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Digital transformation: Driving innovation and projects in companies

Transformación digital: Impulsando la innovación y los proyectos en las empresas

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Abstract


The main purpose of the article is to present a modern approach to making and implementing management decisions on innovations and projects in an enterprise. The object of the study is the system of innovative activity of a modern enterprise. The scientific task involves modeling the system for making and implementing management decisions on innovations and projects at the enterprise. The research methodology involves the use of the modern IDEF0 functional modeling method. As a result, two IDEF0 models were built. The innovativeness of the results lies in the proposed approach to modeling the adoption and implementation of management decisions on innovations and projects at the enterprise. The peculiarity of the article is that two IDEF0 models were presented at once, one for making management decisions, and the other for their implementation. The study is limited by considering only enterprise innovation.


Resumen


El objetivo principal del artículo es presentar un enfoque moderno para la toma e implementación de decisiones de gestión sobre innovaciones y proyectos en una empresa. El objeto del estudio es el sistema de actividad innovadora de una empresa moderna. La tarea científica consiste en modelar el sistema para la toma e implementación de decisiones de gestión sobre innovaciones y proyectos en la empresa. La metodología de investigación implica el uso del moderno método de modelado funcional IDEF0. Como resultado, se construyeron dos modelos IDEF0. El carácter innovador de los resultados radica en el enfoque propuesto para modelar la adopción e implementación de decisiones de gestión sobre innovaciones y proyectos en la empresa. La peculiaridad del artículo es que se presentaron dos modelos IDEF0 a la vez, uno para la toma de decisiones de gestión y el otro para su implementación. El estudio se limita a considerar únicamente la innovación empresarial. Las

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Prospects for further research are aimed at taking into account the innovative security of the enterprise.

Keywords: marketing, business planning, project management, innovation, management, enterprise.

Introduction

Currently, innovation is the basic element of the development of modern companies. It is innovation that has become the basis for increasing the level of their competitiveness and long-term success in the modern market environment. In the context of doing business, innovation has long ceased to concern exclusively the issue of product production. Modern innovations may concern new production processes, business models, and methods of attracting new customers. Overall, this acts as a multi-faceted concept that can cause a company's success and inclusion in the market.

The importance of innovation stems from the ability to create significant value. Thus, the constant search and adaptation of innovations allows the company to remain relevant in a market environment characterized by dynamism. This adaptation allows the enterprise to quickly adjust its activities to changes in the external and internal environment. The search and implementation of innovations also allow the company not only to maintain and develop its own positions in established markets, but also provide resources and opportunities to enter new ones.

The management system plays a key role in developing a culture of innovation. Thus, an effective and optimized management system in a company is a factor in creating an internal environment where the search for new ideas and solutions, as well as the use of creative thinking, is encouraged and rewarded. The implementation of such a management vector involves not only the allocation of the necessary resources for innovation, but also the constant encouragement of creative approaches to solving problems. At the same time, the management system must be open to changes and adjustments, adapting to external and internal changes. Thus, any effective management system includes structured innovation management processes. The structure of these processes includes measures to identify innovations, assess their potential benefits and costs of implementation. In addition, risk management measures are an important element of modern management systems, since not all

perspectivas de futuras investigaciones tienen como objetivo tener en cuenta la seguridad innovadora de la empresa.

Palabras clave: marketing, planificación empresarial, gestión de proyectos, innovación, gestión, empresa.

innovative ideas can lead to success or have exclusively positive consequences.

In the context of the formation and implementation of new projects, innovation acts as a catalyst for development and growth. It is the generation of innovative ideas that subsequently leads to the formation of new projects, through which the company will be able to open new markets and gain more profit. The generation of new projects based on innovation can open up ways for a company to more optimized interaction with customers, reduce production costs, logistics and optimize other areas of its activities. The implementation of innovations in projects can lead to the formation of a culture of continuous education within the enterprise and the improvement of human resources. Company employees who actively participate in the development of projects based on innovative ideas develop new skills and competencies, thereby further increasing the company's innovative potential. Creating such an environment within the company will lead to increased adaptability of the company and distinguish it from others in the market.

A striking and successful example of implementing projects based on innovation is the implementation of automated inventory management systems, which are used by many successful enterprises. Such systems have already proven their effectiveness due to the fact that they can significantly reduce the time for processing orders. In addition, such systems have significantly reduced the error rate due to the elimination of the human factor from a large number of processes. Another example is the active use of artificial intelligence technologies in personalizing offers to customers, which increases the level of service and, accordingly, customer satisfaction.

