection issues; legal

compliance – mitigating risks associated with the introduction of new environmental regulations, reducing environmental pollution, and minimising fines. Establishing socially sustainable organisational structures is a strategic approach that has a targeted impact on society, focusing on the protection of employees' rights, supporting the development of local communities, and ensuring equal opportunities. Corporations that actively integrate social objectives into their operations are able to significantly improve the quality of life for their employees and society as a whole, as well as to create sustainable competitive advantages, increase trust from consumers, partners, and investors.

It is significant to highlight that one of the key aspects of a socially sustainable position for enterprises is the personal factor – the organisation of quality care for the workforce, as a well-managed human resource is a critical element of the enterprise's success. The major areas of focus in this regard include the following indicators: social justice – companies that ensure wages align with market standards and offer competitive compensation packages to employees to enhance motivation and productivity; safe working conditions – adherence to occupational safety standards, provision of health insurance, and implementation of safety systems within the company. An example can be found in heavy and construction industries, where enterprises actively implement innovative monitoring aspects of working conditions and automated tools to minimise risks; career growth and professional development opportunities – employee training, mentoring programmes, access to networks, and internal academies help create a company with highly skilled staff. For instance, in 2020, Microsoft launched a global initiative to provide digital skills to 25 million people affected by the economic impact of the COVID-19 pandemic (Nickelsburg, 2020); flexibility in the work process – the possibility of working from home, flexible schedules and programmes supporting work-life balance is aimed at increasing employees' satisfaction.

Companies focused on social sustainability are increasingly participating in the development of local communities, strengthening their brand reputation and increasing user loyalty. They invest in healthcare and education through financial support for educational institutions, providing scholarships, creating corporate educational facilities, and organising financial resources for medical institutions and preventive healthcare programmes. In 2024, IBM announced a 50% increase in investment in the IBM Sustainability Accelerator programme, pledging up to $45 million in cash and in-kind over the next five years. This initiative is focused on technology projects that improve the sustainability of cities, including water, energy, and greening management (Segal, 2024).

Social sustainability includes the implementation of the principle of creating equal working conditions and employment opportunities for different population groups, with a focus on gender equality. This involves tackling the pay gap between men and women, introducing programmes to increase the representation of women in leadership roles, and ensuring equal opportunities for career advancement within the company. Such initiatives are actively supported by Unilever (n.d.). Employment of people with disabilities involves adapting workplaces and office spaces, as well as organising workflows considering the specific needs of this employee category. SAP is a leader in this field (SAP carries out new initiatives…, 2024). Creating a multicultural, comfortable, and equal work environment involves supporting ethnic diversity, combating discrimination, and establishing social adaptation and sociocultural integration programmes for migrants and representatives of small ethnic groups.

In addition to complying with national labour regulations, companies should also follow international guidelines for defending the rights of both consumers and employees: compliance with international standards through implementation of the UN principles on human rights (Office of the United Nations High Commissioner for Human Rights, 2011) and the ILO standards outlined in the Global Compact (International Labour Organisation & United Nations Global Compact, 2008); ethical business principles that involve transparency in labour relations, as well as the prohibition of forced and child labour. Adidas (2023) is guided by the Workplace Standards, which are a code of conduct for suppliers and are in line with the Fair Labour Association (FLA) Code of Conduct and the Fair Labour and Responsible Sourcing Principles. These standards are mandatory conditions in agreements with manufacturers and are aimed at ensuring fair, safe and healthy working conditions that meet environmental requirements. In addition, they comply with ILO and UN conventions on human rights and fundamental principles and rights at work; consumer protection that involves adhering to product quality standards, providing accurate information, and establishing feedback mechanisms and customer support systems to ensure a positive experience and trust.

Investing in social sustainability will enhance a company's reputation and boost customer loyalty since consumers are more likely to support brands that demonstrate social responsibility. Additionally, these efforts help attract and retain top talent, as employees are drawn to workplaces that value their well-being, foster professional growth, and promote a healthy work-life balance. Enhancing investment attractiveness – ESG scores have become a significant factor for investors and shareholders when selecting long-term investment opportunities. Reducing legal and reputational risks – adhering to labour laws and international standards minimises the likelihood of reputational crises and legal disputes.

All three components – economic, environmental, and social sustainability – must be included in the company's development plan if it wants to achieve sustainable development. It is critical to keep in mind that these components are interconnected rather than opposites. For instance, implementing eco-friendly technologies can improve the company's reputation among consumers who care about the environment in addition to lowering energy consumption expenses. At the same time, improving labour conditions and supporting social initiatives contribute to employee morale and their integration into the company's business processes, which, in turn, increases the company's productivity. Sustainable development requires a long-term approach from businesses and attention to all three aspects, which improves financial performance as well as contributes to the well-being of society and environmental protection. Techniques that enable the alignment of economic, environmental, and social sustainability are

utilised to integrate the concepts of sustainable development into the business process planning mechanism. These strategies establish the framework for the company's balanced, long-term growth (Fig. 2).

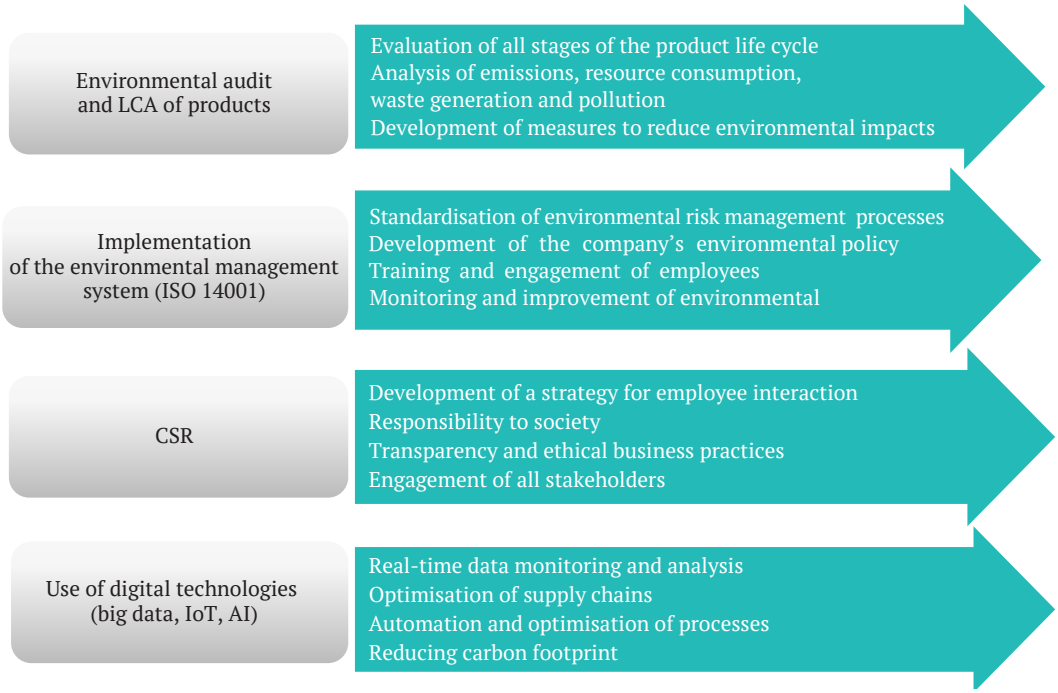

Figure 2. Methods for the effective integration of economic, environmental, and social sustainability
Source: developed by the author

Ecological product assessment and evaluation based on the principles of LCA provide the opportunity to conduct a comprehensive analysis of the organisation's impact on the environment. The analysis includes the assessment of all stages of the product life cycle, starting from raw material extraction, production, use, and ending with disposal or recycling. This approach reveals environmental risks at each stage, enabling more informed decisions regarding environmental improvement. The analysis of emissions, material and energy resource consumption, waste generation, and pollution allows for minimising the organisation's environmental impact while optimising technological processes. It involves formulating measures to improve the environmental condition, such as the use of energy-saving technologies, reduction of water and electricity consumption, use of secondary materials, and waste reduction. As a result, the company not only raises its environmental standards but also acquires long-term competitive advantages that make it more appealing to investors and environmentally conscious customers.

The international standard, the Environmental Management System (ISO 14001:2015/Amd 1:2024, 2024), helps companies take a systematic approach to managing the environmental aspects of their activities. The implementation of ISO 14001:2015/Amd 1:2024 (2024) involves: standardising environmental risk management processes to ensure logical consistency and transparency; developing the company's environmental policy, goals for reducing negative environmental impact, and mechanisms for achieving these goals; monitoring and improving environmental safety through audits, regular reassessment of goals, and adjusting strategies based on new data and technologies; training and educating employees on the principles of environmental improvement, engaging them in environmental management processes to foster a corporate culture of responsibility and raise environmental awareness. This system helps reduce environmental risks and strengthens trust-based relationships with consumers, partners, and regulatory bodies.

CSR includes an internal set of methods aimed at creating a positive social environment, timely management of employees, and environmental stewardship. CSR encompasses key aspects such as: the strategy for employee interaction, ensuring fair employment, promoting professional growth, and creating a healthy and safe working environment; responsibility to society, including active participation in social and charitable initiatives, contributing to community development, and addressing social issues (such as education, healthcare, and environmental support); transparency and ethics in business, which means honesty, ethical treatment of partners, customers, government entities, adherence to civil society principles, and combating corruption; mobilisation of all interest groups for sustainable development, expansion of social responsibility, improvement of employees' quality of life, and development of external partnerships. Thus, CSR contributes to strengthening the company's reputation, improving relationships with collaborators, and enhancing trust and loyalty.

The application of digital technologies, such as big data, IoT, and AI, enables the enhancement of resource management efficiency and the optimisation of business processes. These technologies enable real-time data monitoring and analysis, effectively controlling resource

usage levels, harmful emissions, and the efficiency of key technological processes. They also optimise supply chains by using predictive models and management algorithms for proper inventory control, demand forecasting, and reducing excess. Automating and optimising agricultural business processes contributes to increased production efficiency, energy and time savings, as well as improved product quality and reduced response time to market changes. It also helps reduce the carbon footprint by applying intelligent systems for optimising transportation routes, forecasting energy consumption, and automated energy management. Overall, digital technologies enable the optimisation of resource use, reduce costs, and promote the implementation of innovative products within the framework of sustainable development.

The circular economy is based on a closed-loop production cycle, where resources and materials are reused to reduce waste and increase the value of the product at each stage of its life cycle. The process involves transitioning to closed production cycles, where products are not discarded after use but are recycled and repurposed to create new goods. The use of recycled and sustainable materials eliminates the need for primary resources and minimises the environmental impact of production. Design for recycling and reuse requires a review of development and manufacturing processes, considering the potential for reusing materials, components, and energy. Waste management and recycling, including the implementation of technologies that allow reintegrating waste into the production process or using it in other industries, enable the creation of new business models, revenue streams, and the conservation of resources while minimising the impact on the natural environment. The application of circular principles enables the reduction of the environmental impact of business activities, the recycling of resources, and the creation of sustainable and efficient production chains essential for companies' successful development.

In practice, many large companies are incorporating sustainability principles into their business processes to strengthen their competitive position, enhance their reputation and attract investment in addition to environmental and social performance. For example, Unilever's main principle is to create more sustainable supply chains and do less harm to the environment. Unilever is implementing environmentally friendly technologies in production, using renewable energy sources and aiming to reduce emissions. In 2023, 92% of the electricity used in Unilever's offices, factories, research centres and warehouses came from renewable sources (Addressing climate change..., n.d.). The company is introducing heat pumps and electric boilers to reduce its dependence on fossil fuels, and it is also using biofuels at some production sites. Unilever aims to achieve 100% renewable heat by 2030. Over the past few years, the company has significantly reduced its use of plastic, and has established measures to reuse and recycle packaging and created new initiatives. Since 2019, the company has reduced its use of virgin plastic by 18% (Office of the Chief Executive, Unilever, 2024). In 2023, 22% of Unilever's plastic packaging was made up of recycled plastic, with a target of 25% by 2025 (Unilever Nepal, n.d.). The company introduced more than 50 models of reusable and refillable packaging, and developed new product formats, such as laundry capsules in cardboard boxes, to reduce or eliminate plastic (Office of the Chief Executive, Unilever, 2024).

Sustainable supply chains: Unilever cooperates with suppliers who practise sustainable development approaches, which include sustainable sourcing of raw materials, reduced emissions and socially responsible remuneration. The company uses satellite imagery and AI to increase the transparency and traceability of its supply chains, which allows it to identify deforestation risks and take action to protect ecosystems. Unilever supports regenerative agriculture by working with farmers to implement practices such as cover crops and reduced tillage to improve soil health and increase yields (Our ambition is to deliver..., n.d.). The company actively promotes agriculture and sustainable practices in its supply chain.

Social responsibility: the company is committed to ensuring a decent standard of living for all stakeholders in its value chain, including paying a living wage by 2030 (We're improving the livelihoods..., n.d.). Unilever is helping 250,000 smallholder farmers access livelihood support programmes by 2026 and the company is supporting the growth of 2,5 million SMEs in its retail supply chain. The company invests in education, healthcare and sustainable agriculture in developing countries, including through partnerships with local communities and non-governmental organisations. These initiatives demonstrate Unilever's commitment to sustainable development by focusing on the environmental, social and economic aspects of its activities. The company Tesla Corp is active in the development and production of environmentally friendly technologies, including sustainable transport and battery technologies. The company's main services in the field of sustainable development are as follows:

Electric vehicles – Tesla develops and manufactures electric vehicles which are designed to not only emit no harmful gases into the atmosphere but also significantly reduce fuel costs compared to traditional internal combustion engine vehicles. This is an important part of the company's strategy to reduce its carbon footprint and promote clean technologies. In 2023, Tesla customers avoided more than 20 million metric tonnes of CO_2e emissions by using electric vehicles, which underscores the company's significant contribution to reducing global greenhouse gas emissions (Tesla, n.d.). Battery technologies and solar panels – Tesla also offers energy storage solutions such as Powerwall and Megapack. Powerwall allows households to reduce electricity costs by up to 30% annually, ensuring autonomy and efficient use of renewable energy sources. Megapack, with a storage capacity of more than 3.9 MWh, contributes to grid stability and reduces the need for gas-fired peaking power plants (Tesla's energy storage solutions..., n.d.; Tesla expands energy storage solutions, 2024).

Environmentally friendly production processes – Tesla implements environmental standards in production, including energy and water conservation, as well as logistics optimisation to reduce carbon emissions. The company is also actively developing battery recycling and disposal programmes, contributing to a circular economy. This data demonstrates how Tesla is integrating sustainability into its operations, helping to reduce its environmental footprint and promote clean technologies. IKEA is actively working to reduce its negative impact on the environment

and to develop its business sustainably, including environmental and social aspects. The company's key initiatives in this area include as follows.

Closed-loop production – IKEA is working towards a strategic transition to a circular economy in its efforts to increase the amount of materials used and resources obtained. The application of recycled materials such as wood, metal and plastic for furniture production is a priority area of development. IKEA aims to achieve full circularity of production by 2030. In 2023, 73% of all materials used in production were renewable or recycled, with a target of 100% by 2030 (IKEA, 2023). For example, about 98% of the wood IKEA used in 2023 came from responsible sources, certified by FSC or recycled (IKEA, 2023).

Energy saving – IKEA is focused on working towards more energy efficient processes in its operations. The company's well-known successes include the transition to alternative energy sources such as solar panels and wind turbines. Additional energy management techniques are being incorporated into production and warehouse facilities. By the end of 2023, IKEA had invested more than €2.5 billion in renewable energy. The company owns 575 wind turbines and has installed more than 935,000 solar panels at its facilities around the world (Ingka Group, 2024b). IKEA has already achieved 100% renewable electricity in its stores and warehouses in 15 countries and continues to expand this figure.

Social responsibility and inclusiveness – IKEA works in partnership with communities to support their economies and provide adequate growth opportunities for its employees. The company works with its business partners to implement fair and balanced remuneration and ensure high standards of labour standards. In 2023, more than 300,000 employees in the supply chain gained access to better working conditions, education and healthcare through IKEA Social Entrepreneurship initiatives (Inter IKEA Group, 2023). The company has implemented programmes to support women and refugees in partnership with the UN, ensuring equal employment and development opportunities.

Analytical data confirms that IKEA not only declares the principles of sustainable development but also actively implements them throughout the entire value chain: from raw materials to consumers. Its strategy of circular economy, clean energy and social inclusion is an example for many transnational corporations. For the purpose of summarising and comparing the sustainability approaches of Unilever, Tesla and IKEA, Table 1 has been compiled.

Table 1. Comparison of approaches to sustainable development adopted by Unilever, Tesla and IKEA

Criterion	Unilever	Tesla	IKEA
Main focus	Environmentally friendly technologies and sustainable supply chains	Electric vehicles, battery systems, solar energy	Circular economy, renewables, energy efficiency
Using renewable energy	92% of electricity from renewable sources in 2023; target – 100% of heat from renewable sources by 2030	Solar panels, Powerwall, Megapack; this makes it possible to reduce energy costs by up to 30%	€2.5 billion in renewable energy investments, 575 wind turbines, 935,000 solar panels; 100% renewable energy in 15 countries
Reducing emissions and waste	The use of virgin plastic was reduced by 18%; 22% of packaging is made of recycled plastic, the goal is 25% by 2025	Electric vehicles reduced over 20 million tonnes of CO_2e emissions in 2023; focus on reducing logistics emissions and battery disposal	In 2023, 73% of materials were renewable or recycled; 98% of the wood was from responsible sources
Environmental technologies in manufacturing	Electric boilers, heat pumps, biofuels	Energy-efficient processes, secondary water use, eco-logistics	Improving energy efficiency in warehouses, stores, using sustainable materials
Circularity / recycling	50+ reusable packaging models, new formats (cardboard, plastic-free)	Recycling of batteries, reuse of components	The goal is 100% circular production by 2030; use of recyclable wood, metal, and plastic
Sustainable supply chain	AI and satellites for tracking, supporting farmers, regenerative agriculture	Supply of lithium and nickel with environmental impact control (indirect data)	Collaborating with suppliers to transition to a circular model
Social responsibility	Supporting 250,000 farmers, growing 2,5 million SMEs, investing in education and healthcare	Indirect participation in the creation of new jobs, promotion of STEM education, localisation of production	Supporting 300,000 workers in supply chains, programmes for women and refugees, partnership with the UN
Target by 2030	100% renewable energy, real living wage in the supply chain	Mass reduction of emissions, scaling of energy-saving technologies	Full circularity of production, 100% sustainable materials, decarbonisation of activities

Source: developed by the author based on Unilever (n.d.), Tesla's energy storage solutions: Powering a sustainable future (n.d.), Tesla (n.d.), IKEA (2023), Inter IKEA Group (2023), Ingka Group (2024a)

The table presented illustrates the diverse approaches to sustainable development adopted by leading international companies – Unilever, Tesla, and IKEA. Despite operating in different sectors, all three corporations integrate environmental, social, and economic dimensions into their overarching strategies. Unilever focuses on sustainable supply chains and eco-friendly packaging, Tesla makes a substantial contribution to the decarbonisation of transport and energy, while IKEA implements circular economy practices and invests in renewable energy. All three companies also demonstrate a high level of social responsibility, aiming to generate a positive impact on employees, consumers, and communities. This multifaceted approach reflects a shift from declarative environmentalism to the systematic implementation of sustainable development principles within business strategies.

