INFORMATION AND INNOVATION TECHNOLOGIES IN PROJECT MANAGEMENT FOR THE DEVELOPMENT OF SOCIO-ECONOMIC SYSTEMS

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Information systems improve the efficiency, transparency, and security of processes, and facilitate informed decision-making. Information and innovation technologies for the development of territorial communities contribute to the intensification of social and economic processes in the territory by increasing the transparency of operations, monitoring and control over their implementation by a large number of stakeholders, and increasing the efficiency of economic and administrative decisions. At the same time, these indicators vary considerably depending on the type of community. Urban communities have more resources and opportunities to innovate, while rural and settlement communities face greater challenges due to limited resources and infrastructure.

In the modern world, information systems play a key role in the development of socioeconomic systems. They ensure effective project management, facilitate informed decision-making, and increase productivity. According to international indices, such as the Network Readiness Index (NRI) and the Global Innovation Index (GII), Ukraine is gradually strengthening its position in the field of information and communication technologies (ICT). For example, in 2022, Ukraine improved its performance in several key indices, indicating an increase in innovation potential (Fig. 1).
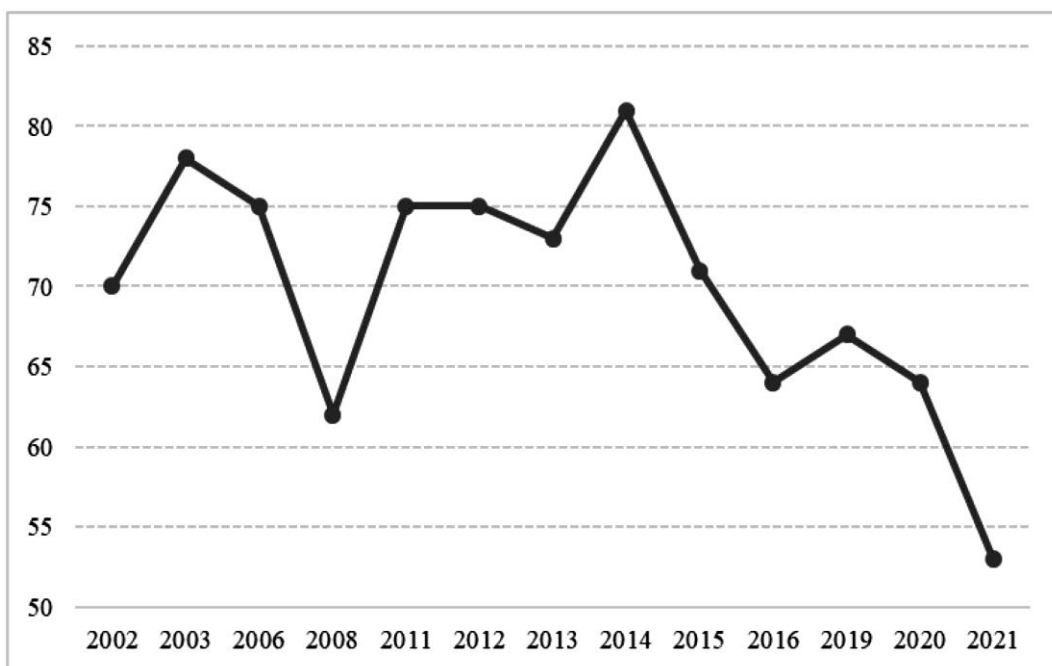

Fig. 1. Ukraine's place in the NRI ranking
(*Source: compiled based on data from [13]*)

According to the State Statistics Service of Ukraine, the number of innovatively active enterprises is growing, which indicates an increase in the level of implementation of new technologies in various sectors of the economy [11]. During the COVID-19 pandemic, many business processes were transferred to the online environment, which accelerated the digital transformation of communities and territories, including the implementation of digital agendas and the development of digital infrastructure. In general, information systems (IS) as a set of hardware and software tools, methods, and procedures that collect, store, process, and transmit information are an integral part of modern project management.

