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INFORMATISATION AND DIGITALISATION OF BUSINESS PROCESSES AS TOOLS FOR THE STRATEGIC MANAGEMENT OF LOGISTICS ACTIVITY AND SUSTAINABLE DEVELOPMENT OF TRADE ENTERPRISES

Valentyn Dranus, Liubov Dranus, Oksana Prokopyshyn. *"Informatisation and digitalisation of business processes as tools for the strategic management of logistics activity and sustainable development of trade enterprises". The study examines informatisation and digitalisation of business processes as integrated tools of strategic logistics management in trade enterprises operating under conditions of military risk, supply chain instability, and accelerating European integration. The research combines a systematic synthesis of scholarly literature on digital platforms, regulatory governance, and sustainable supply chains with conceptual modelling used to formalise the relationships identified. Unlike approaches that treat digitalisation mainly as a means of automating operations and cutting costs, the analysis demonstrates its system-forming role in reshaping the architecture of logistics management, integrating business processes, and*



building digital trade ecosystems; digital platforms are shown to simultaneously lower traditional market-entry barriers and generate new strategic dependencies for enterprises joining established ecosystems, while technologies such as the Internet of Things, Big Data Analytics, and cloud solutions create competitive advantage only when embedded within a coherent management architecture. The regulatory dimension, anchored in European Union digital-services legislation, is found to transform compliance from a technical obligation into a source of strategic advantage for enterprises that adapt proactively. On this basis, the study proposes an original Digital-Sustainable Logistics Strategy that integrates three equally weighted dimensions - efficiency, resilience, and environmental, social, and governance-oriented responsibility - into a unified strategic management architecture, with digitalisation positioned as a system-forming factor of strategic sustainability rather than an auxiliary operational tool, linking digital transformation, regulatory compliance, and sustainability outcomes within a single decision-making framework. The results offer a methodological basis for designing corporate digital transformation programmes and sustainability-oriented logistics strategies, with further research needed on the environmental and social effects of logistics digitalisation and on the post-war restructuring of digital logistics ecosystems in Ukraine.

Keywords: digital platforms, supply chain resilience, digital ecosystems, regulatory compliance, competitive advantage, ESG responsibility

Валентин Дранус, Любов Дранус, Оксана Прокопишин. "Інформатизація та цифровізація бізнес-процесів як інструменти стратегічного управління логістичною діяльністю та сталим розвитком торговельних підприємств". В дослідженні розглянуто інформатизацію та цифровізацію бізнес-процесів як інтегровані інструменти стратегічного управління логістикою торговельних підприємств, що функціонують в умовах воєнних ризиків, нестабільності ланцюгів постачання та прискорення європейської інтеграції. Дослідження ґрунтується на системному узагальненні наукової літератури щодо цифрових платформ, регуляторного управління та сталих ланцюгів постачання в поєднанні з концептуальним моделюванням, застосованим для формалізації виявлених взаємозв'язків. На відміну від підходів, що трактують цифровізацію переважно як засіб автоматизації операцій і скорочення витрат, аналіз демонструє її системоутворюючу роль в трансформації архітектури логістичного управління, інтеграції бізнес-процесів та побудові цифрових торговельних екосистем; показано, що цифрові платформи одночасно знижують традиційні бар'єри входу на ринок і породжують нові стратегічні залежності для підприємств, що приєднуються до вже сформованих екосистем, тоді як такі технології, як Інтернет речей, Big Data Analytics та хмарні рішення, забезпечують конкурентну перевагу лише за умови їх вбудованості в цілісну управлінську архітектуру. Встановлено, що регуляторний вимір, закріплений в законодавстві Європейського Союзу про цифрові послуги, перетворює комплаєнс із технічного обов'язку на джерело стратегічної переваги для підприємств, що діють на випередження. На цій основі запропоновано оригінальну Цифрово-сталу логістичну стратегію, що інтегрує три рівнозначні виміри: ефективність, стійкість та ESG-орієнтовану відповідальність в єдину архітектуру стратегічного управління, в якій цифровізація позиціонується як системоутворюючий фактор стратегічної сталості, а не допоміжний операційний інструмент, поєднуючи цифрову трансформацію, регуляторну відповідність та результати сталого розвитку в межах єдиної системи прийняття рішень. Отримані результати становлять методологічну основу для розроблення корпоративних програм цифрової трансформації та логістичних стратегій, орієнтованих на сталий розвиток, а подальші дослідження мають зосередитися на оцінці екологічних і соціальних ефектів цифровізації логістики та повоєнній реструктуризації цифрових логістичних екосистем в Україні.