In the context of developing an effective model for planning business processes in line with sustainable development principles, it is advisable to apply a set of practical measures aimed at ensuring long-term environmental, economic, and social efficiency. It is essential to develop a corporate strategy that embeds ESG objectives. Employing LCA tools is advisable to evaluate environmental impacts at every stage of a product's life – production, use, and disposal.

The implementation of modern ERP systems – such as SAP S/4HANA or Oracle NetSuite – will facilitate the automation of resource-consumption monitoring, emissions control, and the enhancement of managerial transparency. Big data, IoT, and digital-twin technologies enable risk forecasting and the simulation of the outcomes of innovation adoption. Enterprises are advised to implement closed-loop production cycles with material reuse, design products with high recyclability, and minimise waste. Particular attention should be given to eco-design of goods and the adoption of reusable or refillable packaging. It is recommended to audit suppliers for compliance with sustainable development criteria, including environmental standards, social responsibility, and operational transparency. The use of satellite monitoring, blockchain technologies, and AI is advisable to enhance supply chain traceability and prevent environmental risks. It is essential to implement internal training programmes for staff on sustainable development principles, establish innovation labs and idea incubators, and develop an employee motivation system focused on achieving sustainable outcomes. It is advisable to implement socially oriented projects – particularly in the fields of healthcare, education, and employment for vulnerable population groups. Enterprises should ensure the observance of labour rights throughout their supply chains and adopt gender-sensitive human-resource management practices. It is expedient to implement international non-financial reporting standards, such as the GRI, the Sustainability Accounting Standards Board (SASB), and the Corporate Sustainability Reporting Directive (CSRD). Companies should ensure transparency and accessibility of their sustainability performance data through electronic platforms, social media, and interactive dashboards. The outlined recommendations are aimed at transforming the traditional enterprise management model toward sustainable, innovative, and responsible operations. Their implementation will enable business entities to formulate strategic decisions that address contemporary challenges and trends in sustainable development, while also ensuring long-term competitiveness at both national and global levels.

DISCUSSION

Under current conditions of global change and sustainable development challenges, it is becoming increasingly significant to integrate sustainability principles into all levels of enterprise management, including business process planning. The scientific community is actively researching this issue, focusing on both organisational and technological aspects as well as strategic aspects. S.V. Korobka (2024) carried out a comprehensive analysis of the key advantages of implementing a sustainable development strategy, including the growth of reputational capital, cost reduction through innovation, efficient use of resources and opening up new market opportunities. The author concluded that this strategy increases the efficiency of business processes and ensures the environmental, social and economic sustainability of enterprises. The author also highlighted the importance of communication with stakeholders and transparency in managerial decision-making. However, the role of human capital and corporate culture in the implementation of a sustainable development strategy has not been analysed, although these factors play a key role in shaping values oriented towards sustainable management and motivating staff to achieve sustainability goals (Balanovska *et al*., 2024).

T.O. Stepanenko (2020) identified the stages of sustainable development management, covering economic, social and environmental areas. The author proved that the implementation of a sustainable development strategy that can increase the competitiveness of an enterprise, its sustainability and financial performance, ensure compliance with quality standards and positively influence the environment. The research identified approaches to the formation of a system of sustainable development indicators and their integration into the management accounting system. At the same time, there was no analysis of the instruments of state incentives for sustainable business development (benefits, grants, tax incentives, etc.), which could contribute to a deeper understanding of the motivational factors for enterprises in implementing sustainable development measures.

O.E. Kofanov *et al*. (2023) paid attention to the peculiarities of business processes in the field of green startups, analysing the author's project Bioenergy-Startup and substantiating its Canvas business model. As part of the study, authors proposed a marketing strategy for promoting this startup's innovative products and formed an algorithm for launching them on the market. Particular attention was paid to positioning the product as environmentally friendly, as well as using digital communication channels to attract the target audience. However, the study did not consider the issue of assessing the environmental performance of the Bioenergy-Startup project, in particular, there was no analysis of the potential environmental impact of the proposed innovations, which makes it impossible to comprehensively assess the project's performance in the context of sustainable development principles.

A.O. Cherniaieva & V.O. Metla (2024) conducted a detailed investigation of the stages involved in business process development. Although that study thoroughly examined the phases of business process design, it does not explicitly focus on the aspect of sustainable development. The authors' viewpoint is valid since understanding the structure and logic of business processes serves as a foundational basis for the subsequent integration of sustainable development principles. The research was primarily oriented toward the organisational and technological dimensions of business planning rather than the environmental or social components of sustainability.

Several researchers have made significant contributions to studying innovation management and sustainable development of enterprises. A. Brychko & X. Zui (2023) analysed the features of implementing innovation management within the framework of sustainable development

and proposed a method for evaluating the effectiveness of a continuous innovation process in a dynamic external environment. The authors investigated innovation management in a sustainability context, which is closely related to business process planning. The argument put forward in this study was justified, highlighting the adaptability of processes to change – a crucial element in contemporary business planning. The focus on evaluating the effectiveness of the innovation process, rather than the structural planning of business operations, represents a notable distinction from the previously discussed study. A thorough set of performance indicators was developed by O.V. Bondar-Pidhurskaya *et al*. (2020) to evaluate the management efficacy of creative mechanical engineering businesses in light of the SDGs of the twenty-first century. The scholars proposed the development of performance indicators for the management of innovative enterprises, which serve as a foundation for the strategic planning of business processes. The interpretation offered in the study is credible since it enables the measurement of the sustainable effectiveness of business processes. The conducted research differs from the authors' scientific approaches by its focus on the mechanical engineering industry and its emphasis on metrics rather than directly on planning methodologies.

P.S. Demchenko (2022) presented the key aspects of implementing a strategy for sustainable innovation and investment development in iron ore enterprises, providing economically justified managerial decisions. The author examined innovation-investment development strategies that influence planning; however, the focus is not specifically on business processes themselves. This perspective is valid from the standpoint of strategic management. A key divergence from the present research lies in the broader scope of strategy when contrasted with business processes. Strategy delineates the trajectory of the organisation, rather than detailing granular operational procedures. The study demonstrated how balancing business and sustainability impacts efficiency – a crucial insight for planning. This perspective is highly relevant since it supports the integration of sustainability into both strategic and operational decision-making. The difference from the conducted research is the focus on SMEs and the external environment, rather than on internal planning processes. O.O. Plakhotnik & I.M. Chernyavs'ka (2020) identified methods and tools for sustainable development management that help identify sources and directions of change. The researchers examined change management tools within the context of sustainable development that can be applied in business planning. This perspective is substantiated since business process planning requires flexible approaches to change. The focus of the study was on change management rather than on the development of business processes themselves. F. Rosati *et al*. (2022) employed a constructive research method to develop a managerial approach that fosters business model innovation aimed at achieving the SDGs. The managerial approach was based on business model innovation, which is closely related to process design. This viewpoint is well-founded since innovation is the driving force behind changes in business processes. Unlike research conducted in this study, these authors' studies place greater emphasis on the business model itself rather than on specific processes within the enterprise. J.A. van Zanten & R. van Tulder (2021) demonstrated that managing the interplay between SDGs enhances corporate resilience. This interaction between SDGs strengthens organisational sustainability; however, it operates at the policy level rather than at the level of process planning. Their insight is relevant for management at the macro level but it is less applicable to operational planning. The authors focused on corporate strategy rather than on the development of specific business processes. A. Sumets *et al*. (2022) established that the integration of sustainable development values into the management of agroholdings generates a positive socio-economic impact. Authors' study examined how sustainable development values are incorporated into management practices, directly influencing process planning. This insight is valid since it confirms the practical importance of value orientation in business planning.

The main distinction lies in the sectoral focus – agribusiness. M. Demianchuk *et al*. (2021) outlined the stages of implementing the sustainable development concept in enterprises. The authors identified these implementation stages as a foundational framework for planning. The viewpoint is valid as it provides a rationale for integrating sustainable changes into business operations. The key difference from this research is that authors of aforementioned study outline the general development stages rather than the detailed aspects of process planning. K. Andriushchenko *et al*. (2020) examined key aspects of digital transformation in enterprises within an inter-industry context. While digital transformation influences processes, there is no direct connection to sustainable development in the context of planning. This perspective on digital transformations is sound but it ignores social and environmental factors. The distinction from this research lies in the predominance of the digital dimension over sustainability. S. Bondarenko (2023) investigated the interrelation between sustainable development and quality management in the evolutionary process of enterprises. The study reveals the significant link between quality and sustainability, which is crucial for constructing effective processes. This is a valid perspective – integrating quality management into process planning enhances the effectiveness of sustainable changes. The author emphasised quality rather than the structural aspects of processes. O.S. Moroz (2021) examined CSR through the lens of international standards. The study considered how social responsibility standards influence the ethical dimension of business processes. This is a pertinent perspective, serving as a valuable complement to general planning. The distinction from this research is in the focus on values and norms rather than on process planning itself.

E. Nabais & M. Franco (2024) established that SMEs recognise the importance of sustainable development with external factors significantly influencing their strategies. The study demonstrated how external factors shape sustainable strategies for SMEs, which in turn impact business processes. This argument is sound, emphasising the importance of adaptability of business processes to external challenges. The distinction lies in the study's focus on small businesses rather than a universal model. R. Mahajan *et al*. (2024) reviewed studies related to the SDGs within the fields of business and management to clarify their role in advancing this

global agenda. Authors investigated the role of the SDGs in management, which serves as a foundation for sustainable planning. The viewpoint is rooted in empirical data, providing a global context. The distinction of that study lies in its review nature rather than being directly applied to planning. The studies outlined demonstrate an integrated approach to managing sustainable development and digital transformation of enterprises in the dynamic conditions of the modern business environment. The primary objective of the research was to identify methods and tools that will allow companies to plan their activities in accordance with the principles of sustainable development and to offer practical tools for implementing these methods.

CONCLUSIONS

The research showed that effective business process planning is key to achieving strategic goals, optimising resources and forming an adaptive, innovative management model. The following results were summarised: planning encompasses goal setting, plan development, role allocation and control; strategic planning is based on environmental analysis, SWOT, risk assessment and scenario modelling; flexible planning uses Agile, Lean and digital technologies; PDCA ensures continuous improvement. Practical recommendations were proposed: integration of ESG principles, digital transformation, development of a circular economy, innovative culture, and working with stakeholders.

Within the scope of the present research, it has been established that the sustainable development of an enterprise is predicated upon three interconnected dimensions: economic, environmental, and social. These collectively constitute the foundational tenets of the CSR framework. It has been determined that the establishment of socially resilient organisational structures constitutes a crucial component of enterprises' sustainable development strategy. Furthermore, it has been demonstrated that the integration of social priorities into business processes fosters the enhancement of trust among employees, consumers, and investors, alongside the cultivation of long-term competitive advantages. The key outcomes of the present research encompass: the formulation of a socially oriented corporate policy; the enhanced engagement of enterprises in the development of local communities; the provision of equitable opportunities for all demographic groups; adherence to international standards and ethical norms; the integration of environmental stewardship into managerial decisions; the application of the principles of CSR as an internal governance strategy.

It has been established that the application of digital technologies, including big data, IoT, and AI, significantly enhances the efficiency of resource management and optimises the business processes of enterprises. These technologies facilitate real-time monitoring, thereby contributing to cost reduction, the improvement of product quality, and a decrease in environmental impact. Furthermore, it has been observed that digital solutions enable the automation of production processes, the forecasting of demand, the optimisation of logistics, and the reduction of an enterprise's carbon footprint. It has been proven that the integration of circular economy principles facilitates the formation of closed-loop production cycles, the effective management of waste streams, the reuse of materials, and the creation of novel business models. The synergistic combination of digitalisation and circularity ensures the enhanced resilience of enterprises and the development of innovation-oriented production chains.

An analysis of the practical experience of Unilever, Tesla, and IKEA has demonstrated the efficacy of implementing sustainable development strategies. It has been established that these companies successfully execute initiatives pertaining to emissions reduction, the utilisation of renewable energy sources, the recycling of materials, the development of sustainable supply chains, and the assurance of social responsibility. Their operational practices corroborate the advisability of a comprehensive approach to the transformation of business processes in accordance with the principles of sustainable development.

Taking into account the results and conclusions obtained, a promising direction for further studies is the development of adaptive models for planning business processes of enterprises in the context of sustainable development, with consideration given to industry specifics, digital transformation, and the integration of circular economy principles, in particular, to develop a model of scenarios for the transformation of business processes in conditions of environmental uncertainty and social challenges (for instance, pandemics, migration crises, rising energy prices).

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REFERENCES

[1] Addressing climate change with action. (n.d.). Retrieved from https://www.unilever.com/sustainability/climate/.

[2] Adidas. (2023). Retrieved from https://report.adidas-group.com/2023/en/group-management-report-our-company/sustainability/supply-chain.html.

[3] Andriushchenko, K., Buriachenko, A., Rozhko, O., Lavruk, O., Skok, P., Hlushchenko, Y., Muzychka, Y., Slavina, N., Buchynska, O., & Kondarevych, V. (2020). Peculiarities of sustainable development of enterprises in the context of digital transformation. *Entrepreneurship and Sustainability Issues*, 7(3), 2255-2270. doi: 10.9770/JESI.2020.7.3(53).

[4] Apple and global suppliers expand renewable energy to 13.7 gigawatts. (2023). Retrieved from https://images.apple.com/hu/newsroom/2023/04/apple-and-global-suppliers-expand-renewable-energy-to-13-point-7-gigawatts/.

[5] Balanovska, T., Cherednichenko, O., Stepasyuk, L., Yurchenko, O., Dramaretska, K., & Baranovska, O. (2024). Development of human capital in the context of the emerging creative economy. *Economics and Business Management*, 15(4), 161-184. doi: 10.31548/economics/4.2024.161.

[6] Bondarenko, S.M. (2023). Quality management system of business processes on the principles of sustainable development in fashion industry enterprises. *Journal of Strategic Economic Research*, 4(15), 111-118. doi: 10.30857/2786-5398.2023.4.13.
[7] Bondar-Pidhurskaya, O.V., Khomenko, I.I., & Karangwa, C. (2020). The scientific-methodological aspects of assessing the efficiency of innovative enterprise management in the context of achieving sustainable development goals. *Business Inform*, 9, 172-180. doi: 10.32983/2222-4459-2020-9-172-180.
[8] BREEAM. (n.d.). Retrieved from https://breeam.com.
[9] Brychko, A., & Zui, X. (2023). Innovation management of the enterprise in the context of sustainable development. *Financial and Credit Activity Problems of Theory and Practice*, 5(52), 208-221. doi: 10.55643/fcaptp.5.52.2023.4147.
[10] Cherniaieva, A.O., & Metla, V.O. (2024). Strategic management of innovation of business processes of the enterprise. *Business Navigator*, 2(75), 96-99. doi: 10.32782/business-navigator.75-22.
[11] Demchenko, P. (2022). Improvement of the sustainable development management mechanism of the mining and concentration combination taking into account part of the innovation and investment. *State and Regions*, 3(126), 25-33. doi: 10.32782/1814-1161/2022-3-4.
[12] Demianchuk, M., Koval, V., Hordopolov, V., Kozlovtseva, V., & Atstaja, D. (2021). Ensuring sustainable development of enterprises in the conditions of digital transformations. *E3S Web of Conferences*, 280(5), article number 02002. doi: 10.1051/e3sconf/202128002002.
[13] GRI. (n.d.). Retrieved from https://www.globalreporting.org/.
[14] Hölzle, U. (2021). *Four consecutive years of 100% renewable energy-and what's next*. Retrieved from https://salo.li/664d142.
[15] IKEA. (2023). *Sustainability report 2023 FY23*. Retrieved from https://www.ikea.com/global/en/images/IKEA_SUSTAINABILITY_Report_FY_23_20240125_1b190c008f.pdf.
[16] Ingka Group. (2024a). *Ingka group annual summary FY23*. Retrieved from https://www.ingka.com/static/ingka-group-annual-short-summary-fy23.pdf.
[17] Ingka Group. (2024b). *Ingka Investments expands forestland portfolio into Finland and strengthens presence in the Baltics*. Retrieved from https://is.gd/TLTS3U.
[18] Inter IKEA Group. (2023). *Inter IKEA Group financial summary FY23*. Retrieved from https://www.inter.ikea.com/-/media/interikea/igi/financial-reports/inter_ikea_group_financial_summary_fy23_31-102023_.pdf?rev=84585725b85b450f838b465e735f95bd&sc_lang=en.
[19] International Labour Organisation & United Nations Global Compact. (2008). *The labour principles of the United Nations Global Compact: A guide for business*. Retrieved from https://www.ilo.org/resource/training-material/labour-principles-united-nations-global-compact-%E2%80%93-guide-business.
[20] ISO 14001:2015/Amd 1:2024. (2024). *Environmental management systems – requirements with guidance for use*. Retrieved from https://www.iso.org/standard/88209.html.
[21] Kofanov, O.Ye., Zozulov, O.V., & Kofanova, O.V. (2023). Innovativeness and business process planning of startups in the context of green energy transition. *Marketing and Digital Technologies*, 7(3), 95-114. doi: 10.15276/mdt.7.3.2023.7.
[22] Korobka, S.V. (2024). Sustainable development strategy in organisation management. *Electronic, Scientific and Practical Journal*, 16. doi: 10.54929/2786-5738-2024-16-04-06.
[23] LEED certification. (n.d.). Retrieved from https://support.usgbc.org/hc/en-us/p/leed-certification.
[24] Mahajan, R., Kumar, S., Lim, W.M., & Sareen, M. (2024). The role of business and management in driving the sustainable development goals (SDGs): Current insights and future directions from a systematic review. *Business Strategy and the Environment*, 33(5), 4493-4529. doi: 10.1002/bse.3712.
[25] Makovets'ka, I.M., & Yarhin, M.V. (2021). Strategic planning as a basis for sustainable enterprise development. *Public Administration and Digital Practices*, 2(36), 37-40. doi: 10.31673/2415-8089.2021.023944.
[26] Manuilov, O.V. (2024). Formation of a strategy for sustainable development of enterprises under conditions of uncertainty. *Ukrainian Journal of Applied Economics and Technology*, 9(2), 60-64. doi: 10.36887/2415-8453-2024-2-10.
[27] Moroz, O.S. (2021). Social components of the responsibility of business entities in the coordinates of sustainable development. In *Economics, management and administration in the coordinates of sustainable development* (pp. 577-595). Riga: Baltija Publishing. doi: 10.30525/978-9934-26-157-2-31.
[28] Nabais, E., & Franco, M. (2024), Sustainable development practices in small and medium-sized enterprises: Multiple case studies. *International Journal of Organizational Analysis*, 32(10), 2494-2516. doi: 10.1108/IJOA-08-2023-3900.
[29] Nestlé Waters targets positive water impact by regenerating local water cycles. (2021). Retrieved from https://www.nestle.com/media/pressreleases/allpressreleases/nestle-waters-targets-positive-water-impact/.
[30] Nickelsburg, M. (2020). *Microsoft unveils sweeping job training initiative to teach digital skills to 25M impacted by pandemic*. Retrieved from https://www.geekwire.com/2020/microsoft-unveils-sweeping-job-training-initiative-teach-digital-skills-25m-impacted-pandemic.
[31] Office of the Chief Executive, Unilever. (2024). *How we're aiming for greater impact with updated plastic goals*. Retrieved from https://www.unilever.com/news/news-search/2024/how-were-aiming-for-greater-impact-with-updated-plastic-goals.
[32] Office of the United Nations High Commissioner for Human Rights. (2011). *Guiding principles on business and human rights: Implementing the United Nations "Protect, respect and remedy" framework*. Retrieved from https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf.
[33] Our ambition is to deliver resilient and regenerative natural and agricultural ecosystems. (n.d.). Retrieved from https://www.unilver.com/sustainability/nature/.

