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Sustainable business development in the face of turbulence and digitalisation: Strategic approaches to ensuring competitiveness

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Abstract. Ensuring business competitiveness in the face of turbulence and digitalisation requires rethinking traditional strategic management. Sustainable development serves as the conceptual foundation for building strategic resilience, combining economic efficiency, social responsibility, and environmental sustainability. The purpose of the study was to substantiate strategic approaches to ensuring business competitiveness in conditions of turbulence and digitalisation of the external environment based on the principles of sustainable development. The study was theoretical and conceptual in nature. It applied methods of conceptual modelling and analytical formalisation, which created prerequisites for further empirical verification of the proposed provisions. Contemporary scientific approaches to interpreting the relationship between sustainable development, digitalisation, and business competitiveness were summarised, and the impact of turbulence on the transformation of business models and management processes was analysed. The paper substantiated the change in the role of digital technologies in the strategic management system, which was manifested in the transition from fragmented use of digital tools to their comprehensive integration into the strategies of sustainable development and

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adaptation of enterprises. A conceptual model for ensuring business competitiveness was proposed, which reflected the logic of interaction between external challenges of a turbulent environment, strategic tools for sustainable development, digital management decisions, and mechanisms of organisational adaptation. The analytical relationship between the key processes of the model was formulated, which allowed substantiating hypotheses about strengthening the competitive position of business in conditions of a high level of digital maturity and integration of ESG approaches into strategic management. The practical significance of the results obtained lies in the possibility of their application in the process of strategic planning, development of sustainable development programmes, and implementation of digital business transformation strategies in conditions of increased uncertainty

Keywords: business competitiveness; strategic management; digital transformation; business environment

Introduction

Global environmental, socio-economic imbalances, geopolitical crises and risks, acceleration of technological changes, transformation of consumer behaviour models contribute to the development of insufficiently predictable, to a certain extent chaotic and disordered processes that reflect the turbulence of the society's functioning environment. For business entities, these processes are accompanied by increased uncertainty of strategic decisions, increased competition, and increased requirements for adaptability and sustainability of economic activity. In such conditions, conventional approaches to the development of competitive advantages are insufficient, which is confirmed by the results of empirical and theoretical studies by E.S. Knudsen *et al.* (2021) and D. Hariyani *et al.* (2025), devoted to the analysis of competitive dynamics in conditions of instability and actualising the search for new strategic guidelines for business development.

In this context, the concept of sustainable development, which provides for the integration of economic, social and environmental goals into the long-term strategy of enterprises, is particularly important. M. Porter & M. Kramer (2019) found that the economic, social, and environmental components of sustainable development form an interrelated strategic contour, which directly affects the adaptability of the business to external shocks. Unlike short-term efficiency tools, sustainable development forms a systemic basis for ensuring business competitiveness in conditions of instability, helping to increase its resilience to external shocks, preserve reputational capital, and build trust on the part of stakeholders. As noted in the literature reviews by I.M. Awad *et al.* (2025) and M. Hamdouna & M. Khmelyarchuk (2025), the integration of sustainable development principles is increasingly seen as a strategic factor for long-term competitiveness, rather than as a purely normative or social requirement. However, the practical implementation of the principles of sustainable development requires adaptation to dynamic changes in the digital environment. Digitalisation of business processes acts both as a catalyst for transformation and as a tool for implementing sustainable development strategies. The use of digital technologies is changing approaches to resource management, communication with consumers, management decision-making, and the development of value chains. According to the research by M. Bosovska *et al.* (2023) and D.S. Bindeeba *et al.* (2025), in a turbulent environment, digitalisation can increase both positive effects and strategic risks, which requires its consideration within a holistic strategic management system.

In this regard, the scientific problem is the need to substantiate and systematise strategic approaches to ensuring business competitiveness based on sustainable development, considering the impact of turbulence and digitalisation of the external environment. The solution of this problem is of great theoretical and practical importance, as it will contribute to the establishment of more adaptive and sustainable development strategies for business entities in the current conditions. That is why the purpose of the study was to substantiate and systematise strategic approaches to ensuring business competitiveness based on the principles of sustainable development in conditions of turbulence and digitalisation of the external environment. The main objectives of the study were: to substantiate of the relationship and mutual influence of turbulence phenomena, sustainable development, digitalisation, and competitiveness of business entities; to define the conceptual foundations of an integrated model for ensuring business competitiveness through sustainable development and digitalisation in conditions of turbulence; to reveal possible key causal relationships between digital transformation, integration of sustainable development principles, and the level of business competitiveness in conditions of external turbulence.