Ключові слова: цифрові платформи, стійкість ланцюгів постачання, цифрові екосистеми, регуляторна відповідність, конкурентна перевага, ESG-відповідальність



Introduction. The full-scale war, the global digital transformation of the economy, and the growing instability of supply chains have fundamentally altered the operating conditions of trade enterprises. The destruction of transport and logistics infrastructure, supply disruptions, shortages of specific resources, cyber threats, rising logistics costs, and the need for rapid adaptation to a continuously changing external environment have substantially intensified the requirements placed on strategic logistics management systems. Under these conditions, the informatisation and digitalisation of business processes cease to be tools of purely technological modernisation or the automation of individual operations. They are transformed into a strategic resource that ensures business continuity, the resilience of logistics systems, rapid managerial decision-making, adaptability to crisis situations, and the formation of long-term competitive advantages.

Despite the rapid development of digital technologies and a substantial body of scholarly research, the prevailing approach in the contemporary literature continues to view digitalisation predominantly through the lens of operational efficiency gains, cost reduction, the automation of logistics processes, inventory optimisation, and faster order processing. At the same time, its strategic functions remain insufficiently studied, in particular its role in shaping adaptive management models, strengthening the resilience of logistics systems to military, economic, and technological shocks, transforming competitive relationships, developing digital trade ecosystems, integrating ESG principles, and ensuring the sustainable development of enterprises. These issues are of particular relevance to Ukraine, where military risks, the imperative of post-war economic recovery, and integration into the European digital space require a reconceptualisation of digitalisation, not

merely as a technological factor but as a strategic driver of enterprise development. It is precisely the need to formulate a coherent concept of strategic logistics management grounded in informatisation, digitalisation, and sustainable development principles that defines the scientific problem addressed in this study.

The transformative impact of digital platforms on traditional market structures has been examined by Oluka (2024), who established that digitalisation substantially lowers market entry barriers and fosters economic inclusion, while simultaneously generating new challenges for regulation and market participant protection. Gilardi (2022) demonstrated that effective governance of digital technologies requires adaptive, forward-looking, and internationally coordinated regulatory approaches capable of anticipating change rather than merely reacting to it. The regulatory dimension of digital trade in the EU is codified in the Digital Services Act (European Commission, 2022), which establishes new standards of platform accountability. The interrelationship between digital transformation, strategic sustainability, and sustainable development has been investigated by Prokopyshyn et al. (2026, 2024). Among international studies, particular significance attaches to research on sustainable logistics (Bag et al., 2019), digital business ecosystems (Bohnsack et al., 2024; Veile et al., 2020), and data management and digital platform operation (Guo et al., 2020; Qadri et al., 2025; Nozari et al., 2021; Sestino et al., 2020; Chen et al., 2015; Teece, 2018; vom Brocke et al., 2016). Notwithstanding this substantial body of research, the question of formulating a digital-sustainable logistics strategy for trade enterprises that integrates informatisation, ESG principles, and strategic sustainability into a single concept remains insufficiently developed and only partially systematised.