The main areas of IS use in project management are as follows:

1) planning and control (IS allow for effective resource planning, task allocation, and monitoring of project implementation, provide access to up-to-date information in real time, which facilitates timely decision-making);

2) communication and collaboration (IS help improve communication between project participants by ensuring rapid exchange of information and documents, which is especially important for large projects with many stakeholders);

3) analysis and reporting (information and communication systems provide tools for analyzing data Therefore, the benefits of using IS for socio-economic development include increasing their efficiency by automating processes and reducing time and resources; improving the quality of decisions by providing access to up-to-date and accurate information and making informed decisions; reducing risks by identifying and minimizing them in a timely manner during the preparation, organization, and implementation of the project management process.

At the same time, the existing challenges and limitations, such as the cost of implementation, the need to ensure data security and protection of information from unauthorized access and cyberattacks, and the need to train staff, can sometimes be an obstacle for some organizations or require additional resources (Fig. 2).

Modern indicators of the functioning of innovative technologies in the management of projects for the development of socio-economic systems are as follows:

a) process automation, which includes automatic planning, resource allocation, progress monitoring, and report generation, which significantly increases the efficiency of project management;

b) the use of artificial intelligence (AI), in particular in analytical work with large amounts of data to identify trends, predict risks and optimize decisions, predict possible delays in the project and suggest ways to avoid them;

Strengths	Weaknesses
Active implementation of electronic services. High level of ICT infrastructure, availability of a developed infrastructure for the implementation of information and innovation technologies. Growing number of innovative enterprises and support from the government. Support from international organizations.	Uneven development, different levels of ICT development in urban, settlement and rural communities. The need to increase the level of digital literacy among the population. Low level of digital literacy among the population. Insufficient funding.
Opportunities	**Threats**
Expanding the use of artificial intelligence. Support from international organizations, possibility of receiving grants and technical assistance from international organizations. Development of digital services, introduction of new digital services to improve community management. Creation of a single state platform for electronic services.	Cyber threats. Cybersecurity, risks related to cybersecurity and data protection. Economic instability, the impact of economic instability on the financing of innovative projects. Lack of a clear strategy for digital transformation.

Fig. 2. SWOT-analysis of information and innovation technologies for community management in Ukraine

(*Source: own research*)

c) the introduction of cloud technologies to provide access to information from anywhere and at any time, which allows storing large amounts of data without the need for local infrastructure and improves communication and cooperation between project participants;

d) the accumulation of blockchain technologies to ensure transparency and security of transactions and data, tracking the implementation of tasks, managing contracts and ensuring compliance with regulatory requirements;

e) the establishment of the Internet of Things (IoT) and its use to collect data from various devices and sensors in real time to monitor the condition of equipment, control resources, and optimize production processes;

f) focusing on certain aspects of project management in the virtual and augmented reality (VR/AR) environment in terms of staff training, project visualization, and modeling of various scenarios to enhance understanding of complex processes and make informed decisions;

g) spreading Big Data analytics to obtain valuable information about trends and patterns in strategic decision-making. However, there is a fundamental