[34] Plakhotnik, O., & Chernyavs'ka, I. (2020). The mechanism of ensuring sustainable development of Ukraine's industry in an unstable geopolitical situation. *Efektyvna Ekonomika*, 3. doi: 10.32702/2307-2105-2020.3.3.
[35] Rosati, F., Rodrigues, V.P., Cosenz, F., & Li-Ying, J. (2022). Business model innovation for the sustainable development goals. *Business Strategy and the Environment*, 32(6), 3752-3765. doi: 10.1002/bse.3334.
[36] SAP carries out new initiatives ensuring greater workplace inclusion of the neurodivergent community. (2024). Retrieved from https://news.sap.com/uk/2024/10/sap-expands-commitment-to-neurodiversity-awareness.
[37] Segal, M. (2024). *IBM to invest $45 million in climate adaptation-focused social impact program*. Retrieved from https://www.accessnewswire.com/newsroom/en/computers-technology-and-internet/ibm-to-invest-45-million-in-climate-adaptation-focused-social-impa-842633.
[38] Stepanenko, T.O. (2020). Theoretical and methodological principles of sustainable development of the enterprise. *Scientific Notes of Vernadsky TNU. Series: Economics and Management*, 31(70), 6, 136-141. doi: 10.32838/2523-4803/70-6-23.
[39] Sumets, A., Tyrkalo, Y., Popovych, N., Poliakova, J., & Krupin, V. (2022). Modeling of the environmental risk management system of agroholdings considering the sustainable development values. *Agricultural and Resource Economics: International Scientific E-Journal*, 8(4), 244-265. doi: 10.51599/are.2022.08.04.11.
[40] Tesla expands energy storage solutions. (2024). Retrieved from https://quantaintelligence.ai/2024/09/04/technology/tesla-expands-energy-storage-solutions.
[41] Tesla. (n.d.). Retrieved from https://www.tesla.com/megapack/.
[42] Tesla's energy storage solutions: Powering a sustainable future. (n.d.). Retrieved from https://quantaintelligence.ai/2024/09/04/technology/tesla-expands-energy-storage-solutions.
[43] Unilever Nepal. (n.d.). Retrieved from https://www.unilevernepal.com/.
[44] van Zanten, J.A., & van Tulder, R. (2021). Improving companies' impacts on sustainable development: A nexus approach to the SDGS. *Business Strategy and the Environment*, 30(8), 3703-3720. doi: 10.1002/bse.2835.
[45] Water reduction and stewardship. (2025). Retrieved from https://www.coca-colahellenic.com/en/a-more-sustainable-future/mission-2025/water-reduction-and-stewardship.
[46] We're improving the livelihoods of people throughout our global value chain. (n.d.). Retrieved from https://www.unilever.com/sustainability/livelihoods/.

Планування бізнес-процесів підприємства в умовах сталого розвитку

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Анотація. Сучасні виклики вимагають від бізнесу переосмислення своїх бізнес-моделей шляхом інтеграції принципів сталого розвитку в управлінські процеси. Метою дослідження було визначити методи та інструменти, які допоможуть компаніям планувати свою діяльність відповідно до принципів сталого розвитку, а також надати практичні інструменти для їх впровадження. Враховуючи складність та багатогранність предмету дослідження, було застосовано комплексний підхід, який включав наступні методи: аналіз літературних джерел – проведено огляд наукових публікацій та корпоративних стратегій з метою виявлення ключових тенденцій планування бізнес-процесів відповідно до принципів сталого розвитку. Порівняльний аналіз використовувався для вивчення та порівняння основних методів та підходів до планування бізнес-процесів. Метод кейс-стаді застосовано для аналізу практичної реалізації принципів сталого розвитку на прикладах компаній Unilever, Tesla та IKEA. Їхні бізнес-стратегії, екологічні ініціативи та соціальна відповідальність були розглянуті з метою виявлення ефективних підходів до інтеграції сталого розвитку в планування бізнес-процесів. Метод екологічної оцінки використано для розгляду застосування екологічного аудиту, оцінки життєвого циклу продукції, впровадження систем екологічного менеджменту ISO 14001:2015/Amd 1:2024 та принципів циркулярної економіки. Метод систематизації використано для узагальнення ключових аспектів, які в сукупності складають основу концепції корпоративної соціальної відповідальності; узагальнено методи ефективного поєднання економічної, екологічної та соціальної сталості та упорядковано основні підходи до планування бізнес-процесів. Застосовано аналітичний метод для дослідження впливу сталого розвитку на планування бізнес-процесів. Наведені в публікації приклади підходів і стратегій сприяють формуванню довгострокового стратегічного управління, закріпленню екологічних орієнтирів і цінностей, підвищенню конкурентоспроможності бізнесу в сучасних умовах

Ключові слова: інновації; економічна, екологічна та соціальна стійкість; стратегії; корпоративна соціальна відповідальність; цифрові технології

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Human capital mobility in the context of globalisation, technological change and demographic transformations

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Abstract. The relevance of the research is stipulated by the need to study the impact of military actions on the mobility of human capital as a key factor of economic development in the conditions of the transformation period in Ukraine. The purpose of the study was to determine the main trends in the mobility of human capital and identify groups of factors, influencing the movement of labour resources in different economic and social conditions. Methods of comparative analysis, synthesis and systematisation were applied to achieve this goal. A comparative analysis made it possible to identify differences in mobility factors between different regions and countries. The synthesis method made it possible to integrate the obtained data and identify general patterns. Systematisation allowed for structuring the factors, influencing migration processes. In the course of research, it has been discovered that the key trends in the mobility of human capital include digitalisation of labour, the spread of remote work, the growth of international labour migration and the change in the structure of demand for professional skills. It has been found out that the war in Ukraine has significantly transformed migration processes, stimulating the outflow of highly qualified specialists abroad, as well as boosted internal mobility due to the movement of workers to safer regions. It has been proved that the interaction of globalisation, technological and demographic factors significantly affects the scale and nature of human capital mobility. In particular, the development of digital technologies has expanded the possibilities of remote work, which has become an important mechanism for adapting to crisis conditions. Demographic processes, such as population aging and increasing demand for young labour also affect the nature of international mobility. The practical significance of the study is determined by the possibility of using the results to develop strategies for adapting labour market to new conditions, improving mechanisms for regulating migration processes and increasing the efficiency of labour resource management

Keywords: globalisation challenges; labour migration; organisational culture; remote work; socio-economic processes; technological changes

INTRODUCTION

The issue of human capital mobility is relevant: globalisation contributes to the increase of international labour mobility, as companies seek talent in the global labour market and professionals migrate in search of better career opportunities. Rapid technological developments are changing skill requirements, forcing workers to retrain and seek new labour markets. Apart from voluntary migration, many workers are forced to change their profession or work environment due to external circumstances, posed by social and psychological challenges. Crises, including the COVID-19 pandemic and the Russian invasion of Ukraine in 2022, have exposed the vulnerability of global supply chains and migration flows, reinforcing the need to manage labour mobility.

J. Masdonati *et al*. (2022) concluded that forced career changes are accompanied by isolation, uncertainty and the need for adaptation. This is especially true in conditions of military conflicts and economic crises. S. Orie *et*

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al. (2025) pointed out that the scale of career changes depends on professional mobility, access to education and state support, affecting the reintegration of workers into new markets. Ukrainian researchers have studied the mobility of human capital in various aspects. In particular, I. Tomashuk & L. Boltovska (2022) studied the impact of migration processes on the world economy, emphasising the importance of improving the system of international labour migration regulation. V. Blyzniuk & L. Yatsenko (2023) considered labour mobility as a factor of boosting human capital, analysing the main factors influencing its formation and socialisation, as well as the tasks of state policy to support it. A.V. Moisiyakha (2022) focused on the strategic management of human capital in order to form an innovation-oriented economy on the basis of modern challenges that require the application of new approaches to the development and preservation of human capital, in particular among people with special needs.

Yu. Safonov *et al*. (2023) emphasised the importance of human capital development in the context of Industry 4.0 and social challenges caused by digital transformation. They discovered that demographic changes, in particular the growth of migration flows, population aging and the transformation of demographic structure, directly affect the labour market. It necessitates international mobility to balance labour supply and demand. Labour migration plays an important role in the economic development of countries, contributing to economic growth and strengthening social stability. States actively regulate migration processes through relevant legislation and international agreements, which determines the level of human capital mobility.

Special attention should be paid to social aspects of mobility. L. Mandemakers *et al*. (2024) found out that women, migrants, elderly and unskilled workers are less likely to be career mobile due to limited access to new opportunities, which complicates their integration into the labour market. O. Stryzhak & O. Pravdyvets (2022) pointed out that war transforms the labour market, creating challenges for the development of human capital. It reduces the employment rate and boosts labour migration within and across the country, affecting workers' skills and their adaptation to new economic realities. The authors emphasised that martial law accelerates digitalisation and automation, opening up new opportunities for human capital mobility. At the same time, these changes provide for retraining and adaptation of the workforce to maintain labour market efficiency. O. Stryzhak (2022) emphasised the close connection between human capital development and digital technologies as a key factor in the modernisation of society in the context of globalisation and innovation.

The above mentioned suggests that the problem of human capital mobility is relevant and requires an integrated approach from governments, business and the academic community to achieve effective solutions and measures that would take into account the interests of all the parties involved. Thus, the purpose of the article was to identify key trends in human capital mobility and characterise the main groups of factors, influencing the movement of labour resources in the context of socio-economic changes. The scientific novelty is stipulated by the fact that economic, social, political, technological and demographic factors, determining the scale and direction of population mobility, have been identified in the study. A special attention was paid to the analysis of their interaction and impact on labour market dynamics.

MATERIALS AND METHODS

Methods of comparative analysis, synthesis and systematisation have been used to achieve the goal of the study. Their application allowed for a comprehensive assessment of human capital mobility, identification of key factors influencing it, and development of recommendations for its regulation. The collected data contributed to drawing conclusions regarding the main drivers and barriers to labour mobility in Ukraine, as well as outlining areas for improving state regulation in this sphere. The study was carried out in several stages.

1. Collection and analysis of relevant literature, statistical data processing. The analysis of labour migration trends was conducted based on data from World Bank (2023a; 2023b), OECD (2024), M. McAuliffe & L.A. Oucho (2024). Synthesis was used to combine the results of scientific literature analysis, international reports and statistical data, which made it possible to formulate general trends and patterns of human capital mobility. More than 20 scientific articles, monographs and reports of international organisations were examined. This method also made it possible to summarise information about economic, social, political and technological factors, determining the level of population mobility.

2. Comparative analysis of international experience. A comparative analysis was used to study differences in factors of human capital mobility in different countries and regions. In particular, the peculiarities of labour mobility regulation in the European Union countries, Canada and the USA, as well as mechanisms of state support for Ukrainian migrants, were studied. In addition, the analysis contributed to assessing the effectiveness of policies for attracting and retaining highly qualified specialists, as well as comparing strategies for reducing the outflow of personnel in countries with different levels of economic development.

3. Systematisation of the obtained results. Systematisation made it possible to structure the factors, influencing the mobility of human capital into five main groups (economic, social, political, technological and demographic), which were characterised in the course of the study. Each of the above groups was studied in the context of its impact on international and internal labour mobility. The main attention was focused on assessing the significance of economic, social and political factors for labour mobility. The consequences of the war for the mobility of human capital in Ukraine were considered separately, as well as the prospects for the development of remote work as a tool to curb the outflow of personnel. The analysis also covered state policy mechanisms aimed at regulating labour mobility.

RESULTS AND DISCUSSION

Human capital mobility is defined as the ability and willingness to change employment, profession, residence or education to increase competitiveness in the labour market and to meet personal and professional needs. It covers three main areas: geographical, professional and educational mobility. Geographical mobility involves the

movement of workers between different regions or countries. Professional mobility is characterised by a change in the field of activity or career direction. Educational mobility refers to the transfer of degree-seeking students between educational institutions within or outside the country in order to obtain knowledge and qualifications. One of the most important trends has been the deepening of globalisation processes, which has contributed to the opening of borders and simplifying international cooperation. This, in turn, has reduced barriers to workers' movement between countries and made the labour market more integrated at the global level. Easier access to international labour markets has opened up new opportunities for qualified specialists, although at the same time has intensified competition between countries for attracting highly qualified personnel.

The rapid development of information technologies and digitalisation has allowed employees to work remotely, which has significantly broadened their opportunities for professional mobility. V. Melnychuk (2023) study has proved that digitalisation is a determining factor in the change of labour market structure. In particular, the development of digital technologies contributes to the growth of demand for big data specialists, artificial intelligence (AI) and cybersecurity specialists, which, in turn, increases their mobility and competitiveness. The creation of a continuing education system plays an important role, allowing specialists to adapt quickly to rapid changes in the labour market. It has led to a decrease in dependence on the physical location of the employer, which is especially relevant for specialists in the field of IT, marketing, financial services and data analytics.

Demographic changes have played an equally significant role in shaping modern trends in human capital mobility. The population aging in developed countries has led to an increase in demand for young labour, which has encouraged international migration of specialists from less developed regions. The governments of many countries have developed special programs to attract foreign workers, which has contributed to the strengthening of global migration flows. At the same time, growing competition between countries for highly skilled workers stimulates the development of new strategies for attracting them. A study by D. Kaplan *et al*. (2023) has proved that those countries, which introduced rapid employment programs for foreign specialists, demonstrate better results in the field of economic development and innovation.

Educational migration also had a significant impact on the human capital mobility. The number of students studying abroad increased, which both broadened their professional prospects and increased their chances of employment in the countries of study. Many graduates remained to work in the host countries, which affected the structure of national labour markets and created new challenges for donor countries of educational mobility. Moreover, the growing popularity of flexible forms of employment, such as self-employment, temporary work and remote work, contributed to an increase in the level of worker mobility. The opportunity to work on projects for different companies in different countries enabled specialists to change their place of residence more easily, choosing countries with better working conditions and social security.

The spread of AI has played a special role in the transformation of mobility, having a multifaceted impact. The analysis of scientific literature suggests that the development of AI has changed the structure of demand for skills, contributing to the automation of routine and technical tasks (Butelskyi *et al.*, 2024; Kostyk & Tsymbal, 2024). It has led to a decrease in demand for traditional professions, while contributing to an increase in the need for specialists in programming, big data analysis, cybersecurity and AI. At the same time, the modern labour market has required a combination of technical competencies with soft skills, such as project management and effective communication in a globalised environment.

AI has also significantly affected territorial mobility, expanding opportunities for remote work. Specialists have been able to work anywhere in the world without the need for physical migration, which has reduced relocation costs and facilitated adaptation to new working conditions. This aspect has become particularly important in times of crisis, in particular during military conflicts and economic shocks, such as those occurring in Ukraine.

Thus, modern human capital mobility is the result of a complex interaction of globalisation, technology, demographic and socio-economic factors. The identified trends indicate the growing importance of digital technologies, educational mobility and government policies in shaping global labour markets. The obtained results support the findings of previous studies regarding the significant impact of digitalisation, demographic changes and globalisation on labour mobility (Czaika & de Haas, 2018; Falk & Hagsten, 2020). It is worth mentioning that in the post-war period, Ukraine will face unique challenges, as forced migration, a reduction in the number of highly skilled workers and changes in the organisational structure of enterprises call for immediate measures from the state and business (Antoniuk & Zaloznova, 2023; Halushka, 2024). In particular, key strategies may include the implementation of comprehensive migrant reintegration programs, expanding remote work opportunities and creating financial and social incentives for the return of specialists. At the same time, as international experience suggests, long-term results depend on the effectiveness of adaptation mechanisms, in particular the policy of qualifications recognition, the development of educational programs and the integration of new technologies into human resource management processes (Friedman, 2020; Kaplan *et al.*, 2023).

Due to the introduction of AI, the educational process becomes more flexible: AI helps create personalised curricula for retraining or advanced training; universities adapt their programs to attract foreign students, facilitating knowledge exchange. AI stimulates enterprises, provide for the creation of new business models and start-ups support. Although AI opens up new opportunities, it also creates challenges. One of these is the digital divide. Not all countries and regions have equal access to technology and training. AI also displaces unskilled specialists: it replaces physical and repetitive work, leaving some categories of people unemployed. Therefore, the question of ethical and social aspects and the need to regulate the impact of AI arise. It is important to ensure a balance between the introduction of AI and the protection of workers' rights. The

issue of developing adaptability skills becomes relevant, as the mobility of human capital depends on the ability to learn and adapt quickly.

Taking this into account, the development of digital competencies is an important factor in increasing mobility, which allows employees to adapt to changes in the labour market and increases their competitiveness. M. Czaika & H. de Haas (2018) have concluded that more than 70% of employers in high-tech industries prefer candidates with experience in the field of digital transformation and AI. They point out that such specialists have wider opportunities for employment both in their country and abroad, which contributes to their professional mobility. Moreover, the implementation of digital solutions in various sectors of the economy provides for constant improvement of employees' skills, stimulating the development of continuous education and retraining system. Based on current trends, determining the issue of human capital mobility, and relying on the latest statistical data, 5 groups of factors can be identified, the understanding of which will contribute to revealing features of this process: economic, social, political, technological, psychological (Table 1).

