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DOI: <https://doi.org/10.32782/2224-6282/191-1>**Husarevych Nataliia**Ph.D., Associate Professor at the Department of Finance,
State University of Trade and Economics
ORCID: <https://orcid.org/0000-0002-8266-8498>**Smyrnova Iryna**Doctor of Pedagogy Sciences, Professor,
Deputy Director for Scientific and Pedagogical Work,
Danube Institute National University "Odesa Maritime Academy"
ORCID: <https://orcid.org/0000-0003-2085-5391>**Papp Vasyl**Doctor of Economic Sciences, Professor,
Professor of the Department of Management, Management of
Economic Processes and Tourism,
Mukachevo State University
ORCID: <https://orcid.org/0000-0003-3749-7623>**Гусаревич Н.В.**

Державний торговельно-економічний університет

Смирнова І.М.

Дунайський інститут Національного університету «Одеська морська академія»

Папп В.В.

Мукачівський державний університет

DIGITAL MANAGEMENT OF ENTREPRENEURIAL ACTIVITIES

The relevance of the study is driven by the gradual transition of management processes in entrepreneurial activities into the digital realm. Consequently, the article focuses on defining the characteristics of the effectiveness of digital entrepreneurial management. Within the article, the main characteristics of digital entrepreneurial management and the fundamental principles of its effectiveness are defined. The article delves into defining the essence of digital twins of business processes within effective digital entrepreneurial management. The article provides a virtual representation of the business ecosystem through digital twins of business processes. The research findings demonstrate that for effective digital entrepreneurial management, it is crucial to orient all aspects toward targeted and continuous influence on appropriate digital infrastructures. According to the provided points, the prospects for further research lie in examining the opportunities and challenges associated with implementing digital infrastructure in the operation of the entrepreneur's core business.

Keywords: entrepreneurship, business ecosystem, digital twins of business processes, value creation.

JEL classification: A14, C80, C88

ЦИФРОВЕ УПРАВЛІННЯ ПІДПРИЄМНИЦЬКОЮ ДІЯЛЬНІСТЮ

Актуальність дослідження зумовлена поступовим зміщенням у цифрову площину процесів управління підприємницькою діяльністю. На нашу думку, це є наслідками цифрового розвитку пріоритетних сфер життєдіяльності та цифрової трансформації різних форм діяльності у сфері виробництва і обміну товарів та надання послуг, які здійснюються з метою отримання прибутку. При цьому у межах статті розглянуті основні характеристики цифрового управління підприємницькою діяльністю та основні засади його дієвості. У межах статті реалізоване визначення сутності цифрових двійників бізнес-процесів у дієвому цифровому управлінні підприємницькою діяльністю. Стаття розглядає віртуальне представлення системи життєдіяльності бізнесу через цифрові двійники бізнес-процесів. Згідно з результатами дослідження, підтверджено важливість орієнтації всіх аспектів цілеспрямованого і постійного впливу на правильність цифрових інфраструктур для ефективного цифрового управління підприємництвом. Дослідження підтверджує, що правильна цифрова інфраструктура управління функціонуванням бізнесу має включати різноманітні технології, інструменти і платформи, які сприяють ефективному управлінню та оптимізації різних аспектів підприємницької діяльності. Дослідження підтверджує, що правильна цифрова інфраструктура організації основного бізнесу підприємця має включати широкий спектр цифрових технологій, інструментів і ресурсів, спрямованих на оптимізацію створення основного потоку доходів підприємця. Доведено, що правильна цифрова інфраструктура обслуговування основного бізнесу підприємця має включати широкий спектр цифрових технологій, спрямованих на забезпечення ресурсами відтворювального процесу бізнес-системи. Доведено, що правильна цифрова інфраструктура відстеження стану бізнесу підприємця має включати широкий спектр цифрових технологій, інструментів, спрямованих на інформування, щодо властивих бізнесу змін. Відповідно до наведених положень перспективи подальших досліджень полягають у розгляді можливостей і викликів, пов'язаних з імплементацією цифрової інфраструктури у функціонуванні основного бізнесу підприємця.

Ключові слова: підприємництво, життєдіяльність бізнес, цифрові двійники бізнес-процесів, формування цінності.

