UDC 338.2:004 DOI: https://doi.org/10.64076/iedc250920.07

Information model for managing enterprise economic security under digital transformation

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Abstract. *The paper explores the development of an information model for managing the economic security of enterprises amid digital transformation. Emphasis is placed on the role of decision support systems in processing structured and unstructured data, forecasting risks, and supporting informed decision-making. A modular architecture is proposed to ensure adaptability, scalability, and effective threat response.*
Keywords: *economic security, information model, decision support system, digital transformation.*

A robust economic security system is essential for an enterprise because it ensures stability, resilience and long-term sustainability in an increasingly volatile and competitive environment. Economic security enables a business to identify, assess, and mitigate potential financial, operational and strategic risks that could disrupt its activities or threaten its survival. With growing exposure to cyber threats, market fluctuations, regulatory changes, and supply chain vulnerabilities, enterprises must proactively manage both internal and external challenges. A well-structured economic security system not only protects assets and resources but also supports informed decision-making, enhances stakeholder confidence and provides a foundation for sustainable growth and innovation.

Effective enterprise management and the establishment of a robust economic security system are unattainable without a clearly defined information model. This model functions as both a conceptual and operational tool, facilitating the integration of external environmental factors, internal enterprise resources, and comprehensive security assessments.

The information model for economic security management forms the core of a Decision Support System (DSS), which has become increasingly vital in the context of digital transformation. A DSS is an interactive computer system that integrates hardware, software, databases, analytical models and managerial input to support decision-making under structured, semi-structured or unstructured conditions [1]. According to S. Golsapple and A. Winston, DSSs enhance both individual and collective decision-making by expanding managerial capacity to work with diverse knowledge types [2].

Within the framework of enterprise economic security, DSSs perform critical functions such as the collection, organization, storage, processing and analysis of large volumes of internal and external data. These capabilities allow for the development of

predictive scenarios, early identification of potential threats and data-driven decision-making aimed at mitigating risks.

The construction of an effective information model plays a decisive role in safeguarding the integrated economic security of an enterprise, particularly under conditions of external instability and growing digital threats. In this context, the essential requirements for such a model within a decision support system for managing economic security include:

1. Support for semi-structured and fuzzy data: the system should process both formalized indicators and semi-structured data such as expert opinions, external signals and analytical reports, which are typical in the digital landscape.

2. Risk modeling and forecasting: the DSS must incorporate forecasting models using machine learning, statistical methods and simulation to evaluate risk probabilities and their potential impact on the enterprise.

3. Comprehensive decision-making support: the system should address all phases of the decision-making process based on analytical justification.

4. Automated monitoring of key security indicators: continuous monitoring of financial, HR and technological indicators should be enabled, with automatic alert generation for anomalies or threshold breaches.

5. Integration with existing enterprise information systems: the DSS must seamlessly exchange data with ERP, CRM, BI and other corporate platforms.

6. User-friendly and adaptive interface: the interface should be intuitive and customizable, aligning with users' qualifications and functional responsibilities.

7. Scalability and high performance: the architecture should handle growing data volumes and numerous simultaneous users without performance degradation.

8. Evolutionary development capability: a modular structure should support component updates, functional expansion and integration of new analytical models without disrupting the overall system architecture.

9. High interoperability: the DSS must interact with external services compromising data integrity or coherence.

10. Improved economic security management: the DSS should enhance decision-making quality, enable proactive threat response and reduce overall enterprise risk.

Based on a comprehensive review of the scientific literature and best practices in decision support system design [3, 4], the optimal system architecture has been determined to follow a block-modular structure. It integrates three interconnected functional subsystems – financial, human resources and technological – together with a user interaction interface.

In accordance with this architectural approach, the information model developed in this research incorporates the following structural components (see Figure 1):

1. Input module: facilitates the acquisition of enterprise data, including internal reports, regulatory documentation, internal database records, and external analytical sources.

2. Data preprocessing module: ensures data verification, cleaning, normalization, unification and encoding to prepare information for subsequent analysis.

3. Modeling and analysis module: applies mathematical and machine learning methods to evaluate subsystem states and to produce forecasts and trend analyses.

4. Evaluation integration module: consolidates results from individual subsystems into a unified integral index of the enterprise's economic security.