Table 1. Characteristics of groups of human capital mobility factors

Groups of factors	Characteristics	Statistical data
Group of economic factors	***Economic growth and development.*** Regions or countries with high economic growth rates often create more opportunities for employment and career advancement. Investment in certain industries or regions can lead to the creation of new jobs and an increased demand for skilled labour	According to the OECD, 50% of international migrants relocate for economic opportunities Salary is the main factor for 70% of employees when choosing a workplace
	Wage levels. High wages in certain regions or industries can encourage workers to relocate for better economic conditions. Differences in wage levels between countries or regions are often the main motivator for international or internal migration	
	Infrastructure and working conditions. Developed infrastructure, including transportation, housing and social services, social guarantees, workplace safety, working conditions and opportunities for professional development can contribute to the attractiveness of certain regions for the workforce	
	Tax policy. High taxes can discourage mobility, while tax exemptions or lower tax rates can attract workers. Government fiscal policies aimed at supporting business and creating jobs also affect mobility	
	Cost of living. The high cost of living in a certain region can deter migration, even if wages are higher there. A low cost of living combined with a reasonable wage level can be attractive to workers	
	Investing in human capital. Regions that invest in education and vocational training can create better conditions for the development and mobility of the workforce. Access to advanced training and retraining programs promotes occupational mobility	
	Housing market. The affordability and cost of housing influence decisions to relocate. High housing prices can discourage migration, while affordable housing can encourage it. Government policies to support affordable housing can promote mobility	
	The opening of new markets and the integration of economies can create new opportunities for employment abroad. Transnational corporations often create jobs in different countries, encouraging international mobility	
Group of social factors	***Social networks and connections.*** Social networks availability and support can facilitate adaptation to a new location. Social connections, family circumstances and cultural characteristics can both encourage and discourage mobility	35% of migrants cite family circumstances as the main reason for relocation 40% of new migrants stress the importance of social networks for their integration
	Education and access to learning opportunities. A high level of education increases competitiveness in the labour market and the willingness to relocate for better opportunities. International and domestic student exchange programs, internships and advanced training courses promote mobility, allowing people to acquire new skills and knowledge	
	Quality of life. The availability of good social infrastructure, such as medical facilities, schools, cultural and entertainment facilities, increases the attractiveness of a region for residence. A high level of public safety is an important factor in the decision to relocate	
	Cultural and value factors. Countries and regions with a high level of tolerance for cultural differences attract migrants, providing comfortable conditions for integration. Societies that highly value education, professional development and self-realisation encourage people to seek new opportunities	
	Demographic factors. Young people are generally more mobile than older generations, so regions with a high proportion of young population have higher mobility. Single people and couples without children are more likely to move than families with children	
	Social programs and immigration policies. Government programs that promote employment, training and relocation can stimulate mobility. Liberal immigration policies and integration programs for immigrants promote international mobility	
	Social justice and equal opportunities. Equal opportunities for all increase overall mobility, allowing people from different social groups to realise their potential. Supporting gender equality promotes women's active participation in the labour market and their mobility	

Table 1, Continued

Groups of factors	Characteristics	Statistical data
Group of political factors	***Security and stability policies.*** A high level of political stability and the absence of conflict encourage the inflow of labour. Policies that ensure the protection of human rights and civil liberties contribute to the creation of attractive living and working conditions. Programs aimed at the integration of migrants, such as language courses, housing support and health insurance, contribute to successful adaptation and increase mobility. Policies that support family reunification allow workers to relocate together with their families, which contributes to stability and mobility	55% of international migrants relocate to countries with high levels of political stability Regulatory policies can either reduce or increase migration levels by 20-30%
	Regulatory policy. Laws and regulations, facilitating or restricting migration, play an important role. Simplifying procedures for obtaining work permits and setting up a business promotes the mobility of workers and entrepreneurs. A high level of transparency and efficiency of state institutions contributes to the trust in the state and promotes mobility	
Group of technological factors	***Technological progress and the development of information and communication technologies.*** Process automation and production robotisation: the introduction of automated systems reduces the need for routine physical labour, allowing workers to focus on more complex and creative tasks. A high level of robotisation in industry can create new jobs that require specialised skills, promoting professional mobility. Improved international transport networks (air, railway, road) facilitate physical mobility of workers. Innovations in logistics and transport reduce time and costs for transporting goods and people. Blockchain technologies provide reliable protection of personal data, which is particularly important for migration and employment abroad. The use of blockchain technologies to store and exchange information about qualifications, diplomas and professional achievements simplifies the recognition of qualifications at the international level	60% of freelancers work remotely due to technology 45% of employees consider the possibility of remote work to be the main advantage when choosing an employer
	Virtual work and distance learning. The development of remote work technologies, such as video conferencing, cloud services and shared workspaces, allows people to work from anywhere in the world, reducing the need for physical mobility. Freelancing platforms such as Upwork, Fiverr and others create opportunities for on-demand work, regardless of geographical location. Such platforms as Coursera, edX and Udemy provide access to courses from leading universities and professionals, which helps to improve skills and adapt to new professions. Regular webinars and trainings provide for new knowledge and skills without the need for physical presence	
	AI and data analytics. Using AI and big data to analyse the labour market helps predict skills and occupation needs, which contributes to advanced training and professional mobility. AI-based systems can recommend jobs, training programs and other opportunities based on individual user profiles	
Group of psychological factors	***Personal traits, sense of belonging, family and social ties.*** Personal characteristics such as readiness for change, level of adaptability and stress tolerance, level of resilience and fear of the unknown affect the propensity to relocate. Support from family and loved ones can greatly facilitate the decision to relocate or change jobs. Obligations to family or friends can limit mobility, especially if they require constant support or care. Strong attachment to a hometown or region can discourage relocation. People who feel a strong cultural or national identity may be less willing to move to another environment with a different culture. High self-esteem and confidence in one's professional skills contribute to readiness for change. Insecurity in one's abilities can inhibit decisions to relocate or change careers	70% of highly adaptable employees integrate more easily into new environments 50% of people change jobs due to a desire for self-realisation
	Motivation, previous experience and psychological support. The desire to achieve career success, professional growth and self-fulfilment encourages people to relocate. The desire to improve their financial situation can be a powerful motivator for changing jobs or moving to another city or country. People who have a positive experience of relocating or changing jobs are more likely to move further. Negative previous experiences can create psychological barriers to future mobility. Access to psychological counselling and support can help people overcome fears and anxieties related to mobility. Participation in support groups or professional networks can contribute to a sense of security and confidence when making decisions about changes	

Source: compiled by the author based on M. Czaika & H. de Haas (2018), M. Falk & E. Hagsten (2020), Freelancer (2021), J. Masdonati *et al*. (2022), World Bank (2023a; 2023b), M. McAuliffe & L.A. Oucho (2024), N. Furxhi & A. Toromëni (2024), OECD (2024), SBE Council (2024), Y. Kostyk & K. Tsymbal (2024), Ya. Butelskyi *et al*. (2024), Z. Megdad & D. Çaglar (2024)

The interaction of the above-mentioned groups of factors creates conditions for the movement of the workforce, influencing decisions to change the workplace or residence (Fig. 2). These groups of factors interact with each other, creating synergies, affecting global labour markets, in particular the level of professional mobility and the adaptation of workers to new conditions.

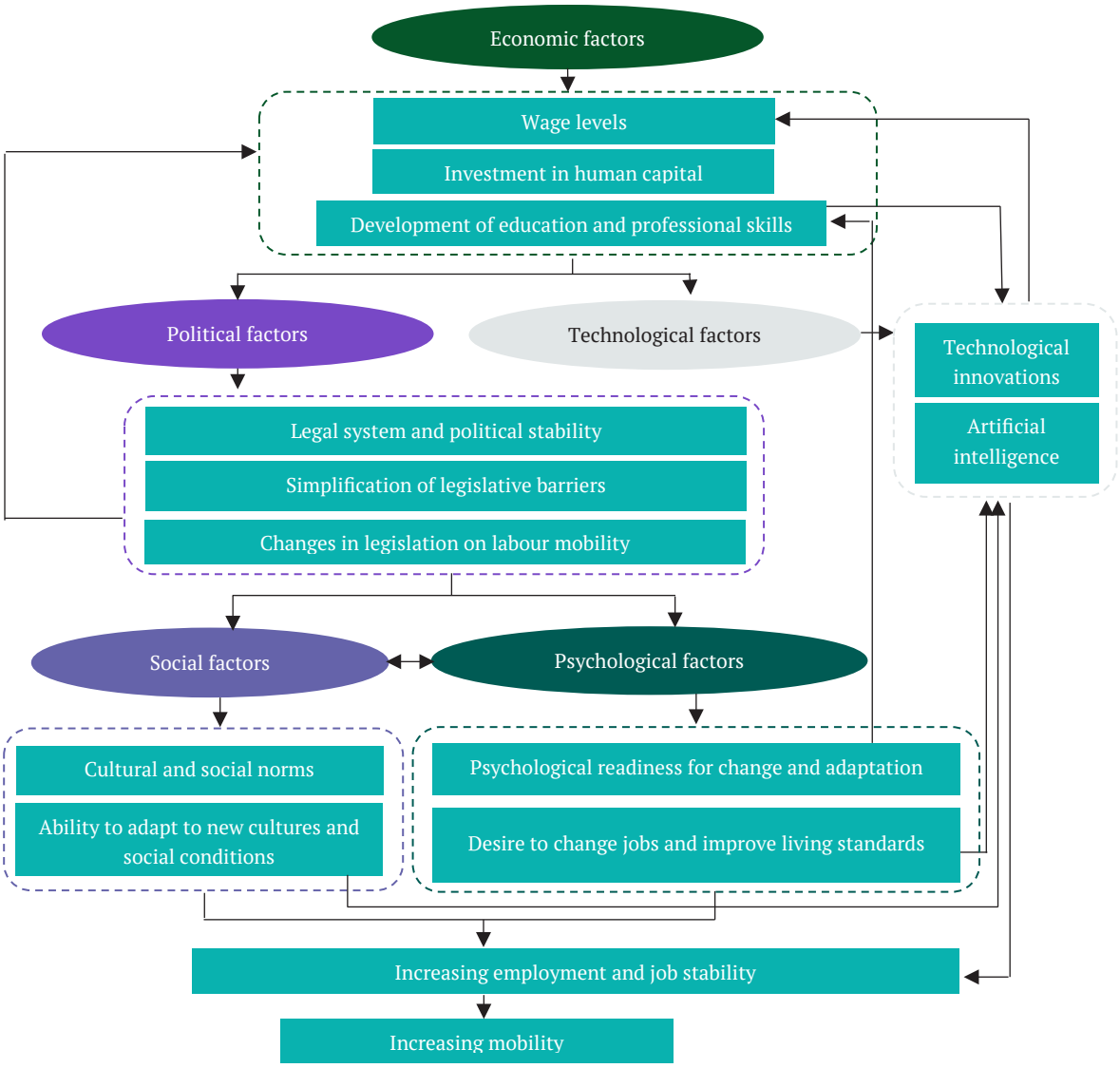

Figure 2. The impact of human capital mobility factors on the global labour market

Source: developed by the authors

The economic group of factors interacts with political and technological ones. High wages in other countries can stimulate the search for work abroad, which, in turn, can affect political (for example, simplifying visa and labour conditions, changes in legislation) and technological factors (the opportunity to work remotely due to the latest technologies and relevant state policies). The group of political factors (legal system and stability), in turn, closely interacts with the group of economic factors. If the political situation in the country is stable, it contributes to the growth of investment in human capital and the development of educational programs, which increases the economic level. A group of technological factors (new technologies, automation) creates new opportunities for psychological factors (e.g., the increase of psychological readiness for change among employees). This allows for the adaptation of workplaces for highly skilled personnel, which contributes to their mobility.

A group of social factors (cultural and social norms) interacts with a group of psychological factors and makes it possible to predict better the behaviour of employees and develop strategies, supporting their mobility. Taking into account personal traits, motives, fears and social connections is key to creating conditions that promote positive decisions regarding mobility. People who are psychologically prepared to change jobs may be more open to moving to countries with different social conditions. Psychological readiness for change, combined with social factors, creates a favourable environment for mobility, where employees strive for professional development and an increase in the standard of living in other countries or regions.

Understanding the synergy of groups of factors, influencing the dynamics of human capital mobility, makes it possible to determine an effective trajectory of measures at the state and regional levels on the return of Ukrainian refugees, as well as the involvement of foreign specialists for the reconstruction of the country. This problem is actively studied by the global scientific community, in particular in the context of the influence of economic, social and political factors on migration processes.

J.N. Friedman (2020) has analysed the impact of state programs on attracting migrants and claimed that

comprehensive social integration measures contribute to both the return of citizens and the attraction of highly qualified specialists from abroad. The scientist has pointed out that states, investing in improving the quality of life, creating competitive working conditions and expanding support for migrants, both reduce the level of emigration and strengthen the domestic labour market by returning qualified labour. An important aspect is the development of adaptation and professional reintegration tools, which contributes to a quick engagement of migrants in the economic processes of the country.

Ukrainian researchers have also studied the issue of labour migrants' return in the context of the country's post-war reconstruction. L. Shymanovska-Dianych *et al*. (2023) and L.M. Shymanovska-Dianych & M.M. Sosyan (2024) have analysed in the works changes in the organisational culture of companies, taking place under the influence of the war, and their impact on human capital management. The scientists have concluded that it is necessary to create flexible adaptation programs for Ukrainians returning from abroad, as well as expand the possibilities of remote work, which can become an important factor in the reintegration of specialists into the Ukrainian labour market.

Significant attention to measures aimed at stimulating migrants' return was paid by D. Kaplan *et al*. (2023), studying the impact of economic inequality on labour mobility. The effectiveness of programs to overcome socio-economic gaps, such as raising wages, affordable housing, financial support for entrepreneurship and infrastructure development have been examined in the work. Researchers' findings prove that these factors determine workers' decisions to return to their country of origin. The literature review has revealed that human capital mobility is an important element of the global economy and its current trends are increasingly dependent on technological progress, digital transformation, and demographic changes (Falk & Hagsten, 2020; Safonov *et al.*, 2023). In particular, digitalisation has opened up new opportunities for remote work, which significantly expands the scope for geographical mobility of workers without the need for physical relocation (Freelancer, 2021).

According to the OECD research (2024), remote work has become a key factor in productivity growth in many sectors. It creates new opportunities for developed countries to retain talented specialists, as well as for developing countries to export intellectual capital without significant migration flows. In addition, the COVID-19 pandemic has significantly accelerated these processes, contributing to the active introduction of flexible forms of employment. According to the research, conducted by the Small Business & Entrepreneurship Council, more than 60% of workers in developed countries want to work in a hybrid format or completely remotely. It opens up new opportunities for developing economies, as specialists can work in the global market without the need to emigrate (SBE Council, 2024).

Foreign scientists' studies prove that human capital mobility is an important factor in the economic development of regions and cities. M. Ruesga (2019) has analysed the key factors, encouraging international mobility of specialists, among which economic, political and social conditions play a special role. The scientist treats migration processes as a mechanism for adapting the labour market to changes in the global economy and emphasises the competition between countries for highly qualified personnel. This study contains data on the impact of labour migration on labour markets of both donor and recipient countries and reveals the role of international programs in regulating these processes.

The work of the Professor of Economics from the University of Missouri, D. Kaplan *et al*. (2023), is devoted to the study of migration, labour mobility and labour market characteristics in developing countries. The researcher has investigated structural changes caused by mass labour migration and focused on such problems as precarious employment of migrants, discrimination in the labour market and limited access to social services in host countries. In particular, the work emphasises the importance of state integration programs that help reduce negative consequences of inequality in access to the labour market. However, the challenges of migrants' social integration remain relevant. The study of L. Mandemakers *et al*. (2024) has proved that about 40% of labour migrants face difficulties in recognising their qualifications, which complicates their adaptation in new labour markets.

J.N. Friedman (2020) has examined the issues of social and economic mobility, in particular the mechanisms, contributing to increasing opportunities for economic growth. Policy measures that affect the movement of labour resources were analysed, in particular the impact of tax policy, small business support programs and access to education on population mobility. Among the author's key findings is the acknowledgement that reducing the tax burden on the middle class, expanding microcredit programs and investing in quality education significantly increase economic mobility, contributing to both domestic and international labour activity. These findings emphasise the importance of targeted government regulation to enhance human capital.

An important role in increasing the mobility of human capital is played by the strategic adaptability of companies, which contributes to the integration of innovations into the personnel management system. Researchers Z. Megdad & D. Çaglar (2024) have pointed out that strategic adaptability significantly strengthens the relationship between human resource management strategies and the innovative development of organisations. This is especially true for developing countries, where enterprises are forced to respond quickly to market changes and adapt personnel policies in accordance with global economic challenges.

Ukrainian researchers also pay considerable attention to transformations in the field of human resource management caused by military actions. In particular, scientists L. Shymanovska-Dianych *et al*. (2023) and L.M. Shymanovska-Dianych & M.M. Sosyan (2024) have analysed changes in the organisational culture of companies, taking place under the influence of war and their impact on human capital management. The study contains specific examples of enterprises adapting to new conditions, in particular, the transition to remote work, introduction of flexible schedules and strengthening of social support programs for employees. The authors also consider psychological aspects of mobility, such as the need to support employees in crisis situations and the adaptation of organisations to changes in the employment structure.

Z. Halushka (2024) has analysed the impact of the war on the main components of the country's human capital. He highlighted the problem of forced labour migration and the reduction of highly qualified specialists in strategically important industries. The author emphasised that without effective state programs for the return and reintegration of Ukrainian specialists, the country's economy may suffer long-term negative consequences. Y. Zaloznova & N. Azmuk (2022) have analysed large-scale direct and indirect losses of the country's labour potential. As a result of forced migration, infrastructure destruction and production reduction, a significant part of qualified personnel either left the country or lost the opportunity for professional activity. At the same time, in the post-war period, human capital will become a key factor in economic recovery and state policy should be aimed at creating incentives for the return of specialists, adapting internally displaced persons to new market conditions and implementing educational programs to increase the competitiveness of labour force.

V. Antoniuk & Yu. Zaloznova (2023) have paid considerable attention to the problems of regional disparities in the formation of human capital, analysing the consequences of economic infrastructure destruction, forced migration and reduction of labour for different regions of Ukraine. The authors have claimed that the personnel shortage could become a serious challenge for the post-war recovery of the country. In this regard, they have concluded that it is necessary to develop regional programs for the development of human capital aimed at restoring the labour market, attracting young specialists and creating conditions for the return of migrants.

The issue of social integration is also an important aspect of labour market recovery. D. Raiko & I. Krolivets (2023) have investigated the process of forming marketing personnel taking into account the peculiarities of the human capital of people with disabilities. In their work, the authors have pointed out the need to develop specialised training programs and adapt such workers to modern market requirements. Their approach emphasises the importance of combining traditional methods of personnel management with marketing strategies, which provides for creating an inclusive environment, promotes social adaptation of employees and increases the competitiveness of organisations.

Modern research covers a wide range of issues related to human capital mobility – from socio-economic to political aspects. Considerable attention is paid to the development of state regulatory mechanisms aimed at stimulating the return of qualified personnel to Ukraine in the post-war period. However, this problem remains open for further research, since human capital mobility is one of the key factors determining macroeconomic stability and prospects for the development of the national economy.

Based on the analysis of scientific literature and research results, a number of measures necessary for the return of Ukrainian refugees and the attraction of foreign specialists can be identified. These include simplifying visa procedures for returning Ukrainians and foreign specialists willing to work in Ukraine; expanding the network of language courses to facilitate the reintegration of returned citizens and the adaptation of foreign workers; simplifying the mechanisms for recognising qualifications, which will reduce barriers to the return of professionals and increase the mobility of human capital. It is also important to develop programs to retain qualified personnel, which provide for improved working conditions, social support and career growth opportunities. Moreover, programs are needed to overcome economic inequality, which will contribute to increasing the standard of living of Ukrainians and reducing the scale of labour emigration.

Some Ukrainians, mostly women with children, have found refuge abroad. Despite social support programs in host countries, many of them face integration challenges, including language barriers, differences in education systems and difficulties finding employment. Ukraine needs to develop return programs aimed at professional reintegration, job creation and improved living conditions to prevent the loss of skilled professionals and support economic recovery. The priority tasks are to modernise health facilities, ensure access to quality education for returning children and create advanced training programs that meet current needs of the labour market. This will ensure decent working conditions and help realise the potential of each individual (UNICEF, 2025). Effective reintegration provides for cooperation with civil society organisations, international funds and government agencies. Special attention should be paid to the psychological rehabilitation of war-affected people and the creation of social programs for internally displaced ones. Effective economic incentives, in particular, affordable housing programs, tax exemptions for entrepreneurs and career development opportunities, are needed to attract Ukrainians back home (World Bank, 2023a; 2023b).

Understanding the nature and peculiarities of human capital mobility will make it possible to tailor better policy strategies that promote economic growth and social well-being. It can stimulate innovation and productivity, facilitate the exchange of knowledge and technology but it can also cause imbalances in the labour market and create social and political challenges. It is important for politicians and business leaders to take into account both positive and negative aspects of human capital mobility when designing development strategies. Thus, modern research proves that human capital mobility is a multifactorial process, which depends on comprehensive political, economic and social measures. The implementation of effective state strategies can significantly affect the processes of re-emigration, contributing to the return of skilled labour and attracting foreign specialists to restore Ukraine.