But while considering the success of such projects, we must not forget that the implementation of each of them was accompanied by a complex management and control system. Thus, the innovation management system is a key element of their

implementation, especially in the field of innovation in new projects.

Thus, the main goal of the article is to form a new approach to making and implementing management decisions in the context of innovations and company projects. The object of the study is the system of innovative activity of a modern enterprise. In the process of conducting the research, a modern methodological approach will be formed, which will increase the efficiency and adaptability of the company's activities in the market.

The structure of the article includes a number of sections: a literature review highlighting key scientific vectors for the development of this topic and gaps in existing research; section on methodology, results and discussion, and conclusions.

Literature review

The importance of this literature review for the current study is that it not only highlights key aspects of innovation development and project management in the context of digital transformation, but highlights the relevance of the topic to modern business practices. Due to the identified gaps and trends, this review provides a foundation for our research to explore specific strategies and mechanisms that can be used by enterprises to enhance their innovation capabilities and project management in a dynamic digital environment. This allows our research to make an important contribution to the theory and practice of innovation management, providing companies with recommendations based on the latest scientific developments and empirical evidence.

This review delves into various studies that shed light on the evolving nature of innovation and project management in the era of digital transformation.

Abdi et al. (2018) and Al-Hajj and Zraunig (2018) highlight the relationship between project management, organizational culture, and organizational learning with innovativeness in successful project completion. At the same time, the authors note the importance of internal resources and culture for promoting innovation. This perspective reflects the need for an integrated approach to modeling management decisions in the field of innovation, as proposed in the article using the IDEF0 method.

Carvalho et al. (2013) examine the determinants of innovation in small open economies, offering a multidimensional view of innovation processes. This indicates the importance of the external environment and its influence on the innovative activity of enterprises, which is consistent with the emphasis of our study on modeling a system of management decisions in a dynamic external environment. Frolova et al. (2021) provide a model for assessing opportunities to enhance enterprise innovation activity. Their work aligns closely with the theme of innovation management, offering a structured approach to identifying and leveraging opportunities for innovation within enterprises, an aspect critical in the digital age. Wendra et al. (2019) explore the relationship between dynamic capabilities, intellectual capital, and innovation performance, emphasizing the role of internal resources and capabilities in driving innovation. Popelo et al. (2023) discuss the influence of digitalization on the innovative strategies of industrial enterprises. Their findings highlight how digital technologies reshape strategic approaches to innovation, echoing the primary focus of the current article on digitalization's impact on innovation management.

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Sylkin et al. (2021) and Nosan (2022) study economic and financial security issues in the context of a dynamic external environment and a post-pandemic space, respectively. Their work points to the need to strengthen the economic security of enterprises as a key aspect of innovation and project management.

Need to say that, Yuryk et al. (2021) delve into the intricate balance between the right to medical secrecy and the employer's right to access employee health information within the digitalized workspace. Their study highlights the critical need for businesses to navigate privacy concerns and legal frameworks effectively to foster a secure and trustful environment, which is essential for innovative and agile project management. Petroye et al. (2020) examine the impact of information security and innovations on a country's image from a governance perspective. Their findings underscore the

importance of digital security measures in enhancing a nation's reputation, which in turn can attract innovative projects and investments. This study suggests that digitalization, when aligned with robust security protocols, can significantly influence the perception and success of business activities on a global scale. In other hand, Kopytko et al. (2023) present a sustainable socio-economic system model that leverages agile management technologies to foster innovations. Their research advocates for the adoption of agile methodologies in the development and management of projects, emphasizing the role of digital tools in enhancing flexibility, responsiveness, and sustainability in the innovation process. This approach is critical in today's fast-paced and ever-evolving business landscape. Clauss et al. (2019) explore the relationship between strategic agility, business model innovation, and firm performance. This study highlights the necessity for enterprises to embrace digital transformation to remain competitive and innovative in the modern economy. Okoń-Horodyńska et al. (2020) introduce a new approach to creating more effective teams in the innovation process within enterprises. They argue for the strategic

integration of digital tools and platforms to facilitate collaboration, knowledge sharing, and creativity among team members.

