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Adapting Intelligent Digital Technologies in Modern Higher Humanities Education and Research Management: Adaptation Strategies for Extreme Turbulence and Systemic Risk (Under SHIVA and WARMI Environmental Conditions)

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Abstract. *This publication explores the specifics, features and directions of adaptation of digital intellectual technologies in the management of modern higher humanitarian education and science in the conditions of SHIVA and WARMI environments. The relevance of hybrid intelligent information technologies that combine the capabilities of AI, Big Data, expert systems and human knowledge is substantiated. The key areas of their application, the potential of proactive and anti-crisis management, as well as the main technological, organizational and ethical risks are identified. An adaptive human-centric approach to the intellectualization of the management of humanitarian education and science is proposed.*

Keywords: *digital education; digital intelligent technologies; artificial intelligence; hybrid intelligent information technologies; higher humanitarian education; humanities; intelligent management; digital transformation; adaptive management; crisis management; Big Data; SHIVA; WARMI; systemic risks; uncertainty; turbulence.*

Introduction. The modern transformation of higher humanities education and science is taking place in conditions of fundamentally complicated environment [1], characterized by acceleration of changes, increasing uncertainty [2], turbulence, interdependence and systemic risks [3]. While traditional models of higher education management were mainly oriented towards a relatively stable institutional environment, modern universities and scientific organizations operate in conditions of dynamic instability [4], when management decisions must be made faster, relying simultaneously on large masses of diverse data, expert knowledge and intelligent digital tools [5]. In this logic, the transition from VUCA- and BANI-like characteristics of the environment to more complex conceptual representations of SHIVA and WARMI actualizes the need not just for digitalization, but for intelligent adaptation of management mechanisms [6].

Digital intelligent technologies are becoming one of the key tools of such adaptation; These include artificial intelligence technologies [7], machine learning, intelligent data analytics, natural language processing, generative AI, recommender systems, intelligent modeling [8], digital platforms and management decision support systems. However, their implementation in humanitarian education and science cannot be carried out according to a universal technocratic model [9]. The specificity of humanitarian knowledge, the high role of interpretation, context, language, culture, values, academic autonomy and human creativity require special adaptation of digital intelligent technologies to educational, scientific and management processes [10].

That is why the author of the main goal of this publication is to systematically determine the specifics and features of the application of digital intelligent technologies in the management of modern higher humanitarian education and science, as well as to substantiate the directions of their adaptation to a complex and dynamic environment characterized by uncertainty, turbulence and systemic risks of the SHIVA and WARMI paradigms.

Results. The modern digital transformation of higher humanities education and science is gradually moving from the automation of individual administrative operations to the formation of an intellectual-digital management system. Its fundamental difference lies in the ability not only to collect, store and process information, but also to identify patterns, predict changes, identify risks and form recommendations for management decisions. At the same time, the humanitarian sphere requires a special approach: digital intelligent technologies should not replace a teacher, researcher or manager, but ensure their intellectual strengthening. The specificity of humanities education and science is determined by the high contextuality, interpretability, semantic complexity and value-based nature of the researched and educational processes. Language, culture, history, society, texts and communication cannot be fully represented by a set of quantitative indicators. Therefore, intelligent technologies should take into account the cultural and linguistic context, work with unstructured and multimodal data, ensure the interpretability of results and maintain the leading role of human expertise. This necessitates the transition from purely technological to human-centric and content-oriented digital management.

The main areas of application of digital intelligent technologies are the intelligent management of educational trajectories, analysis and forecasting of scientific activity, management of human capital and competencies, analytics of university processes, monitoring of the quality of education, as well as the identification and forecasting of management risks. Hybrid intelligent information technologies [11], which combine artificial intelligence, machine learning, Big Data, expert systems, digital platforms and human expert knowledge, are of particular relevance in this context. Their value is determined by the ability to combine the computational speed and analytical power of algorithms with the contextual, interpretative and value potential of a person. For the humanitarian sphere, it is the hybrid approach that allows you to avoid both excessive algorithmization and insufficient technological justification of management decisions.

