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Innovative information technologies in management of educational projects in the era of turbulence

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Abstract. *The study highlights the role of innovative information technologies in managing educational projects under uncertainty and crises. Traditional methods lose efficiency amid turbulence caused by economic shocks, conflicts, and rapid technological change. Tools such as Big Data, AI, blockchain, and cloud systems enhance adaptability, optimize resources, and support collaboration. Special attention is given to hybrid technologies, which integrate diverse solutions for more reliable forecasting and risk management. The paper concludes that these technologies evolve into strategic resources, ensuring resilience and competitiveness of educational projects.*
Keywords: *IT, innovative management, educational projects, uncertainty & crisis.*

Introduction. In modern conditions, innovative project management is the main form of implementing strategic initiatives, effective adaptive solutions and digital transformations [1], [2]. In addition, the modern global environment is characterized by a high degree of uncertainty [3] and instability [4], which is often described by the term “era of turbulence”. Crisis phenomena in the world economy, the cardinal and accelerating pace of technological transformations, geopolitical challenges, environmental disasters and pandemic threats create conditions [5-7] when traditional project management methods cease to be sufficient to ensure their effectiveness and sustainability. In these conditions, innovative technologies come to the fore, which not only expand the project management toolset, but also fundamentally transform the approach to management itself [8]. Innovative total digitalization [9], [10] and intelligent (knowledge-based & data-driven) automation [10], [11], the use of artificial

intelligence [12-13], Big Data, blockchain and cloud technologies allow organizations and institutions to: adapt to changes faster; build hybrid and adaptive project management models; increase the accuracy of forecasting deadlines, costs and risks; strengthen transparency and trust between all stakeholders. This ensures both the efficiency of individual projects, and the stability of portfolios and programs in the context of systemic instability [14], [15]. Thus, studying the role of innovative technologies in the management of (including educational) projects in the era of turbulence allows not only to realize new opportunities and challenges, but also to develop strategic guidelines for organizations that seek to survive and develop in conditions of radical uncertainty.

The Main Part. As stated above, the modern era is characterized by a high degree of uncertainty, accelerating socio-economic changes, and frequent crisis phenomena that have a direct impact on the education system.

The modern education system operates in conditions where global and local challenges - economic crises, military conflicts, pandemics, technological shifts, and social instability - become constant factors affecting its sustainability and development. In these circumstances, classical approaches to educational project management lose their effectiveness, as they are not always able to provide sufficient flexibility, efficiency, and adaptability.

That is why educational project management under such conditions requires not only flexibility and strategic thinking, but also the implementation of innovative information technologies. Digitalization, artificial intelligence, cloud solutions, Big Data and Data Mining systems are becoming the foundation that allows educational institutions and project teams to respond promptly to challenges, predict risks, adapt strategies, and increase the sustainability of educational initiatives.

Innovative information technologies open up new horizons in project management: from process optimization and results monitoring to decision support in conditions of limited resources and external threats. This is especially relevant in times of crisis, when traditional management approaches often prove insufficient.

In response to such challenges, innovative information technologies are beginning to play an increasingly significant role, providing new opportunities for strategic and operational management of educational initiatives. The most popular technologies include:

1). Big Data and Data Mining systems, which allow collecting, storing and analyzing huge amounts of educational, financial and socio-cultural data in order to identify patterns and predict risks.

2). Artificial intelligence and machine learning methods, which are used in predicting student behavior, optimizing educational programs, automating quality control processes and making management decisions.

3). Cloud technologies and distributed databases that ensure the availability of educational resources, digital collaboration of project participants and reduced dependence on local restrictions (for example, territorial or infrastructure).

4). Intelligent project management systems (IPMS), which allow not only to track key performance indicators (KPI), but also to model scenarios of events in real time, which is critical in crisis conditions.

5). Cybersecurity technologies that ensure data protection and continuity of educational processes in the face of information attacks and digital threats.

In an era of crises, the most important characteristics of educational management are: 1. Flexibility - the ability to quickly change the strategy and tactics of the project; 2. Adaptability - the ability to adapt to changing external conditions; 3. Resilience - preservation of key functions and results even in adverse scenarios; 4. Innovation - active implementation of digital tools and intelligent technologies to increase the efficiency of processes.

Thus, the integration of innovative information technologies into the management of educational projects becomes a necessary condition for their survival and success.

Conclusions. The use of innovative information technologies in the management of modern educational projects in conditions of uncertainty and crises allows:

1. To increase the stability and adaptability of projects, due to forecasting and risk modeling systems.

2. To optimize the management of resources (financial, personnel, temporary) using intelligent analytics and automated controlling systems.

3. To accelerate the processes of making management decisions using artificial intelligence algorithms, digital platforms and cloud services.

4. To reduce the level of uncertainty by processing large data sets (Big Data) and applying Data Mining methods to identify hidden patterns.

5. To create conditions for the continuous development of educational initiatives, despite crisis circumstances, ensuring their stability and long-term effectiveness.

Thus, innovative information technologies become not just a tool to support educational management, but a strategic resource that forms the competitiveness and survival of educational projects in a turbulent world.

Discussion. The modern education system is increasingly faced with challenges associated with increasing uncertainty and crisis phenomena: global economic shocks, military conflicts, technological shifts, climate change and pandemics. In these conditions, classical approaches to managing educational projects are insufficient, since they are based on environmental stability and predictability of key parameters. Hybrid information technologies come to the fore, combining the capabilities of various digital and intellectual tools, forming a synergistic effect in management. The special value of hybrid technologies lies in their ability to combine different methods and algorithms to solve complex tasks [16] in a turbulent environment. In the long term, the use of hybrid information technologies becomes not only a tool for increasing efficiency, but also a strategic competitive advantage of educational organizations, allowing them not only to survive in an era of crises, but also to form innovative development trajectories.

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Traditional machine learning for adaptive management of education in crisis contexts

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Abstract. *Modern management systems operate in an environment of constant instability and crisis phenomena, where traditional approaches often lose their effectiveness. To ensure flexibility and strategic adaptability, intelligent technologies are needed that can process large amounts of data and make informed management decisions. The integration of classical machine learning into educational management is an effective tool in conditions of instability and crisis situations. This creates opportunities for comprehensive analysis, strategic planning and implementation of innovative solutions that increase the competitiveness of educational organizations. In general, the use of classical machine learning in adaptive education management ensures effective information processing, transparency of results, prompt response to changes and improvement of educational processes. Thus, machine learning becomes a key means of increasing the stability and competitiveness of educational institutions in conditions of constant transformations.*
Keywords: *innovative management, educational management, classical machine learning, crisis.*