CONCLUSIONS

Human capital mobility has been analysed as a multidimensional phenomenon shaped by five key factors: economic, social, political, technological and demographic. It has been discovered that the development of digital technologies and the growing popularity of remote work are transforming traditional forms of labour mobility, reducing workers' dependence on geographical location. The analysis of demographic trends has proved that population aging in developed countries is a catalyst for attracting young personnel from developing countries, including Ukraine. Statistical data suggest that over 40% of Ukrainian labour migrants face barriers to recognition of qualifications, which limits their mobility.

The findings also suggest that the most important factors for retaining personnel in wartime in Ukraine are flexible forms of employment, support for the psycho-emotional state of employees and the development of retraining programs. The collected empirical data indicate the need to improve state policy in the field of recognition of foreign experience, as well as create conditions for the return of specialists through tax incentives and investments in labour infrastructure. The experience of multinational companies has shown that corporate training programs, digital platforms for employee integration and corporate social responsibility initiatives are effective tools for mobilising human capital.

In Ukraine, these practices can be adapted to strengthen internal labour mobility, especially in the fields of IT, healthcare and education. The obtained results make it possible to provide a number of practical recommendations for public policy, including the creation of a comprehensive strategy for the return of Ukrainian specialists from abroad, improving mechanisms for the recognition of qualifications and supporting the digital transformation of workplaces. Further research should be aimed at a comparative analysis of mobility regulation models in the EU countries and identifying key factors, contributing to the effective migrants' integration into Ukrainian labour market.

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None.

REFERENCES

[1] Antoniuk, V., & Zaloznova, Yu. (2023). *Human capital in the regions of Ukraine: Problems of reproduction in the conditions of hybrid and full-scale war as a threat to post-war recovery of the country*. Kyiv: Institute of Industrial Economics of National Academy of Sciences of Ukraine.

[2] Blyzniuk, V., & Yatsenko, L. (2023). Labor mobility enhancement as a factor of human capital development. *Economy of Ukraine*, 66(2(735)), 73-95. doi: 10.15407/economyukr.2023.02.073.

[3] Butelskyi, Ya., Burmekha, Yu., Hnatiuk, D., Latyshev, Yu., Melnychuk, V., & Tsybrukh, A. (2024). Key trends of structural transformations of the labor market in connection with the spread of artificial intelligence. *Academic Visions*, 28. doi: 10.5281/zenodo.10554675.

[4] Czaika, M., & de Haas, H. (2018). The globalization of migration: Has the world become more migratory? *International Migration Review*, 48(2), 283-323. doi: 10.1111/imre.12095.

[5] Falk, M., & Hagsten, E. (2020). Technological innovations and labor demand using linked firm-level data. In K. Zimmermann (Ed.), *Handbook of labor, human resources and population economics* (pp. 1-18). Cham: Springer. doi: 10.1007/978-3-319-57365-6_170-1.

[6] Freelancer. (2021). *The future of work*. Retrieved from https://www.my.freelancer.com/articles/future-of-work.

[7] Friedman, J.N. (2020). *Intergenerational mobility around the world*. Retrieved from https://thedocs.worldbank.org/en/doc/7f03f1cdc098bb2d79a325c8e2367fed-0050022023/original/Friedman-World-Bank-ABCDE.pdf.

[8] Furxhi, N., & Toromëni, A. (2024). Youth migration: The role of family. *International Journal of Community and Cooperative Studies*, 12(1), 84-92. doi: 10.37745/ijccs.2014/vol12n18492.

[9] Halushka, Z. (2024). Human capital of the Ukrainian economy: The impact of war and post-war recovery potential. *Herald of Khmelnytskyi National University. Economic Sciences*, 328(2), 100-108. doi: 10.31891/2307-5740-2024-328-15.

[10] Kaplan, D., Rivera, A., & Van der Werf, C. (2023). *A fair chance for migrants in the labor market*. Washington: Inter-American Development Bank. doi: 10.18235/0005198.

[11] Kostyk, Y., & Tsymbal, K. (2024). The impact of artificial intelligence on the labor market. *Economy and Region*, 3(94), 6-12. doi: 10.26906/eir.2024.3(94).3477.

[12] Mandemakers, L., Jaspers, E., & Van der Lippe, T. (2024). Not leaving your unsatisfactory job: Analyzing female, migrant, elderly and lower-educated employees. *Equality, Diversity and Inclusion*, 43(9), 18-38. doi: 10.1108/EDI-07-2023-0223.

[13] Masdonati, J., Frésard, C.É., & Parmentier, M. (2022). Involuntary career changes: A lonesome social experience. *Frontiers in Psychology*, 13, article number 899051. doi: 10.3389/fpsyg.2022.899051.

[14] McAuliffe, M., & Oucho, L.A. (Eds.). (2024). *World migration report 2024*. Geneva: International Organization for Migration.

[15] Megdad, Z., & Çaglar, D. (2024). The mediating role of strategic adaptability on the relationship between human resource management strategies and innovation. *Sustainability*, 16(20), article number 8729. doi: 10.3390/su16208729.

[16] Melnychuk, V. (2023). The role of human capital in the digital economic environment. In *Business, innovation, management: Problems and prospects collection of abstracts of the IV international scientific and practical conference* (pp. 46-47). Kyiv: Igor Sikorsky Kyiv Polytechnic Institute.

[17] Moisiyakha, A.V. (2022). State management of human capital development in the post-war period. *Scientific Notes of the V.I. Vernadsky Tavrichesky National University. Series: Public Management and Administration*, 33(72(4)), 52-57. doi: 10.32782/TNU-2663-6468/2022.4/09.

[18] OECD. (2024). *International migration outlook*. Paris: OECD Publishing.

[19] Orie, S., Peeters, E.R., & Semeijn, J.H. (2025). Disentangling career change magnitude through expert analysis. *Journal of Career Development*, 52(3), 336-353. doi: 10.1177/08948453251319028.

[20] Raiko, D., & Krolivets, I. (2023). Features of the formation of marketing staff regarding the human capital of persons with special needs in the personnel management system. *Efektyvna Ekonomika*, 8. doi: 10.32702/2307-2105.2023.8.5.

[21] Safonov, Yu., Stangret, A., Olyanyshen, T., & Bahinskyi, D. (2023). Industry 4.0: Human capital development and social challenges. *Investytsiyi: Praktyka ta Dosvid*, 9, 12-21. doi: 10.32702/2306-6814.2023.9.12.
[22] SBE Council. (2024). *Gallup: Employee views and preferences on remote work*. Retrieved from https://sbecouncil.org/2024/12/17/gallup-employee-views-and-preferences-on-remote-work.
[23] Shymanovska-Dianych, L., Pedchenko, N., & Lozova, O. (2023). Changes in the organizational culture of companies in the conditions of war: Experience and priorities of multinational and Ukrainian companies in matters of human capital management. *Scientific Bulletin of Poltava University of Economics and Trade. A Series of "Economic Sciences"*, 2(108), 97-102. doi: 10.37734/2409-6873-2023-2-13.
[24] Shymanovska-Dianych, L.M., & Sosyan, M.M. (2024). Management of strategic changes by domestic enterprises during the war and in the post-war period. *Economics: Time Realities*, 6(76), 126-134. doi: 10.15276/ETR.06.2024.13.
[25] Stryzhak, O. (2022). Features of the relationship between human capital development and digital technologies in the context of society 5.0 formation. *Agricultural and Resource Economics: International Scientific E-Journal*, 8(3), 224-243. doi: 10.51599/are.2022.08.03.11.
[26] Stryzhak, O., & Pravdyvets, O. (2022). Human capital of Ukraine under martial law. *Finance of Ukraine*, 12, 112-129. doi: 10.33763/finukr2022.12.111.
[27] Tomashuk, I., & Boltovska, L. (2022). Migration processes in the context of globalization of the world economy. *Economy and Society*, 40. doi: 10.32782/2524-0072/2022-40-50.
[28] UNICEF. (2025). *Three years of full-scale war for Ukraine's children*. Retrieved from https://www.unicef.org/eca/stories/three-years-full-scale-war-ukraines-children.
[29] World Bank. (2023a). *Global migration in the 21st century: Navigating the impact of climate change, conflict, and demographic shifts*. Retrieved from https://www.worldbank.org/en/news/feature/2023/12/11/global-migration-in-the-21st-century-navigating-the-impact-of-climate-change-conflict-and-demographic-shifts.
[30] World Bank. (2023b). *Updated Ukraine recovery and reconstruction needs assessment*. Retrieved from https://www.worldbank.org/en/news/press-release/2023/03/23/updated-ukraine-recovery-and-reconstruction-needs-assessment.
[31] Zaloznova, Y., & Azmuk, N. (2022). Human capital of Ukraine in the conditions of war: Losses and gains. *Economy and Society*, 38. doi: 10.32782/2524-0072/2022-38-59.

Мобільність людського капіталу в умовах глобалізації, технологічних змін та демографічних трансформацій

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Анотація. Актуальність теми зумовлена необхідністю дослідження впливу військових подій на мобільність людського капіталу як ключового чинника економічного розвитку в умовах трансформаційного періоду в Україні. Метою дослідження було визначити основні тенденції мобільності людського капіталу та ідентифікувати групи факторів, які впливають на переміщення трудових ресурсів у різних економічних і соціальних умовах. Для досягнення цієї мети були застосовані методи порівняльного аналізу, синтезу та систематизації. Порівняльний аналіз дозволив виявити відмінності у факторах мобільності між різними регіонами та країнами. Метод синтезу дав змогу інтегрувати отримані дані та виявити загальні закономірності. Систематизація дозволила структурувати фактори, що мали вплив на міграційні процеси. У результаті дослідження було встановлено, що ключовими тенденціями мобільності людського капіталу стали: цифровізація праці, поширення віддаленої зайнятості, зростання міжнародної трудової міграції та зміна структури попиту на професійні навички. Виявлено, що війна в Україні значно трансформувала міграційні процеси, стимулюючи відтік висококваліфікованих фахівців за кордон, а також активізувала внутрішню мобільність через переміщення працівників до безпечніших регіонів. Підтверджено, що взаємодія глобалізаційних, технологічних та демографічних факторів суттєво впливає на масштаби та характер мобільності людського капіталу. Зокрема, розвиток цифрових технологій розширив можливості дистанційної роботи, що стало важливим механізмом адаптації до кризових умов. Демографічні процеси, такі як старіння населення та зростання попиту на молоді трудові ресурси, також визначають характер міжнародної мобільності. Практична цінність дослідження полягає в можливості використання результатів для розробки стратегій адаптації ринку праці до нових умов, удосконалення механізмів регулювання міграційних процесів і підвищення ефективності управління трудовими ресурсами

Ключові слова: глобалізаційні виклики; технологічні зміни; соціально-економічні процеси; трудова міграція; віддалена зайнятість; організаційна культура

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Optimisation of business processes of an international IT company in the context of digitalisation

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Abstract. Digital technologies are becoming increasingly important in all areas of business, causing irreversible changes in the management of companies to improve their financial and economic performance, increase flexibility and competitiveness in the market. The use of powerful software, hardware and digital tools creates a company's competitive advantage in the international market, while the intensification of competition and the widespread use of information and communication technologies have created opportunities to improve business processes to ensure efficient operations. The study aimed to determine the development of digitalisation of business processes in the context of the formation of a modern mechanism for managing business processes of international IT companies and to generalise the directions of their optimisation in the digital space. General scientific and special research methods were

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used in the study: deduction and induction, analysis and synthesis, abstraction, generalisation, methods of statistical and economic analysis, systematisation, comparison and analysis, systemic and functional analysis. The status of digitalisation of business processes of international IT companies was analysed by determining the interaction between business processes at the organisational level and addressing the hierarchy of business processes of an economic entity. The study highlighted the components of the IT company's digitalisation process, which optimises the available resource potential, work time and improves the efficiency of business processes, thereby increasing the effectiveness of economic activity. A model of optimisation of business processes of an IT company in the context of international activity is formed using the method of functional modelling of the architecture of integrated information systems. The stages of optimising an IT company's business processes are formed, which can be used to find solutions to improve business operations and are manifested in the quantity and quality of services, cost and reliability of IT services, launching new services on the market or creating optimal conditions for the rapid implementation of new services. The practical value is determined by the proposed recommendations for creating optimal business processes in the context of international activities, which will increase the efficiency of the IT business

Keywords: IT enterprises; digitalisation of business processes; benefits of optimisation; reengineering; architecture of integrated information systems; international activities; information and computer technologies

INTRODUCTION

Since the beginning of the Fourth Industrial Revolution (since the mid-2010s), organisations have increasingly recognised the importance of effective management due to increased global competition, shorter product lifecycles and the need for comprehensive data analysis to make informed decisions. The growing dependence on technology has made corporate information systems key tools for processing large amounts of data, automating routine tasks and improving the efficiency of business processes. This, in turn, increases the load on the information system, increases the need for its continuous improvement and gradually affects its quality. Without the use of performance analysis, it becomes almost impossible to ensure effective management of business processes. This means that IT enterprises must not only monitor these changes but also constantly adapt their approaches and apply the analysis data to improve their operations and ensure their efficiency.

In this context, business process management (BPM), defined as "the management of the (re)design of individual business processes and the development of fundamental BPM capabilities in companies operating in different environments and with different goals", is central. It facilitates the integration of information systems with the organisation's business processes, which increases operational efficiency and adapts to market changes more quickly. Gaining new opportunities to optimise business processes and increase efficiency requires companies to be prudent, strategically planned and ready for change. These issues were discussed and considered by leading scholars and management practitioners. A. Baiyere *et al*. (2020) addressed the dominant logic of BPM by proposing new logics, which the authors conceptualise as lightweight sensing processes, infrastructure flexibility, and attentive agents.

R. Bouncken *et al*. (2021) investigated the key concepts related to business model digitalisation; the authors developed a conceptual matrix for portfolio considerations of a firm's business model digitalisation. The study systematised information on how leading companies plan and implement digital transformation (DT). These proposed roadmaps for the successful implementation of digitalisation, systematised organisational capabilities and the impact of DT on company performance. F. Wiesböck *et al*. (2020) investigated the role of IT capabilities (IT-C) in the specific context of digital product and service innovation. The study addressed the impact of on the performance of innovative digital products and services (DPI), which have different characteristics compared to traditional innovations. The study hypothesised that IT-C influences DPI both directly and indirectly through the development of internal organisational capabilities, in particular, the firm's DPI capabilities (DPI-C). To test this hypothesis, they use structural equation modelling based on survey data from DPI projects in Germany, Austria, and Switzerland.

The study by R. Teubner & J. Stockhinger (2020) on digital tools, such as social, mobile, analytical and cloud technologies (SMAC), which stimulate digitalisation, is notable. J. Aström *et al*. (2022) proved that digital tools significantly transform the organisational mechanisms of firms, changing the way they create, deliver and capture value. Due to its reprogrammability, imperceptibility, and simplicity, digital infrastructure reduces business dependence on physical locations, facilitating both the decentralisation of knowledge-intensive processes and the concentration of routine functions. The study also demonstrated that digital technologies increase the adaptability and resilience of companies to crises. According to Y.E. Chan *et al*. (2022), social media provides a firm with market visibility and establishes connections with its stakeholders; mobile networks also connect different actors in the business ecosystem and offer learning and continuous access to information anytime and anywhere. The cloud provides accessibility, storage and appropriate exchange of information, workflow monitoring and remote collaboration. Analytics facilitates understanding of business and customer needs, identifying opportunities and market trends, as well as recommending and delivering services and personalised communications.

The Ukrainian scientific discourse mainly studies the impact of DT on the business processes of international companies. The dissertation study by A.I. Papinko (2024) examined the specific principles of IT companies at different stages of business processes based on the development of information aspects of decision theory. The economic security management is disclosed, indicators are identified that can be used for assessing the effectiveness of business processes of IT enterprises, identifying possible problems and risks associated with economic security, and the performance indicators of business processes in IT companies in the context of risk management are investigated.

The ways and methods of creating information about the company's activities by business processes in management accounting have been improved, and recommendations for analysing business processes in IT companies have been provided. A.S. Zaverbnyj & Y.O. Sharovskii (2024) analysed the challenges and prospects of using innovative tools to optimise business processes of enterprises in the context of European integration and proposed a scheme for a phased process of reengineering business processes of enterprises based on an innovative approach in the context of European integration. V. Dergachova *et al*. (2021) analysed the organisation of business processes at enterprises in the context of digitalisation, considers various aspects of the perception of the process and presents the components of the digitalisation of enterprise business processes, which consist of certain procedures and areas of implementation, provides a logical and structural diagram of the technology for organising business processes.

The literature analysis indicates that there are controversial approaches to the interpretation of DT and its consequences at the micro and macro levels. Most of the studies reviewed summarise the practical experience of companies and digitalisation, examine its impact on the company's competitiveness, and systematise the importance of the human factor. However, the issues of generalising recommendations for optimising the business processes of international IT companies to overcome the challenges of DT remain unresolved. The purpose of the article was to identify trends in the development of digitalisation of business processes in the context of forming an effective mechanism for managing the activities of international IT companies, and to systematise the main factors that optimise processes in the context of DT.

MATERIALS AND METHODS

To achieve this goal, a combination of general scientific and special research methods was used: deduction and induction, analysis and synthesis, to determine the impact of modern digital technologies that significantly change business processes and ways of doing business. The study of theoretical sources on the practical experience of DT in IT companies identified the key elements of the digitalisation process and analysed its impact on the transformation of business processes by means of theoretical generalisation. The study, using the method of abstraction, addressed digitalisation as a general transformation process aimed to transfer activities, operations and interactions to a digital environment of solutions and changing organisational culture without reference to specific technologies or industries. The use of statistical and economic analysis methods in the study of the preconditions, scope, characteristics of the environment and factors of digitalisation and their impact on the business processes of international IT companies identified key trends in DT, assessed its dynamics and determined the relationship between the level of digitalisation and operational efficiency. The method was also used to identify the factors that influence the speed and scale of digital solutions implementation, as well as assess their impact on the competitiveness of companies in the global environment.

Systematisation methods were used to determine the hierarchical structure of business processes of an IT company and to develop a structural and logical scheme of organisation of business processes of an IT company based on digitalisation, as well as to provide recommendations for their further implementation to integrate digital solutions into the organisational structure of companies, radically changing the principles of their work by creating new business processes, customer interaction and organisational culture. The methods of comparison and analysis were used to identify the benefits of optimising business processes for the international activities of an IT company. The system-structural and functional approaches were used to build a model for optimising the business processes of an IT company in the context of international activities using the ARIS functional modelling method.

In the context of modern IT process management, considerable attention was paid to the process approach, which ensures consistent organisation of operations and result orientation. The methodological basis of the study was the ITIL/ITSM model, which, within the process approach, interprets a process as a sequence of interrelated operations aimed at achieving certain results. This approach can effectively structure the activities of IT departments, optimise the interaction between the functional elements of the organisation and ensure the quality of IT services following the business needs. The generalisation method was also used to formulate the research results. Using inductive and deductive methods, the conclusions were substantiated and proposals for further research were made. The abstract and logical method was also used in writing the conclusions and recommendations of the study. The information base for the study was formed by the works of researchers in the field of information technology, public information and specialised scientific research on the problems of modern trends in the development of the digital society, as well as on the optimisation of business processes in the implementation of digital technologies in the activities of international IT companies.