Statement of the problem. Currently, the processes of managing entrepreneurial activities (which in Ukraine are perceived as synonymous with the category "business") are increasingly shifting into the digital realm. In particular, currently, up to 70% of Ukrainian entrepreneurs utilize digital platforms for various aspects of their operations, including sales, marketing, customer relationship management, and supply chain management [4]. This, in our opinion, is the consequence of the digital development of priority areas of activity (due to the advancement of internet services, technical maintenance, and operation of digital equipment) and the digital transformation of various forms of activity in the production and exchange of goods and services, conducted to generate profit. In particular, the process of digitizing entrepreneurial management is characterized by digitization, increased flexibility, and the level of automation of the entrepreneur's basic business processes, changing ways of creating value for customers, and forming unique digital management infrastructures in terms of content, which collectively enable entrepreneurs to remotely control and achieve desired outcomes or entrepreneurial goals by leveraging specific forms of digital channels and virtual workspaces.

Analysis of recent research and publications. The general methodology for identifying the characteristics of digital entrepreneurial management or limited specification of their content is presented in the works of such Ukrainian scholars as Bannikov V., Lobunets T., Buriak I., Maslyhan O., Shevchuk L., Kulinich T., Biletska N., Halachenko O. However, in most of these works, the effectiveness of digital entrepreneurial management is limited to identifying the consequences of transitioning to digitized business processes or new forms of value creation for customers. Considering that the effectiveness of digital entrepreneurial management is a combinatorial category, it should be examined through the lens of a finite set formed according to specified rules.

Objectives of the article. The purpose of the article is to determine the characteristics of the effectiveness of digital entrepreneurial management. To achieve the outlined goal, the following research tasks need to be addressed: 1) Determining the key characteristics of digital entrepreneurial management and the fundamental principles of its effectiveness; 2) Defining the essence of digital twins of business processes in effective digital entrepreneurial management; 3) Providing a virtual representation of the business ecosystem through digital twins of business processes.

Summary of the main results of the study. Within the study, we pay attention to the fact that digital entrepreneurial management is a new approach to the actions undertaken by an entrepreneur or their involved management personnel to achieve the desired outcome, ultimately fulfilling entrepreneurial goals through digital technologies and tools utilization.

According to such content, the main characteristics of digital entrepreneurial management include:

– Transitioning to digitized business processes involves managing business operations as systems. This entails implementing digital technologies and platforms to automate, optimize, and control various aspects of enterprise activities.

– Transitioning to managing new or modified forms of value creation for customers involves implementing digital

technologies to expand the ways goods and services are consumed to the maximum extent possible.

– Transitioning to managing comprehensive systems, tools, and technologies that support the maintenance and development of digital processes and services involves utilizing integrated solutions to optimize the management of all aspects of entrepreneurial activities.

– Transitioning to managing through a flexible value proposition system involves formalizing a model of customer behavior, forecasting demand, shaping advantages, and even adapting products and services [1].

– Transitioning to customer service management and service personalization involves using digital technologies and strategies to increase customer satisfaction and provide an individualized approach to each client.

– Transitioning to digital partnerships and collaboration involves creating and developing digital platforms for interaction with partners [1].

Essentially, the combination of the above-mentioned characteristics leads to digital entrepreneurial management forming:

1. Digital twins of business processes that manage the functioning of the business.

2. Digital twins of business processes that constitute its core business.

3. Digital twins of business processes that serve its core business.

In addition, these digital twins of business processes collectively form a virtual representation of the business ecosystem, which serves as the foundation of effective digital management. According to the outlined provisions, such management can be represented as a three-tier structure, as depicted in Figure 1. Indeed, the main directions for ensuring effective digital management include [4]:

1. Development of coordinated conditions for primary, support, and managerial activities, considering that:

– Primary activities encompass requirements for processes directly related to the production of goods or provision of services.

– Support activities cover requirements for processes associated with resource management, procurement, logistics, etc.

– Managerial activities involve requirements for processes related to strategic and tactical planning, data analysis, decision-making, etc.

2. Development of coordinated conditions for the engagement and utilization of resources to carry out primary, support, and managerial activities. This entails specific conditions for processes related to procurement, inventory management, resource allocation, etc.

3. Development of coordinated conditions for operational execution. This includes requirements for processes that allow coordination and management of various operational aspects of the business, as well as operational aspects of production, order processing, customer support services, etc.

Indeed, digital twins of business processes that manage the functioning of the business are essentially virtual models or replicas of real business processes created to facilitate management activities using digital technologies or simulation of real managerial influences in a virtual environment (to analyze, optimize, and modify them without direct impact on the real business).