Literature Review

Contemporary scientific literature showed that the issue of sustainable development of enterprises combined with digital transformation and competitiveness is one of the key areas of strategic research in a turbulent environment. This is indicated by a number of systematic reviews and analyses focusing on the relationship between technological innovation, digitalisation, and business sustainabilityresults. A comprehensive review by M. Hamdouna & M. Khmelyarchuk (2025), devoted to the role of technological innovation in shaping competitiveness, highlighted the importance of technology for the sustainable development of enterprise benefits. The researchers emphasised that it is innovation that becomes the key determinants of sustainable competitiveness in the long term, as it contributes to increasing resilience to external challenges and supporting sustainable growth. Separate metaanalysis by D.S. Bindeeba *et al.* (2025) proved that digital transformation is a strategic factor in improving the economic, social, and environmental performance of businesses. The synthesis of empirical research has shown that digital technologies contribute to the achievement of comprehensive sustainable development goals, in particular, by optimising resources, improving operational efficiency, and improving interaction with stakeholders.

The study by D. Hariyani *et al.* (2025) pointed to the role of digital leadership in mediating the function between external institutional pressures and sustainability indicators. This effect was enhanced by turbulent changes in the environment, which actualised the need for digital management strategies to adapt and maintain competitive advantages. The classical study by E.S. Knudsen *et al.* (2021) showed that digitalisation can both increase competitive advantages and create conditions for their rapid loss, depending on the businessmodel and the use of big data. This means that digital tools do not always automatically lead to stable competitiveness, but with proper strategic management, they can become a source of sustainable growth. In addition, research by D. Chen & S. Wang (2024) examined the mechanisms through which digitalisation contributes to the achievement of environmental, social, and governance goals (ESG, environmental, Social, and Governance), including risk reduction and increased operational flexibility.

Systematic literature review by G.H. Sagala & D. Eri (2024) on digital transformation in small and medium-sized enterprises has shown that success factors include strategic recognition of digital transformation, development of organisational abilities, managerial competencies, and adaptive strategies. These aspects are relevant for building competitiveness strategies precisely in the turbulent context of markets. The study on the example of Chinese enterprises conducted by L. Kong & J. Chen (2024) demonstrated that digital transformation encourages green and sustainable innovation processes, which created the basis for strategic improvement of competitiveness with an environmental component. This confirmed that digital technologies can act as a tool for implementing the sustainable development goals in a turbulent environment. Review by I.M. Awad *et al.* (2025) also showed that the scientific debate is actively developing towards combining digital transformation with various aspects of sustainability – including ESG (Environmental, Social, and Governance factors), social responsibility, and corporate sustainability. Similar results were obtained by F. Kraus *et al.* (2021), who, based on a systematic analysis of scientific publications, proved that digital transformation creates new opportunities for combining economic efficiency with environmental and social goals of enterprises, forming prerequisites for long-term business competitiveness.

Despite the scientific interest in digital transformation, there is a need for integrated research that simultaneously considers environmental turbulence, digital capabilities, and strategic competitiveness management. Accordingly, despite a significant number of scientific studies devoted separately to the problems of sustainable development, digital transformation and business competitiveness, the issue of a complex combination of these approaches within a single strategic logic of business development in conditions of turbulence remains insufficiently systematised in the scientific literature. The lack of agreed strategic approaches complicates the practical implementation of sustainable development principles and reduces the potential of digitalisation as a factor of long-term competitiveness.

Materials and Methods

The research was theoretical and conceptual in nature and was aimed at generalising and systematising scientific approaches to ensuring business competitiveness in conditions of turbulence and digitalisation based on the principles of sustainable development. It was based on systematic, and structural and functional approaches. Thus, the systematic approach provided for the consideration of strategic management as an integral multi-level system, within which sustainable development, digital management solutions, and competitiveness acted as interrelated subsystems. The structural and functional approach determined their internal structure and functional role in shaping the effectiveness of an enterprise in conditions of turbulence.

The study covered the period 2015-2025, as this period was associated with the beginning and intensification of research on digital transformation and the integration of sustainable development ideas into business after the adoption of the United Nations Sustainable Development Goals (2015). The information base for the research was scientific publications and analytical materials of international organisations (World Commission on Environment and Development, n.d.; United Nations, 2015). To ensure scientific validity, sources were selected according to the criterion of academic significance, and most of them were indexed in the international databases Scopus and Web of Science. The key criterion was relevance: the selection of sources was carried out in accordance with such areas as digital transformation of business, the impact of environmental turbulence on the competitiveness of business entities, the relationship between digitalisation and sustainable development for the creation of economic values. The study also considered classical theoretical papers, in particular the concept of the triple result by J. Elkington (1997, 1998) and the theory of dynamic abilities by D.J. Teece *et al.* (1997) as fundamental methodological sources. These concepts were chosen as the methodological basis of the study due to their complementarity. The concept of triple result by J. Elkington provided a theoretical substantiation for the multidimensional nature of sustainable business development (economic, social, and environmental dimensions), while dynamic ability theory by D.J. Teece *et al*. explained the mechanisms of strategic adaptation of the enterprise in conditions of turbulence. The combination of these approaches allowed integrating target (effective) and process (adaptive) components within a single strategic management model.

