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SMART-PROJECTS OF REGIONAL DEVELOPMENT: CONTENT, TAXONOMIC IDENTIFIERS, AND PROJECT MANAGEMENT SPECIFICS

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This research examines the theoretical and methodological foundations of initiating, developing, and implementing smart-projects of regional development as a unique form of implementing the smart economy concept on the regional level. This research builds on the fundamental concept of human-machine intellectual systems. It presents an original interpretation of the "smart-project for regional development" concept and develops a system of taxonomic identifiers. These identifiers clearly differentiate smart-projects from ordinary digitalization initiatives. This research defines seven attributive characteristics that form the content of smart-projects: intellectual core, knowledge-information orientation, adaptive potential, synergistic properties, integrative architecture, transformational capability, and cognitive processes. This study develops a classification matrix of smart-projects based on their smart component development level, with clear criteria for each level and subsequent categorization into four functional groups: "traditional projects," "projects with digitalization elements," "entry-level smart-projects" and "advanced smart-projects." The paper examines smart project management features, analyzing modifications to the project and management cycles, differences in decision-making tools, and methodological approaches to forecasting and evaluating project effectiveness and efficiency. Practical recommendations are formulated for identifying and implementing smart-projects on the regional level. The research results have significant theoretical and practical value for developing and implementing smart specialization strategies for Ukrainian regions within the context of current global economic transformations.

Keywords: smart economy, smart specialization, smart-project, human-machine intellectual system, regional development, project taxonomy, project management.

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Introduction and statement of the problem

The current stage of economic development is characterized by the rapid, large-scale emergence of a new economic reality – the smart economy. Its foundation consists of human-machine intellectual systems that represent a unique type of interaction between human and machine intelligence. This uniqueness stems from the changing quality of interaction. In this context, the functional-intellectual machine not only executes programmed algorithms but also becomes an active participant in decision-making, multi-dimensional data analysis, and adaptive scenario modeling. Simultaneously, humans remain the leading actors who determine the ethical parameters and strategic goals of such interaction. This new combination of machine and human intelligence creates unprecedented opportunities to transform regional economic systems and develop innovative models of territorial development.

Smart-projects implement the smart economy concept on the regional level. These projects aim to transform the economic and social space of regions

through implementing intellectual technologies, forming innovative interaction models between economic entities, and creating knowledge-information products. Despite the growing use of the term "smart project" in scientific and practical discourse, there is no clear understanding of this concept, no definitive criteria for identifying such projects, and limited awareness of how to manage them effectively.

The key problem is that many initiatives labeled as "smart-projects" are actually traditional projects with digitalization elements that lack the essential characteristics of a smart economy. This leads to the devaluation of the "smart" concept, the dilution of its conceptual meaning, and irrational and inefficient use of regional development resources. This problem is particularly acute when forming and implementing smart specialization strategies for the regions. In these contexts, clearly understanding what smart-projects are and how they work is critical for achieving strategic goals [1].

The absence of a system of taxonomic identifiers for smart-projects complicates the processes of their selection, evaluation, and monitoring, while insufficient understanding of the specific aspects of project management during smart economy formation leads to the application of inadequate management approaches and tools. This prevents correctly evaluating the effectiveness of smart initiatives, forecasting the consequences of their implementation, and the impact on the dynamics of regional economic systems. On the other hand, it hinders the full disclosure of the transformational, innovative, and competitive potential of the respective projects.

Therefore, there is an objective need to develop theoretical and methodological foundations for studying smart-projects of regional development in terms of their categorical definition, developing a system of taxonomic identifiers for their classification, and determining the specifics of the project management under the conditions of the smart economy formation.

Analysis and research of publications

Studying smart-projects of regional development requires a comprehensive analysis of scientific works on both the general conceptual issues of the smart economy and the specific aspects of smart-projects and project management within the context of the global digital transformations.

The fundamental theoretical foundations of the smart economy as a special economic reality were laid in the research of Tarasevych V.M. [2], who proposed the concept of human-machine intellectual systems as the initial, basic object of the smart economy. The scientist categorizes smart economies into generations I, II, III, and IV, based on different aspects of how human-machine intellectual systems function and interact. The research emphasizes the defining role of humans as the controlling actors in these systems.

Yehorov I.Yu. studies regional smart specialization issues, examining the scientific and methodological foundations of smart specialization policy through synthesizing scientific-technical, innovation, regional, and industrial policies [3]. Vyshnevskyi O.S. [4] analyzes smart specialization from the positions of leading schools of economic theory, including Schumpeterian, institutional, and developmentalist paradigms.