RESULTS AND DISCUSSION

The digitalisation process involves the use of modern information technologies to transfer a company's business processes into a digital environment. The simplest business processes, such as organising various events via video communication (meetings, conferences, seminars, personal interviews); consulting and customer support via online channels (for text messaging); using virtual and augmented reality to advertise products, promote services and company activities via a website, and demonstrate all the company's advantages to investors, partners and customers, are already present in many international IT companies.

The use of modern information and communication technologies in the organisation of business processes, as well as the introduction of digital management tools, contributes to the efficiency of enterprises. Digitalisation helps to eliminate excessive bureaucratisation of internal business process procedures, which ensures prompt management decision-making and flexibility in responding to changes in the external environment. At the same time, there has been a significant reduction in the time spent on core business processes and optimisation of the organisational structure by reducing the number of staff and management levels.

DT also enables the transition from traditional paper-based document management to cloud-based electronic systems, which significantly improves access to information and speeds up its processing. This process can be used to accelerate response to customer requests, which has a positive impact on customer satisfaction and builds sustainable customer loyalty. In addition, the shift to digital communication channels has resulted in a reduction in marketing costs, as cost-effective platforms such as social media and messengers (Facebook, Instagram, Telegram, etc.) are used instead of traditional advertising. A significant factor in increasing the transparency and accountability of management decisions is the introduction of automated reporting and control systems, which minimise time and labour resources while maintaining a high level of analytical accuracy at all stages of business processes.

The digitalisation of business processes involves the use of digital tools during a company's business activities. At the same time, a preliminary assessment of the company's existing information system is required to identify procedures and processes that need to be automated or digitised. An essential aspect of this process is to determine the interaction between business processes at the organisational level and to consider the hierarchy of business processes of the entity. The hierarchical structure of an IT company's business process is shown in Figure 1.

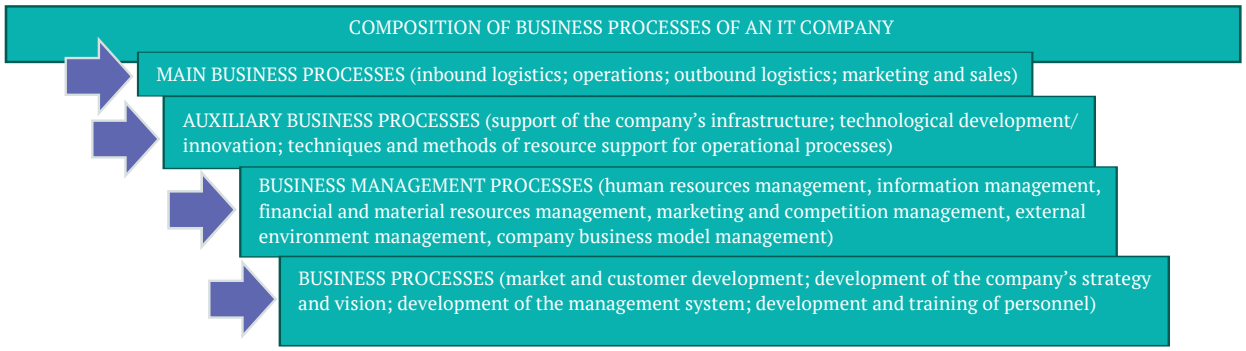

Figure 1. Hierarchical structure of IT company business processes

Source: compiled by the authors

The DT of the main business processes (digital work) that support the operational activities of IT companies is implemented through the introduction of a number of technological solutions. In particular, the key role is the information and communication technologies that ensure unified interaction between participants in business processes regardless of their geographical location, including video and audio communication tools (Zoom, Viber, Telegram, Skype, WhatsApp). An important component is the use of specialised business management software, such as BAS, BAS ERP, Bitrix24, which can be used to integrate planning, accounting and analysis functions. The effective functioning of the digital environment is also ensured using electronic data interchange (EDI), which accelerates the exchange of information between internal and external business entities. In addition, leading companies are implementing tools for processing large amounts of data, including big data technologies, which enable analytical market monitoring. Equally important are cloud computing and fog computing, which optimise data storage and access, as well as intelligent digital solutions, including machine learning and hybrid technologies, which increase the adaptability and flexibility of management processes (Zaverbnyj & Sharovskii, 2024).

The introduction of information technology into the organisation of business processes is based on electronic document management and the transformation of information resources (data) into tools for achieving business goals. The goal of digitalising an IT company's business processes is to optimise the available resource potential, working time and increase the efficiency of business processes, thereby improving the effectiveness of business activities. The modern procedure for organising business processes includes several key components that ensure its effectiveness in the context of DT. It includes the digitalisation of operational stages of activities, which enables automation of routine processes and increases the speed of information processing. An important component is to ensure continuous monitoring of the work performed and the quality of the final product, which helps increase the level of responsibility and standards in the company's internal environment. Effective interaction with staff and customers is realised through a well-established communication system based on digital channels and supported by the continuous development of feedback mechanisms between all participants in business processes. The logistics component is key in the structure of the procedure, as it plays an important role in the timely supply of inputs and delivery of finished products. Furthermore, the digitalisation of certain elements of the value creation process, including the modernisation of production approaches through the integration of information technology into the processes of using, processing and storing databases, acts as a catalyst for increasing the productivity and competitiveness of companies in the global market (Fig. 2). Digital document management tools provide easier and faster access to the necessary documents on demand; they can be used to store large amounts of information, which, after careful analysis, can be used for planning, organisation and control business processes in the future. Digital tools for collecting and analysing information are often part of the implementation of digital workplace programmes, providing managers with

information about the activities of their business units. Not only is this information available for evaluation and analysis at any time and on demand in a user-friendly format, but it is also stored for the required period and can be analysed effectively. These tools reduce the need for management intervention in the internal affairs of the unit, as interactive employee performance monitoring systems provide IT companies with a certain degree of automation. According to I.V. Orlov (2024), these tools provide a powerful information base for planning and organisational design processes.

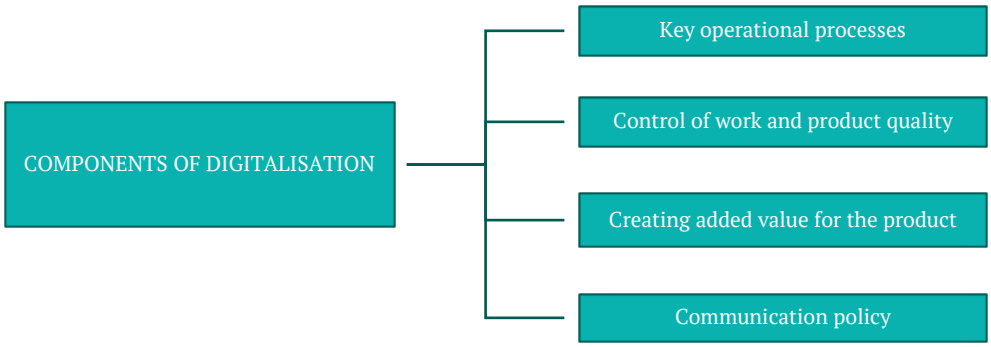

Figure 2. Components of the IT company digitalisation process

Source: compiled by the authors

The dashboard is becoming an effective tool for managers to track the dynamics of the company's economic performance. Aggregated data on the main areas of work provides a comprehensive view of the company's activities and respond quickly to negative changes in performance. Digitalisation of business processes in the digital environment offers many benefits, including economic predictability for companies, timely response to employee signals, automated time tracking processes, etc. The goal of digitalising business processes is to make them simpler and more flexible. A diagram of the logical structure of an IT company's business processes based on digitalisation is shown in Figure 3.

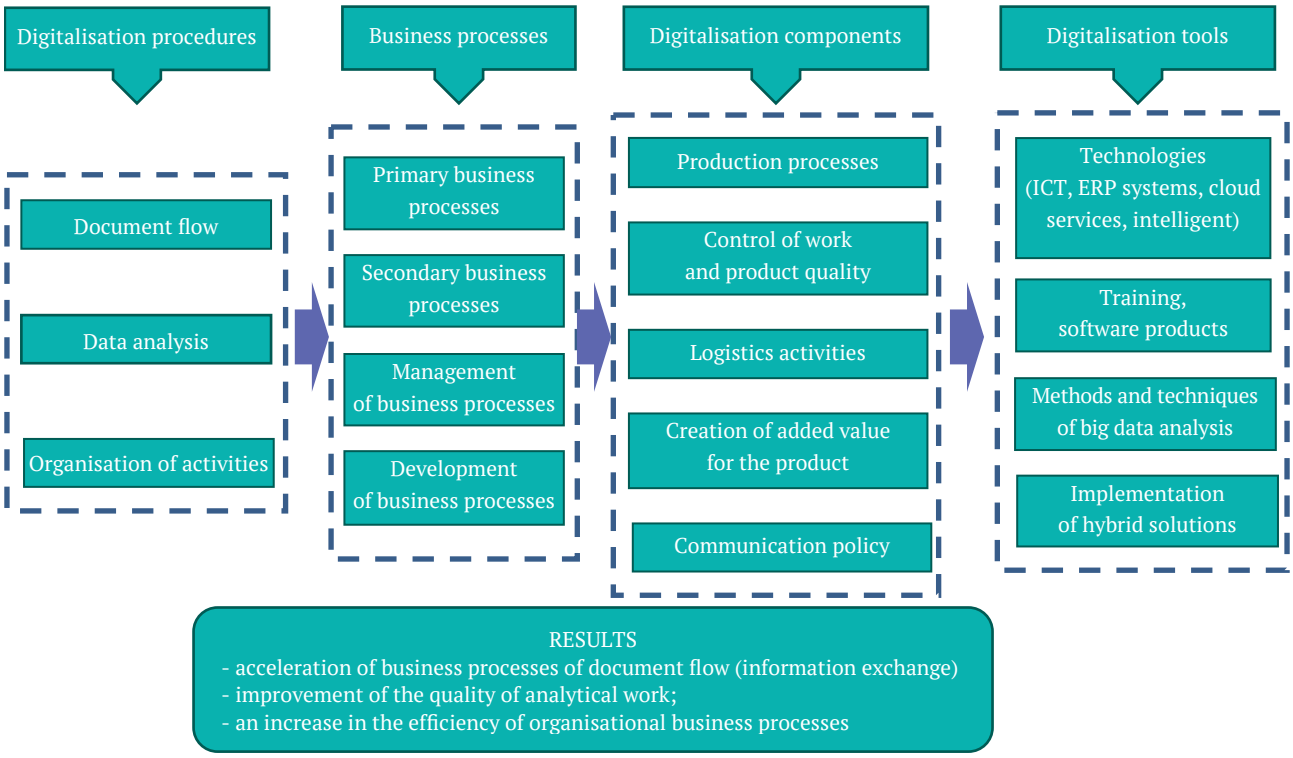

Figure 3. A structural and logical diagram of the organisation of the IT company's business processes based on digitalisation

Source: compiled by the authors

Figure 3 shows that the company has important technologies to organise business processes on favourable terms, including fast access to the company's digital database of digitalisation. With the help of information about business clients, types of economic activity, available resources and the potential of predictive modelling

to use such data correctly, the company forecasts trends and responds to international market challenges as quickly and accurately as possible. According to W.W. Baber *et al*. (2019), digital business models evolve as entrepreneurs move to new digital platforms, and this evolution is linked to the logic of effect and cause and effect. This proposed a digital business transformation framework that facilitates the successful implementation of new digital solutions.

The digitalisation of an IT company leads to changes in the external (in terms of interaction with government agencies and contractors) and internal (in terms of business processes covering the management area) environment. That is, IT companies are affected by digitalisation from two sides. On the one hand, in the course of business activities in the context of growing demand for their products and services, and on the other hand, in the organisation of core business processes in these companies, which determines the sequence of employees' work, information processing, organisation of auxiliary business processes, etc. The active introduction of digital technologies in all spheres of life and economic sectors increased the number of orders for software development, implementation and/or other additional services in this area.

Effective project management business processes are carried out by a project manager (PM), who is responsible for the "project triangle" of lead time, budget, and scope (scope). The life cycle of a "classic" project includes the phases of initiation, planning, execution, closure, and handover to the client. The responsibilities of a PM in outsourcing and product companies are the same: responsibility to the business, collaborating with the team to execute and complete the project on time, within a certain budget and the specified scope without changing the quality. Different projects of IT companies have different implementation durations. Sometimes clients ask to develop a feature, a small application, or a company website. Such projects can last for weeks or months, and the company delivers the finished product to the client without further support. Some of these have been in development for several years.

Working with digital project management tools, including JIRA, analytical metrics, and other project tools, takes time. In the process of project management, Atlassian JIRA is usually used, a bug tracking system designed to organise communication with users, available in two versions: Cloud and Server. JIRA currently includes three projects: JIRA Software (for developers), JIRA Service Desk (project support), and JIRA Core (project management). JIRA is currently one of the most popular project management systems for IT companies. Adapted to work with JIRA and other Atlassian software products, including Bamboo, Clover, Crowd, Crucible, and Fisheye, is Confluence, which is part of an integrated collaboration platform (used as a project wiki to store access, project documentation, descriptions, etc). Project data is usually stored on Google Drive, a data storage service owned by Google Inc. that stores relevant information on servers in the cloud and shares it with other users online.

Efficient organisation of accounting, incorporating methods of optimising business processes for more efficient and high-quality information support for managing the activities of an IT company, is relevant. Accounting is usually done with the help of modern software. According to N.L. Shyshkova (2019), well-established centralised IT process management systems ensure a high level of productive activity of IT company employees. Large IT companies with in-house accounting or accounting departments should prefer integrated business process automation solutions using modern ERP systems. Medium-sized IT companies can employ both options for modifying a standardised ERP system to meet individual requests, IaaS solutions, PaaS solutions that require software maintenance by in-house programmers, and options for purchasing a licensed ERP system with further installation, software support and administration, or a cloud-based SaaS solution (Kurhan, 2020).

O. Petruk & I. Hrabchuk (2021) conducted a thorough study of the peculiarities of accounting in IT companies in the context of digitalisation. They substantiated the feasibility of outsourcing accounting functions, emphasising its economic and organisational benefits for IT companies at the current stage of development. The study also revealed an approach to the selection of accounting software, incorporating the specifics of the outsourcing model. The researchers conducted a critical analysis of scientific sources and covering the peculiarities of the functioning of IT companies, which supplements the list of key issues that an enterprise should consider when choosing accounting software. These formulated criteria are of practical importance in the management decision-making process. In addition, as part of an integrated approach to automating business processes in IT companies, the study helped to identify appropriate options for implementing ERP systems depending on the needs and scale of the company's operations. The researchers identified four models of cooperation between outsourcers and customer companies based on the introduction of information and computer technologies: providing data through special services; import/export of data from the customer company's software products; "remote workplace"; and accounting in cloud services. According to O.I. Malyshkin (2020), the latter model is the most appropriate for IT companies, given the specifics of their activities. Cloud services are suitable for IT companies that keep records through outsourcing and in-house accountants. However, it is the conditions for the adoption of SaaS, DaaS and IaaS models that achieve the effect of computerised processing of basic documents, which renders accounting services more innovative.

The market of accounting and reporting software is represented by Ukrainian and American, German and Polish products in different price categories and with different functions. When choosing accounting software for IT companies, incorporating the needs for information provision and functionality, it is recommended to consider the following issues when choosing accounting software: whether the software has a cloud version; whether there are tools for generating reports based on user-defined sections; whether it is possible to modify the software in-house; and which applications/software it integrates with. Selection of a specific accounting software product is a difficult task for IT managers who are interested in reviewing and using reporting tools independently, and in consolidating management processes and IT services. This software product contains the reports most needed by managers in the form

of tables and diagrams. Thus, in the context of outsourced accounting, access to the information base is agreed upon with the head of the IT company.

The specifics of working in IT companies require constant monitoring of employees' working hours, as this indicator affects the cost of IT projects. For this purpose, time trackers are used in companies that work remotely and need to monitor their employees. R. Bacho & G. Loskorikh (2024) noted that the described digital tools can: increase work efficiency several times; demonstrate the real time spent, which explains the increase in time spent compared to the planned indicators; ensure transparent reporting to the clients of the IT company on the incurred resource costs and the actual justification of the cost of specific IT projects.

Analysing all the activities of an IT enterprise, international standards for typical methods of managing software development, including its projects, such as DSTU ISO 9000:2015 (2015), ISO/IEC/IEEE 12207:2017 (2017), ISO/IEC TS 33061:2021 (2021), should be addressed. Despite significant progress in the digitalisation of IT companies, there are still unresolved problems, including: high initial costs of operating information systems, relatively high transaction and transformation costs associated with the transition of companies to digital technologies; shortage of highly qualified specialists with experience in Western companies; lack of necessary unified standards, technical regulations and relevant legislation to regulate interaction between industry participants.

Analysing the aforementioned issues, it is worth noting that digitalisation does not always increase company profits. To avoid the negative consequences of the digitalisation process, it is necessary to balance all risks by determining the expected results of digitalisation and comparing them with the costs of implementation. Sometimes, the implementation of new processes is difficult, as established business processes can lose their advantages when moving to a digital environment, which can lead to errors and often changes in the company's operations. A tool to overcome this problem is a detailed analysis of each specific situation and an understanding of what problems rapid changes in business processes can cause during digitalisation.

The problem of information leakage arises when the introduction of digital technologies may have insufficiently developed systems and increase the risk of information leakage, especially in the area of personal data storage and processing of confidential information. The cost of implementing digitalisation is often high due to the need to ensure an adequate level of security. It is important to objectively weigh up these additional risks and their possible consequences, which may cause direct and indirect damage to the image of the business, its customers and counterparties. Another problem is the impossibility of digitising some business processes, when there are operations that necessarily require the presence of a person and the availability of conventional rather than electronic documents. Thus, digitalisation leads to significant changes in the activities of IT companies, on the one hand, stimulating the development of their activities (in terms of developing digital products), and on the other hand, requiring the introduction of modern digital technologies in their management activities.

Optimisation of business processes of an international IT company is one of the conditions for successful sustainable development, and the relevant decision is made by the owners in order to identify, analyse and improve existing business processes in the company. In the process of optimising BPM, IT companies use a variety of digital tools to ensure the efficiency of the company itself, realise its future potential, increase profits, improve productivity, reduce costs and improve the quality of products and services to meet customer needs. Business process optimisation is a set of interrelated management, organisational and information measures, unified by a certain technology, aimed at improving the parameters of individual processes and the overall performance of the company to meet the needs and expectations of stakeholders. Business process optimisation means the gradual development and implementation of a new method of company management using economic and mathematical modelling of business processes to adapt it to changes in the internal and external environment, international market requirements, as well as to expand operations and achieve higher performance indicators. The technology of business process optimisation must comply with certain principles (Fig. 4).

