

Preliminary Results of a Systematic Mapping Study of AIOps Practices and Trends

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Abstract. *This work aims at identifying the main AIOps techniques reported in peer-reviewed literature in the last six years (1) and classify the techniques according to what software quality attribute to they contribute to. It presents the preliminary results of a systematic mapping study considering peer-reviewed literature. 72 peer-reviewed studies were analyzed in order to extract strategies and practices. Anomaly detection and fault prediction were the strategies most often applied on AIOps. Classical machine learning techniques, as well as deep learning techniques were the most frequently found groups of techniques in literature. Availability and maintainability are the most frequently software quality attributes improved by applying AIOps techniques.*

1. Introduction

Organizations have reacted to an emerging culture of acceleration, and in particular in the collection of feedback. This enables IT organizations to produce large volumes of real-time operational data.

At the same time the adoption of AI in the software industry also grew larger [Durrani et al. 2024]. The availability of large operational records as well as the know-how of machine learning (ML) models and artificial intelligence (AI) in general settles the ground for an emerging trend: using AI to enhance software development and operation, which would be named AIOps.

AIOps is a set of organizational practices and AI tools that use vast amounts of data created by disparate systems to assist IT organizations operations that lead to more effective and faster decisions to resolve operational incidents even before clients report them [Zhang et al. 2024] [Potts and Carver 2024].

The research questions that guide this study are:

- RQ1. What software engineering problems do AIOps practices solve?
- RQ2. What AI strategies and tools are used for solving software engineering problems?
- RQ3. Which software quality attributes are impacted when applying AIOps?

2. Results

This section presents the findings after analyzing 72 peer-reviewed primary studies published between 2020 and 2025.

The most commonly addressed problems in the AIOps practice are anomaly detection, defect prediction, ops data management and root cause analysis. The number of occurrences of each problem in the primary studies is presented in table 1.

Table 1. Software engineering problems results

Software engineering problem	Occurrences
Anomaly detection	28
Defect prediction	11
Ops data management	8
Root cause analysis	8
Resource allocation	5
Metric prediction	5
ML lifecycle support	2
Support development	2
Correlation analysis	2
Change point detection	1

Table 2 presents the frequency in which software quality attributes were the main quality attributes impacted on the studies considered by the systematic mapping of literature when solving software engineering problems.

Table 2. Software quality attributes are impacted when applying AIOps

Software quality attributes are impacted when applying AIOps	
Software quality attribute	Occurrences
Availability	44
Maintainability	18
Security	5
Performance	5
Functionality	2

3. Artifact Availability

Following open science transparency and reproducibility principles, all research artifacts involved have been published and made available on Zenodo and can be accessed here.

References

- Durrani, U. K., Akpinar, M., Fatih Adak, M., Talha Kabakus, A., Maruf Ozturk, M., and Saleh, M. (2024). A decade of progress: A systematic literature review on the integration of ai in software engineering phases and activities (2013-2023). *IEEE Access*, 12.
- Potts, W. C. and Carver, C. (2024). Best practices implementing aiops in large organizations. In *2024 International Conference on Smart Applications, Communications and Networking (SmartNets)*.
- Zhang, C., Chen, W., and Xie, Y. (2024). Research on aiops-based intelligent monitoring technology for meteorological business. In *2024 IEEE 7th Advanced Information Technology, Electronic and Automation Control Conference (IAEAC)*.