Theoretical aspects of smart-projects within the context of regional development are studied by Kalenyuk I.S. and Uninets I.M. [5], who consider the smart economy as a way of structuring economic relations based on the use of modern intellectual technologies and the implementation of sustainability principles. The scientists also analyze the ecosystem of the smart economy in the global environment and its transformational impact on economic relations on the regional level.

Bruneckiene J. [6] examines the smart economy concept within the context of forming economic value in the urban environment, which is directly related to the issues of developing and implementing smart-projects on the regional level. The author proposed methodological approaches to assessing the smart potential of cities and regions, which can be used for identifying and evaluating smart-projects.

Issues of the project management under the conditions of the digital transformation are studied in the works of foreign authors, particularly Zhou Z. and co-authors [7], who analyze the impact of digital economy on sustainable development of enterprises and regional systems. Theoretical and practical aspects of managing smart cities and smart regions are the subject of research by Levy C. and Wong D. [8], who consider the smart economy within the context of the broader concept of "smart society."

Brych V. and co-authors [9] study smart specialization as a catalyst for the system of innovative regional development, which is directly related to the development and implementation of smart-projects. The authors examine the features of innovative development of regions under the conditions of smart specialization and define the role of smart-projects in this process.

It should be noted that among the multitude of scientific developments on the issues of the smart economy and smart specialization, there are almost no works in which smart-projects themselves would be the direct object of research interest. This explains

the vagueness of terminology and fragmentation of theoretical and methodological foundations of smart-project design, and stimulates further research.

Purpose of the article

This article aims to provide theoretical and methodological justification for the content of smart regional development projects, develop a comprehensive system of taxonomic identifiers for classifying these projects and determine the specific features of project management during the smart economy formation.

Main material presentation

To determine the essence and economic content of smart development projects, we must examine the basic conceptual framework of the smart economy as a distinct economic reality. According to the theoretical concept of Tarasevych V.M. [2], the initial, basic object of the smart economy is the human-machine intellectual system, which represents a contradictory actor-object unity of a human (the leading actor-subject with corresponding intellectual essential forces) and a functional-intellectual machine controlled and led by a human.

Based on this foundation, we define a smart regional development project as a special form of economic activity organization. At its core are one or several interconnected human-machine intellectual systems. These projects aim to achieve specific regional development goals through creating, transforming, and using various knowledge-information products.

Smart-projects differ from traditional or digitally-enhanced projects through a fundamentally new level of human-machine interaction. In these projects, functional-intellectual machines don't merely execute human-specified algorithms but actively participate in decision-making, data analysis, problem identification, development scenario modeling, and results prediction.

To illustrate this difference, let's consider a specific example. In a traditional regional transport infrastructure development project, digital technologies are used to create basic models of transportation flows. In contrast, in a smart-project, a system of interconnected functional-intellectual machines continuously analyzes multidimensional data on movement, predicts potential problems, forms adaptive solutions, and integrates with other urban systems, creating a holistic ecosystem of intelligent mobility.

Based on the conducted research, seven key content characteristics of smart-projects of regional development have been identified [5].

Intellectual core – the presence of a human-machine intellectual system as the basic, system-forming element of the project, not just an auxiliary tool. This characteristic implies not only the use of digital technologies but also a new quality of interaction between human and machine intelligence, where the functional-intellectual machine becomes an active element of project activity rather than just a tool.

Knowledge-information orientation – focus on creating higher-order knowledge-information products, not just material or simple information results. Smart-projects aim to produce new knowledge, models, algorithms, decision-making systems, and other intellectual products with high added value and transformational potential.

Transformational capability – the ability of a smart-project to change not only the direct object of influence but also to transform systemic interconnections in the regional environment. Smart-projects act as catalysts of systemic changes that go beyond the immediate objectives of the project.

Adaptive potential – the ability of the project structure to self-regulate and adapt in conditions of uncertainty, as opposed to the rigid determinism of traditional projects. Smart projects are characterized by a flexible architecture that allows them to adapt to changes in the external environment and internal conditions without a cardinal restructuring of the entire project structure.

Synergistic properties – interaction of different-level human-machine intellectual systems that generates emergent properties of the project. This effect manifests in the emergence of new qualities and capabilities that cannot be achieved by simply summing the individual components of the project.

