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CONCEPTUAL MODEL OF THE ORGANIZATIONAL AND ECONOMIC MECHANISM FOR SUSTAINABLE ENTERPRISE DEVELOPMENT BASED ON THE IDEF0 METHODOLOGY

The purpose of the article is to model the organizational and economic mechanism for sustainable enterprise development using the IDEF0 methodology. A new definition of the organizational and economic mechanism for sustainable development is proposed, which is presented as a set of sequential processes that ensure the efficient use of enterprise resources to achieve economic, environmental, and social goals. The application of the IDEF0 methodology is substantiated, and a contextual diagram (A-0) is constructed, illustrating the overall mechanism for ensuring sustainable enterprise development, including inputs, outputs, mechanisms, and controls. The decomposition of the main process into five key elements is carried out: aggregate enterprise potential, goals and strategies, internal standards and evaluation methods, monitoring and assessment of stability, and adaptation of management decisions. The proposed model is a universal tool for managing sustainable development and can be adapted to the specific characteristics of individual enterprises or industries. The use of the model improves the effectiveness of managerial decisions, ensures the achievement of strategic goals, and promotes long-term sustainable enterprise development.

Key words: sustainable enterprise development, organizational and economic mechanism, IDEF0 methodology.

Чмут О.О. КОНЦЕПТУАЛЬНА МОДЕЛЬ ОРГАНІЗАЦІЙНО-ЕКОНОМІЧНОГО МЕХАНІЗМУ СТАЛОГО РОЗВИТКУ ПІДПРИЄМСТВА ЗА МЕТОДОЛОГІЄЮ IDEF0

Сучасні соціально-економічні процеси відзначаються високою динамічністю, невизначеністю та зростаючою складністю управлінських викликів, що обумовлює необхідність пошуку нових підходів до стратегічного розвитку підприємств. В умовах глобалізації, структурних зрушень у світовій економіці та посилення екологічних і соціальних вимог до бізнесу концепція сталого розвитку набуває статусу стратегічного орієнтира господарської діяльності. Вона дозволяє інтегрувати економічну ефективність, соціальну відповідальність та екологічну безпеку в єдину систему управління, забезпечуючи довгострокову конкурентоспроможність підприємств. Питання формування організаційно-економічного механізму сталого розвитку набуває особливого значення, оскільки саме цей механізм забезпечує узгодження стратегічних цілей, оптимізацію використання ресурсів, адаптацію до динамічного зовнішнього середовища та підвищення результативності управлінських рішень. Метою статті є дослідження концептуальних засад побудови організаційно-економічного механізму сталого розвитку підприємства та обґрунтування методичних підходів до його моделювання, із використанням методології IDEF0. Дослідження зосереджене на з'ясуванні сутності механізму, його функціональних елементів і логік взаємодії між ними, що дозволяє структурувати систему управління як цілісну модель, спрямовану на досягнення стратегічних цілей сталого розвитку. Особлива увага приділяється питанням узгодження зовнішніх та внутрішніх факторів впливу, формуванню адаптивних управлінських стратегій, підвищенню ресурсної ефективності та розробці інструментів, здатних забезпечити стійке функціонування підприємства в умовах турбулентності економічного середовища. Запропонований підхід базується на процесному баченні організаційно-економічної системи, що дає змогу забезпечити прозорість управління, чіткість взаємозв'язків між складовими та підвищити рівень керованості стратегічного розвитку. Представлена робота створює концептуальне підґрунтя для подальших досліджень у сфері стратегічного управління, дозволяючи розглядати сталий розвиток підприємства як інтегрований, багатовимірний процес, що охоплює економічні, соціальні та екологічні аспекти його функціонування

Ключові слова: сталий розвиток підприємств, організаційно-економічний механізм, методологія IDEF0.

Problem statement. In modern conditions, sustainable enterprise development is gaining increasing importance as businesses face numerous challenges caused by economic, environmental, and social factors. The implementation of integrated management models that take these three components into account has become a key task for businesses.

Considering this, the modeling of the organizational and economic mechanism for sustainable development represents a crucial stage in establishing an effective enterprise management system.

One of the tools for building such models is the IDEF0 methodology, which enables clear structuring of processes, visualization



of their interconnections, and management at various organizational levels. The primary advantage of this methodology lies in its ability to create hierarchical models that allow for process detailing and enhance the effectiveness of managerial decisions. The aim of this study is to develop a model of the organizational and economic mechanism for sustainable enterprise development using the IDEF0 methodology, which will enable enterprises to optimize resource utilization and achieve strategic goals in the field of sustainable development.

