ABSTRACT

Explanatory note size – 154 pages, contains 23 illustrations, 33 tables, 1 application, 35 references.

Topicality. Examines the problem of scaling monolithic architecture, highlights the key features of microservices architecture as a solution to scalability issues, and explores their advantages and disadvantages. The need for developing an architecture that is balanced in terms of scalability and development complexity is identified, along with the importance of refining architectural assessment methods to find optimal solutions.

The aim of the study. The main target is to enhance the scalability of monolithic systems by integrating certain characteristics of microservices architecture while maintaining low complexity.

The object of research: software architecture

The subject of research: Methods of modifying monolithic architectural solutions to improve scalability while ensuring low complexity.

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

- Analyze and highlight the drawbacks in both monolithic and microservices architectures.
- Develop a method for assessing the optimality of solutions in tasks involving the balance between scalability and complexity.
- Design a hybrid architecture using a pilot project as an example.
- Evaluate the optimality of the developed architecture.
- Test the scalability of the developed architecture.

The scientific novelty of the results of the master's dissertation is the hybridization of monolithic and microservices architectures to achieve optimality between scalability and development complexity. A multi-criteria assessment

method has been suggested to find the optimal architectural solution based on scalability and development complexity characteristics. This method is developed by combining architectural characteristics evaluation and development complexity assessment methods. The result is achieved through the integration of properties from both monolithic and microservices architectures.

The practical value of the obtained results is a hybrid architecture type and a tool for decomposing a monolith into a hybrid architecture. A practical instrument is offered in the form of the proposed method, which architects can utilize in their work to identify the optimal architecture for a specific system in terms of scalability and development complexity.

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 Fifth International Scientific and Practical Conference of Young Scientists and Students "Information Systems and Management Technologies" (SoftTech- 2023).

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

1. Hodik T.M. An architectural solution for improving the scalability of monolithic systems / T.M.Hodik, O.P. Syrota // Proceedings of the Fifth International Scientific and Practical Conference of Young Scientists and Students "Information Systems and Management Technologies" (SoftTech-2023).

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