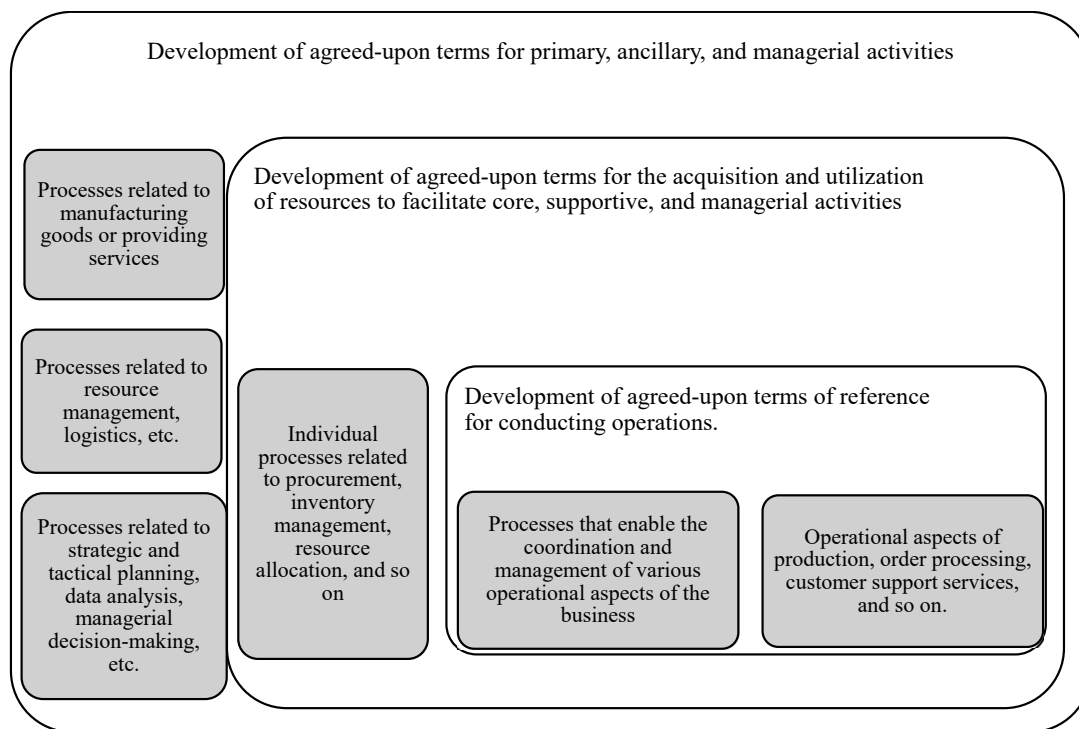


Figure 1. Structure of digital management of entrepreneurial activities

Source: formed based on [1; 2–3]

Scenario replication systems for potential entrepreneurial actions in the business environment through management action modeling tools, simulation tools for various management action scenarios, and testing of business strategies applicable according to the specifics outlined in Table 1.

The tools for replicating scenarios and actions defined above are effective only when applied within the context of a proper digital infrastructure. The signs of such effectiveness include the entrepreneur's ability to:

1. Establish effective managerial influences (interpreted as a set of strategies, methods, and techniques that managers use to achieve goals, maximize performance, and ensure successful operations).
2. Reduce entrepreneurial risks.
3. Increase the chances of achieving positive business outcomes, such as implementing innovative ideas, self-

affirmation, changing the course of events, etc. While profit is an important component of success, it cannot solely serve as its measure.

Systems for influencing the parameters and conditions of primary and supporting business processes through means of process parameterization, variability in operational process conditions, optimization of management process provisioning, and automation of information processes applicable according to the specifics outlined in Table 2.

The aforementioned means of influencing business parameters and conditions are effective only if they enable the entrepreneur to:

1. Modify the management content of core and supporting business processes according to existing strategic goals and needs;
2. Take timely measures to support the competitiveness of the business.

Table 1

Systems for replicating scenarios of development and potential actions of the entrepreneur in the business environment

Means of reproducing scenarios and actions	Benefits of using means	Scope of possible application	Basis of the system
Tools for modeling managerial actions	Allow the construction of virtual models of business processes and potential managerial actions	Representation of various aspects of activity, from production processes to strategic management	A proper digital infrastructure for managing business operations should include a wide range of technologies, tools, and platforms that facilitate effective management and optimization of various aspects of the entrepreneur's activities
Simulation tools for various scenarios of managerial actions	Enable the creation of virtual development scenarios, experimentation with various strategic and tactical action options	Simulation or design of reactions to changes in the internal or external environment, testing different change management strategies	
Testing of business strategies	Test the effects of different business strategies and decisions in a virtual environment	Generalized assessment of the effectiveness of different strategies and selection of the most optimal decisions before their implementation in real business	

Source: formed based on [2–3]

Impact assessment systems for different strategies and decisions on business operations through tools such as analytical models and instruments, key performance indicators of business processes, as well as monitoring and reporting systems, tailored to the specifics outlined in Table 3.