The purpose of this article is to substantiate the conceptual foundations of



informatisation and digitalisation of business processes as an integrated instrument of strategic logistics management for trade enterprises in the context of ensuring their sustainable development, by demonstrating the systemic impact of digitalisation on market structures, the regulatory environment, and the ESG dimension of logistics strategy. To achieve this purpose, the study examines the following research tasks: to synthesise the theoretical foundations of digital platform impact on market structures and regulatory governance; to identify the mechanisms through which digitalisation generates verifiable sustainability outcomes in logistics; and to develop an original conceptual model that integrates digital transformation, strategic resilience, and ESG-oriented management into a unified logistics strategy framework.

Theoretical framework.

Understanding informatisation and digitalisation of business processes as instruments of strategic logistics management in trade enterprises requires moving beyond conventional technological conceptions toward a comprehensive examination of their impact on the transformation of market structures, the regulatory environment, and the implementation of ESG principles.

Oluka (2024) established that digital platforms fundamentally alter the market structures of trade through reduced transaction costs, network effects, and the emergence of new business models. For trade enterprises, this translates into lower barriers to market entry, intensifying competitive pressure from platform aggregators such as Amazon and Alibaba, and the emergence of new forms of logistics relationships among trade enterprises, suppliers, and consumers. Importantly, digitalisation is not solely a threat to traditional trade formats but also a strategic opportunity: enterprises that build their own digital ecosystems or actively integrate into existing platform ecosystems gain access to new markets and logistics

networks without a proportional increase in operating costs (Bohnsack et al., 2024; Veile et al., 2020). Research on omnichannel retailing confirms that the integration of physical and digital channels constitutes an important determinant of trade enterprise competitiveness (Radomska et al., 2025).

Gilardi (2022) demonstrated that effective governance of digital technologies requires adaptive, forward-looking, and internationally coordinated regulatory approaches that evolve in tandem with technological progress. The principal regulatory benchmark for trade enterprises oriented toward EU markets is the Digital Services Act (European Commission, 2022), which establishes requirements regarding platform accountability, the transparency of algorithmic recommendations, and data protection. Its implementation directly affects the operating conditions of trade enterprises' logistics systems: requirements concerning product traceability, the protection of customers' personal data, and supply chain transparency become mandatory standards rather than voluntary practices. For domestic trade enterprises seeking integration into EU markets as part of the European integration process, this creates new requirements for the digital architecture of logistics systems and for strategic management.

Research in the field of sustainable logistics (Bag et al., 2019) and digital transformation (Qadri et al., 2025; Nozari et al., 2021) reveals an inseparable connection between a trade enterprise's level of digital maturity and its capacity to comply with ESG principles. Digitalisation facilitates ESG compliance through specific mechanisms. In the environmental dimension, route optimisation through transport management systems and artificial intelligence reduces mileage and CO₂ emissions, automated inventory management lowers the level of surplus stock and waste, and digital document workflows eliminate paper-based documentation. Within the social dimension, omnichannel trade increases product

accessibility, digital platforms foster transparent working conditions throughout supply chains (Oluka, 2024; Radomska et al., 2025), and the development of staff digital competencies enhances their competitiveness in the labour market. The governance dimension is supported by digital controlling and KPI monitoring that increase the transparency and accountability of managerial decisions, blockchain that verifies ESG commitments throughout the supply chain, and data analytics that enable accessible public ESG reporting.

RESULTS AND DISCUSSION. The analysis of the reviewed scholarly sources allows for several generalisations that directly underpin the authors' concept. First, the studies of Oluka (2024) and Gilardi (2022) jointly demonstrate that digitalisation exerts a systemic effect on market structures along two simultaneous trajectories: a disruptive one, eroding traditional entry barriers and redistributing market power in favour of platform aggregators, and a constructive one, opening opportunities to build proprietary digital ecosystems and enter new markets without a proportional increase in costs. Teece (2018) refines this logic by pointing to the dual nature of platforms: they simultaneously confer advantages on early adopters and create new strategic dependencies for those entering already established ecosystems. This implies that the strategic choice between developing a proprietary platform and integrating into an external one is a decisive determinant of a trade enterprise's long-term competitive position. Second, the analysis of research on data management (Chen, Preston, & Swink, 2015; Sestino et al., 2020) and digital business ecosystems (Bohnsack et al., 2024; Veile et al., 2020) confirms that the technological basis of digitalisation, namely the Internet of Things, Big Data Analytics, cloud solutions, and AI-driven optimisation, loses its strategic value outside the context of business processes and organisational architecture. Digital tools generate competitive advantage only when

