MANAGEMENT OF PORTFOLIOS, PROGRAMS AND PROJECTS INTEGRATION IN ACCORDANCE WITH THE STRATEGY OF THE SYSTEM DEVELOPMENT

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Introduction. The modern IT industry is characterized by a shift from single-project management to concurrent multi-project environments. In practice, software companies frequently manage multiple projects with shared, limited resources, leading to competition for qualified personnel. The Software Multi-Project Scheduling (SMPS) problem involves assigning employees to tasks across various projects to optimize objectives such as duration, cost, and resource utilization [1].

Effective resource management is widely recognized as a critical factor for project success, particularly in the processes of estimating and acquiring resources [2]. A key challenge in this domain is ensuring that the assignment of team members aligns with both the project schedule and the organizational constraints. Ineffective distribution leads to resource bottlenecks, where some teams are overloaded while others remain idle, ultimately causing project delays and budget overruns.

Relevance and Problem Statement. The problem of distributing IT projects among development teams is complicated by the need to balance competing resource demands. Traditional manual allocation based on subjective managerial experience is often time-consuming and prone to errors. Recent studies indicate that integrating AI-based optimization methods with Project Management Information Systems (PMIS) can significantly reduce planning time and operational costs [3]. However, existing Decision Support Systems (DSS) rarely provide comprehensive integration of flexible organizational structures with advanced optimization techniques, such as Genetic Algorithms or Machine Learning ensembles, for effective team formation [4]. Furthermore, decision-making in this area is often complicated by uncertainty regarding project start times and the availability of specific competencies [5]. Therefore, the development of models and methods that support decision-making in such complex multi-project environments represents a relevant and timely scientific challenge.

The aim of the research is to enhance the efficiency of IT project management by developing a DSS for the distribution of projects among development teams, considering modern organizational approaches and industry standards. To achieve this aim, an analysis of multi-project environment features and risk assessment processes was conducted, which allowed for the identification of potential bottlenecks and resource constraints.

Based on these findings, the team formation process has been formalized through the development of a mathematical model for assigning executors to development teams. The model defines team formation criteria, including platform compatibility, application domain, and technology stacks, as well as operational constraints such as project deadlines, budget limitations, and team workload balance.

The objective functions are focused on optimizing team composition, skill complementarity, and overall resource utilization in IT projects [6].

In addition, standard project management principles have been systematically integrated into the team formation decision-making model. These principles cover resource availability, levels of competence, role suitability, and experience matching, ensuring that all assignments comply with established industry best practices and organizational standards, and provide a practical framework for effective team management [2].

Given the NP-hard nature of the team formation and scheduling problem in multi-project environments, meta-heuristic and data-driven optimization approaches have been investigated. In particular, the applicability of Genetic Algorithms, Random Forest models, and their hybrid combinations has been analyzed to obtain near-optimal team formation solutions under conditions of uncertainty and dynamically changing project parameters [3, 4].

Conclusion. The proposed research addresses the critical issue of development team formation and allocation in multi-project software development environments. By integrating structured team formation approaches, standard project management methodologies, and modern optimization algorithms, the developed information support methods will enable IT companies to improve the effectiveness of team composition, ensure balanced utilization of development teams, and reduce project planning time. The further research focuses on analyzing the risks associated with development team formation and assignment, taking into account the qualification and competencies of individual developers. This includes identifying potential bottlenecks, skill mismatches, and uncertainties related to project start times, workloads, and employee availability, as well as organizational, technical, and human-related risks..

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