

ABSTRACT

Explanatory note size – 166 pages, contains 9 illustrations, 30 tables, 3 applications, 16 references.

Topicality. The work examines the problem of transforming monolithic software into modular software through reengineering, shows the main features of existing solutions to the problem (static and dynamic code analysis, domain-oriented approach, use of artificial intelligence), their advantages and disadvantages. The need for developing a universal method for transforming monoliths has been identified, since such a transition is a complex and risky process that requires significant efforts and well-thought-out strategies, and existing approaches have limitations and do not provide complete automation of the process.

The aim of the study. The main target is to systematize the process by creating a universal method for transforming monolithic software into modular software through reengineering.

The object of research: the process of transforming monolithic software into modular software.

The subject of research: methods, tools and approaches for transforming monolithic software into modular software.

To achieve this goal, the **following tasks** were formulated:

- analysis of existing methods for reengineering monolithic systems;
- development of an approach that combines static analysis with a domain-oriented approach;
- implementation of an automated transformation process using AI/ML technologies;
- evaluation of the effectiveness of the proposed solution.

The scientific novelty of the results of the master's dissertation is that a method of automated reengineering of monolithic software based on an agent approach has been

proposed, which, unlike existing solutions, combines the advantages of static analysis, domain-oriented approach and automation through the use of artificial intelligence agents. The result was achieved by developing a three-phase transformation process using specialized AI agents and a self-correction mechanism.

The practical value of the obtained results is that the developed method is implemented within a single software solution and is maximally simple to use, minimizing the need for expert knowledge. The developed solution accelerates the process of transforming monolithic software into modular software. This solution can be used in software engineering, software architecture and automation of the software development process for modernizing existing monolithic systems.

Relationship with working with scientific programs, plans, topics. Work was performed at the Department of Informatics and Software Engineering of the National Technical University of Ukraine «Kyiv Polytechnic Institute. Igor Sikorsky».

Approbation. The scientific provisions of the dissertation were tested at the IX International Scientific and Practical Conference of Young Scientists and Students «Software Engineering and Advanced Information Technologies (SoftTech-2025)».

Publications. The scientific provisions of the dissertation were published in:

- 1) Sodolskyi A.M., Lishchuk K.I. Method of Transforming Monolithic Software into Modular Software by Reengineering. Materials of the IX International Scientific and Practical Conference of Young Scientists and Students «Software Engineering and Advanced Information Technologies (SoftTech-2025)». Department of Informatics and Software Engineering Section. November 26-28, 2025. Kyiv.

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