Scientific sources were systematised using comparative analysis, which enabled a comparison of different approaches to the interpretation of digital transformation and sustainable development. In addition, logical and structural grouping was used, which helped to create author's tables with the characteristics of key signs of turbulence in the business environment, the evolution of scientific approaches to sustainable development and digital technologies in business. The tables reflected the impact of sustainable development components on business competitiveness and the integration of sustainable development and digitalisation in competitive advantage strategies.

Several methods were used in the study. Analysis and synthesis methods were used to summarise theoretical provisions on sustainable development, ESG approaches, and digital business transformation. The induction method was used to summarise the results of the analysis of scientific publications and empirical data on the impact of turbulence on the digital transformation of enterprises, which allowed forming general conclusions about the role of strategic coherence and adaptability of the proposed model. The deduction method was used to test the theoretical provisions put forward about the relationship between digital solutions, dynamic abilities, transformation, and efficiency of the enterprise by their logical deployment within the proposed conceptual model. The method of abstraction was used to identify key factors of strategic management in conditions of turbulence by separating essential characteristics (strategic consistency, digitalisation, adaptability of the business model, effectiveness) from secondary environmental factors. This helped to form a generalised conceptual design of the study. The formalisation method was used to provide this conceptual construction with a logical and mathematical expression through the construction of an analytical equation that reflected the functional relationships between certain variables and allowed assessing their impact on the enterprise performance.

The method of conceptual modelling was used to substantiate the integration of sustainable development tools into the strategic management system. It allowed combining external challenges, management tools, and adaptation mechanisms into a single logical structure. The research was conducted at the level of an individual enterprise, with a focus on the development of its competitiveness in the context of digital transformation and an unstable external environment. The sectoral and macroeconomic context (institutional constraints, turbulence, ESG requirements) that affect the strategic decisions of business entities were considered.

The limitation of the study was that it was theoretical in nature and did not pass empirical testing in enterprises. It was limited by chronology and sources (2015-2025, Scopus and WoS), which may not consider the latest trends. The analysis was carried out at a general level, without detailing for individual industries or regions. The level of turbulence was estimated conceptually, without the use of precise measurement tools. The proposed indicators of digitalisation, ESG orientation, and strategic management were of a recommendatory nature and may need to be adapted depending on the specifics of the enterprise.

Results

The idea of investigating strategic approaches to ensuring business competitiveness based on the principles of sustainable development in conditions of turbulence and digitalisation lies in the following logical visions: turbulence of the business environment is a factor in the transformation of development strategies → sustainable business development is a strategic basis for ensuring competitiveness → digitalisation is a tool for implementing sustainable business development strategies. These phenomena link turbulence, sustainable development, digitalisation, and the competitiveness of business entities. The contemporary business environment operates in conditions of increased turbulence, which is manifested in the instability of market conditions, the acceleration of technological changes, and the growth of geopolitical and socio-economic risks. In scientific (Teece *et al.*, 1997) and analytical studies (United Nations, 2015), turbulence is considered as an environmental state characterised by unpredictability, nonlinearity, and limited ability to extrapolate previous development trends. Under such conditions, conventional strategic models focused primarily on stability and predictability lose their effectiveness.

The analysis of scientific approaches showed that turbulence transforms the very logic of ensuring business competitiveness: from the dominance of price and resource advantages to advantages based on adaptability, speed of response, and strategic flexibility. K.M. Eisenhardt & J.A. Martin (2000) and E.S. Knudsen *et al.* (2021) proved that in such conditions, the dynamic abilities of business entities, i.e., the ability to integrate and reorient resources in accordance with changes in the external environment, become crucial. In this context, sustainable development takes on a new meaning – not as stability in the traditional sense, but as the ability of a business to operate for a long time in the face of constant changes, which makes it an important tool for strategic management in a turbulent environment. For an in-depth analysis of the impact of turbulence on strategic business development, it is advisable to systematise the main signs of an unstable external environment and their consequences for management decisions. Generalisation of scientific approaches in Table 1 allows identifying the key manifestations of turbulence that form new requirements for strategies to ensure the competitiveness of business entities.