Integrative architecture – organic combination of physical, digital, information, and cognitive technologies into a single system, not just their parallel use. This characteristic implies the formation of an integral complex in which different technological solutions are integrated based on a single conceptual model.

Cognitive processuality – non-linear processes of accumulation and use of knowledge in the project, as opposed to linear information flows in traditional projects. This characteristic reflects a qualitatively new level of working with knowledge, which implies not just its accumulation and transfer, but also transformation, recombination, and creation of new knowledge structures.

These characteristics are interconnected and interdependent, forming an integral system that defines the essential content of regional development smart-projects. At the same time, the key role belongs to humans as the controlling actor, who ensures purposefulness, ethics, and social responsibility of the functioning of human-machine intellectual systems within the framework of smart-projects.

For practical identification and classification of smart-projects of regional development, a comprehensive system of taxonomic identifiers is needed, which will allow for clearly distinguishing smart-projects from traditional projects with elements of digitalization. Based on the identified content characteristics of smart-projects, we developed a matrix for identifying the level of "smart maturity" of projects, presented in the table below.

Table

Matrix for identifying the "smart maturity" level of regional development projects

Taxonomic identifier	Traditional project	Project with digitalization elements	Entry-level smart-project	Advanced smart-project
Intellectual core	Absent. Traditional technologies and management methods are used	Individual digital technologies are used as auxiliary tools without significant change to the management model	The basic human-machine intellectual system is present as a key element of the project	A complex of interconnected human-machine intellectual systems functions, forming a new management model
Knowledge-information orientation	Orientation toward creating material products and traditional services	Creation of material products and services with a digital component or information support	Creation of knowledge-information products in parallel with material products and services	Dominance of high-level knowledge-information products that transform the regional environment
Transformational capability	Local impact on the immediate object of the project without systemic changes in the regional environment	Expanded impact on related objects and processes within the existing system of regional interconnections	Purposeful transformation of individual elements of the regional system according to the defined project goals	Systemic transformation of the regional environment with the formation of new models of interaction between economic agents and institutional structures
Adaptive potential	Rigid determinism of project parameters. Changes are made through formal procedures	Limited adaptivity within the framework of specified algorithms and procedures	Structured adaptivity with elements of self-organization based on feedback mechanisms	Proactive self-adaptation based on predictive analytics and cognitive models
Synergistic properties	Absent or minimal. Linear addition of results from individual project components	Local synergistic effects in individual project elements without systemic impact	Systemic synergistic effects that arise at the level of the main subsystems of the project	Multiple emergent properties that manifest at different levels of the project and form new qualities of the regional environment
Integrative architecture	Traditional hierarchical structure with a clear division of functions and responsibilities	Parallel use of traditional and digital technologies without their deep integration	Partial integration of physical, digital, and information technologies within a unified architecture	Full integration of physical, digital, information, and cognitive technologies into a holistic system with a unified management contour
Cognitive processuality	Linear information flows with limited feedback	Accelerated information flows with expanded feedback, but without qualitative transformation of knowledge	Elements of non-linear cognitive dynamics with the formation of new knowledge structures within the project	Dominance of non-linear cognitive dynamics with active production, transformation, and recombination of knowledge at different levels of the project

Source: Developed by the authors based on [5]

The proposed matrix allows not only identification of smart-projects but also determination of their "smart maturity" level, which has practical significance for assessing potential and prospects for implementation and development as a dynamic object. It is important to emphasize that for a project to be identified as an entry-level smart-project, at least four identifiers of the corresponding level must be present, and for an advanced smart-project – at least five identifiers.

The practical application of this matrix requires specific classification criteria. An entry-level smart-project must demonstrate at least four identifiers of the corresponding level. Similarly, an advanced smart-project must exhibit more than five identifiers. The presence of an intellectual core – specifically, a human-machine intellectual system – serves as a mandatory condition and must be among these identifiers. This characteristic defines the smart economy as a special economic reality.

For example, let's consider a project to create an intelligent system for monitoring and managing regional energy resources. If this project has a human-machine intellectual system that collects, analyzes, and interprets data on energy consumption, elements of self-adaptation based on feedback mechanisms, systemic synergistic effects at the level of main subsystems, partial integration of physical, digital, and information technologies, but lacks characteristics of a higher level, such a project can be classified as an entry-level smart-project. The developed system of taxonomic identifiers can be used by regional administrations, expert organizations, and other stakeholders to evaluate regional development projects, select them for funding, and monitor their implementation within the framework of smart specialization strategies for the regions [3].