Ilyash et al. (2018) and Mamatova (2018) examine the role of innovation in industrial revenue generation and the development of innovative activities in international contexts. These studies provide a broader perspective on the economic implications of innovation, relevant to understanding the financial aspects of managing innovations at enterprises. Domljan and Domljan (2021) discuss enterprise-based support for innovative activities, offering a viewpoint on how businesses can internally foster and support innovation. This perspective is vital for understanding the internal mechanisms necessary for nurturing innovation in a digital context. Alazzam et al. (2023)'s work on developing an information model for E-Commerce platforms highlights the significance of adapting to digitalization in modern socio-economic systems. This research is particularly pertinent to the current study as it reflects on the practical aspects of digital transformation in commerce. Lets see main gaps in literature (Fig.1).

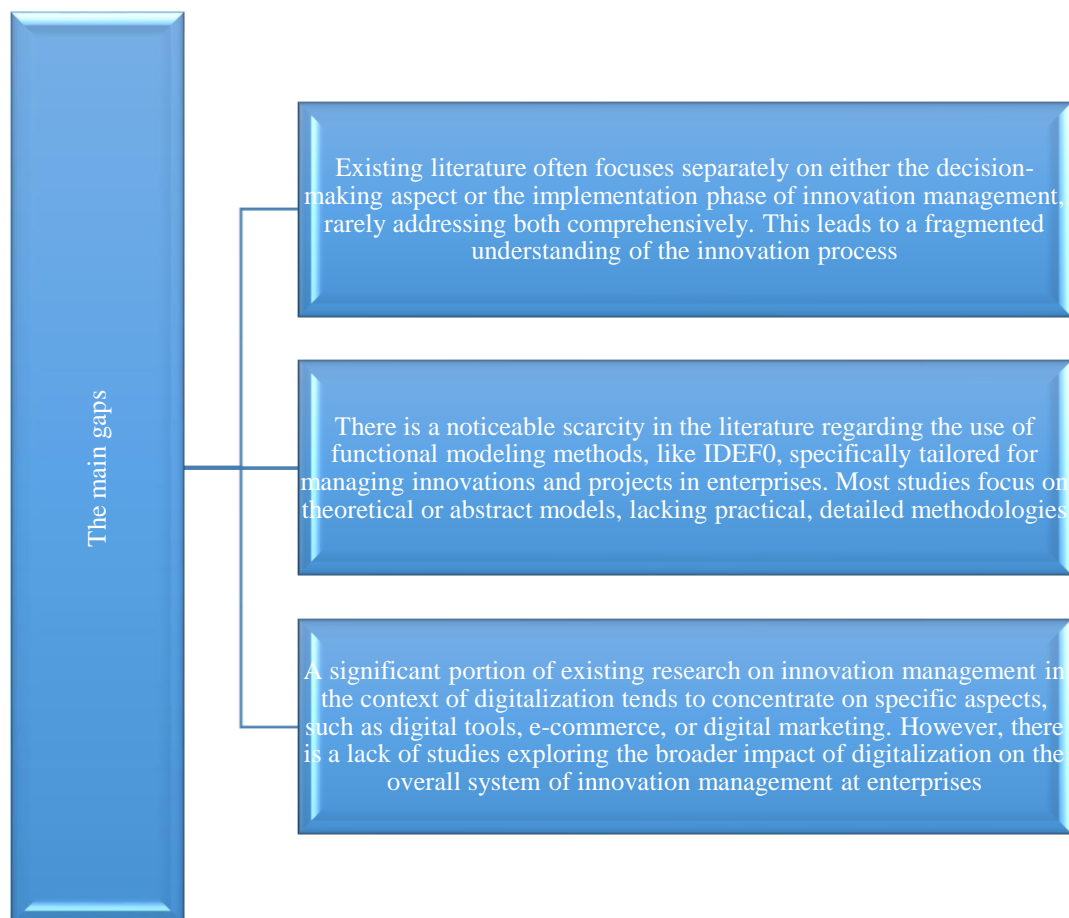


Figure 1. T The main crucial to identify key gaps in the existing literature (formed by authors)

Reviewing existing research, it becomes clear that there is a need for a deeper understanding of the relationships between digital transformation and innovation processes in companies. Despite the significant literature on this topic, there are gaps in the study of specific digital innovation management strategies and their impact on organizational performance. This review highlights the need for more research to help understand how companies can effectively integrate emerging technologies to drive innovation and project management.