Analysis of recent research and publications. The issues of sustainable development have been widely explored by scholars, but recent research increasingly focuses on creating organizational and economic mechanisms that operationalize these principles through process-oriented approaches. Panchenko V. et al. examined methodological foundations of enterprise management, while Tsiberman Y. and Belov V. highlighted the potential of functional modeling. Cantamessa M. and Paolucci E. and Bargelis A. and Stasiukis A. [1] demonstrated the effectiveness of IDEF0 in structuring and improving business processes. Fedorova N. et al. and Godlevskyi M. et al [2]. analyzed its application in modernization and optimization contexts. Ukrainian scholars, including Ushkarenko I. [3], Chmut O. [4, 5], Hladynets, N. [6], investigated conceptual foundations of such mechanisms, while Kulinich T. and Kozlova E. [7], et al. focused on their structure and practical implementation. These studies confirm the growing role of IDEF0 modeling as a tool for enhancing the efficiency and adaptability of enterprise management systems. Despite significant scientific progress in this field, the development of a comprehensive organizational and economic mechanism for sustainable enterprise development remains unresolved, which determined the relevance and purpose of this study.

The purpose of the article is to study the conceptual foundations of building the organizational and economic mechanism of sustainable enterprise development and to substantiate methodological approaches to its modeling using the IDEF0 process approach.

Presentation of the research material and its main results. In their earlier research, the authors analyzed the views of different scholars regarding the concept and definition of sustainable development at the enterprise level. [3–4]. Summarizing their approaches,

it can be concluded that this concept is one of the key factors for enterprise development in a rapidly changing external environment. The foundation of the concept of sustainable development lies in recognizing the limitations of natural resources, the need for their conservation, and the growing importance of the human (social) factor.

The implementation of the sustainable development concept in enterprises is carried out through an appropriate organizational and economic mechanism. After analyzing the definition of the “organizational and economic mechanism of an enterprise,” we concluded that most authors interpret it using a systemic approach [7]. Therefore, within the framework of sustainable development, the organizational and economic mechanism can be viewed as a system of interrelated components that promotes the effective utilization of resources and contributes to achieving sustainable development objectives across economic, environmental, and social spheres.

Given the conditions of our research, which is based on a process-oriented approach, we propose the following definition: the organizational and economic mechanism for sustainable enterprise development is a set of sequential processes, each performing specific functions and interacting to ensure the efficient use of all resources, aiming to achieve sustainable development goals in the economic, environmental, and social dimensions.

Accordingly, in line with the goal of our research, we develop a model of the organizational and economic mechanism for sustainable enterprise development using the IDEF0 methodology [1–2].

The detailed application of the IDEF0 methodology for constructing the organizational and economic mechanism has been examined by the author in previous research [5].

At the first stage, we build a contextual diagram (A-0). The contextual diagram represents the overall model of the organizational and economic mechanism for sustainable enterprise development, where the primary process is ensuring sustainable enterprise development (Fig. 1).

External regulators influencing sustainable enterprise development were thoroughly analyzed in previous studies [4]. These include the general concept and principles of sustainable development at the global level, international and national

legislation regulating the environmental, social, and economic aspects of enterprise activity, and international standards such as ISO 14001 (environmental management) and ISO 26000 (social responsibility). National sustainable development strategies, which set general frameworks for enterprises in different industries, also play a significant role.

Internal regulators include internal standards that define the order of execution for key business processes, internal policies that regulate compliance with environmental and social norms, and enterprise strategies aimed at achieving sustainable development. These internal regulators play an important role in shaping a corporate culture of sustainable management, ensuring that enterprise activities comply with external requirements and adapt to the changing external environment.

The inputs of the contextual diagram include the enterprise's primary resources: economic (finances, equipment), environmental (natural resources), and social (human capital). These resources are essential for the implementation of processes aimed at ensuring sustainable development. Without these resources, enterprises cannot effectively integrate sustainability principles into their operations, nor can they achieve a balanced approach to development. The proper allocation and utilization of these inputs play a vital role in ensuring the efficiency of subsequent stages. The mechanisms are provided by accountable departments and management personnel, who directly carry

out the processes. Additionally, information systems that support management are included among the mechanisms. These systems ensure accurate data collection and analysis, which are critical for informed decision-making and timely interventions to align with sustainability goals.

The output represents the achievement of sustainable development in three key dimensions – economic, environmental, and social. This output serves not only as an indicator of enterprise performance but also as a benchmark for evaluating long-term progress toward sustainability objectives. Enterprises must regularly assess these dimensions to ensure alignment with broader sustainability frameworks and standards.