As a special form of organizing economic activity, smart regional development projects feature unique project management characteristics that appear at various levels and stages of the project cycle [7]. Based on the conducted research, three key aspects of the specifics of project management in smart-projects have been defined: transformation of the management cycle, specifics of decision-making tools, and features of the methodology for evaluating effectiveness.

In smart-projects, the traditional project management cycle (initiation, planning, implementation, monitoring, and completion) transforms into a more flexible and adaptive model. The main differences are as follows:

a) during the initiation stage of a smart project, developing a conceptual model of the human-machine intellectual system that will form the project's core plays a defining role;

b) the planning stage in smart-projects is characterized by flexibility and adaptivity, where detailed planning covers only the nearest stages, and long-term parameters of the project are defined in the form of general principles and directions of development;

c) the implementation stage of a smart-project involves the active use of iterative development methods, where the project develops through a sequence of short cycles with constant feedback and correction of the direction of movement;

d) monitoring and control in smart-projects evolve from periodic compliance checks into a continuous process of collecting and analyzing project performance data, enabling quick identification of deviations and course corrections;

e) the completion stage of a project in smart-projects does not mean the termination of the functioning of the created human-machine intellectual systems, but rather a transition to a new phase of their development, when they continue to function as independent elements of the regional environment.

The decision-making tools in smart-projects of regional development are characterized by the following features:

– use of methods of intellectual data analysis – application of machine learning algorithms, neural networks, and other methods of analyzing big data to identify hidden patterns and trends in the regional environment;

– application of predictive analytics – use of digital twins, simulation models, and other forecasting tools to assess the potential results of different management decisions and their impact on the regional environment;

– implementation of adaptive decision support systems – use of integrated platforms that combine human and machine intelligence to ensure an optimal balance between creativity and analytical accuracy in the decision-making process;

– development of collective intelligence mechanisms – involving a distributed network of actors (experts, stakeholders, citizens) in the decision-making process using digital platforms and data aggregation algorithms;

– formation of continuous monitoring and feedback systems – use of tools for continuous tracking of the results of decisions made and their correction based on real data on the functioning of human-machine intellectual systems.

The methodology for evaluating smart-project effectiveness differs fundamentally from traditional approaches:

a) multidimensionality of evaluation – going beyond traditional financial indicators to include social, environmental, innovative, and transformational project effects;

b) evaluation of synergistic effects – development of methods for quantitative and qualitative assessment of emergent properties that arise as a result of the interaction of different components of the project and elements of the regional environment;

c) dynamic nature of evaluation – transition from static evaluation of project results at the moment of its completion to dynamic evaluation of its impact on the regional environment in the short-term, medium-term, and long-term perspective;

d) evaluation of cognitive effects – inclusion in the evaluation methodology of indicators that reflect the impact of the project upon the cognitive potential of the region, including the creation of new knowledge, development of competencies, and formation of an innovation culture;

e) use of complex evaluation models – application of system dynamics methods, agent-based modeling, and other tools for complex evaluation of the effectiveness of smart-projects taking into account their complex nature and multidimensional impact on the regional environment [6].

Practical identification of smart-projects can rely on a system of taxonomic identifiers:

– a checklist for primary identification of the presence of a human-machine intellectual system as the core of the project, which allows for quickly determining whether the project meets the basic condition of belonging to the category of smart-projects;

– an evaluation map of the project's level of compliance with the key content characteristics of smart-projects, which makes it possible to analyze the project in detail for each of the seven defined characteristics;

– a matrix for determining the level of «smart maturity» of the project according to 7 key taxonomic identifiers, which allows for attributing the project to one of the four categories and determining its position in the development continuum from traditional to advanced smart-project.

The practical application of this toolkit can be illustrated as follows: when evaluating a project to create a regional information system, first the presence of a human-machine intellectual system is determined (using a checklist), then the project's compliance with each of the seven characteristics is analyzed in detail (using an evaluation map), and based on this analysis, the project is placed in the «smart maturity» matrix, which allows for determining its status and potential for development.