The reviewed literature collectively emphasizes the multifaceted nature of innovation and project management in the digital era. It highlights the need for a structured approach to innovation, the importance of internal capabilities and resources, and the transformative impact of digital technologies on business strategies and operations. This comprehensive review sets the stage for a deeper exploration of how enterprises can effectively manage innovations and projects in an increasingly digital business environment.

Methodology

The IDEF (Integrated Definition Methods) suite of modeling methods was developed in the late 1970s and early 1980s, primarily for manufacturing and systems engineering. It originated as part of the U.S. Air Force's Integrated Computer-Aided Manufacturing (ICAM) project. The primary goal of IDEF was to promote effective communication between various stakeholders, including engineers, designers, and managers, and to provide a standardized approach to analyzing and documenting functional processes.

IDEF comprises several modeling techniques, each serving a specific purpose. Among them,

IDEF0, a method designed for modeling the decisions, actions, and activities of an organization or system, is particularly relevant to this study. The IDEF0 method is grounded in the principles of functional modeling, aiming to capture the functions of a system or process, their relationships, and the data flow among them.

The IDEF0 model utilizes a series of diagrams and symbols to represent the functions and sub-functions of a system. At its core, each diagram in IDEF0 consists of boxes and arrows. The boxes, also known as activity blocks, depict the functions or processes. These are linked by arrows that illustrate the inputs, outputs, controls, and mechanisms of each function. Inputs represent the data or resources necessary for a function, outputs are the results of the function, controls guide the operation of the function, and mechanisms are the means by which the function is performed.

The methodological approach used in the study is mixed, combining both quantitative and qualitative methods of analysis. This allows for a deeper understanding of innovation and project management processes while providing the ability to test theoretical concepts through statistical data analysis.

In this study, the IDEF0 method was employed to construct two distinct models for managing innovations and projects at enterprises. The first model focuses on the decision-making process involved in selecting and prioritizing innovations and projects. It delineates the various inputs, controls, and mechanisms influencing decision-making and the resulting outputs.

Figure 2 shows a schematic diagramming framework for the models used in this study.

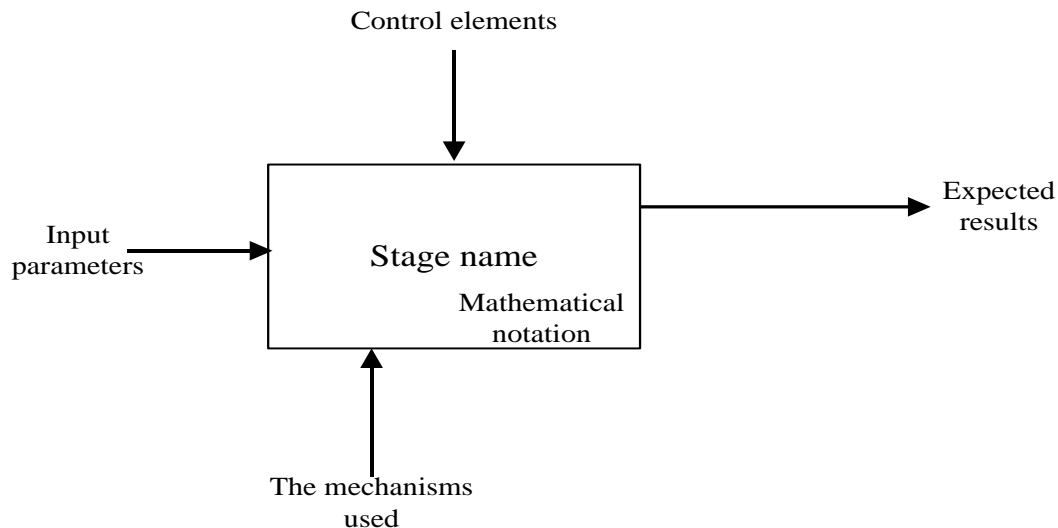


Figure 2. A schematic diagramming framework for the models used in this study (formed by authors)

The second IDEF0 model developed in this research addresses the implementation phase. This model captures the sequential activities and processes required to execute the selected innovations and projects, detailing the necessary inputs, the controls governing the implementation, and the mechanisms facilitating it.

By utilizing IDEF0, the study achieves a clear, systematic, and replicable framework for understanding and improving the management of innovations and projects in the digital era. This methodology is particularly suited for the study's objectives due to its structured approach, ease of interpretation, and ability to capture complex processes comprehensively. It facilitates the visualization of the decision-making and implementation processes in a manner that is both analytically rigorous and practically applicable, thus contributing significantly to the field of innovation and project management.

