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Development of a method for calculating the health-status of an IT project portfolio for resource management

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Abstract. *This work aims to develop an integrated method for calculating the Health status of an IT project portfolio to increase the efficiency of resource management and the validity of managerial decision-making in outsourcing companies. The research methodology is based on system analysis for the systematization of key performance metrics, mathematical modeling for the development of calculation formulas, and empirical methods for verification. The proposed method provides a comprehensive, multidimensional analysis by synthesizing operational, technical, and financial metrics into a single integral index. A key advantage of the method is its transparency and deterministic calculations, in contrast to "black box" models, which increase management's confidence in the results.*

Keywords: *portfolio Health-status, IT resource management, automated monitoring, project risk management, Agile metrics integration.*

Introduction.

In today's conditions of high market uncertainty and systemic crises, the effective management of IT projects has become particularly important for ensuring the competitiveness of companies. The growing complexity of modern IT projects and the dynamism of the environment require the continuous improvement of management methods. This makes scientific research in the field of resource optimization and project status assessment critically important. A review of recent studies indicates a gap in the availability of holistic, transparent, and automated methods for assessing the Health-status of an IT project portfolio that would effectively integrate operational, technical, and financial indicators. This study is dedicated to addressing this unresolved issue.

Methodology.

The proposed method is based on the automated collection of data from key project management systems: Jira, Tempo, GitLab, SonarQube, and ERP. The core of the method is the calculation of an integral Health-status index for an individual project (H_i) and for the entire portfolio (P_i), based on a systematized set of metrics covering four key domains: Delivery Performance, Code Quality & Stability, Flow & Predictability, and Cost Management.

The project's Health-status (H_i) is calculated as a weighted sum of normalized metric statuses, which provides a quantitative assessment of its current state:

$$Hi = \frac{\sum_{j=1}^{m} Wj \cdot Sj}{\sum_{j=1}^{m} Wj}, \quad (1)$$

where H_i – Health status of project i;

W_j – weight of metric j (selected by the PMO and representatives of the Project Delivery team and documented for each parameter);

S_j – status of metric j, which takes the values: 3 (Green), 2 (Amber), 1 (Red);

m – number of metrics used for project evaluation.

The portfolio's Health-status (P_i) is calculated by aggregating the indices of individual projects, considering their strategic priority within the portfolio:

$$Pi = \frac{\sum_{i=1}^{n} Wi \cdot Hi}{\sum_{i=1}^{n} Wi}, \quad (2)$$

Where H_i – Health status of an individual project i;

W_i – weight of project i in the portfolio, determined by a collegial decision of the group of individuals involved in strategic management and decision-making in project management. This process involves assessing the relative importance of each project within the portfolio based on key factors such as budget, strategic priorities, potential benefits, and risk level. Thus, the weighting coefficients reflect a consensus-based evaluation and prioritization of projects, ensuring their optimal balance within the portfolio;

n – number of projects in the portfolio.

Results and Discussion.

The developed method provides a comprehensive, multidimensional analysis of project status by synthesizing various metrics into a single integral index. A key element of its scientific novelty is its transparency and deterministic calculations, which distinguish it from "black box" machine learning models, where the logic behind conclusions can be opaque. The influence of each metric is clearly traceable through calculation formulas, and the final assessment is formed using interpretable formulas (1) and (2). This transparency is critically important for gaining the trust of management and ensuring the practical applicability of the results.

The methodology integrates risk assessment into the overall management system, providing a holistic view of the portfolio's condition instead of an isolated analysis of individual aspects. The practical significance of the results lies in providing IT companies with a tool to transition from intuitive to data-driven portfolio management. Automation of data collection minimizes the human factor, providing an objective basis for decisions on resource reallocation and minimization of potential losses.

Conclusion.

As a result of this study, a comprehensive set of metrics for project evaluation was systematized, an approach to automated data collection was proposed, and an

integrated method for calculating the Health-status of a project and portfolio was developed. It has been established that the developed index serves as a quantitative indicator for identifying high-risk projects, providing a basis for making managerial decisions. Future research will focus on integrating artificial intelligence elements to combine the advantages of the transparent deterministic approach with predictive capabilities for forecasting risks based on historical data analysis.

References

1. Lanskykh, Ye. V., & Pomohaibo, D. A. (2024). Rol suchasnykh tekhnolohii v optymizatsii finansovykh i liudskykh resursiv autsorsynhovykh IT-kompanii [The role of modern technologies in optimizing the financial and human resources of IT outsourcing companies]. Management of Development of Complex Systems, 60, 87–94.

2. Lanskykh, Ye., & Pomohaybo, D. (2025). Development of a method for calculating the health status of an IT project portfolio for resource management. Management of Complex Systems Development, 62, 15–25.

3. Brown, T., & Davis, R. (2023). Project health monitoring in agile environments. In Agile project management for developers (pp. 245–260). Apress.

4. Cheverda, S. S. (2023). Metody optymizatsii portfelia proiektiv autsorsynhovoi IT-kompanii [Methods for optimizing the portfolio of outsourcing IT company projects]. Economic Synergy, 4, 187–206.

5. Kumar, A., & Singh, V. (2024). Resource optimization in cloud computing: A machine learning approach. Cluster Computing, 27(3), 4145–4160.

6. Smith, J., & Johnson, L. (2023). Automated risk management in IT projects: A framework for decision support. Computers & Security, 131, 103284.