Transforming traditional projects and digitally-enhanced projects into smart-projects requires step-by-step development of «smart characteristics» which encompasses:

– diagnostics of the current state of the project according to the system of taxonomic identifiers, which allows for determining the starting position for transformation;

– identification of the project's «smart potential» and priority directions of its development, i.e., those characteristics, the improvement of which will offer the greatest effect considering the specifics of the project and the regional context;

– development of a roadmap for project transformation with the definition of key stages, necessary resources, and expected results for each stage;

– formation of a monitoring and evaluation system for the process of project transformation, which allows for tracking progress and making necessary corrections to the roadmap.

The "smart potential" of a project in this context is understood as the set of opportunities for increasing its "smart maturity" taking into account existing limitations and features of the regional environment [8]. For example, a project for the digitalization of urban transport may have a high "smart potential" in terms of developing integrative architecture and synergistic properties, but a limited potential in terms of cognitive processes due to the specifics of the industry. The development of smart-projects on the regional level requires a certain infrastructure, in particular:

– formation of regional centers of competence in the field of smart technologies and smart-projects, which will become centers for the accumulation and dissemination of relevant knowledge, methodologies, and best practices;

– creation of platforms for interaction between developers of smart-projects, potential investors, and regional administrations, which will facilitate effective communication between key stakeholders and accelerate the implementation of innovative solutions;

– development of educational programs for training specialists in the field of smart technologies and project management under the conditions of the smart economy, which will provide the region with the necessary human resources for the implementation of smart-projects;

– formation of a system of grant support for smart-projects at the initial stage of their development, which will reduce risks for innovators and stimulate

experimentation with new approaches and technologies.

Effective management of smart-projects of regional development involves:

– adaptation of traditional project management methodologies (PMI, PRINCE2, Agile) to the specifics of smart-projects, which implies their supplementation with elements that take into account the features of human-machine intellectual systems and their interaction [4];

– development of specialized decision support tools in smart-projects, which integrate methods of intellectual data analysis, predictive analytics, and collective intelligence;

– formation of a system of indicators for monitoring and evaluating the effectiveness of smart-projects taking into account their synergistic and transformational effects, which will allow for adequately reflecting the real value of such projects;

– development of mechanisms for involving stakeholders in the management of smart-projects at different stages of their life cycle, which will ensure a multifaceted contribution to the formation and implementation of projects.

Conclusions

This research has developed theoretical and methodological foundations for smart regional development projects, a system of taxonomic identifiers for their classification, and specific project management approaches for the smart economy context.

The research clarifies the concept of "smart regional development project" as a special form of economic activity organization with one or several interconnected human-machine intellectual systems at its core. These projects aim to achieve specific regional development goals through creating, transforming, and using various knowledge-information products.

Seven key content characteristics of smart-projects of regional development have been defined: intellectual core, knowledge-information orientation, transformational capability, adaptive potential, synergistic properties, integrative architecture, and cognitive processes, which form an integral system that defines the essential content of smart-projects. A system of taxonomic identifiers for smart-projects of regional development has been developed in the form of a matrix for identifying the level of "smart maturity" of projects, which allows for classifying projects into four categories: traditional projects, projects with elements of digitalization, entry-level smart-projects, and advanced smart-projects.

The project management in smart-projects of regional development exhibits unique characteristics in three key aspects. First, it transforms the traditional project management cycle. Second, it employs specialized decision-making tools. Third, it utilizes distinctive methodologies for evaluating effectiveness. Practical recommendations have been formulated for the identification and implementation of smart-projects on the regional level, which include diagnostic tools for identifying smart-projects, a methodology for the step-by-step development of "smart characteristics" of projects, recommendations for the development of infrastructure to support smart-projects on the regional level, and methodological recommendations for adapting project management tools for smart-projects.

The practical significance of the obtained results lies in the possibility of their use by regional administrations and other stakeholders for the identification and implementation of smart-projects of regional development, as well as for the formation of relevant smart specialization strategies for the regions.

Prospects for further research are related to the development of detailed methodologies for evaluating the effectiveness of smart-projects of regional development, formation of a system of indicators for monitoring their implementation, as well as studying the mechanisms of integration of smart-projects into smart specialization strategies for the regions.

REFERENCES

1. European Commission. S3 Community of Practice: The central knowledge and information hub for Smart Strategies Specialisation. Retrieved from: https://ec.europa.eu/regional_policy/policy/communities-and-networks/s3-community-of-practice/community_of_practice_en [in English].

2. Tarasevych, V. M. (2024). Do teoretychnoho rozuminnia smart-ekonomiky [Toward a theoretical understanding of smart economy]. *Ekonomika Ukrainy – Economy of Ukraine*, 67(10), 92–112. DOI: https://doi.org/10.15407/economyukr.2024.10.092 [in Ukrainian].