The source of data for building the models were interviews with experts in the field of project and innovation management, as well as analysis of documentation from leading companies that implement advanced innovative projects. This made it possible to collect diverse information reflecting real business processes and approaches to managing them.

Several measures have been taken to ensure the reliability and validity of the models. First of all, data triangulation was carried out, including comparison and analysis of information obtained from different sources and using different data collection methods. Also, expert assessment of the models was carried out by involving independent experts from relevant industries to check the logic and practical applicability of the developed models. In addition, the use of IDEF0 as a recognized and standardized modeling method provides additional validity, as the methodology is generally accepted in academic and professional circles.

Results and discussion

The IDEF0 method, a functional modeling methodology used for modeling the decisions, actions, and activities of an organization or system, utilizes "tree goals" to ensure a comprehensive and structured approach. When discussing the necessity of these goals in the context of IDEF0, it's important to consider the overall objectives of the methodology. IDEF0 is designed to model the functions (processes) of a system and their relationships to each other. It's a way to create a clear, high-level map of a workflow or process. The use of "tree goals" in this context refers to the hierarchical structuring of these functions and their objectives (Fig.3).

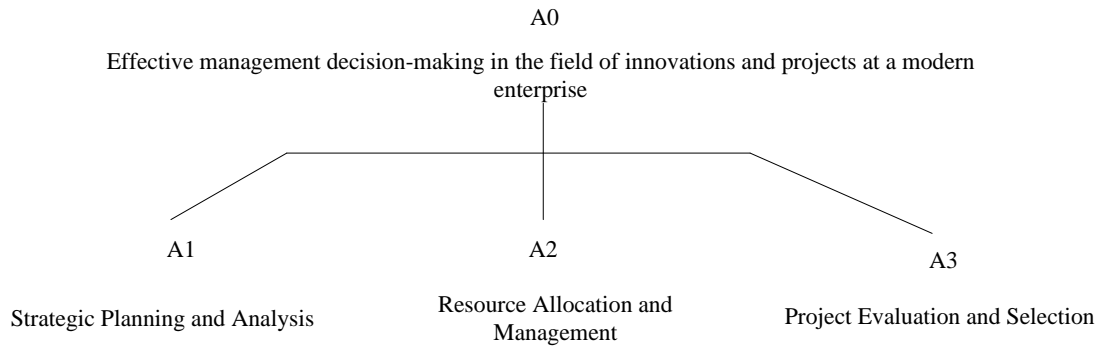


Figure 3. The tree goal for first model (formed by authors)

Each of these sub-functions (A1, A2, A3) plays a vital role in supporting the overall decision-making process in the context of innovations and projects at a modern enterprise. They are

interrelated, where the output of one process often serves as input for another, creating a cohesive framework for effective management and decision-making (Fig.4).

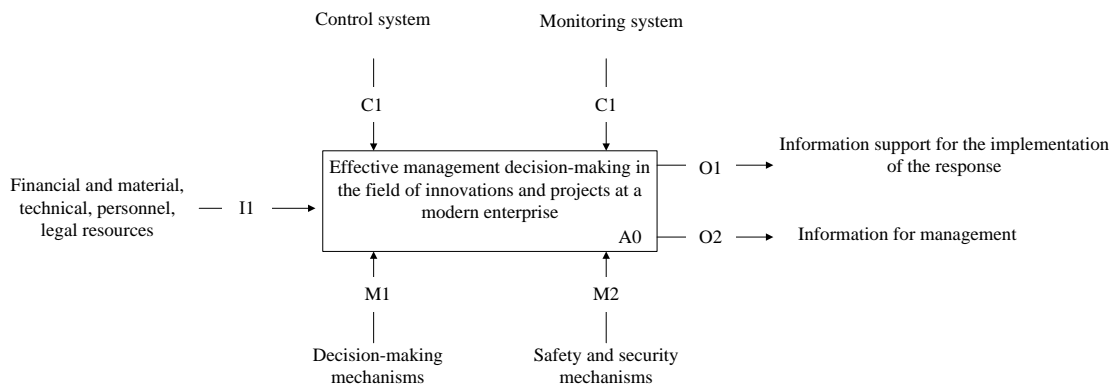


Figure 4. Black box for first model (formed by authors)

A1. Strategic Planning and Analysis. This process involves the identification of strategic goals related to innovations and projects, assessing market trends, and performing SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis. It is crucial for aligning the decision-making process with the enterprise's long-term objectives and external environment.