Table 1. Characteristics of key signs of business environment turbulence and their strategic challenges

Sign of turbulence	Manifestation in the business environment	Strategic business challenges	References
High uncertainty	Market instability, demand fluctuations	Shift towards flexible strategies	D. Teece (1997), United Nations (2015), X. Guo & W. Pang (2025)
Acceleration of changes	Fast technology updates	Need for dynamic abilities	G.C. Kane *et al.* (2016)
Geopolitical risks	Supply chain disruption	Business model diversification	World Commission on Environment and Development (n.d.), United Nations (2015)
Information asymmetry	Excess data	Implementation of digital analytics	G. Vial (2019)

Source: created by the authors

The characteristics presented in the table indicate that the turbulence of the business environment not only complicates the strategic planning process, but also acts as a catalyst for the transformation of management approaches. Growing uncertainty and accelerating change necessitate a move from rigid strategic models to flexible and adaptive strategies focused on long-term business sustainability. The concept of sustainable development in the research by J. Elkington (1997), M.E. Porter *et al.* (2019) and Nogueira *et al.* (2022) is considered as an integrated system of economic, social and environmental priorities aimed at creating long-term value for business and society. Unlike conventional approaches to performance management, sustainable development focuses not only on financial results, but also on the quality of resource management, interaction with stakeholders, and social responsibility of businesses.

The analysis of scientific publications has shown that sustainable development is increasingly considered as a factorin the development of competitive advantages, in particular, through increasing reputational stability, reducing operational risks, and increasing confidence on the part of investors and consumers. Research by E. Nogueira *et al.* (2022), C. Simbalari (2023) and S.B. Khaled *et al.* (2025) confirmed the existence of a positive link between the implementation of the principles of sustainable development and the financial performance of companies in the long term. In order to substantiate the role of sustainable development in ensuring business competitiveness, it is important to analyse the evolution of scientific approaches to its interpretation. In the scientific literature, the concept of sustainable development has undergone significant changes – from a predominantly ecological approach to an integrated strategic paradigm of business management. The evolution of relevant scientific approaches is summarised in Table 2.

Table 2. Evolution of scientific approaches to the interpretation of sustainable business development

Author/approach	Key idea	Focus for business	Value for competitiveness
J. Elkington (1997), E. Nogueira *et al.* (2022)	Triple result	Balance of economy, society, and ecology	Long-term sustainability
M.E. Porter & M.R. Kramer (2019)	Shared value	Integration of social goals	Competitive advantages
ESG approach (Khaled *et al.*, 2025)	Responsible management	Transparency and trust	Investment attractiveness
Strategic management (Sîmbalari, 2023)	Sustainable strategies	Adaptability	Improvement of sustainability

Source: created by the authors

The generalisation of scientific approaches given in the table gives grounds to assert that the current understanding of sustainable business development goes beyond social responsibility and environmental orientation. Sustainable development is increasingly seen as a strategic tool for building competitive advantages, ensuring long-term sustainability and adaptability of business in conditions of turbulence. In the face of turbulence, sustainable development allows businesses to reduce their dependence on short-term market fluctuations, ensuring a strategic balance between economic feasibility and social and environmental responsibility. However, the effectiveness of implementing sustainable development strategies largely depends on the ability of enterprises to adapt them to digital transformation.

Digitalisation is one of the key drivers of contemporary business transformation and significantly affects the mechanisms for implementing sustainable development strategies. G.C. Kane *et al.* (2016) and G. Vial (2019) defined digital transformation as a profound change in business models, management processes, and organisational structures influenced by digital technologies. The research analysis showed that digital technologies create opportunities for more efficient use of resources, increased transparency of management, and improved decision-making processes, which is critical for the implementation of the principles of sustainable development. In particular, the use of data analytics, digital platforms, and automated management systems helps reduce costs, optimise value chains, and improve business environmental efficiency. Nowadays, digitalisation is an important tool for implementing sustainable business development strategies. To identify its role, it is advisable to systematise the main digital technologies and areas of their use in the context of achieving economic, social, and environmental goals for the development of enterprises. The corresponding systematisation is shown in Table 3.

Table 3. Digital technologies as tools for implementing sustainable business development strategies

Digital technology	Area of use	Link to sustainable development
Big Data	Solution analytics	Resource optimisation
Digital platforms	Interaction with stakeholders	Transparency
Automation	Business processes	Energy efficiency
AI and ML	Forecast	Risk reduction

Source: created by the authors based on M. Bosovska *et al.* (2023), I.M. Awad *et al.* (2025), D.S. Bindeeba *et al.* (2025), M. Hamdouna & M. Khmelyarchuk (2025)

These tables demonstrated that digital technologies provide a practical basis for implementing the principles of sustainable development, contributing to improving the efficiency of resource management and transparency of business processes. However, their effectiveness depends on the strategic integration of digital solutions into the overall business development model, and not on the fragmented implementation of individual tools. Despite the significant potential of digitalisation in ensuring sustainable development and business competitiveness, its implementation is accompanied by a number of risks that increase in a turbulent environment. For a comprehensive assessment of these challenges, Table 4 systematised the main types of risks of digital business transformation.