At the next stage, to ensure a detailed modeling of the organizational and economic mechanism for sustainable development, the model is decomposed. At the first level of decomposition, key elements are identified, each performing important functions within the mechanism. Each of these elements plays a crucial role in achieving sustainable development by managing resources, setting strategies, ensuring standards, and conducting monitoring [4]. The decomposition process allows for a more focused analysis of each element, enabling enterprises to identify weaknesses and opportunities for improvement. It also facilitates better coordination among various components of the mechanism, ensuring a cohesive approach to sustainability. Based on a review of the literature dedicated to the analysis of the components of the organizational and economic mechanism, the following key elements of the sustainable development mechanism have been identified (Fig. 2).

Let us consider the components of the Organizational and Economic Mechanism for Sustainable Development of Enterprises in more detail.

The first key element of the organizational and economic mechanism for sustainable development is the aggregate enterprise potential, which includes material, financial, human, and informational resources. These resources serve as inputs for ensuring the functioning of the sustainable development mechanism. The optimal use of these resources is the main output, ensuring stable development of the enterprise in economic, social, and environmental dimensions. The implementation of this task is carried out through mechanisms, which include management personnel and accountable

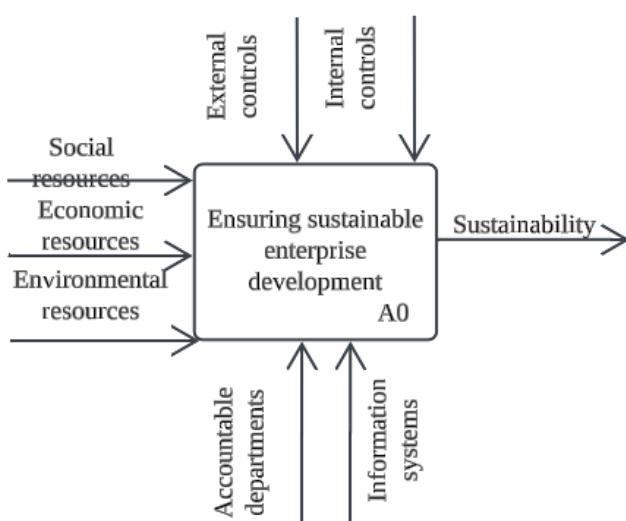


Figure 1. Contextual diagram of providing sustainable development in IDEF0

Sources [5]