3. Yehorov, I. Y., Bazhal, Y. M., et al. (Eds.). (2020). *Formation of "smart specialization" in the economy of Ukraine.* National Academy of Sciences of Ukraine, State Institution "Institute of Economics and Forecasting NAS of Ukraine" [in Ukrainian].

4. Vyshnevskyi, O. S. (2022). Smart-spetsializatsiia z pozytsii providnykh shkil ekonomichnoi teorii [Smart specialization from the perspective of leading schools of economic theory]. *Visnyk ekonomichnoi nauky Ukrainy – Bulletin of Economic Science of Ukraine*, 1(42), 3–8. DOI: https://doi.org/10.37405/1729-7206.2022.1(42).3-8 [in Ukrainian].

5. Kalenyuk, I., & Uninets, I. (2021). Ekosystema smart-ekonomiky v hlobalnomu seredovyshchi [The ecosystem of smart economy in the global environment]. *Stratehiia ekonomichnoho rozvytku Ukrainy – Strategy of Economic Development of Ukraine*,

49, 5–16. DOI: https://doi.org/10.33111/sedu.2021.49.005.020 [in Ukrainian].

6. Bruneckiene, J. (2014). The concept of smart economy under the context of creation the economic value in the city. *Public Policy and Administration, 13(3),* 469–482. DOI: https://doi.org/10.5755/j01.ppaa.13.3.8301 [in English].

7. Zhou, Z., Liu, W., Cheng, P., & Li, Z. (2022). The impact of the digital economy on enterprise sustainable development and its spatial-temporal evolution: An empirical analysis based on urban panel data in China. *Sustainability, 14(19),* Article 11948. DOI: https://doi.org/10.3390/su141911948 [in English].

8. Levy, C., & Wong, D. (2014). Towards a smart society. Big Innovation Centre [in English].

9. Brych, V., Putsenteilo, P., Kostetskyi, Ya., & Hunko, S. (2022). Smart-spetsializatsiia yak draiver systemy innovatsiinoho rehionalnoho rozvytku [Smart specialization as a driver of the innovative regional development system]. *Innovatsiina ekonomika – Innovative Economy*, *1(90),* 141–151. DOI: https://doi.org/10.37332/2309-1533.2022.1.19 [in Ukrainian].

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СМАРТ-ПРОЄКТИ РЕГІОНАЛЬНОГО РОЗВИТКУ: ЗМІСТ, ТАКСОНОМІЧНІ ІДЕНТИФІКАТОРИ ТА СПЕЦИФІКА ПРОЄКТНОГО УПРАВЛІННЯ

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У представленому дослідженні розглянуто теоретичні та методологічні засади ініціювання, розробки та реалізації смарт-проєктів регіонального розвитку як унікальної форми втілення концепції смарт-економіки на регіональному рівні. Спираючись на фундаментальну концепцію людино-машинних інтелектуальних систем, запропоновано авторське тлумачення поняття «смарт-проєкт регіонального розвитку» та розроблено систему таксономічних ідентифікаторів, що забезпечує чітке відмежування таких проєктів від звичайних ініціатив із цифровізації. Визначено сім атрибутивних характеристик, що формують змістовне наповнення смарт-проєктів: інтелектуальне ядро, знаннєво-інформаційна орієнтація, адаптивний потенціал, синергетичні властивості, інтегративна архітектура, трансформаційна спроможність та когнітивна процесуальність. Розроблено матрицю класифікації смарт-проєктів за рівнем розвиненості їх смарт-складової із чіткими критеріями для кожного рівня та подальшим об'єднанням у чотири функціональні групи: «традиційні проєкти», «проєкти з елементами цифровізації», «смарт-проєкти початкового рівня» та «смарт-проєкти розвинутого рівня». У контексті діалектики загального та особливого досліджено специфіку управління смарт-проєктами, зокрема проаналізовані модифікації життєвого циклу проєкту та циклу управління, конкретизовані відмінності в інструментарії прийняття управлінських рішень і методологічних підходах до прогнозування й оцінки результативності та ефективності проєктних розробок. Сформульовано практичні рекомендації щодо ідентифікації та впровадження смарт-проєктів на регіональному рівні. Результати дослідження становлять значну теоретичну та практичну цінність для розробки та імплементації стратегій смарт-спеціалізації регіонів України в контексті сучасних глобальних економічних трансформацій.