Table 4. Risks and limitations of business digitalisation in the face of turbulence

Type of risk	Characteristics	Potential consequences
Cyber risks	Data leak	Loss of trust
Technological dependence	Platform dependency	Reduced autonomy
Organisational risks	Lack of competencies	Resistance to change
Financial risks	High investment	Rising costs

Source: created by the authors based on G.C. Kane *et al.* (2016), G. Vial (2019), E.S. Knudsen *et al.* (2021), S.B. Khaled *et al.* (2025)

The risk systematisation presented in Table 4 showed that digitalisation requires a balanced strategic approach and the development of appropriate management competencies. Ignoring risks can reduce the expected effects of digital transformation and increase business vulnerability, which is especially important in high turbulence. Digitalisation in the face of turbulence is accompanied by an increase in strategic risks associated with cybersecurity, dependence on technology suppliers, and uneven access to digital resources. This leads to the need for an integrated strategic approach, in which digitalisation is considered not as an end in itself, but as a tool for ensuring sustainable development and business competitiveness.

Generalisation of the results of the analysis of scientific sources allows considering sustainable development and digitalisation as complementary components of modern competitiveness strategies. Digital technologies strengthen the ability to implement the principles of sustainable development, while sustainability forms strategic guidelines for digital business transformation in a turbulent environment. Thus, business competitiveness in is formed based on integration of sustainable development and digitalisation strategies. A summary of the impact of key components of sustainable development on the competitive position of the enterprise is given in Table 5.

Table 5. Impact of sustainable development components on business competitiveness

Component of sustainable development	Key tools	Expected strategic effect
Economic	Effective resource management	Improved productivity
Social	Human capital development	Increasing staff loyalty
Ecological	Resource saving	Reduce costs and risks
Institutional	Corporate governance	Reputational sustainability

Source: created by the authors based on J. Elkington (1997), M.E. Porter *et al.* (2019), E. Nogueira *et al.* (2022), S.B. Khaled *et al.* (2025)

The results showed in Table 5 show that business competitiveness is formed not at the expense of individual components of sustainable development, but as a result of their complex interaction. The integration of economic, social, and environmental tools into the development strategy allows businesses to increase efficiency, reduce risks, and strengthen their market position in the long term. To summarise the research results and form a holistic vision of strategic approaches to ensuring business competitiveness, it is advisable to consider the possibilities of integrating sustainable development and digitalisation within a single strategic management logic. The corresponding integration model is presented in Table 6.

Table 6. Integration of sustainable development and digitalisation in business competitiveness strategies

Strategic approach	Role of sustainable development	Role of digitalisation	Expected result
Integrated	Strategic guidelines	Implementation tools	Long-term competitiveness
Adaptive	Sustainability	Flexibility	Risk reduction
Stakeholder	Social responsibility	Communications	Reputational advantages

Source: created by the authors based on M.E. Porter *et al.* (2019), G. Vial (2019), E.S. Knudsen *et al.* (2021), D. Hariyani *et al.* (2025)

The strategic approaches shown in Table 6 confirm that an effective combination of sustainable development and digitalisation principles forms the basis for long-term business competitiveness. Such integration increases enterprise adaptability, reduces strategic risks, and creates sustainable value in an unstable and digitally transformable environment. Thus, in the context of growing turbulence of the external environment, characterised by accelerating technological changes, unstable markets and increasing institutional challenges, conventional approaches to ensuring business competitiveness are not effective enough. This makes it necessary to form integrated conceptual solutions that can combine strategic guidelines for sustainable development with digital transformation opportunities.

Accordingly, the analysis of scientific sources provided the following scientific conclusions:

- digital transformation and ESG orientation are key factors in modern business competitiveness;
- strategic management acts as an integration mechanism for implementing digital and sustainable initiatives;
- environmental turbulence is a factor that changes the effectiveness of strategic instruments.

In this context, a conceptual integrated model for ensuring business competitiveness through sustainable development and digitalisation in conditions of turbulence is proposed (Fig. 1). It systematises the key factors, mechanisms, and results of interaction between sustainable development, digital management tools, and enterprise adaptability to external changes. The model demonstrates that digitalisation enhances the effectiveness of implementing the principles of sustainable development, and sustainable development creates the strategic basis for digital transformation.