A2. Resource Allocation and Management. This function focuses on the effective allocation and management of resources (financial, human, technical) for innovation and project initiatives.

It ensures that the necessary resources are available and optimally utilized to support the chosen strategies and projects.

A3. Project Evaluation and Selection. This process involves evaluating various project proposals and innovation ideas based on predefined criteria, such as feasibility, return on investment (ROI), alignment with strategic goals, and resource availability. It includes the selection of the most promising projects for implementation (Fig.5).

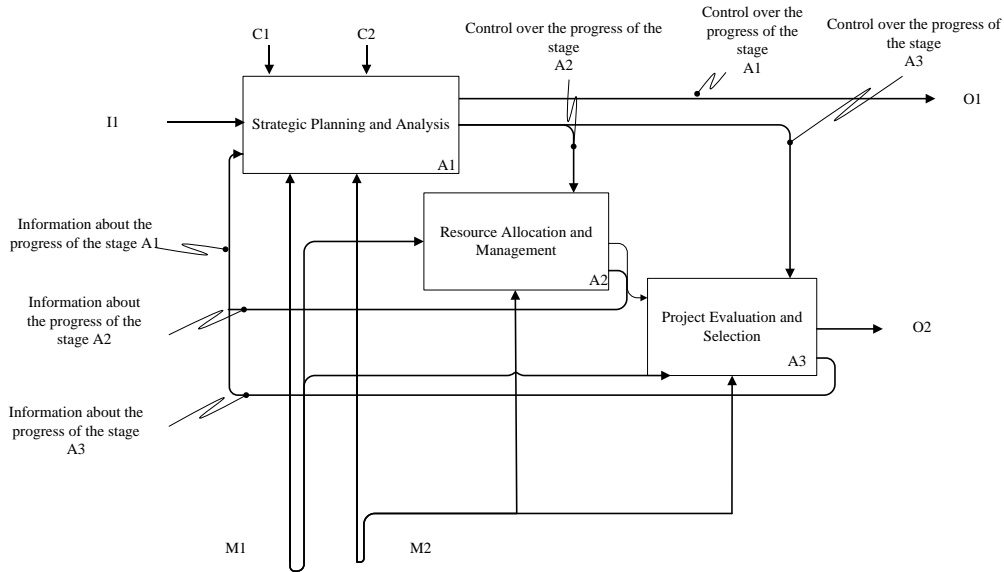


Figure 5. Model IDEF0 for effective management decision-making in the field of innovations and projects at a modern enterprise (formed by authors)

For the IDEF0 model with the top-level function (A0) defined as "Implementation of management decisions in the field of innovations and projects at the enterprise," the following sub-functions (A1, A2, A3) could be key components of this

process. These sub-functions represent the major activities or steps necessary to effectively implement management decisions regarding innovations and projects within an enterprise (Fig.6).

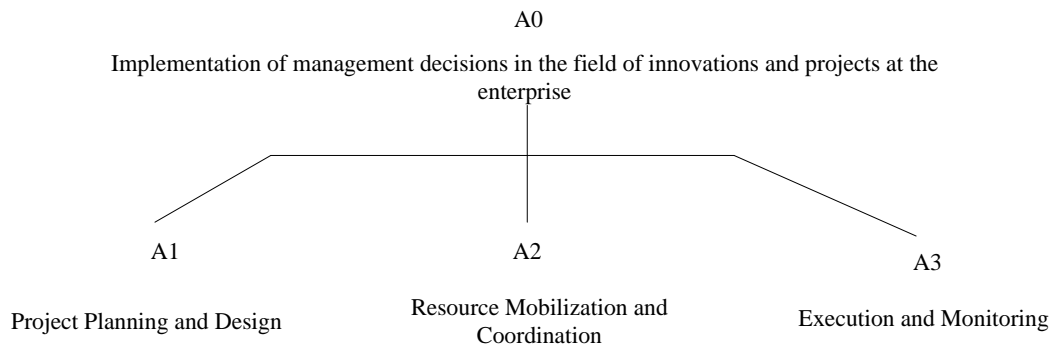


Figure 6. The tree goal for second model (formed by authors)

Each of these sub-functions (A1, A2, A3, A4) plays a crucial role in the effective implementation of management decisions in the area of innovations and projects at an enterprise. They ensure that strategic decisions are not only

executed but also monitored, evaluated, and refined, leading to continuous improvement in project management and innovation processes (Fig.7).