The above-mentioned impact assessment tools are effective only if they contribute to:

1. Streamlining information processing processes that facilitate effective management of primary business risks.
2. Generating data for making informed strategies and decisions.
3. Optimizing entrepreneurial activities to achieve strategic objectives.

Indeed, the ultimate goal of each of the identified digital twins of business processes in entrepreneurial management is to create closed-loop feedback between the virtual and

real processes to influence the overall functionality of the business. Features of a proper digital infrastructure for business management include:

1. A wide range of technologies.
2. Integration of tools and platforms.
3. Efficient data management.
4. Security assurance systems.
5. Complexity and scalability.
6. User support.

Conclusions. The research findings demonstrate that for effective digital entrepreneurship management, it is crucial to align all aspects toward purposeful and continuous influence on proper digital infrastructures. The following conclusions have been drawn:

A proper digital infrastructure for business management should encompass a wide range of technologies, tools,

Table 2

Systems for influencing the parameters and conditions of primary and supporting business processes of the entrepreneur

Means of influencing parameters and conditions	Benefits of using means	Scope of possible application	Basis of the system
Parameterization of business processes	They help achieve greater flexibility, efficiency, and effective management of one's activities	Adapting business processes to changing market conditions and internal factors	The correct digital infrastructure for organizing the entrepreneur's core business should encompass a wide range of digital technologies and tools aimed at optimizing the creation of the entrepreneur's primary revenue stream The correct digital infrastructure for servicing the entrepreneur's core business should encompass a wide range of digital technologies aimed at providing resources for the replicative process of the business system
Variability in operational conditions of business processes	They help businesses adapt to changes in supply, production, marketing, and sales and take appropriate measures	Variability of conditions affecting operational processes, such as changes in market conditions, technological innovations, or regulatory environment changes	
Optimization of management process provisioning	They assist in optimizing management-related business processes such as accounting, personnel, and information management	Creating the necessary conditions for the flow of core processes	
Automation of information processes	They enable efficient management of data flows within the enterprise, from collection and processing to analysis and reporting	Ensures the generation of repetitive tasks for processing, storing data across various areas of entrepreneur's activity	

Source: formed based on [1; 3; 5]

Table 3

Systems for assessing the impact of various strategies and decisions on the performance of an entrepreneur's business

Means of assessing the impact of various strategies and decisions	Benefits of using means	Scope of possible application	Basis of the system
Analytical models and impact tools	The ability to leverage financial, analytical, and mathematical models in activities	Forecasting the outcomes of implementing various strategies and decisions based on input data and parameters	A proper digital infrastructure for monitoring the state of an entrepreneur's business should encompass a broad array of digital technologies and tools aimed at informing about pertinent changes within the business
Key performance indicators of business processes	Definition and measurement of key performance indicators reflecting the effectiveness of strategies and decisions	Assessing the degree of achievement of entrepreneurial goals	
Monitoring and reporting systems	Tracking the execution of strategies and decisions, analyzing their outcomes, and generating reports for internal and external use	Systems for tracking finances, inventory and stock management, customer service and relations, logistics and supply chain, production task management, and more.	

Note

* Financial indicators, quality metrics, customer satisfaction indicators, and so forth, can all be part of it.

Source: formed based on [1; 3; 5]

and platforms that facilitate effective management and optimization of various aspects of entrepreneurial activity.

Proper digital infrastructure for organizing the core business of an entrepreneur should encompass a wide range of digital technologies, tools, and resources aimed at optimizing the creation of the entrepreneur's main revenue stream.

A proper digital infrastructure for servicing the core business of an entrepreneur should include a wide range

of digital technologies aimed at providing resources for the replicative process of the business system.

Proper digital infrastructure for tracking the state of an entrepreneur's business should encompass a broad spectrum of digital technologies and tools focused on providing information about pertinent business changes.

According to the provisions outlined, the prospects for further research involve considering the opportunities and challenges associated with implementing digital infrastructure in the functioning of an entrepreneur's core business.

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