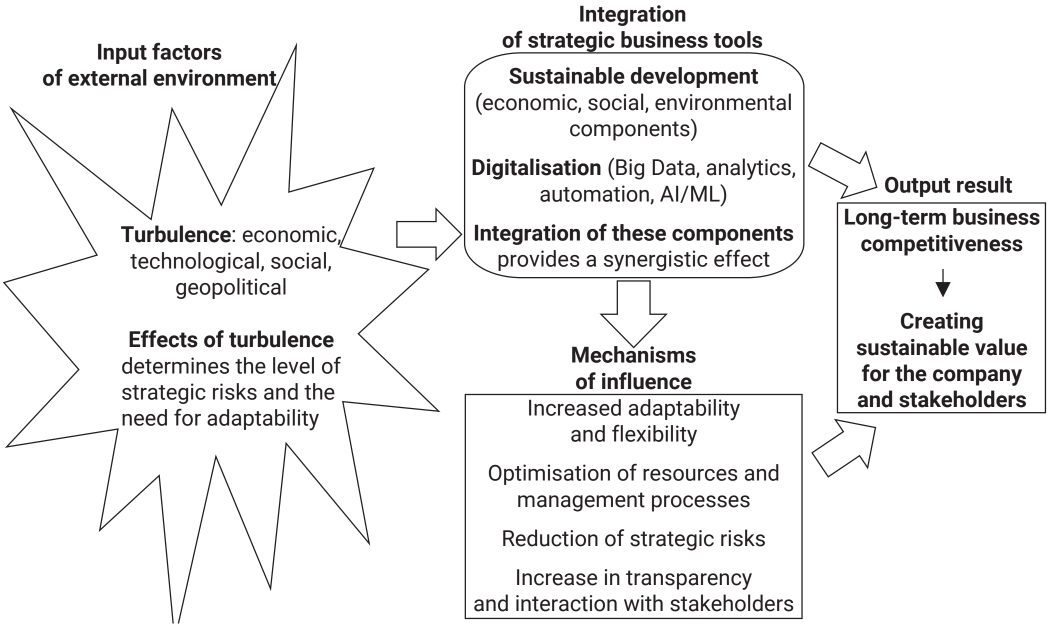

Figure 1. Integrated model for ensuring business competitiveness through sustainable development and digitalisation in the face of turbulence

Source: created by the authors

The proposed conceptual model comprehensively reflects the logic of forming business competitiveness as a dynamic result of integrating the principles of sustainable development, digital management decisions, and mechanisms for responding to environmental turbulence. Its application creates a methodological basis for justifying strategic management decisions aimed at improving the sustainability, adaptability, and long-term efficiency of enterprises. In addition, the model can serve as an analytical basis for further empirical research, quantitative assessment of the relationships between its elements, and practical testing in various sectors of the economy.

The presented conceptual model serves as a theoretical basis for further formalisation of relationships between key processes, in particular, digital transformation, integration of ESG approaches, and the level of external turbulence, which makes it necessary to move to an analytical description of these dependencies. In order to deepen the analysis of the relationship between the processes of digitalisation, sustainable development, and ensuring business competitiveness in conditions of increased environmental variability, it is advisable to use an analytical model that considers not only the direct influence of key factors, but also their interaction. Contemporary research proved that the effectiveness of digital and sustainable strategies largely depends on the level of economic, technological, and institutional turbulence, which necessitates a formalisation of the corresponding moderation effects within the framework of strategic analysis.

Competitive strength (CS) is proposed to be considered as a result of the impact of the level of digital transformation (DT), the integration of sustainable development principles and ESG approaches (ESG), the effectiveness of Strategic Management (SM), and the level of external turbulence (ET). To reflect the complex nature of the interaction of these processes, a generalised analytical model is proposed, which includes the moderation effect of turbulence on the results of digitalisation and the implementation of sustainable strategies

$$CS = \alpha + \beta_1 DT + \beta_2 ESG + \beta_3 SM + \\ + \beta_4 (DT \times ET) + \beta_5 (ESG \times ET), \tag{1}$$

where α – basic level of competitive potential of the enterprise; β_1-β_3 – direct impact of digital transformation, ESG orientation, and strategic management, respectively; β_4 and β_5 – reflect changes in the strength of digital and sustainable strategies depending on the level of external turbulence. DT – systematic integration of digital technologies into business processes, management, and value creation that changes the operational model of an enterprise and its competitive behaviour. Theoretically, it is evaluated through: the level of digitalisation of business processes, the share of investment in digital technologies, the use of Big Data, AI, digital platforms, enterprise digital maturity indices, and the share of digital sales channels. ESG orientation – integration of environmental, social, and governance principles into an enterprise's strategic decisions to ensure long-term sustainability and create value for stakeholders. Its possible measurement indicators are: the presence of an ESG strategy, an ESG rating or sustainability indices, indicators of personnel development, and transparency of corporate governance. SM – ability of an enterprise to develop and implement a long-term competitive strategy based on digital and sustainable benchmarks. Theoretically, this can be evaluated through: the presence of a formalised development strategy, the level of strategic flexibility, innovation activity, and indicators of strategic adaptability. ET – degree of instability, unpredictability, and intensity of changes in the market, technology, and institutional environment. Its possible indicators are: the frequency of changes in regulatory requirements, the intensity of technological innovations in a particular industry, the level of competition, macroeconomic volatility, and business climate indices. The proposed indicators for measuring variables are recommended in nature and can be specified depending on industry specifics and data availability.