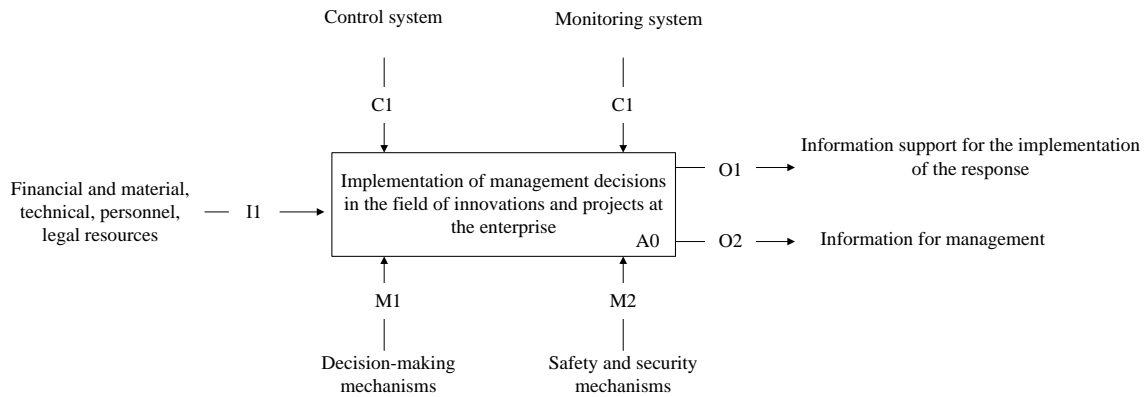


Figure 7. Black box for second model (formed by authors)

Now, lets build second model (Fig.8).

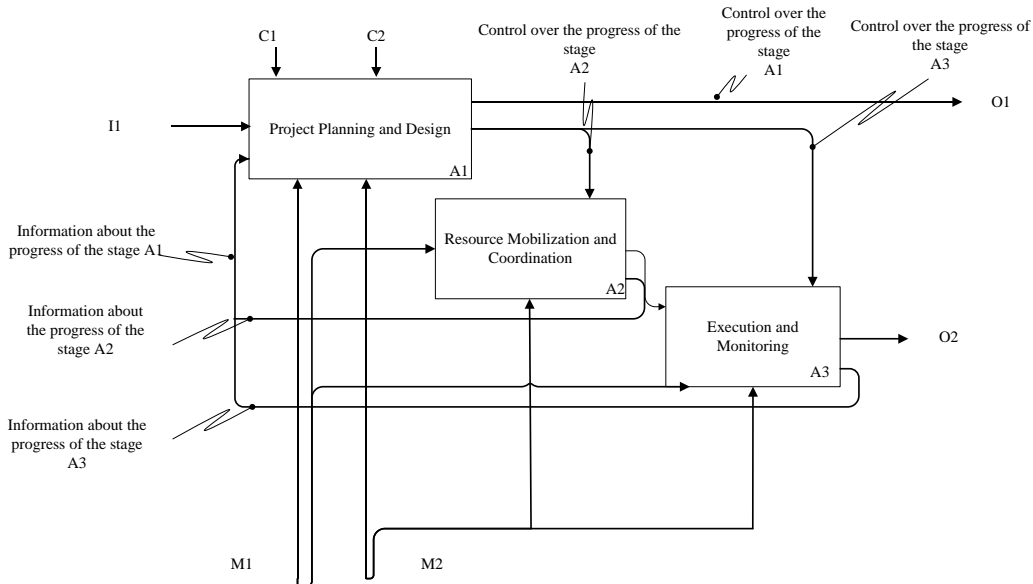


Figure 8. Model IDEF0 for implementation of management decisions in the field of innovations and projects at the enterprise (formed by authors)

A1. Project Planning and Design. This stage involves translating management decisions and strategies into detailed project plans. It encompasses the design of the project's structure, setting timelines, defining deliverables, and planning for the resources required. Effective project planning is essential to ensure that the implementation aligns with the strategic decisions made.

A2. Resource Mobilization and Coordination. This function focuses on mobilizing and coordinating the resources necessary for the execution of projects. It includes acquiring financial resources, technology, and human capital, as well as ensuring these resources are

effectively aligned and utilized throughout the project's lifecycle.

