INTELLIGENT TECHNOLOGIES IN QUALITY MANAGEMENT OF URBAN INFORMATION SYSTEMS WITHIN DIGITAL DEVELOPMENT PROGRAMS

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Modern processes of urban digital transformation lead to an increasing role of urban information systems in the implementation of strategic development programs, which has become particularly relevant in the context of the full-scale war in Ukraine. Military actions have resulted in infrastructure destruction, disruption of information flows, increased cyber threats, and higher requirements for the resilience, reliability, and continuity of urban information systems. Under these conditions, the problem of managing the quality of urban information systems within digital development programs and portfolios becomes critically important for ensuring urban viability and supporting managerial decision-making.

Within digital development programs, urban information systems act not only as technical tools but also as strategic assets, the quality of which determines the achievement of planned socio-economic outcomes. As noted in contemporary research, the development of a «smart city» is considered one of the global trends in urban development, where the city is formed as a complex socio-economic and cultural ecosystem integrating infrastructure, technologies, and human capital [1]. Insufficient data quality, fragmentation of information resources, lack of unified standards, and weak system integration lead to reduced effectiveness of managerial decisions and complicate the implementation of digitalization programs.

Studies emphasize that data quality is critical for building reliable and effective artificial intelligence systems, as the use of incomplete or outdated data may result in erroneous managerial decisions and reduced effectiveness of digital development programs [3]. Research also highlights that even highly digitalized cities often have fragmented smart services due to the absence of systemic strategies and integrated management platforms [1]. Traditional approaches to information system quality management, primarily based on regulatory and static control methods, do not meet the dynamic nature of the urban environment.

In this context, the application of intelligent technologies in managing the quality of urban information systems represents a promising direction.

Artificial intelligence enables automated analysis of large datasets, detection of anomalies, failure prediction, and real-time assessment of information process quality. In particular, the use of machine learning and deep learning algorithms supports pattern recognition in data and facilitates scenario forecasting for urban system development [2].

The Internet of Things ensures continuous monitoring of urban facilities and systems, forming an up-to-date information base for managerial decisions. The combination of IoT with artificial intelligence technologies (AIoT) allows real-time data processing and enhances the efficiency and functionality of urban information systems [2].

Big Data technologies enable the integration of heterogeneous information sources and support comprehensive assessment of urban information system performance.

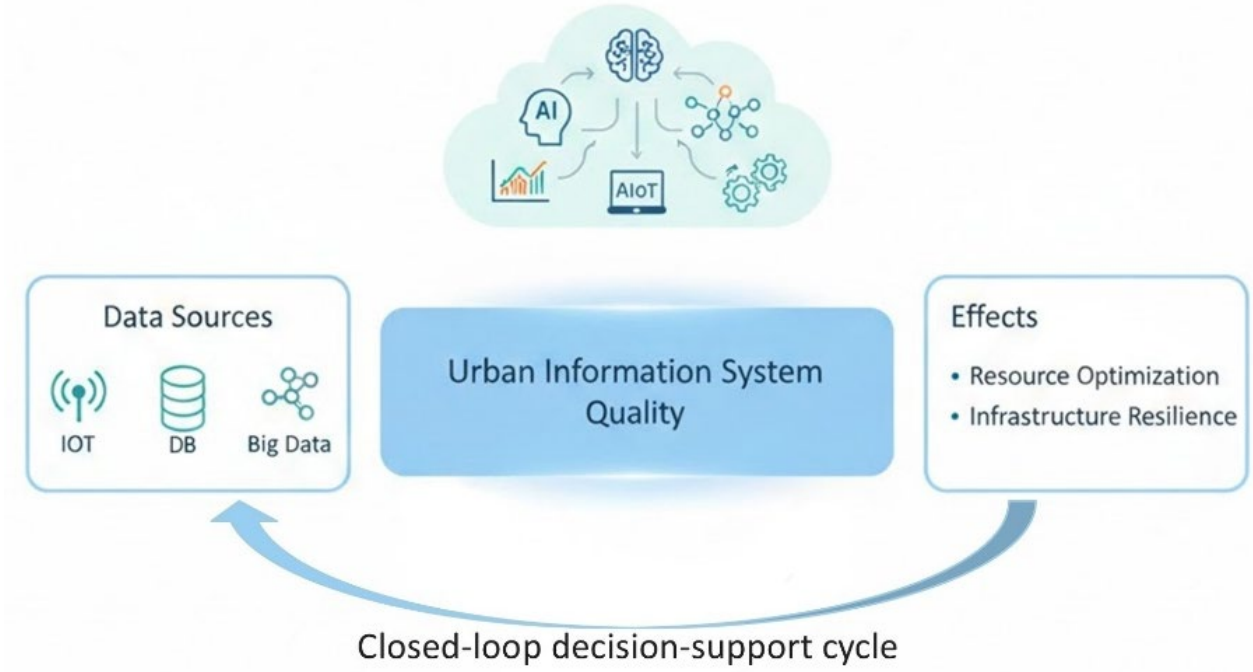

Fig. 1. Conceptual scheme «Intelligent ecosystem for Quality Management»

The conceptual scheme presented in Figure 1 illustrates the integration of data sources, intelligent technologies, and feedback mechanisms that together form an intelligent ecosystem for managing the quality of urban information systems within digital development programs.

The use of intelligent technologies creates prerequisites for the transition to adaptive quality management of urban information systems within digital development programs. The integration of solutions such as Urban Brain and Urban Digital Twin ensures the combination of real-time analytics with strategic forecasting and forms a closed-loop decision-support cycle within digital development programs and portfolios [2]. Such approaches allow alignment of strategic urban development goals with digital project portfolios, ensure transparency in program implementation, and increase the justification of managerial decisions. Intelligent decision-support systems contribute to resource optimization, risk reduction, and improved effectiveness of digital transformation programs.

Thus, the integration of intelligent technologies into the quality management of urban information systems is an important factor in enhancing the effectiveness of digital development programs and strategic urban governance. Further research should focus on the development of intelligent quality management models for urban information infrastructure, taking into account the specifics of urbanized territories and the requirements of sustainable development.

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