It is worth noting that the impact of digitalisation and ESG orientation is not linear and is the same under all conditions. In a stable environment, their effect can manifest itself gradually and through long-term investments. In the face of high turbulence, digital technologies increase adaptability and speed of response, and ESG practices can act as a factor of trust and stability. However, excessive intensity of change can reduce the effectiveness of long-term strategies due to increased uncertainty and risks. That is why the model includes variables (DT × ET) and (ESG × ET), which allows considering the variable nature of their influence depending on environmental conditions.

Notably, the proposed model is explanatory (conceptual) in nature, it has not passed empirical testing on a sample of enterprises, and its provisions are based on generalisation and systematisation of scientific sources. However, it reflects the complex nature of the development of business competitiveness in modern conditions, in which digitalisation and integration of sustainable development principles cannot be considered in isolation from the dynamics of the external environment. The inclusion of interacting variables explains the multidirectional results of implementing digital and ESG strategies during periods of increased turbulence and emphasises the key role of strategic management as a mechanism for adapting enterprises to unstable operating conditions. ESG is used both as an independent determinant and as a variable whose influence is modified by the level of environmental turbulence. In this context, competitive advantages acquire not only a technological or environmental dimension, but also a strategic character that ensures their relative sustainability in the long term.

Thus, the conceptual model proposed in Figure 1 reflects the structural and logical relationships between the processes of sustainable development, digitalisation, and ensuring business competitiveness, while the analytical model (1) allows formalising these relationships in the form of functional dependence. The combination of visual and analytical approaches provides a comprehensive disclosure of the problem under study.

Within the framework of the proposed analytical design, the following research hypotheses were formulated:

- Digital transformation of a business has a positive impact on its competitiveness.
- Integration of ESG approaches into the business strategy contributes to the development of sustainable competitive advantages.
- External turbulence moderates the impact of digital transformation on competitiveness by increasing the importance of strategically managed digital solutions.
- Impact of ESG-oriented strategies on business competitiveness depends on the level of external turbulence.

The formulated hypotheses reflect the key causal relationships between digital transformation, integration of sustainable development principles, and the level of business competitiveness in the context of external turbulence. They logically follow from the proposed conceptual and analytical models and create a theoretical basis for further empirical research aimed at quantifying the impact of certain factors and checking moderation effects. These hypotheses serve as a generalisation of the obtained theoretical provisions and determine the areas of further scientific research.

Discussion

The theoretical and methodological foundations of the proposed model were consistent with the results of empirical and review studies by E.S. Knudsen *et al.* (2021), I.M. Awad *et al.* (2025). In these studies, it was proved that digital transformation and integration of sustainable development principles form competitive advantages not in isolation, but through a complex system of interdependencies with the external environment. In particular, research by D.S. Bindeeba *et al.* (2025) showed that in the context of growing market and institutional turbulence, the effectiveness of digital solutions significantly depends on the strategic coherence of management actions and the ability of the enterprise to adapt the business model to changing operating conditions. Accordingly, the results of this study correlate with the findings of D.S. Bindeeba *et al.* (2025), as they also proved that digital solutions do not automatically improve efficiency in turbulence, strategic consistency of management decisions, and the ability of an enterprise to adapt its business model in accordance with changes in the external environment are also an important factor.

Similarly, M. Hamdouna & M. Khmelyarchuk (2025) proved that, in particular, ESG-oriented strategies show a heterogeneous impact on competitiveness. This impact was enhanced in situations of increased regulatory pressure and environmental instability, which was confirmed by the results of systematic reviews and conceptual studies in the field of sustainable business development. In this context, the inclusion of the moderation effect of external turbulence in the analytical model allowed generalising existing scientific approaches. It also explained why digitalisation and sustainability in the strategic dimension were not only tools for improving operational efficiency, but also key mechanisms for ensuring adaptive business competitiveness in the long term.

The results obtained as part of the study were generally consistent with research by I.M. Awad *et al.* (2025) and M. Hamdouna & M. Khmelyarchuk (2025), according to which the competitiveness of a business in conditions of growing turbulence is increasingly determined not by individual management tools, but by their integration into a comprehensive system of strategic decisions. The proposed conceptual model confirmed the opinion that sustainable development and digitalisation do not function independently, but form an interconnected basis for strategic adaptation of business to an unstable external environment, which corresponds to the conclusions of contemporary systematic reviews.

