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Adapting Smart and Knowledge-Based Technologies in the Management of Modern Philological Education and Research: Navigating Environmental Dynamic Uncertainty and External Systemic Risks

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Abstract. *The article explores the specifics, features and directions of adaptation of intellectual knowledge-based technologies in the management of modern philological education and science. The possibilities of their application for knowledge management, personalization of education, support of scientific research and increasing the stability of organizations in conditions of uncertainty, turbulence and systemic risks are determined. The need to combine intellectual technologies with human expert potential is substantiated.*

Keywords: *modern digital pedagogy; knowledge-based technologies; intelligent technologies; knowledge management; philological education; philological science; intelligent management; artificial intelligence; digital transformation; adaptability; uncertainty; turbulence; systemic risks.*

Introduction.

Modern education and science in general operate in complex and complex conditions of uncertainty dynamics [1], turbulence and systemic risks of the external environment [2], which significantly increases the requirements for quality, adaptability and intellectualization of management [3]. In such conditions, traditional information and management tools do not always provide the necessary speed of processing of constantly growing volumes of knowledge, operational decision-making and stability of educational and scientific organizations [4]. Therefore, intellectual knowledge-based technologies focused on systematic accumulation, structuring, integration, analysis, updating and practical use of knowledge [5] are gaining particular relevance. Their specificity, features and adaptation to a dynamically changing environment are becoming an important direction of intellectual transformation of

modern management of education and science [6], creating the prerequisites for increasing its flexibility, stability, innovation and ability to effectively respond to new challenges and systemic changes.

Modern philological education and modern philological science are also developing in conditions of significant complication of the external environment [7], which is characterized by high dynamics of uncertainty, turbulence, information load and systemic risks. The digitalization of the humanitarian sphere, the rapid increase in the volume of text and multimodal data, the spread of artificial intelligence, the transformation of communication practices and the acceleration of the renewal of scientific knowledge require a review of traditional approaches to the organization of educational and research processes [8]. In these conditions, intellectual knowledge-based technologies, focused not only on information processing, but also on the accumulation, structuring, representation, interpretation and practical use of knowledge [9], acquire special importance. The specificity of the application of knowledge-based technologies in philology is determined by the very nature of philological knowledge. Unlike predominantly formalized subject areas [10], it includes a significant amount of contextual, semantic, interpretative, cultural and value-based information. Linguistic and literary phenomena are characterized by ambiguity, variability, and dependence on the historical and socio-cultural context. Therefore, the direct transfer of universal intellectual technologies to philological education and science does not provide the necessary efficiency: their substantive, methodological, and organizational adaptation is necessary.

This problem becomes particularly relevant in the context of the transition from a relatively stable VUCA environment model to more complex ideas about dynamic uncertainty, including the conceptualization of BANI, SHIVA, and WARMI. In such conditions, the management of philological education and scientific research must ensure not only the effectiveness of current processes, but also stability, adaptability, the ability to quickly retrain, preserve intellectual continuity, and make decisions with incomplete information.

So, taking into account all of the above, the purpose of the article is precisely to systematically determine the specifics, features and directions of adaptation of intellectual knowledge-based technologies in the management of modern philological education and science in conditions of high uncertainty, turbulence and systemic risks of the external environment. To achieve the set goal, it is necessary to reveal the essence of the knowledge-based approach in the philological sphere, determine its technological specifics, establish key areas of adaptation and form the conceptual foundations of intellectual knowledge management.

Results.

Intelligent knowledge-based technologies are focused not only on data and information processing, but primarily on the accumulation, structuring, representation, integration and practical use of knowledge. In philological education and science, they create the basis for intellectual knowledge bases, electronic thesauri, ontologies, text corpora, knowledge graphs, expert and recommendation systems.

The specificity of knowledge-based technologies in philology is determined by the semantic complexity, contextuality, variability and cultural and historical conditioning of

linguistic and literary objects. A significant part of philological knowledge has an informal expert nature, therefore automated technologies require constant substantive verification by a specialist. The “human + intelligent technology” model becomes especially important, in which technologies expand analytical capabilities, but do not replace professional interpretation.

In philological education, knowledge-based technologies allow personalizing educational trajectories, intellectually supporting learning, managing educational and methodological resources, and identifying competence deficits. In scientific activity, they provide intelligent search and clustering of publications, identifying research connections, analyzing scientific discourses, and supporting the formation of new hypotheses. In applied philology, intelligent text analysis, semantic search, automatic annotation, terminology extraction, and discursive analysis are promising.

In a dynamic external environment, the adaptation of knowledge-based technologies should be carried out at the technological, organizational, and methodological levels. Flexible architectures, constant updating of knowledge bases, monitoring of changes, feedback, and the ability to promptly adjust management decisions are necessary. In the educational process, this involves a transition to adaptive learning models, and in scientific activity, flexible intellectual research practices.

Knowledge-based management can act as a mechanism of intellectual sustainability of educational and scientific organizations. The formation of corporate knowledge bases that combine scientific results, educational resources, methodological developments and expert experience helps to preserve institutional memory, reduce dependence on individual knowledge carriers and accelerate adaptation to external changes.

The main limitations include incompleteness and heterogeneity of data, automatic interpretation errors, algorithmic distortions, insufficient clarity of solutions, problems of authorship and intellectual property, as well as the risk of reducing critical thinking. In philology, these risks are especially significant due to the complexity of the cultural, historical and aesthetic context. Therefore, the human-in-the-loop principle is necessary, which involves keeping the specialist in the decision-making loop.

A promising approach is the combination of knowledge-based technologies with Big Data, machine learning, large language models, knowledge graphs and intelligent text analysis. A hybrid model “data → algorithm → knowledge → expert → decision → feedback” is being formed, in which automated processing is combined with professional interpretation.

This approach allows us to move from simple digitalization of the philological sphere to adaptive intellectual knowledge-based transformation, focused on continuous accumulation and updating of knowledge, personalization of education, support of scientific research and increasing the sustainability of the philological educational and scientific system.

Conclusions.

The analysis conducted allows us to identify intellectual knowledge-based technologies as a promising tool for transforming the management of modern philological education and science. Their fundamental difference from traditional information technologies is their orientation not only on data processing, but also on the formation, structuring, integration, interpretation and reproduction of knowledge.

The specificity of the application of knowledge-based technologies in philology is due to contextuality, semantic complexity, variability, cultural conditioning and a significant share of informal expert knowledge. Therefore, their effective implementation requires adaptation to the subject specifics of philology and a combination of algorithmic capabilities with professional human interpretation.

In the conditions of the dynamics of uncertainty, turbulence and systemic risks, knowledge-based management becomes a mechanism not only for digital modernization, but also for the intellectual stability of educational and scientific organizations. It ensures the preservation of institutional memory, increased adaptability, acceleration of the search and use of knowledge, personalization of education and increased efficiency of scientific activity.

The most promising is the hybrid model [11], which combines Big Data, artificial intelligence, machine learning, large language models, knowledge graphs, semantic technologies and expert knowledge. At the same time, it is fundamentally important to preserve the human in the decision-making process, since automatic processing cannot completely replace philological interpretation and critical thinking. Thus, the further development of philological education and science should be associated with the transition from simple digitalization of information processes to adaptive intellectual knowledge-based transformation, in which knowledge becomes the central resource of management, and intellectual technologies - a tool for increasing the stability, flexibility, quality and innovativeness of branches.

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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.*