difference in the use of information and innovation technologies in the development of territorial communities depending on their category, in particular in the process of large and complex projects (Fig. 3; Table 1, source: compiled by the authors based on [1–8]).
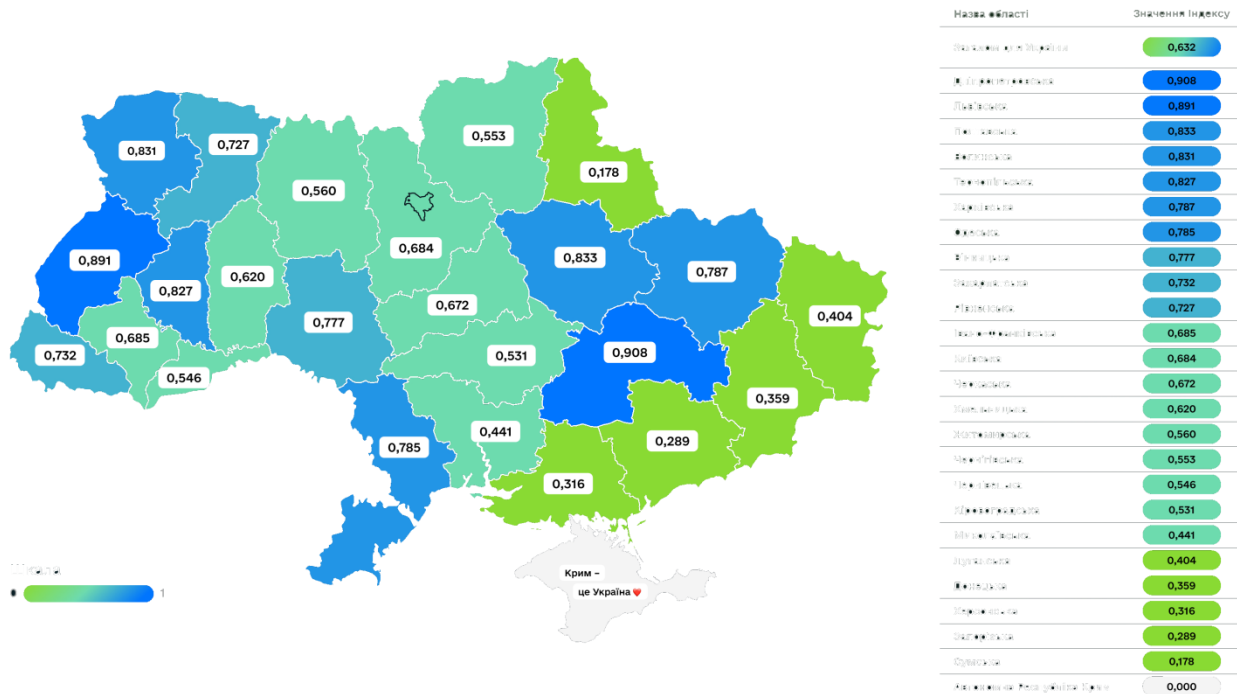

Fig. 3. Digital transformation index of Ukraine's territories in 2023
(*Source: compiled based on data from [8]*)

Table 1

Use of information and innovation technologies by communities

Feature	Cities	Settlements	Villages
1	2	3	4
Investment in innovation	Urban communities typically have larger budgets and invest more in information and innovation technologies, with investments in smart cities reaching billions of dollars in developed countries	Suburban communities have more limited budgets than urban ones, but still invest in infrastructure and technology development	Rural communities have the smallest budgets for investments in information and innovation technologies
Internet coverage	In urban areas, the level of access to high-speed Internet is much higher than in rural areas	The level of Internet access in settlements is usually lower than in cities, but higher than in rural areas	The level of Internet access in countryside is much lower than in urban and suburban areas

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1	2	3	4
Innovation readiness	Urban communities are often leaders in the implementation of new technologies, such as smart transportation systems, energy and security management	Suburban communities often adopt technology to improve public services and resource management	Rural communities often face difficulties in adopting new technologies due to limited resources and infrastructure
Challenges	The main challenges include the high cost of implementation and the need to integrate different systems	Key challenges include limited financial resources and the need for staff training	The main challenges include low levels of digital literacy and lack of infrastructure
Assessment of the number of innovation and information infrastructure facilities	Urban communities usually have the largest number of innovation and information infrastructure facilities.	Suburban communities have fewer innovation and information infrastructure facilities than urban ones, but still a significant number	Rural communities have the smallest number of innovation and information infrastructure facilities
Administrative service centers (ASCs)	They are widespread in urban communities and provide access to a variety of public services	Many suburban communities have their own ASCs that provide access to administrative services	Many rural communities do not have their own ASCs, but they can use the services of mobile ASCs or contact the nearest village or city ASCs
Innovation hubs and technology parks, Internet centers, Internet access	Cities such as Kyiv, Lviv, and Kharkiv have several technology parks and innovation hubs that support startups and tech companies	Internet centers are often established in settlements to provide access to information resources	The level of Internet access in rural communities is much lower, which limits opportunities for the introduction of innovative technologies
Digital platforms and services, digital educational programs, digital educational initiatives	Urban communities are actively implementing digital platforms for managing urban resources and services	Suburban communities are actively implementing digital educational programs to improve the digital literacy of the population	Digital literacy programs are often held in rural communities, but their number and coverage are limited

The number of innovation and information infrastructure facilities varies significantly by community type. Urban communities have the largest number of such facilities, rural communities are in an intermediate position, and rural communities have the smallest number of facilities due to limited resources and infrastructure.