The results of the study added to the scientific discussion about the role of digital technologies in providing sustainable competitive advantages. Unlike approaches that view digitalisation primarily as a driver of operational efficiency, this study, in line with the findings of D.S. Bindeeba *et al.* (2025) and L. Kong & L. Chen (2025), emphasised its strategic role in implementing the principles of sustainable development and ESG approaches. Furthermore, the results obtained are consistent with the conclusions of E.S. Knudsen *et al.* (2021) and D. Hariyani *et al.* (2025), confirming the ambiguous nature of the impact of environmental turbulence on the competitive position of business. On the one hand, increasing instability complicates strategic planning and increases the level of risks, on the other hand, it encourages enterprises to accelerate digital transformation and implement more flexible management models. Thus, sustainable development combined with digital maturity should be considered not only as a regulatory or reputational requirement, but also as a strategic tool for reducing business vulnerability and increasing its adaptability in a turbulent environment.

Conclusions

The study showed that business competitiveness in a turbulent and digitally transformed environment is formed through the integration of sustainable development principles and digital technologies. Sustainable development is a strategic framework that ensures long-term business sustainability, while digitalisation increases the efficiency of management processes, promotes resource optimisation, transparency, and rapid response to changes. In this context, digital technologies are not an end in themselves, but serve as a tool for implementing strategies aimed at achieving economic, social, and environmental goals. The results of the analysis showed that the level of external turbulence moderates the effectiveness of digital and ESG initiatives: in high turbulence, digitalisation increases business adaptability, and ESG-oriented strategies ensure the trust of stakeholders and reputational sustainability. However, excessive volatility can weaken the effect of long-term strategies, which highlights the need for strategic governance as an integration mechanism between digital and sustainable initiatives.

The proposed conceptual model reflects the development of business competitiveness as a result of the integration of sustainable development, digital management solutions, and effective response and adaptation to turbulence. The formalisation of such interaction in the form of functional dependence, considering the moderation role of turbulence, emphasises that competitive advantages are not a linear consequence of the implementation of individual management decisions, but are formed through their strategic consistency and adaptability to changes in the environment. Therefore, it is advisable to combine digital tools and ESG-oriented strategies as the basis for long-term competitiveness of business entities. This approach is consistent with empirical and meta-analytical studies that prove that digital transformation can enhance long-term business performance only if it is integrated into the strategic and value orientations of business entities. The use of a conceptual model can serve as a basis for strategic decisions, increasing the adaptability and sustainability of business entities. The study provided a theoretical basis for further empirical research aimed at quantifying the proposed relationships, industry adaptation of the model, and analysing the impact of digital maturity on achieving the sustainable development goals in various sectors of the economy. Further research should be directed to empirical verification of the proposed model and hypotheses taking in consideration industry and large-scale features of enterprises' activities.

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Conflict of Interest

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Сталий розвиток бізнесу в умовах турбулентності та цифровізації: стратегічні підходи до забезпечення конкурентоспроможності

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Анотація. Забезпечення конкурентоспроможності бізнесу в умовах турбулентності та цифровізації потребує переосмислення традиційного стратегічного управління. При цьому концептуальною основою для формування стратегічної стійкості, де поєднуються економічна ефективність, соціальна відповідальність та екологічна доцільність виступає сталий розвиток. Метою статті було обґрунтування стратегічних підходів до забезпечення конкурентоспроможності бізнесу в умовах турбулентності та цифровізації зовнішнього середовища на засадах сталого розвитку. Дослідження мало теоретико-концептуальний характер. У ньому було застосовано методи концептуального моделювання й аналітичної формалізації, що створило передумови для подальшої емпіричної верифікації запропонованих положень. Узагальнено сучасні наукові підходи до інтерпретації взаємозв'язку між сталим розвитком, цифровізацією та конкурентоспроможністю бізнесу, а також проаналізовано вплив турбулентності на трансформацію бізнес-моделей і управлінських процесів. Обґрунтовано зміну ролі цифрових технологій у системі стратегічного управління, що проявляється у переході від фрагментарного використання цифрових інструментів до їх комплексної інтеграції у стратегії сталого розвитку та адаптації підприємств. Запропоновано концептуальну модель забезпечення конкурентоспроможності бізнесу, яка відображає логіку взаємодії зовнішніх викликів турбулентного середовища, стратегічних інструментів сталого розвитку, цифрових управлінських рішень та механізмів організаційної адаптації. Сформульовано аналітичну залежність між ключовими процесами моделі, що дозволило обґрунтувати гіпотези щодо посилення конкурентних позицій бізнесу за умов високого рівня цифрової зрілості та інтеграції ESG-підходів у стратегічне управління. Практична значущість отриманих результатів полягає у можливості їх застосування в процесі стратегічного планування, розроблення програм сталого розвитку та реалізації стратегій цифрової трансформації бізнесу в умовах підвищеної невизначеності

Ключові слова: конкурентоспроможність бізнесу; стратегічне управління; цифрова трансформація; бізнес-середовище