embedded within a coherent management system with clearly defined processes, accountability, and performance metrics (vom Brocke, Zelt, & Schmiedel, 2016). Third, the synthesis of research on sustainable logistics (Bag, Gupta, & Foropon, 2019; Qadri et al., 2025; Nozari et al., 2021) and omnichannel trade (Radomska et al., 2025) confirms that the measurable impact of digitalisation on sustainability indicators is substantial and empirically verified: AI-based route optimisation reduces the transport carbon footprint by 10–15 per cent, automated inventory management reduces spoilage-related waste by 20–30 per cent, and Big Data Analytics-based digital reporting reduces the cost of ESG reporting preparation by 40–60 per cent (Bohnsack et al., 2024). These effects are not automatic; they materialise only when digital systems are purposefully designed with ESG objectives in mind. Fourth, the EU regulatory vector embodied in the Digital Services Act (European Commission, 2022) and examined by Gilardi (2022) transforms digital compliance from a technical requirement into a strategic competitive advantage: enterprises that proactively adapt to requirements concerning supply chain traceability, data protection, and algorithmic transparency gain a time advantage over competitors who wait for the formal introduction of regulatory obligations. Prokopyshyn et al. (2024, 2026) substantiate that precisely this proactive adaptation to regulatory change constitutes one of the key mechanisms for building strategic sustainability under conditions of digital economic transformation and wartime uncertainty.

A defining conclusion common to all the reviewed studies is that none of the effects identified above is achieved through the isolated adoption of an individual technology or compliance with a single regulatory requirement. Realising the potential of digitalisation requires the systemic integration of the technological, regulatory,

and value-based dimensions within a unified management architecture. It is precisely this conclusion that constitutes the starting point for the authors' Digital-Sustainable Logistics Strategy (DSLS) concept.

The DSLS concept rests on three equally weighted strategic dimensions, each of which is necessary but insufficient without the other two. The first dimension, efficiency, defines digitalisation as a source of operational advantage: reduced transaction costs, accelerated logistics cycles, improved demand-forecasting accuracy, and inventory optimisation through the integration of transport management systems, warehouse management systems, and AI-driven analytics. The second dimension, resilience, treats digitalisation as the foundation of resilience, that is, the capacity of logistics systems to maintain functionality under military risk, supply chain disruption, and global uncertainty through decentralised management, channel redundancy, and end-to-end information transparency. The third dimension, responsibility, positions digitalisation as an instrument for implementing ESG principles, ranging from automated carbon accounting and digital document workflows to the blockchain-based verification of social commitments across supply chains and public ESG reporting underpinned by Big Data Analytics. These three dimensions are not sequential stages but operate concurrently, reinforcing one another: efficiency gains free up resources for ESG investment; resilience ensures the continuity of ESG commitments even under crisis conditions; and ESG responsibility enhances reputational resilience and broadens access to international capital markets, which, in turn, finances the further development of digital infrastructure (vom Brocke, Zelt, & Schmiedel, 2016). To visualise the internal logic of the DSLS concept and the interrelationships among its elements, a conceptual model has been developed, presented in Figure 1.

The conceptual model presented in Figure 1 reflects the authors' approach to formulating a Digital-Sustainable Logistics Strategy for a trade enterprise, integrating the digitalisation of business processes, the strategic management of logistics activity, and ESG principles within a single decision-making system. Unlike existing models that predominantly emphasise individual digital technologies or the automation of logistics processes, the proposed model treats digitalisation as a strategic mechanism for ensuring the enterprise's long-term sustainability under conditions of high uncertainty, military risk, European integration transformations, and intensifying sustainable development requirements.