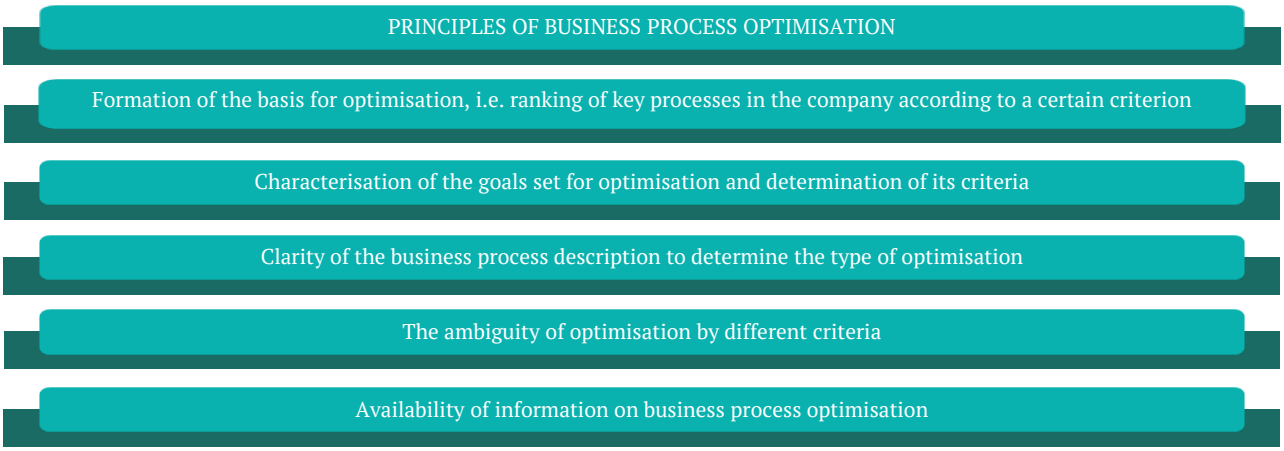

Figure 4. Principles of optimisation of IT company business processes

Source: compiled by the authors

Optimisation of business processes requires a systematic approach that comprehensively covers all areas of the company's activities and is based on the existing management functions of the company. The key to success in the effective management of business processes in a company's international operations is an understanding of the structure of an IT company's business processes, which can identify sources of signals about quality loss, management shortcomings, and a decline in strategic performance. Optimisation of business processes of an IT company's international activities should contribute to the achievement of certain goals (Fig. 5).

Figure 5. Objectives of optimising IT company business processes

Source: compiled by the authors

To adequately choose a method of optimising business processes, it is necessary to address the factors of the external and internal environment of a particular company. Among the internal factors, the most important are the organisational structure of the company, the way it cooperates with foreign counterparties, the number of international contracts, external sources of financing, the degree of digitalisation of document flow, the company's internal communication system, the duration of business processes, the degree of interdependence of tasks, the cost of existing business processes, etc. In terms of the external environment, the greatest influence is exerted by the requirements of legislation and international standards, as well as the degree of dependence on counterparties, which significantly affects the timeliness of processes. Optimised business processes change the priority of resource allocation, the main functional areas of the company, including marketing, finance, production, personnel, etc.; determine the available capabilities of information systems that support production and organisational activities; focus the decision-making process mainly on the use of an integrated information base formed at lower levels of management, as well as data flows from external structures of the company, obtained through new means of telecommunications and services depending on the Optimisation of business processes in the international activities of an IT company provides certain advantages, as shown in Figure 6.

Figure 6. Advantages of optimising business processes for international operations of IT companies

Source: compiled by the authors based on M.I. Mostafiz *et al*. (2019)

Optimisation of business processes in the context of international operations can be based on the concept of business process improvement, which is based on four approaches aimed at improving the productivity, efficiency and adaptability of business processes: the Fast Analysis of Solutions Technique (FAST); benchmarking; redesign (concentrated improvement); and business process reengineering. The efficiency of an IT company depends on analysing the success of an IT project. Given the high risk involved, analysing the success of IT projects becomes extremely complex and requires a variety of expertise. Different methods of analysis are used to obtain reliable and objective results. As the nature of decision-making in the IT sector is fluid, the process of analysing project performance in this area is complex, time-consuming, and requires the collection of relevant information, which is then subject to various processing and calculations.

One of the most common and effective methods of increasing the competitiveness of an IT company in an unstable and changing internal and external environment is business process reengineering. According to the approach of M. Hammer & J.A. Champy (1993), reengineering was considered a deep rethinking and redesign of business processes to significantly improve their efficiency. Business process reengineering in the course of international activities is a thorough overhaul of business processes aimed at accelerating the company's response to changes in consumer demand in domestic and foreign markets; establishing effective communication and cooperation with foreign contractors; optimising costs through the teamwork of a team of highly qualified and effectively motivated specialists who develop and implement innovative and creative ideas to increase competitiveness, optimise business processes, improve productivity and product quality, service and customer satisfaction.

When implementing business process reengineering in IT companies, typical mistakes are often made that significantly reduce the effectiveness of transformations. One of the key problems is the insufficient level of corporate culture, which hinders the adoption of new management approaches and causes significant resistance to internal changes. In addition, reengineering approaches are characterised by fragmentation, with a focus on superficial or partial redesign of processes rather than a comprehensive rethinking of them. Another significant barrier is limited resources: company management often seeks to achieve efficiency gains without the necessary investments, including the involvement of highly qualified specialists and time spent on strategic planning. In addition, in some cases, there is a complete disregard for the need to change business processes, which leads to delays in adapting to market changes and causes financial losses (Plakhotnik, 2021). The main principles of business process reengineering in the context of an IT company's international activities are presented in Table 1.

Table 1. Principles of reengineering the business processes of international activities of an IT company

Principles	Events
Integration of business processes	creation of working teams responsible for certain groups of processes
Decentralisation of responsibility	vertical compression of business processes, which expands the decisions that performers of certain work can make independently, without recourse to senior management, and which reduces the "time lags" that arise during the execution of business processes
Logic of business process implementation	increasing the efficiency and reducing the time of business processes, implementing parallel work, which mitigates duplication of information and work
Rationalisation of management influence	management influence is recommended when necessary and can affect material results
Flexibility of business processes	changing market conditions and international relations require a rapid response and the ability to make changes to business process models at any time

Source: compiled by the authors

As noted by S. Ito *et al*. (2021), the need to ensure the correctness of business processes in enterprises is widely recognised in terms of reengineering and improving business processes. Formal methods are a promising approach to this issue. The goal of business process validation is to create a formal model that matches reality well. One of the most modern solutions for modelling business processes during reengineering is the ARIS functional modelling method, which is designed to increase the flexibility of business processes in the context of international operations. ARIS is a modelling tool that models functions, organisations and data and then integrates them into a management model. According to P.Y. Chao & Y.M. Su (2023), it can be used to analyse enterprise processes, which is the goal of business process reengineering, BPR. It is also the basis of enterprise resource planning (ERP).

The modelling process in ARIS involves collecting information about the research area, documenting the information obtained, presenting it in the form of a model and improving the model through iterative review. The purpose of using the ARIS model is to create the most realistic model of the company's activities in the changing conditions of the internal and external environment, including the company's international activities. For this purpose, all the most probable scenarios are considered. It is worth noting that the flexibility of the ARIS model means that it can be changed and improved at any time in accordance with the requirements of the environment. Forrester consulting's the total economic impact™ of software AG's ARIS (n.d.) considers the concept of business process architecture, formed based on the ARIS model of integrated information systems, which structures BPM into four levels: development, planning, process and workflow control, and application systems. The presented architecture of ARIS-House of Business Engineering covers the full life cycle of a business process from its modelling to the implementation of digital solutions and forms a new process-oriented software model. The approach, proposed by A.-W. Scheer & M. Nüttgens (2000), provides integration between conceptual business process design and practical applications, facilitating both reengineering and continuous process improvement. The recommended model for optimising an IT company's business processes in the context of international operations using the ARIS functional modelling approach is shown in Figure 7.

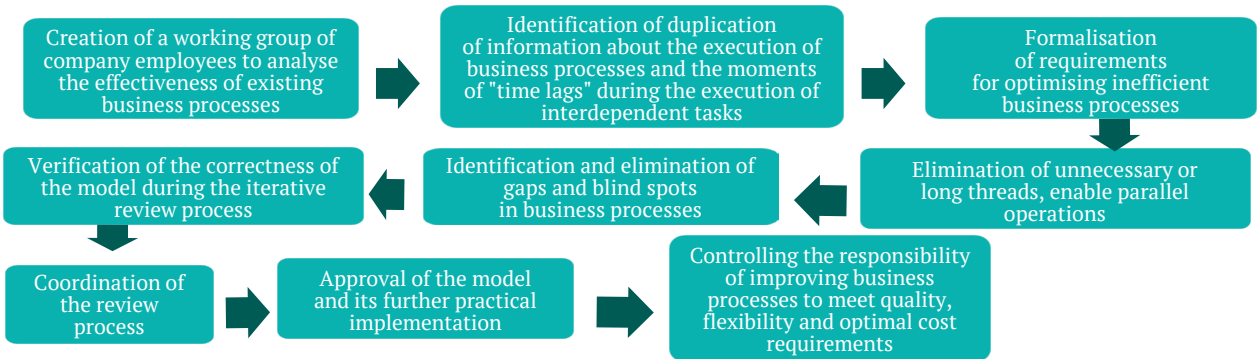

Figure 7. Model for optimising IT company business processes in the context of international activities using the ARIS functional modelling method

Source: compiled by the authors

By applying the ARIS modelling method, companies can gain the following opportunities: real-time process editing; reduction of internal and administrative costs; automation and digitalisation of key decision-making; reduction of maintenance costs; reduction of operating costs; increased productivity; improved forecast accuracy; improved customer service, etc. Forrester consulting's the total economic impact™ of software AG's ARIS (n.d.), which highlights the real possibility that millions of dollars worth of opportunities are hidden in business processes. The economic impact of these benefits is real and significant. The study shows that after three years; ARIS customers can expect to see 301% return on investment (ROI); 7.9 million USD in total payments over three years; and 5.9 million USD in net present value (NPV). Through a series of interviews with ARIS customers, the study found that a consolidated approach is key for organisations to succeed in transformational change, based on a solution that simplifies processes from strategy to operations. ARIS customers can analyse operations and define a strategic framework for business transformation, and effectively implement these strategies to achieve operational excellence while ensuring internal and external compliance. The stages of optimising an IT company's business processes are shown in Figure 8.

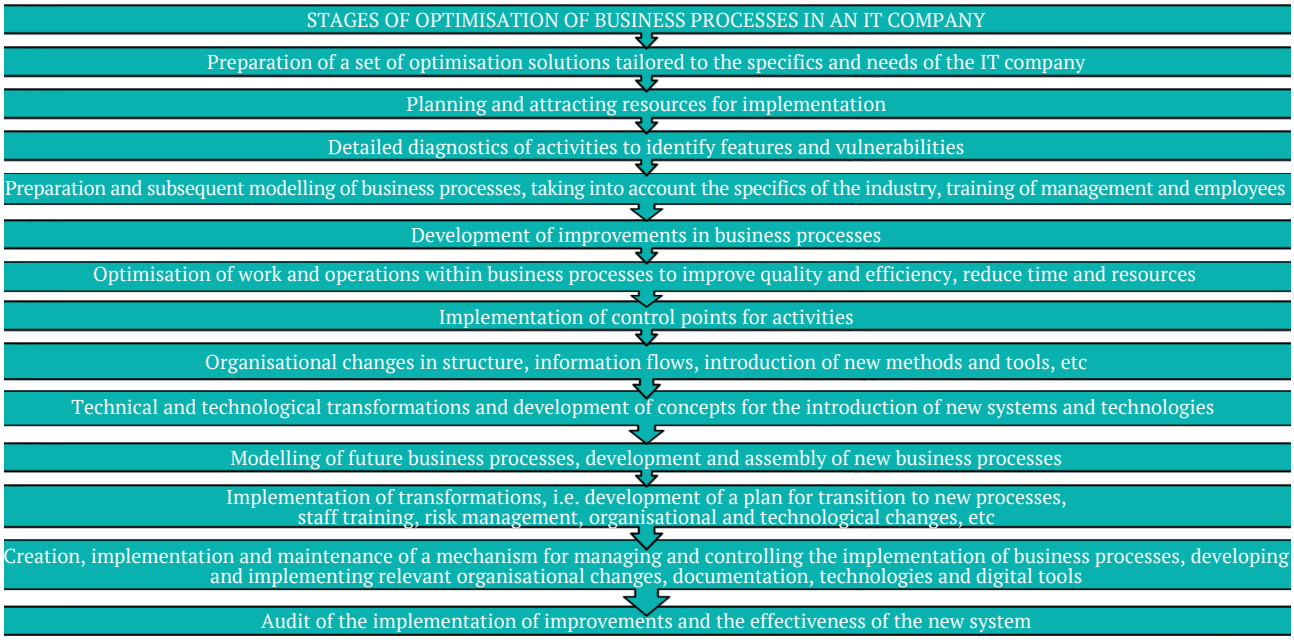

Figure 8. Stages of business process optimisation for an IT company

Source: compiled by the authors

Following the process approach, the ITIL/ITSM model describes a process, which is defined as a series of interdependent operations and changes aimed at achieving the goals declared by IT companies in their development strategy. Service process management has a greater impact than any reorganisation or optimisation. An IT process is a set of actions aimed at achieving a certain result, consisting of several subprocesses, as well as inputs and outputs. Information technology can be used to find solutions to improve business and manifests itself in the quantity and quality of services, the cost and reliability of IT services, the introduction of new services to the market or the creation

of new conditions for the rapid operation of new services. Creation of new business processes based on IT-C requires a clear understanding of the responsibilities of the company's information systems department. IT service management is divided into three areas: aligning IT services with current and future business needs; improving the quality of IT services; and optimising the long-term costs of providing IT services. In the context of business goals, IT companies define technological processes for optimisation following the balanced scorecard in 4 areas (Fig. 9).

Figure 9. Measures to optimise the business processes of an IT company

Source: compiled by the authors

Depending on the company's strategy, the main business goals are determined, which are divided into three categories: primary, secondary and minor. IT processes are a tool for achieving these goals. After defining 5-7 IT goals, the main IT processes of the enterprise are identified, as well as IT processes that do not contribute to the achievement of business goals, since investments in these processes do not yield the expected result and profit. The effectiveness of an IT process is usually assessed by determining its maturity level. In this context, the maturity of key IT processes is diagnosed to gradually improve them to the required target level. It is worth noting that maturity characteristics are constant, while maturity levels are discrete values that can take on values ranging from 0 to 5.

There are six levels of process maturity. At the zero level, the process is virtually absent, which indicates that it has not been implemented or ignored. The initial level implies chaotic activities without organised management, which leads to instability of results. The repetitive level is characterised by the fact that the same tasks are performed by different employees using a similar approach, but the lack of formalised procedures and division of responsibilities leads to dependence on individual specialists. At a defined level, procedures are standardised and documented, although deviations from the established rules occur and are not always controlled; procedures often capture current practice without making improvements. Controllable level means that there are mechanisms for monitoring and measuring the efficiency of the process, which ensures a timely response to its inefficiency, by automating certain stages. The highest level is the optimised level, when processes are systematically improved through the implementation of best practices based on continuous benchmarking with the results of other organisations, as noted in A. Pogorelyy (2017). This tool should be used to address the specifics of the IT company, in particular, the form of ownership (public, private), restrictions (e.g., depending on the type of activity), industry and other components.

Organising analytical work aimed at determining the effectiveness of an IT project involves a series of sequential actions, each of which is important for making informed management decisions. The first stage involves developing general principles and procedures for conducting the analysis, which forms the methodological basis for the entire process. Next, the stages of analytical activities are planned, with a clear definition of the sequence of work and the responsible persons. An important role is also played by the determination of resource provision, which includes material, methodological and scientific components necessary for the full conduct of the research. At the project implementation stage, general management of the analysis process is carried out, followed by the acceptance of the analytical work performed. After the completion of the main stages of analysis, the results are properly documented following reporting and standardisation requirements. The final component, according to H. Kerzner (2013), is monitoring the implementation of measures developed within the IT project to improve the efficiency of the IT enterprise.

Therefore, an IT company should identify critical IT processes that require investment and resources (time, money). The expediency of achieving the highest level of IT process maturity is not universally justified, as excessive investment in all processes without incorporating strategic importance and economic feasibility may not

provide the expected return. At the same time, companies can identify IT processes that do not contribute to the achievement of business goals and stop investing in them, thereby reducing losses from inefficient investments. The maturity level of each key IT process should not fall below a certain level. A "certain level" of IT process maturity should be defined as the minimum acceptable level that ensures consistency, stability and continuity of the process without adversely affecting other interrelated business processes. This means that the process should not be too underdeveloped compared to others and should meet at least the basic requirements of efficiency, controllability and quality assurance adopted by the company. A certain level refers to the limit below which the process no longer provides adequate support for other functions and may pose risks to the stability of the entire organisation. Increasing the maturity level of key IT processes leads to an increase in the maturity level of additional (supporting) business processes, which in turn leads to an increase in business efficiency. The gap between process maturity levels should not be significant, as this can lead to the degradation of more mature processes.

To form effective business processes in modern conditions, it is advisable to introduce several organisational and managerial measures. It is necessary to distinguish between the functions of governance and management in information technology. The concepts of "IT governance" and "IT management" cover different types of activities that have different goals. IT governance ensures that the strategic goals of the enterprise are aligned with the relevant IT priorities. The main functions in this area include assessing the current state of the IT infrastructure, setting priorities in decision-making, and continuously monitoring the compliance of activities with the company's goals. As a rule, the responsibility for this area lies with the company's governing body, headed by the CEO. IT management, in turn, involves the implementation of the defined IT priorities through the organisation and monitoring of tasks, as well as solving problems in the process of their implementation. In the context of DT, this function is mostly assigned to the head of IT or the Chief Information Officer (CIO).

An important prerequisite for achieving the optimal level of IT processes is the involvement of a qualified and experienced CIO. This means a professional with experience, preferably with an MBA degree, and a proven track record of impacting key business indicators such as revenue, EBITDA, or operating expenses. In case of limited resources, an alternative solution may be to use the CIO-as-a-service model, which employs interaction with a specialist on an outsourced basis with cost optimisation. As part of the modern management of an IT company, it is advisable to introduce a penetration test, which may include elements of social engineering. Such a measure is advisable if the company has a comprehensive information security policy, an effective information flow management system, regulated security procedures, and established staff information processes.

The next step is to identify the key business processes, which increases maturity level to at least the optimal level. This, in turn, reduces operating costs, increases the impact on other processes by improving their maturity, and increases the overall efficiency of the company's operations. An important principle in creating an effective IT budget is to adhere to the concept of capital expenditures based on the company's real business needs and priorities. This approach ensures strategic alignment between funding and digital initiatives. In addition, it is advisable to provide for mechanisms for independent assessment of IT functions, through regular (biannual) external IT audits. It is also considered a good practice to involve an independent CIO in the board of directors. Such a specialist, who is not part of the internal management structure, can act as a consultant, interim head (fractional CIO) or strategic advisor on digital issues. They can provide unbiased expertise, help shape DT strategies, and act as a mentor to the full-time CIO to improve their professional maturity. Thus, an IT company can independently form a model for managing internal business processes, based on an integrated approach, a unified methodology, a quantitative assessment of IT's contribution to business results, and a deep understanding of the organisation's future needs.

The results of the study show that optimisation of business processes in the field of international activities can provide several important benefits. In particular, the unification of the description of activities based on a single language helps to ensure that all participants in the process have access to a common and understandable communication format. This approach ensures a better understanding of the essence of business processes implemented within the framework of international cooperation. Additionally, the ability to graphically visualise processes and define functional responsibilities improves efficiency of formulation of requirements for staff. This also simplifies the determination of the control points necessary to achieve the strategic goals of international activities.