In the conditions of the SHIVA environment, digital management must acquire an adaptive character. The management system should not only record the current state of a university or scientific organization, but also identify the causes of changes, detect weak signals, predict possible scenarios and form options for management actions. This requires constant updating of data and analytical models, the use of predictive and scenario analytics, early identification of risks and prompt adjustment of management decisions. Thus, there is a transition from static digitalization to dynamic intellectualization of management.

In even more complex WARMI conditions, uncertainty, turbulence and systemic risks become interconnected, which is potentially amplified. Therefore, intellectual management of higher humanities education and science should focus not only on predicting individual changes, but also on ensuring systemic stability. Its important characteristics are adaptability, resilience, scenario-based, anti-fragility and hybridity. The human-in-the-loop principle, which involves keeping a person in the decision-making loop, is of particular importance: the intelligent system analyzes data, models options and offers recommendations, while the final management assessment remains with the specialist. In this context, digital intelligent technologies become an important tool for proactive and anti-crisis management. Their application allows you to form a continuous cycle of monitoring → intellectual analysis → detection of deviations and weak signals → forecasting → scenario modeling → formation of recommendations → management decision → result assessment → system training. Such a mechanism allows for timely identification of potential problems in educational, scientific, personnel and organizational activities and to take measures to prevent local deviations from becoming a systemic crisis.

At the same time, the intellectualization of management is accompanied by a number of risks: algorithmic bias, errors in generative models, dependence on data quality, opacity of individual algorithms, threats to confidentiality, problems of academic integrity and protection of intellectual property. For the humanitarian sphere, the risk of algorithmic reductionism is particularly significant, in which complex educational and scientific processes are evaluated mainly through formalized digital indicators. Therefore, a balance is needed between data-driven management and knowledge-driven management, in which quantitative analytics is supplemented by expert and meaningful interpretation.

In general, adaptive intelligent management of higher humanities education and science should be considered as a socio-technical system that combines digital infrastructure, data, artificial intelligence, machine learning, Big Data, natural language processing, generative and expert technologies, management analytics and human expertise. Its key element is a hybrid circuit of human interaction and intelligent technologies, which provides constant feedback between changes in the external environment, analytics, management decisions and the results of their implementation. Such a model creates the basis for more flexible, sustainable, proactive and anti-crisis management of higher humanities education and science in the conditions of the dynamics of the SHIVA and WARMI world.

Conclusions. The analysis conducted allows us to conclude that digital intelligent technologies are becoming the most important factor in the transformation of the management of modern higher humanities education and science. However, their effectiveness is determined not by the very fact of the introduction of artificial intelligence, machine learning or Big Data, but by the degree of compliance of these technologies with the specifics of humanitarian knowledge and the complexity of the external environment.

The specifics of the humanitarian sphere necessitates the need for contextual, semantic, human-centered and ethically oriented adaptation of intelligent technologies. Unlike technical and predominantly formalized systems, humanitarian education and science require the preservation of the leading role of interpretation, expert knowledge, academic autonomy, creativity and human management decisions.

In SHIVA conditions, the priority is given to the adaptability of digital management, which is based on constant monitoring of the environment, intelligent data analysis, scenario forecasting and early detection of risks. In more complex WARMI conditions, a transition to resilient and anti-tendency management is necessary, capable of both resisting uncertainty and systemic risks, and using such changes as a source of organizational learning and development.

A promising direction is the formation of a hybrid management model that combines artificial intelligence, Big Data, intelligent analytics, expert knowledge and human decision-making. Such a model allows us to move from reactive management to proactive, adaptive and anti-crisis management.

Thus, the digital intellectualization of higher humanities education and science should be considered not as a simple technological modernization, but as a systemic transformation of management mechanisms, based on the adaptive interaction of humans, data, intelligent technologies and the changing external environment. It is this approach that creates the prerequisites for increasing the sustainability, flexibility, scientific effectiveness and strategic competitiveness of the humanities university in the dynamics of the SHIVA and WARMI world.

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