A3. Execution and Monitoring. This critical phase involves the actual execution of project plans and continuous monitoring of project progress. It includes overseeing day-to-day operations, ensuring adherence to the plan, identifying and resolving issues, and making necessary adjustments based on ongoing performance and feedback.

The utilization of the IDEF0 functional modeling method, as highlighted in the study, aligns with the growing emphasis on structured and systematic approaches to innovation

management, especially in the digital era. This is evidenced by the work of Nikonenko et al. (2020), who underscore the importance of methodological rigor in assessing institutional dynamics and economic freedom in the context of regional development and governance improvement, respectively. The application of IDEF0 in the current study extends this notion by providing a practical and replicable model for managing innovation and project decisions at the enterprise level.

The research's focus on innovative activity within enterprises resonates with the discussions by Rushchyshyn et al. (2022), emphasizing the regulatory and practical aspects of economic security in business. The IDEF0 models developed in this study contribute to this discourse by offering a roadmap for enterprises to navigate the complex terrain of innovation amidst regulatory and economic challenges.

Doroshkevych et al. (2021) further illustrate the significance of strategic and anti-crisis management in the context of innovative development and financial security. The findings of this study provide a complementary perspective, showcasing how structured decision-making and implementation processes can be instrumental in steering enterprises through periods of crisis and innovation-driven change.

Borowski's (2020) insights into the role of new technologies and innovative solutions in the development strategies of energy enterprises echo the relevance of the current study's approach to digitalization in business activities. The IDEF0 models serve as a testament to the increasing need for enterprises to adopt innovative and technologically driven strategies for sustainable development. Novykova et al. (2022) and Sylkin et al. (2018) bring attention to the adaptability of management systems in the innovative activity of construction and engineering enterprises, highlighting the dynamic nature of financial security management. The present study extends this understanding by demonstrating how adaptable and robust management systems, as represented by the IDEF0 models, are crucial in managing innovation and projects in the digital age.

In conclusion, the discussion of the study's findings against the backdrop of existing literature emphasizes the critical role of structured and adaptable management systems in driving innovation and project management in enterprises. The proposed IDEF0 models not

only align with current academic discourse but also offer practical insights for enterprises grappling with the challenges and opportunities presented by digitalization. The study underscores the necessity for continuous innovation and adaptability in management practices to stay competitive and resilient in the ever-evolving business landscape.

Conclusions

The study successfully presents a modern approach to the management of innovations and projects within enterprises, emphasizing the importance of effective decision-making in the rapidly evolving digital business landscape. The primary contribution of this article is the development and presentation of two distinct IDEF0 models, which collectively offer a comprehensive framework for both making and implementing management decisions in the realm of enterprise innovation and project management. The first IDEF0 model, focused on decision-making, illustrates the systematic process involved in evaluating and selecting innovative projects and initiatives. This model serves as a valuable tool for managers and decision-makers, providing a structured approach to navigate the complex and often multifaceted aspects of innovation management. It emphasizes the need for a strategic and informed approach to decision-making, ensuring that the chosen innovations align with the enterprise's overall objectives and market dynamics. The second IDEF0 model addresses the implementation aspect, detailing the steps necessary to successfully execute the chosen innovations and projects. This model underscores the importance of meticulous planning, resource allocation, and execution in bringing innovative ideas to fruition. It highlights the pivotal role of effective project management in translating strategic decisions into tangible outcomes and achieving the desired impact on the enterprise's operations and market position.

The innovative aspect of this research lies in the proposed approach to modeling the adoption and implementation of management decisions on innovations and projects. By employing the modern IDEF0 functional modeling method, the study offers a clear, systematic, and replicable approach to managing innovation in the digital age. This methodology is particularly pertinent given the increasing complexity and speed of change in today's digital business environment. However, the study acknowledges its limitation in focusing solely on enterprise innovation, suggesting the scope for future research to

incorporate aspects of innovative security. This expansion is crucial as it can provide a more holistic understanding of innovation management, considering not just the opportunities but also the risks and challenges associated with enterprise innovation.

In conclusion, the article makes a significant contribution to the field of enterprise innovation and project management in the digital era. The development and presentation of two IDEFO models for decision-making and implementation provide a valuable framework for practitioners and scholars alike. The research paves the way for future studies to explore broader dimensions of innovation, including its security aspects, thereby enriching the discourse and practice of innovation management in the digital age.

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