5. Output module: produces reports, visualizations, recommendations and alerts, presenting results in a format accessible to managers at all levels.

6. User interface: provides interaction with the system, including parameter input, module execution, report visualization, and decision support. The interface is designed to be intuitive, user-friendly and adaptable to different levels of digital literacy.

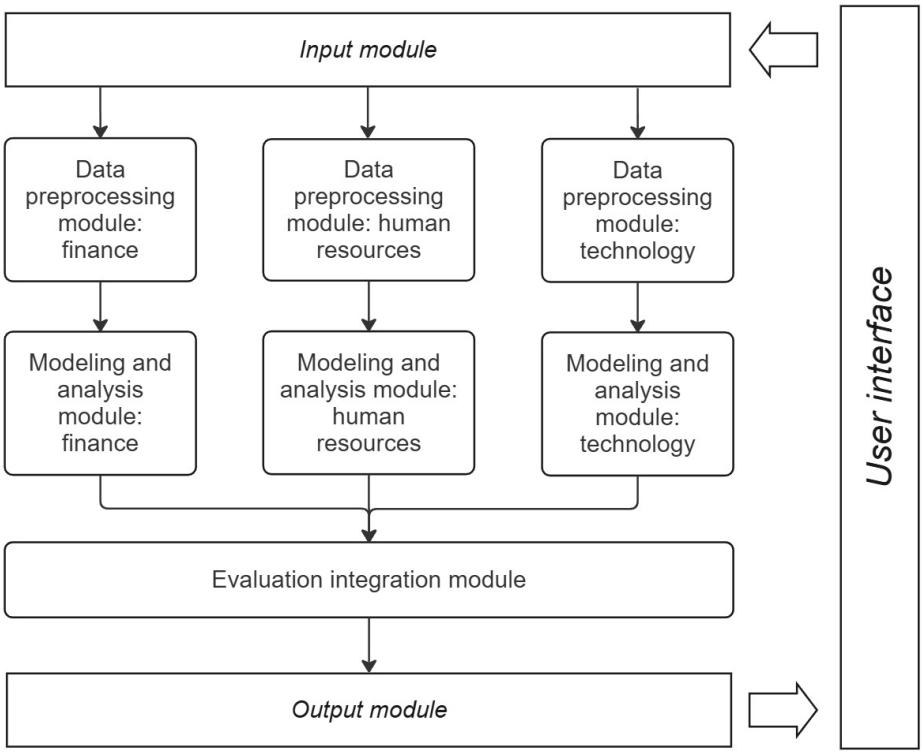

Fig. 1. Information system of enterprise economic security under digital transformation

Source: compiled by the author.

An information system developed according to a block-modular approach ensures high adaptability, scalability and functional flexibility. Its implementation transforms the management of economic security by automating processes related to monitoring, analysis and risk forecasting.

The proposed information model serves not only as a technological support tool but also as a strategic resource for enhancing enterprise economic security in the digital economy. Its implementation facilitates a transition from reactive to proactive risk management, significantly increasing enterprise resilience against both internal and external threats.

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UDC 338.242.2:502.131.1(4-6EU+477) DOI: https://doi.org/10.64076/iedc250920.08

Key opportunities and challenges of the European Green Deal policy for Ukraine

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Abstract. *The European Green Deal (EGD) sets a long modernization trajectory for Ukraine: from Fit for 55 and CBAM to Farm to Fork and Biodiversity 2030. It opens access to EU markets and capital, while imposing requirements for MRV capacity, decarbonization, and sustainable land use. A portfolio of actions is proposed: Cadastre/Grids/Industry 2.0, CBAM preparedness, "green" agri-food policy, and a national MRV/KPI 2025–2030 package; the expected effects are lower compliance costs, preserved export competitiveness, and productivity growth.*
Keywords: *European Green Deal; CBAM; bioeconomy; agroecology; MRV system; sustainable agriculture; decarbonization; agri-food value chains; biodiversity strategy.*

Introduction. The EU Green Deal is understood as a growth strategy aiming at climate neutrality by 2050 [1]. The legislative backbone, *Fit for 55*, sets 2030 targets by aligning energy, transport, and industry [2]. For partner countries, the Carbon Border Adjustment Mechanism (CBAM) becomes a key channel of influence, translating a carbon price into external trade relations [3]. For the agri-food pillar, *Farm*