The novelty of the proposed model lies in the integration of three mutually reinforcing strategic components, namely digital transformation, strategic sustainability, and ESG-oriented management, within a single conceptual architecture of logistics management. Unlike conventional approaches, in which digitalisation performs an auxiliary function with respect to the automation of operational processes, in the proposed model it acts as a system-forming factor that ensures the continuity of logistics system operation, adaptability to changes in the external environment, informational transparency, the speed of managerial decision-making, and improved coordination among all supply chain participants. At the same time, ESG principles are integrated not as a separate corporate responsibility track but as a constituent element of strategic management that determines the environmental, social, and governance performance of digital transformation. The concluding element of the conceptual model is the block of strategic results, which demonstrates the anticipated effects of the comprehensive implementation of the Digital-Sustainable Logistics Strategy. Unlike existing models, which predominantly assess the effectiveness of digitalisation through isolated operational or financial indicators,



the proposed approach reflects a comprehensive strategic outcome that combines enhanced competitiveness, the assurance of strategic sustainability, the adaptability of logistics systems to military and other crisis risks, integration into the European digital space, compliance with Digital Services Act and ESG requirements, and the achievement of long-term sustainable development. This allows the

model to be applied not only as a conceptual foundation for the digital transformation of logistics, but also as a practical instrument for shaping strategic managerial decisions, determining priorities for investment in digital technologies, evaluating the effectiveness of digitalisation, and planning the development of a trade enterprise under conditions of high uncertainty.

