ABSTRACT

Explanatory note size – 132 pages, contains 17 illustrations, 28 tables, 3 applications, 22 references.

Topicality. This paper considers the problem of reusing and supporting open source in a software project. The literature analysis has shown that this area of software engineering requires additional attention, as there are still projects that use outdated dependencies, dependencies with vulnerabilities, or incompatible versions of dependencies.

The aim of the study. The main goal is to create a software tool for analyzing, detecting, and automatically resolving conflicts between dependencies in a software project. The developed solution should reduce the time for updating versions of third-party libraries and make this process less cognitively burdensome for engineers.

The object of research: management of direct and transitive dependencies in software development.

The subject of research: a method of automated conflict resolution between modules in software by applying big data methods.

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

– analysis of the problem of dependency management in software development, its impact on the efficiency of engineers;

– research of existing competitors, their functionality and efficiency;

– formulation of current problems related to software dependency management;

– development of an architecture that will have full functionality and initial data;

– development of a graphical user interface and program interface;

– conducting an experimental study that will establish the effectiveness of the developed product;

– creating a startup project to analyze the practical value of the software product.

The scientific novelty of the results of the master's thesis is that a new method for finding solutions in a system of graphs is proposed, which will focus on the limited number of solutions and the simplicity of selecting a solution for the user. The advantage of this method is to reduce the number of possible solutions in a graph by introducing user constraints. This way, you can simplify the complexity of resolving conflicts in the project and speed up decision-making.

The practical value of the results obtained is that the developed software product can be used by software engineers to support existing projects that are based on third-party libraries. Also, the developed functionality can be integrated with third-party software development services.

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 VII All-Ukrainian Scientific and Practical Conference of Young Scientists and Students "Software Engineering and Advanced Information Technologies (SoftTech-2024)" - Kyiv.

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

1. Molnar M.M., Methods and software tools for managing dependencies using big data algorithms / M.M. Molnar, K.I. Lishchuk // Proceedings of the VII Scientific and Practical Conference of Young Scientists and Students "Software Engineering and Advanced Information Technologies (SoftTech-2024)". Kyiv: NTUU "KPI", 2024.

Keywords: DEPENDENCY MANAGEMENT, VERSION CONFLICTS, JAVA, ANGULAR.