FORMATION OF COGNITIVE–SEMANTIC CONTOURS IN IT SPECIALISTS TRAINING UNDER DIGITAL TRANSFORMATION

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The training of IT specialists under conditions of digital transformation reveals a persistent gap between the technological level of project solutions and the understanding of the value created for users and organizations. Students are capable of developing technically complex digital systems; however, they experience difficulties in identifying target users, formulating the problems being addressed, and defining success criteria for proposed solutions. This situation can be interpreted not only as a pedagogical issue, but also as a cognitive–managerial problem associated with insufficient formation of a semantic level of control in complex socio-technical systems.

In the context of digital transformation, characterized by the growing role of data, platform-based solutions, and intelligent technologies, the formation of cognitive–semantic contours becomes particularly important. Their absence leads to the substitution of meaningful system design with formal optimization of isolated indicators and reduces the ability of future specialists to account for strategic and user-oriented contexts in decision-making.

The aim of this study is to develop a model for forming cognitive–semantic contours in IT specialists training through the integration of digital transformation strategies into the educational process.

The methodological basis of the study is an interdisciplinary approach that combines systems analysis, digital transformation theory, and architectural management. The Value–Capability–Technology architectural logic is used as a conceptual framework, aligned with the TOGAF framework and the ArchiMate modeling language. A cognitive–semantic contour is defined as a set of cognitive models and managerial practices that ensure alignment between system goals, user representation, architectural decisions, and result evaluation criteria.

The paper proposes a three-level model for the formation of cognitive–semantic contours, comprising the levels of digital economy and strategy, digital business models, and digital product management. For practical implementation, three levels of adoption are defined—minimal, intermediate, and comprehensive—allowing the approach to be adapted to the capabilities of specific educational programs.

Empirical results demonstrate qualitative changes in educational practice, including a shift from technology-driven design toward user and problem analysis, the emergence of a semantic layer in project documentation, and improved interdisciplinary communication. The key observed effect is a transition from solving isolated technical tasks to meaningful design of digital systems oriented toward value creation.

The proposed model exhibits cross-profile applicability and can be employed across various IT training programs. Education is thus considered as an environment for the formation and validation of cognitive–semantic mechanisms for managing complex socio-technical systems in the context of digital transformation.