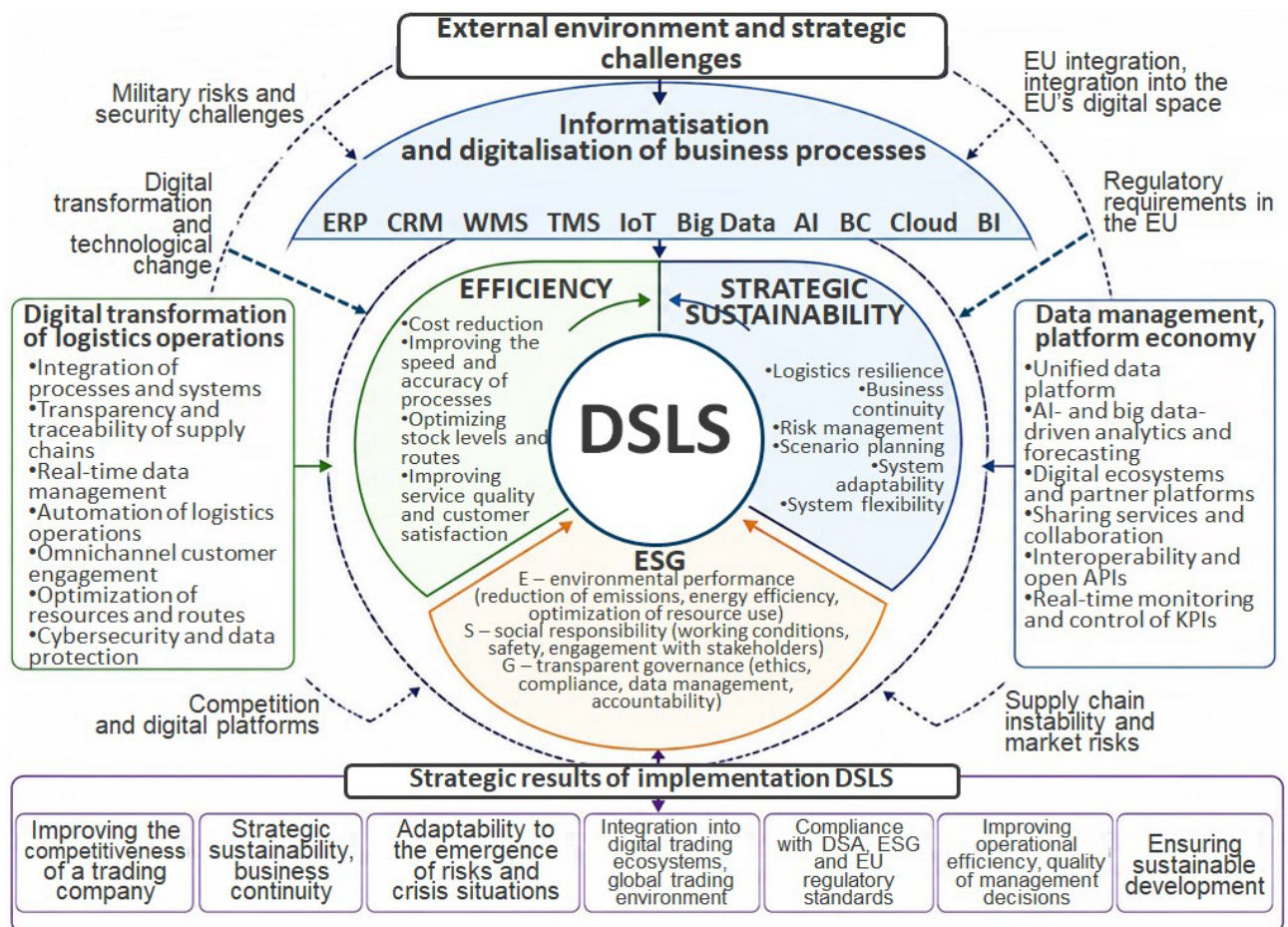


Figure 1-Conceptual model of the integration of ESG principles and digitalisation into the logistics strategy of a trade enterprise (DSLS)

Source: developed by the authors.

The practical value of the proposed model lies in its potential use as a methodological foundation for the formulation and implementation of trade enterprises' logistics strategies. Its application would enable a systematic assessment of the relationship among digital technologies, the effectiveness of

logistics processes, the level of strategic sustainability, and sustainable development indicators; the identification of priority directions for digital modernisation; an increase in enterprises' adaptability to crisis and wartime challenges; the minimisation of logistics risks; compliance with

European regulatory requirements (the Digital Services Act, ESG, and supply chain traceability requirements); and the formation of long-term competitive advantages. In addition, the model may serve as a conceptual basis for designing corporate digital transformation programmes, constructing systems of strategic key performance indicators, and assessing the effectiveness of logistics digitalisation in the context of achieving sustainable development goals.

Conclusions.

The study substantiates that the informatisation and digitalisation of business processes constitute an integrated strategic instrument that simultaneously transforms the operational efficiency of logistics processes, the market structures of trade, the regulatory environment, and the mechanisms for ensuring the sustainable development of trade enterprises. Unlike approaches that reduce digitalisation to the automation of operations or the adoption of individual technological solutions, the proposed Digital-Sustainable Logistics Strategy (DSLS) concept integrates three strategic dimensions, namely efficiency, resilience, and social responsibility, within a unified system of strategic management.

It has been established that the regulatory dimension of digitalisation is an independent strategic factor that directly determines the parameters of the digital architecture of logistics systems, rather than merely an external constraint on enterprise activity. For Ukrainian trade enterprises pursuing European integration, proactive adaptation to EU digital regulatory requirements is a source of strategic competitive advantage. The research purpose formulated in the Introduction, namely to substantiate the conceptual foundations of digitalisation as integrated tools of strategic logistics management oriented toward sustainable development, has been achieved through the synthesis of the theoretical foundations of digital platform impact and the development of the DSLS conceptual model.

Directions for further research include the development of methodological tools for assessing the ESG effects of trade enterprises' logistics digitalisation; the formulation of a practical mechanism for adapting logistics strategies to EU regulatory requirements within the European integration process; and the examination of the impact of digital platforms on the restructuring of domestic trade enterprises' logistics chains following the cessation of hostilities.

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