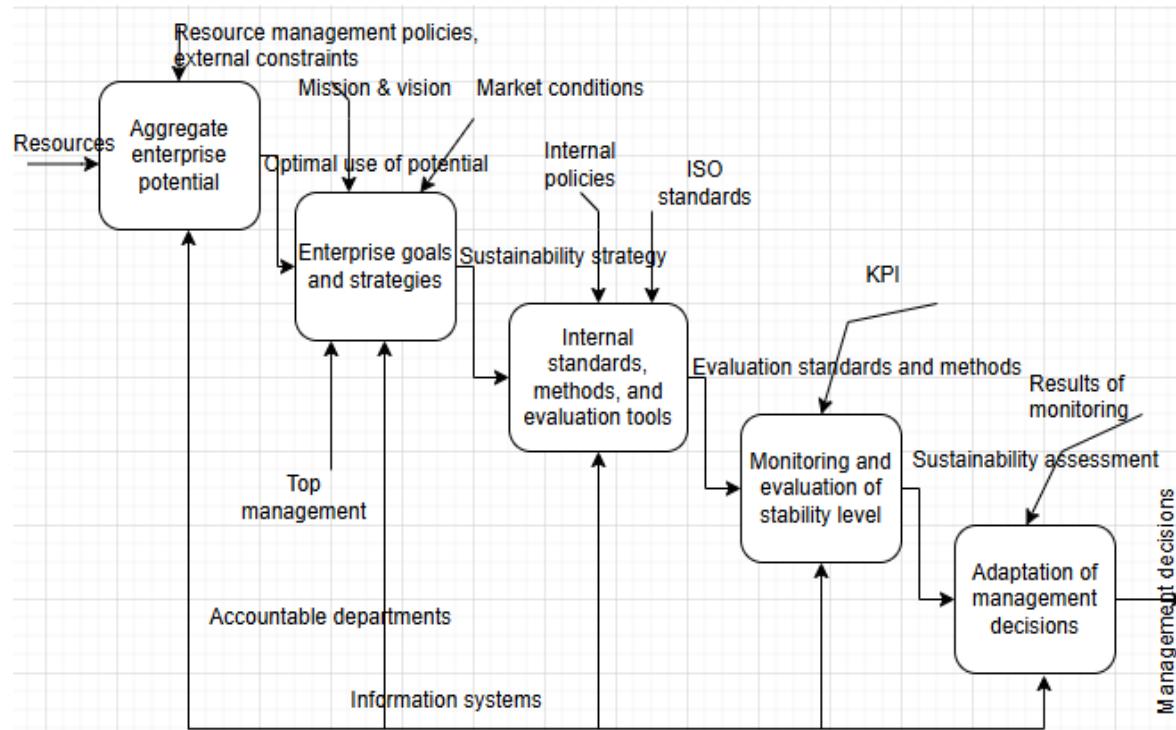


Figure 2. Organizational and Economic Mechanism for Sustainable Development of Enterprises

Sources: own research

departments. Control over resource utilization and goal achievement is ensured through controls, which include resource management policies, external market conditions, and legal requirements.

The next element is the enterprise goals and strategies, which define the strategic direction of its development. The main inputs for this element are the strategic orientations of the enterprise and the results of internal and external environment analysis. Based on these data, outputs in the form of developed sustainable development strategies are generated. This process is ensured by mechanisms, including the strategic planning department and enterprise management. Control over the alignment of strategies with the mission, vision, and overall corporate goals is exercised through established controls, such as market requirements and corporate policies.

The third element includes internal standards, methods, and evaluation tools, which ensure a unified approach to assessing enterprise performance. The main inputs for this element are regulatory documents and evaluation methodologies. The outputs are the implemented standards and methods that enable the assessment of sustainable development strategy effectiveness. The

corresponding mechanisms are internal audits and quality management information systems, while controls include regulations, internal policies, and international standards, such as ISO.

The fourth element is monitoring and assessment of stability, which is a critical stage in ensuring sustainable development. This stage involves not only the collection and analysis of performance indicators but also their interpretation in the context of sustainability goals. The primary inputs for this element are enterprise performance indicators and the results of internal audits, which provide data on efficiency, compliance, and areas of improvement. The output is an assessment of the sustainability level, enabling the enterprise to determine its current state and identify potential deviations that could hinder long-term objectives. The monitoring process is supported by mechanisms, such as monitoring information systems, which facilitate real-time tracking, and internal control services, which ensure compliance with established policies and standards. At the same time, control is exercised based on key performance indicators (KPIs) and monitoring policies, which serve as the primary controls for evaluating progress.



and making adjustments when necessary. Effective monitoring provides a solid foundation for informed decision-making, ensuring that enterprises stay aligned with their sustainability strategies.

The final element is the adaptation of management decisions, which represents the concluding stage of the management cycle. The main inputs for this element are the results of monitoring and an evaluation of deviations from established goals. This stage involves analyzing feedback from the monitoring process to identify necessary adjustments. Based on these data, outputs in the form of adapted management decisions are developed, enabling the enterprise to promptly respond to changes in internal and external environments. Such decisions allow enterprises to refine their strategies and align their operations with dynamic market conditions and sustainability objectives. The implementation of this process is ensured by mechanisms, including enterprise management teams, consultants, and internal departments that collaborate to execute revised plans effectively. Control is carried out through corporate policies, market requirements, and the external environment, which act as external and internal controls. Together, these elements create a responsive and flexible framework, capable of maintaining enterprise sustainability under fluctuating conditions.

Thus, each of the outlined elements plays a crucial role in ensuring sustainable enterprise development. Their interaction fosters a comprehensive management system that is adaptable, robust, and geared toward achieving long-term sustainability goals.

Conclusion. Thus, in the course of the study, a new definition of the organizational and economic mechanism for sustainable enterprise development was proposed, utilizing a process-oriented approach. Based on this definition, a model of the organizational and economic mechanism was developed using the IDEF0 methodology. The model includes key elements: aggregate enterprise potential, goals and strategies, internal standards and evaluation methods, monitoring and assessment of stability, and adaptation of management decisions. For each element, inputs, outputs, mechanisms, and controls were identified, which enabled the formation of a comprehensive management model for sustainable enterprise development.

Therefore, the proposed model is a universal tool that can be adapted to the specific characteristics of individual enterprises or industries. The use of this model will allow enterprises to optimize resource management, improve the efficiency of strategic decision-making, and achieve sustainable development in the long term. Future research may focus on the implementation of quantitative methods for evaluating the effectiveness of the proposed mechanism.

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