The territorial communities with a high level of innovation and information infrastructure in Ukraine include such urban areas as Kyiv (the capital of Ukraine is a leader in the implementation of innovative technologies, with numerous technology parks, innovation hubs, and administrative service centers; Kyiv is actively implementing smart city projects), Lviv (the city is known for its IT clusters and innovation initiatives that bring together more than 100 companies and actively promote the development of innovative infrastructure) [9]. Unique is the experience of such village councils as Novoborivska community in Zhytomyr region, which is known for its tourism and recreational potential and active implementation of innovative technologies for the development of local infrastructure, and Slavska community in Lviv region, which is actively developing tourism infrastructure and implementing digital technologies for managing resources and services; rural – Bilozirska community in Cherkasy region is known for its initiatives in the field of digital education and implementation of innovative technologies to improve the quality of life. These examples demonstrate how different types of communities can successfully implement innovative information technologies to improve the quality of life and develop local infrastructure [14].

The activation of territorial community development processes is proposed through the Digital Community project management mechanism, which aims to improve the efficiency of territorial community management through the introduction of modern information and innovation technologies. The main objectives of the project are as follows:

a) development and implementation of a digital platform for community management, which will include modules for electronic document management, budgeting, project management, and communication with residents;

b) training and professional development of local government employees in the field of information and communication technologies (ICT) and digital technologies;

c) development of digital infrastructure: providing access to high-speed Internet in all settlements of the community;

d) introduction of electronic services for The pilot announcement of the project implementation on the example of the Bronyky village council envisages the following stages of implementation:

1) analysis of community needs (conducting surveys and collecting data to identify key needs and problems);

2) development of terms of reference, determination of requirements for the digital platform and other project components;

3) selection of suppliers and partners, tendering and contracting with hardware and software suppliers;

4) development and testing of the platform, creation of a prototype, its testing and making necessary changes;

5) staff training through the organization of trainings and seminars for local government employees;

6) implementation of the project. The expected results of the project implementation are to increase the efficiency of community management, increase the transparency and accountability of local authorities, improve the quality of service delivery to residents, and stimulate local economic development through support for innovative enterprises. This project can be adapted to the specific needs of the community, taking into account its unique characteristics and challenges.

The estimated cost of implementing the Digital Community project includes the following elements: development and implementation of a digital platform ($2000), staff training ($500), development of digital infrastructure ($1500), implementation of electronic services ($1000), support for innovative startups ($1000), and the total project cost is $6000. Expected economic benefits: reduction of management costs by 20%, savings in the community budget (approximately $1200 per year), increase in work efficiency by 15%, increase in employee productivity, increase in revenues from new services – $500 per year. The total annual benefits of the project will amount to $1700, and the payback period will be 3.5 years. However, no less important is the project's environmental impact by reducing paperwork, reducing paper use by 80%, which contributes to forest conservation, reducing CO_2 emissions, and reducing transportation by 10%. Social benefits include improved access to services, increased availability of online services, and reduced time and costs for obtaining them. Staff and residents will be trained to improve their digital literacy. The introduction of electronic services will ensure greater transparency and accountability of local authorities. The availability of a digital platform will facilitate better communication between residents and authorities. Expected sources of funding may include the state budget, international donor organizations, the private sector, and NGOs. The assessment of the synergistic effect of cooperation between the authorities, local self-government, and the public sector is

reflected in the econometric model of community budget growth (Y) depending on investments in public sector development $(X1)$ and the level of education of the population $(X2)$:

$$Y = \beta 0 + \beta 1 \times X1 + \beta 2 \times X2 + \varepsilon \,, \qquad (1)$$

where $\beta 0, \beta 1, \beta 2$ – regression coefficients;

ε – random error.