Streamlining business processes has a positive impact on the internal organisation of a company, by reducing the number of management levels, eliminating isolation between departments and officials, and establishing more efficient information exchange. This, in turn, increases efficiency and interaction within the organisation. Process optimisation can be used to assess the functional efficiency of operations within the company's overall operations, which contributes to more accurate performance measurement. Consistency of results between individual operations is achieved by minimising duplication of information and actions, which increases the overall rationality of business processes. Such optimisation creates the preconditions for reducing costs and the corresponding reduction in the value of the results and opens the possibility of introducing an effective system of staff motivation. Such a system can be based on the effectiveness of employees' participation in business processes, which, in turn, stimulates the achievement of organisational goals.

Undoubtedly, the issues discussed in this article are not entirely new. A broad scientific discourse has been formed on the necessity, mechanisms and challenges of DT of companies. Modern research by scholars contributes to a deeper understanding of this process and explains the changes in IT companies' business processes caused by the digital environment. Research on DT and BPM management has attracted considerable attention in business and management. Research has classified business processes based on their dynamics, in particular, their predictability

and the intensity of knowledge use during execution, which significantly affects the achievement of the goal.

J.I.C. Goni & A. Van Looy (2022), analysing process innovation capability (PIC) in the context of less structured business processes (LSBP), demonstrated that it is becoming increasingly important in a complex, dynamic and technologically rich business environment. The study conducted a systematic review of both PIC and LSBP, and based on this review, developed a conceptual framework that integrates process innovation with organisational capabilities in the three dimensions of people, processes and technology using the resource-based theory, dynamic capabilities and sociotechnical approach. The study also identified areas for further research and practical approaches to improve the effectiveness of PIC in LSBPs.

S. Monaghan *et al*. (2020) found that greater access to data, information and knowledge, as well as better business analytics methods, has brought unprecedented challenges and opportunities to managers, paving the way for new and effective strategies. K. Rong *et al*. (2022) argued that the specific advantages of firms, at least digital firms that rely on the Internet for their production, operation and delivery processes, are largely based on intangible assets such as technology, business models and knowledge. Despite the proposed changes brought about by the digitalisation of the nature of the firm and the associated advantages of the internationalisation process, there is still a lack of comprehensive insight of how new digital technologies, through the knowledge processes they enable, the new knowledge they help to create, and the new field of knowledge they constitute, new business strategies are emerging on the international stage.

Based on previous research, E. Autio *et al*. (2021) emphasised that digital communication technologies contribute to the dispersion of knowledge-intensive activities of firms, thereby exerting a centrifugal effect that triggers the emergence of new internationalisation strategies, while digital technologies on-site tend to concentrate firms' low-knowledge activities. Furthermore, when digital technologies are part of an offering that includes physical products, they may be location-bound, or when implemented as part of cross-border strategies, they may face institutional and legal constraints from the host country.

Knowledge of the process dimensions is undoubtedly useful for scientists and practitioners analysing the nature of BP. S. Zelt *et al*. (2019) conducted a study that identified numerous features that characterise the nature of business processes. These features include dimensions such as automation, creativity, predictability, and knowledge intensity, as well as aspects such as the codependence of process participants, process value, process analysis capability, process variability, and differentiation of process participants. However, the nature of processes is often unclear, which requires the development of tools to assess the nature of BPs (business processes). BPM Maturity Models (BPM MMs) are conceptual frameworks that can be used to assess how effectively an organisation manages its business processes. They define successive levels of development (maturity), each of which is characterised by certain indicators in the areas of governance, organisational culture, technology, methods and process performance. Unfortunately, BPM maturity assessment methods or BPM maturity models MMs do not fulfil this role. Most of these models cover a wide range of often very detailed or field-specific criteria, which makes their use time-consuming and complex. In addition, the amount of information analysed usually goes beyond the scope of assessing the nature of BP.

Studies that most closely correspond to the topic of this study are those by J. Berniak-Woźny & M. Szelągowski (2022), who presented an approach to the nature of BP that enables proper classification in terms of both the dynamics (predictability) of their performance and the intensity of knowledge. The nature of BP is a multidimensional problem presented in various ways. Researchers have identified its importance in the management process, contributing to better process identification and enabling more detailed analysis. Proper assessment of the nature of BPs performed in an organisation directly affects the success of their implementation (or the implementation of BPM). Therefore, there is a need to develop a diagnostic tool to bridge the theoretical gap and meet business needs (Truong *et al*., 2023).

Despite the acknowledged importance of BP as a research area, a research gap has been identified concerning the field of DT, which involves the introduction of digital technologies into all areas of business, causing fundamental operational and value changes that occur in different contexts where enterprises employ different strategies to enhance their digital presence. On the one hand, BP's research draws on important logics such as modelling, infrastructure and procedural actor logic, but does not confirm how these work in the context of DT. On the other hand, DT research highlights success factors: a sustainable digital strategy, an operational framework that drives operational excellence, and a service platform that enables rapid innovation. Many of BP's themes can contribute to these elements of DT. However, empirical research remains relatively limited. The combination of traditional BP paradigms and the business context of DT has pioneered new areas of process management research, including light-touch processes, infrastructure and agent agility.

In the modern scientific discourse, effective BPM is critical for maintaining the competitiveness and stable functioning of IT companies. The importance of this study is stipulated by the need to identify innovative approaches that contribute to strengthening the sustainability of the IT sector and developing modern management methods that help optimise the activities of international companies, Therefore, the study of BPM problems in IT companies and the development of an algorithm for managing business processes in IT companies under conditions of uncertainty increases their efficiency, adaptability and sustainability. Review of scientific works, consideration of theoretical foundations, including the definition of key concepts: "business process" and "business process management", formulated a general algorithm of BPM. The proposed approach will maintain sustainability, increase efficiency and adaptability in an unstable environment for IT companies, and its implementation will help to increase the competitiveness of the IT sector in the domestic and international markets.

CONCLUSIONS

DT leads to significant changes in the operations of international companies, which radically affect the business environment, open new opportunities and create

significant challenges. The most effective scenario for most of the companies studied in the context of digitalisation is the scenario that focuses on the cost and speed of business processes. Modelling business processes under the scenario of focusing on the cost and speed of business processes has the highest positive effect on their modelling, which contributes to the financial efficiency and productivity of international companies. The study confirmed the need for integrated business process modelling, which addresses various combinations of the resulting indicators and contributes to the efficiency of business process modelling and the financial efficiency and productivity of companies in the context of DT.

The study addressed components of the process of digitalisation of an IT company, presents a structural and logical scheme of organisation of business processes of an IT company, and shows advantages of optimisation of business processes of the international activity of an IT company. The study analysed a model of optimisation of business processes of an IT company in the context of international activity using the ARIS functional modelling method. Thanks to the ARIS modelling method, companies can gain the following opportunities: real-time editing of processes; reduction of internal and administrative costs; automation and digitalisation of key decision-making; reduction of maintenance costs; reduction of operating costs; increased productivity; improved forecast accuracy; improved customer service, etc.

The results of the study demonstrated that optimisation of business processes in the field of international activities can provide several significant benefits. It helps to unify the description of activities using a language that is clear to all participants, which facilitates a clear understanding of business processes. Visualisation of processes and assignment of responsibilities facilitate the formulation of staff requirements, while the definition of control points ensures the effective implementation of strategic indicators. It also simplifies the exchange of information between structural units by reducing the number of levels in the organisational hierarchy and breaking down the isolation between individual functional units. Optimisation can be used for an objective assessment of the efficiency of functions within processes, which helps to improve overall performance. At the same time, it ensures consistency of operations by avoiding duplication of tasks and data, which reduces costs and improves the value of the results. In addition, such optimisation creates the basis for the introduction of incentive systems that reward employees based on the results achieved in the business processes in which they participate.

The results of the study indicate a significant impact of DT on changing approaches to the functioning of international companies on improving the efficiency of business processes. The most effective model was the one that focuses on the cost and speed of processes, which requires further study of the impact of specific digital technologies on the achievement of companies' strategic goals. Further research should be aimed at developing adaptive digital modelling models that address industry specifics, the level of digital maturity of the company, and the dynamics of the external environment. Particular attention should be paid to a comparative analysis of the effectiveness of various modelling methodologies (in particular, ARIS, BPMN, UML) in the context of international activities, as well as to assessing their impact on improving operational efficiency, risk resilience and adaptability to the challenges of the digital age. An empirical study of the relationship between the level of integration of digital business processes and the effectiveness of staff motivation systems is also a promising area. In addition, further research could focus on formalising approaches to assessing the economic impact of DT of business processes, particularly in the field of IT companies operating internationally.

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REFERENCES

[1] Andros, S.V., & Chang, S. (2019). Digitalization and enterprises: New trends of innovative development. *Economic Journal of Odesa Polytechnic University*, 4(10), 5-13. doi: 10.5281/zenodo.3757950.

[2] Aström, J., Reim, W., & Parida, V. (2022). Value creation and value capture for AI business model innovation: A three-phase process framework. *Review of Managerial Science*, 16(2), 2111-2133. doi: 10.1007/s11846-022-00521-z.

[3] Autio, E., Mudambi, R., & Yoo, Y. (2021). Digitalization and globalization in a turbulent world: Centrifugal and centripetal forces. *Global Strategy Journal*, 11(1), 3-16. doi: 10.1002/gsj.1396.

[4] Baber, W.W., Ojala, A., & Martinez, R. (2019). Effectuation logic in digital business model transformation: Insights from Japanese high-tech innovators. *Journal of Small Business and Enterprise Development*, 26 (6/7), 811-830. doi: 10.1108/JSBED-04-2019-0139.

[5] Bacho, R., & Loskorikh, G. (2024). Efficiency of IT enterprise: Accounting and analytical aspect. In *Collection of abstracts of the VII all-Ukrainian scientific and practical conference "New information technologies of business management"* (pp. 18-20). Kyiv: Union of Business Automat.

[6] Baiyere, A., Salmela, H., & Tapanainen, T. (2020). Digital transformation and the new logics of business process management. *European Journal of Information Systems*, 29(3), 238-259. doi: 10.1080/0960085X.2020.1718007.

[7] Berniak-Woźny, J., & Szelągowski, M. (2022). Business process nature assessment matrix-a novel approach to the assessment of business process nature. *Aslib Journal of Information Management*, 74(2), 244-264. doi: 10.1108/AJIM-04-2021-0110.

[8] Bouncken, R.B., Kraus, S., & Roig-Tierno, N. (2021). Knowledge- and innovation-based business models for future growth: Digitalized business models and portfolio considerations. *Review of Managerial Science*, 15, 1-14. doi: 10.1007/s11846-019-00366-z.

[9] Chan, Y.E., Krishnamurthy, R., & Sadreddin, A. (2022). Digitally-enabled university incubation processes. *Technovation*, 118, article number 102560. doi: 10.1016/j.technovation.2022.102560.
[10] Chao, P.Y., & Su, Y.M. (2023). Modeling of the design change process. In *Advances in concurrent engineering* (pp. 175-182). Boca Raton: CRC Press. doi: 10.1201/9781003423508.
[11] Dergachova, V., Vorzhakova, Y., & Khlebynska, O. (2021). Organization of business processes in the conditions of digitalization. *The Journal of V. N. Karazin Kharkiv National University. Series: International Relations. Economics. Country Studies. Tourism*, 14, 60-68. doi: 10.26565/2310-9513-2021-14-06.
[12] DSTU ISO 9000:2015. (2015). *Quality management systems. Fundamentals and vocabulary*. Retrieved from https://online.budstandart.com/ua/catalog/doc-page.html?id_doc=64030.
[13] Forrester consulting's the total economic impact™ of software AG's ARIS. (n.d.). Retrieved from https://www.softwareag.com/en_corporate/platform/aris/forrester-total-economic-impact-infographic.html.
[14] Goni, J.I.C., & Van Looy, A. (2022). Process innovation capability in less-structured business processes: A systematic literature review. *Business Process Management Journal*, 28(3), 557-584. doi: 10.1108/BPMJ-07-2021-0487.
[15] Hammer, M., & Champy, J.A. (1993). *Reengineering the corporation: A manifesto for business revolution*. New York: Harper Business Books.
[16] ISO/IEC TS 33061:2021. (2021). *Information technology – process assessment – process assessment model for software life cycle processes*. Retrieved from https://www.iso.org/obp/ui/en/#iso:std:iso-iec:ts:33061:ed-1:v1:en.
[17] ISO/IEC/IEEE 12207:2017. (2017). *Systems and software engineering – software life cycle processes*. Retrieved from https://www.iso.org/obp/ui/ru/#iso:std:iso-iec-ieee:12207:ed-1:v1:en.
[18] Ito, S., Vymětal, D., & Šperka, R. (2021). Process mining approach to formal business process modelling and verification: A case study. *Journal of Modelling in Management*, 16(2), 602-622. doi: 10.1108/JM2-03-2020-0077.
[19] Kerzner, H. (2017). *Project management: A systems approach to planning, scheduling, and controlling* (11th ed.). Hoboken: John Wiley & Sons, Inc.
[20] Kurhan, N.V. (2020). Justification of the choice of ERP-solution for digitalization of accounting, analysis and management at the enterprise of Ukraine. *Economic Bulletin of the National Technical University of Ukraine "Kyiv Polytechnic Institute"*, 1(17), 238-249. doi: 10.20535/2307-5651.17.2020.216359.
[21] Malyshkin, O.I. (2020). Transformation of accounting forms under the influence of digitalization. In *Accounting, analysis, audit and taxation: A modern paradigm in the context of sustainable development* (pp. 431-434). Kyiv: KNEU.
[22] Monaghan, S., Tippmann, E., & Coviello, N. (2020). Born digitals: Thoughts on their internationalization and a research agenda. *Journal of International Business Studies*, 51(1), 11-22. doi: 10.1057/s41267-019-00290-0.
[23] Mostafiz, M.I., Sambasivan, M., & Goh, S.K. (2019). Impacts of dynamic managerial capability and international opportunity identification on firm performance. *Multinational Business Review*, 27(4), 339-363. doi: 10.1108/MBR-09-2018-0061.
[24] Orlov, I.V. (2024). Role of document management system for business processes optimization. *Problems of Theory and Methodology of Accounting, Control and Analysis*, 2(58), 45-49. doi: 10.26642/pbo-2024-2(58)-45-49.
[25] Papinko, A.I. (2024). *Management accounting of business processes in IT companies*. (Doctoral dissertation, West Ukrainian National University, Ternopil, Ukraine).
[26] Petruk, O., & Hrabchuk, I. (2021). Organization of accounting for IT companies: The impact of digitalization. *Efektyvna Ekonomika*, 9. doi: 10.32702/2307-2105-2021.9.17.
[27] Plakhotnik, O. (2021). Development areas of reengineering processes of management systems in the context of innovative economy. *Economic Bulletin of Dniprovsk State Technical University*, 1(2), 47-55. doi: 10.31319/2709-2879.2021iss1(2).232573pp47-55.
[28] Pogorelyy, A. (2017). *New ways to manage it or how business goals are linked to IT processes*. Retrieved from https://eba.com.ua/en/novi-pidhody-v-upravlinni-abo-yak-biznes-tsili-povyazani-z-protsesamy/.
[29] Rong, K., Kang, Z., & Williamson, P.J. (2022). Liability of ecosystem integration and internationalisation of digital firms. *Journal of International Management*, 28(4), article number 100939. doi: 10.1016/j.intman.2022.100939.
[30] Scheer, A.-W., & Nüttgens, M. (2000). ARIS architecture and reference models for business process management. In *Business process management: Models, techniques, and empirical studies* (pp. 376-389). Berlin: Springer. doi: 10.1007/3-540-45594-9_24.
[31] Shyshkova, N.L. (2019). Prospects for IT-modernization of accounting: Actualization of theory and practice. *Economic Bulletin of Dnipro University of Technology*, 3, 146-159. doi: 10.33271/ev/67.146.
[32] Teubner, R.A., & Stockhinger, J. (2020). Literature review: Understanding information systems strategy in the digital era. *Journal of Strategic Information Systems*, 29, article number 101642. doi: 10.1016/j.jsis.2020.101642.
[33] Truong, B.Q., Nguyen-Duc, A., & Van, N.T.C. (2023). A quantitative review of the research on business process management in digital transformation: A bibliometric approach. *Software*, 2, 377-399. doi: 10.3390/software2030018.
[34] Wiesböck, F., Hess, T., & Spanjol, J. (2020). The dual role of IT capabilities in the development of digital products and services. *Information & Management*, 57(8), article number 103389. doi: 10.1016/j.im.2020.103389.
[35] Zaverbnyj, A.S., & Sharovskii, Y.O. (2024). Application of innovative tools to optimize business processes of enterprises in the context of European integration: Challenges and prospects. *Management and Entrepreneurship in Ukraine: Stages of Formation and Development Problems*, 2(12), 48-56. doi: 10.23939/smeu2024.02.048.
[35] Zelt, S., Recker, J., Schmiedel, T., & vom Brocke, J. (2019). A theory of contingent business process management. *Business Process Management Journal*, 25(6), 1291-1316. doi: 10.1108/BPMJ-05-2018-0129.

Оптимізація бізнес-процесів міжнародної IT-компанії в контексті цифровізації

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Анотація. Цифрові технології набувають все більшого значення у всіх сферах діяльності, спричиняючи незворотні зміни в управлінні компаніями в напрямку покращення їхньої фінансово-економічної діяльності, збільшення гнучкості та конкурентоспроможності на ринку. Використання потужного програмного забезпечення, обладнання та цифрових інструментів формує конкурентну перевагу компанії на міжнародному ринку, а загострення конкуренції та широкомасштабне використання інформаційно-комунікаційних технологій створили можливості для вдосконалення бізнес-процесів із метою забезпечення ефективної діяльності компаній. Метою статті було визначити розвиток цифровізації бізнес-процесів у контексті формування сучасного механізму управління бізнес-процесами міжнародних IT-компаній та узагальнення напрямків їх оптимізації в цифровому просторі. Під час написання статті були використані методи загальнонаукових і спеціальних методів наукового дослідження: дедукції та індукції, аналізу та синтезу, абстрагування, узагальнення, методів статистично-економічного аналізу, систематизації, порівняння та аналізу, системно-структурного та функціонального. Досліджено стан цифровізації бізнес-процесів міжнародних IT-компанії через визначення взаємодії між бізнес-процесами на організаційному рівні та врахуванням ієрархії бізнес-процесів суб'єкта господарювання. Виділено складові процесу цифровізації IT-компанії, які дозволяють оптимізувати наявний ресурсний потенціал, витрати робочого часу та підвищення ефективності бізнес-процесів, тим самим підвищуючи ефективність господарської діяльності. Сформовано модель оптимізації бізнес-процесів IT-компанії в контексті здійснення міжнародної діяльності з використанням методу функціонального моделювання архітектури інтегрованих інформаційних систем. Сформовано етапи оптимізації бізнес-процесів IT-компанії, які дозволяють знаходити рішення для покращення ведення бізнесу та проявляються в кількості та якості послуг, вартості та рівні надійності IT-послуг, виведенні на ринок нових послуг або створенні оптимальних умов для швидкої дії нових послуг. Практична цінність полягає у запропонованих рекомендаціях щодо створення оптимальних бізнес-процесів у контексті міжнародної діяльності, які дозволять підвищити ефективність IT-бізнесу

Ключові слова: IT-підприємства; цифровізація бізнес-процесів; переваги оптимізації; реінжиніринг; архітектура інтегрованих інформаційних систем; міжнародна діяльність; інформаційно-комп'ютерні технології

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