Ключові слова: смарт-економіка, смарт-спеціалізація, смарт-проєкт, людино-машинна інтелектуальна система, регіональний розвиток, таксономія проєктів, проєктне управління.

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This research examines the theoretical and methodological foundations of initiating, developing, and implementing smart-projects of regional development as a unique form of implementing the smart economy concept on the regional level. This research builds on the fundamental concept of human-machine intellectual systems. It presents an original interpretation of the "smart-project for regional development" concept and develops a system of taxonomic identifiers. These identifiers clearly differentiate smart-projects from ordinary digitalization initiatives. This research defines seven attributive characteristics that form the content of smart-projects: intellectual core, knowledge-information orientation, adaptive potential, synergistic properties, integrative architecture, transformational capability, and cognitive processes. This study develops a classification matrix of smart-projects based on their smart component development level, with clear criteria for each level and subsequent categorization into four functional groups: "traditional projects," "projects with digitalization elements," "entry-level smart-projects" and "advanced smart-projects." The paper examines smart project management features, analyzing modifications to the project and management cycles, differences in decision-making tools, and methodological approaches to forecasting and evaluating project effectiveness and efficiency. Practical recommendations are formulated for identifying and implementing smart-projects on the regional level. The research results have significant theoretical and practical value for developing and implementing smart specialization strategies for Ukrainian regions within the context of current global economic transformations.

Keywords: smart economy, smart specialization, smart-project, human-machine intellectual system, regional development, project taxonomy, project management.

REFERENCES

1. European Commission. S3 Community of Practice: The central knowledge and information hub for Smart Strategies Specialisation. Retrieved from: https://ec.europa.eu/regional_policy/policy/communities-and-networks/s3-community-of-practice/community_of_practice_en [in English].

2. Tarasevych, V. M. (2024). Do teoretychnoho rozuminnia smart-ekonomiky [Toward a theoretical understanding of smart economy]. *Ekonomika Ukrainy – Economy of Ukraine*, 67(10), 92–112. DOI: https://doi.org/10.15407/economyukr.2024.10.092 [in Ukrainian].

3. Yehorov, I. Y., Bazhal, Y. M., et al. (Eds.). (2020). *Formation of "smart specialization" in the economy of Ukraine.* National Academy of Sciences of Ukraine, State Institution "Institute of Economics and Forecasting NAS of Ukraine" [in Ukrainian].

4. Vyshnevskyi, O. S. (2022). Smart-spetsializatsiia z pozytsii providnykh shkil ekonomichnoi teorii [Smart specialization from the perspective of leading schools of economic theory]. *Visnyk ekonomichnoi nauky Ukrainy – Bulletin of Economic Science of Ukraine*, 1(42), 3–8. DOI: https://doi.org/10.37405/1729-7206.2022.1(42).3-8 [in Ukrainian].

5. Kalenyuk, I., & Uninets, I. (2021). Ekosystema smart-ekonomiky v hlobalnomu seredovyshchi [The ecosystem of smart economy in the global environment]. *Stratehiia ekonomichnoho rozvytku Ukrainy – Strategy of Economic Development of Ukraine*, 49, 5–16. DOI: https://doi.org/10.33111/sedu.2021.49.005.020 [in Ukrainian].

6. Bruneckiene, J. (2014). The concept of smart economy under the context of creation the economic value in the city. *Public Policy and Administration, 13(3),* 469–482. DOI: https://doi.org/10.5755/j01.ppaa.13.3.8301 [in English].

7. Zhou, Z., Liu, W., Cheng, P., & Li, Z. (2022). The impact of the digital economy on enterprise sustainable development and its spatial-temporal evolution: An empirical analysis based on urban panel data in China. *Sustainability, 14(19),* Article 11948. DOI: https://doi.org/10.3390/su141911948 [in English].

8. Levy, C., & Wong, D. (2014). Towards a smart society. Big Innovation Centre [in English].

9. Brych, V., Putsenteilo, P., Kostetskyi, Ya., & Hunko, S. (2022). Smart-spetsializatsiia yak draiver systemy innovatsiinoho rehionalnoho rozvytku [Smart specialization as a driver of the innovative regional development system]. *Innovatsiina ekonomika – Innovative Economy*, *1(90),* 141–151. DOI: https://doi.org/10.37332/2309-1533.2022.1.19 [in Ukrainian].