A graphical representation of the scenario analysis of the territory's development, provided that the existing trends are maintained (a), a project-based approach to management is applied (b), and all stakeholders cooperate, is shown in Fig. 4.
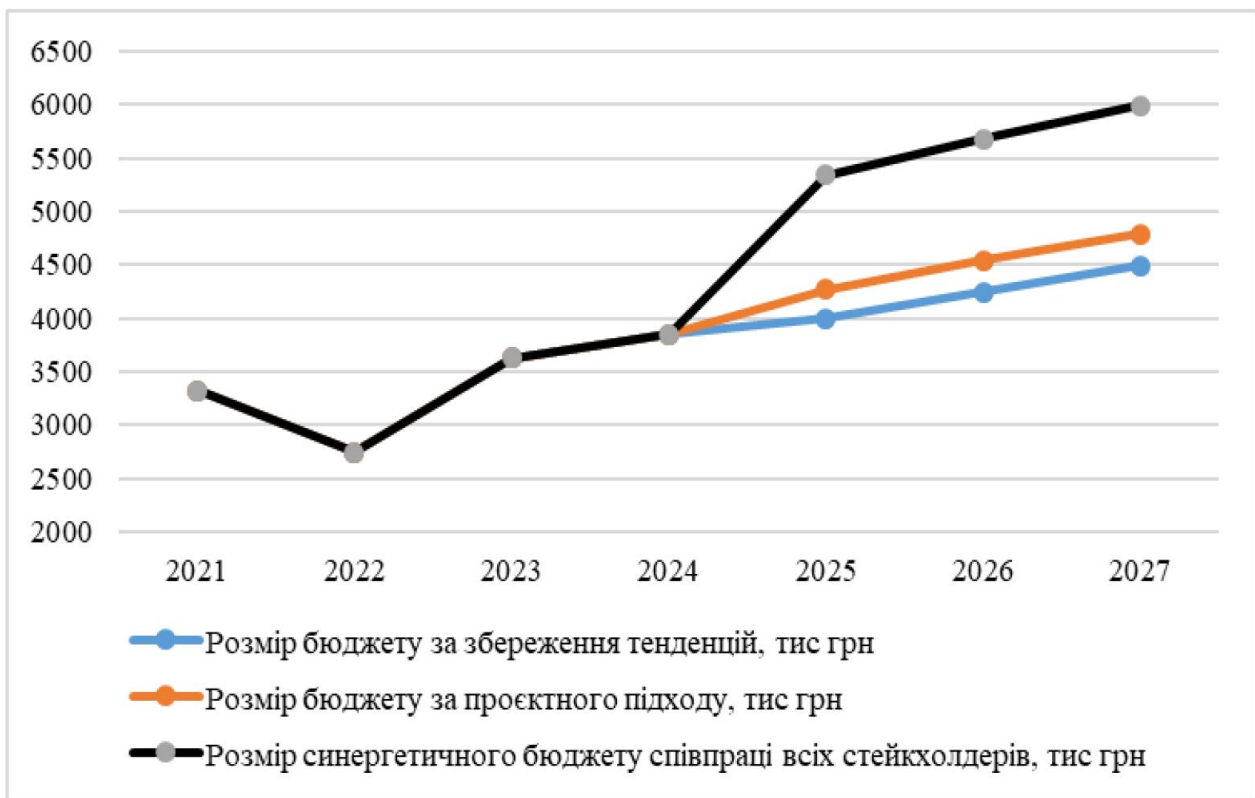

Fig. 4. Budget forecast for the Bronyky community
(*Source: own research*)

Thus, information systems are an integral part of modern project management for the development of socio-economic systems. They ensure effective planning, control, communication, and analysis, which contributes to the successful implementation of projects. Innovative technologies are significantly changing approaches to managing projects for the development of socio-economic systems. They increase the efficiency, transparency, and security of processes, and facilitate

informed decision-making. However, for the successful implementation of these technologies, it is necessary to take into account possible challenges and limitations, such as cost, data security, and the need for staff training. Information and innovation technologies for the development of territorial communities contribute to the intensification of socio-economic processes in the territory by increasing the transparency of operations, monitoring and control over their implementation by a large number of stakeholders, and increasing the efficiency of economic and administrative decisions. At the same time, these indicators vary considerably depending on the type of community. Urban communities have more resources and opportunities to innovate, while rural and settlement communities face greater challenges due to limited resources and infrastructure.

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