Alireza Parvizi-mosaed, Shahrouz Moaven, Jafar Habibi, Ghazaleh Beigi, Mahdieh Nasershariat, 2015. Towards a self-adaptive service-oriented methodology based on extended SOMA. *Frontiers of Information Technology & Electronic Engineering*, **16**(1):43-69. [doi:10.1631/FITEE.1400040]

Towards a self-adaptive serviceoriented methodology based on extended SOMA

Key words: Service-oriented architecture, Self-adaptive process, Architectural pattern, Quality attribute, Adaptation pattern, Architectural tactic

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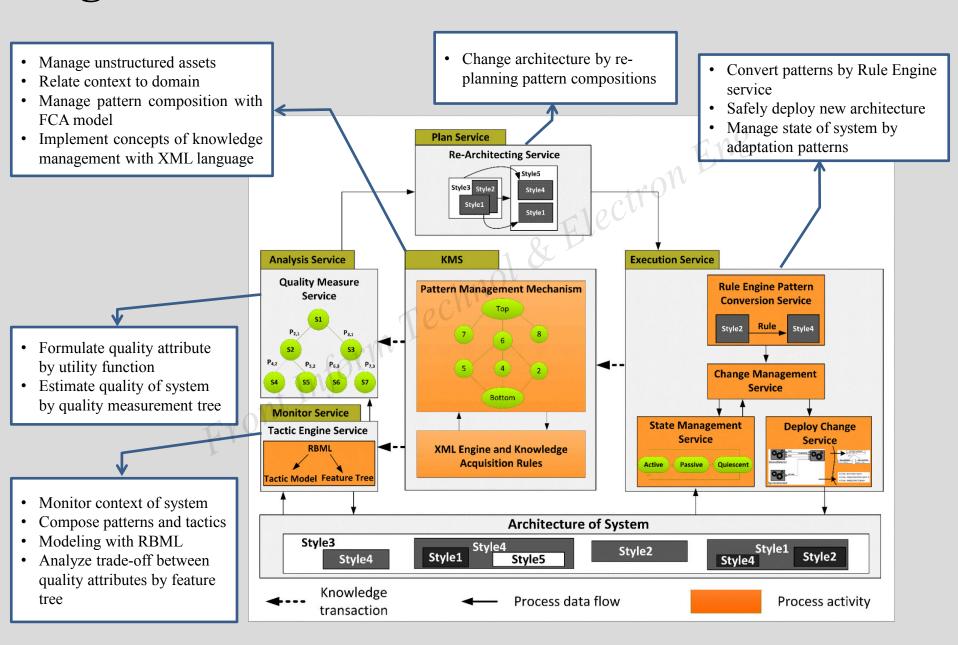
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Introduction

- Maintaining the quality of software architecture at runtime is a major challenge for architects.
- This paper proposes an independent self-adaptive process (SAP) to automate SOMA methodology.
- SAP takes advantage of the MAPE-K model to monitor and analyze the environment, re-plane the architecture, and execute it after detecting any disturbance in the quality of software.

High-level structure of SAP



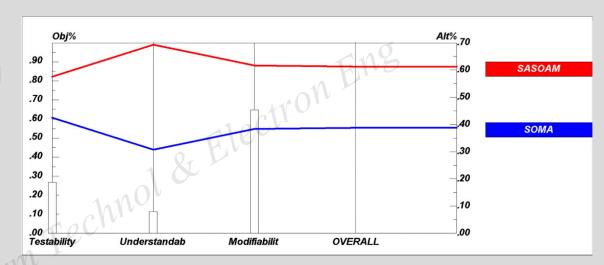
Evaluation

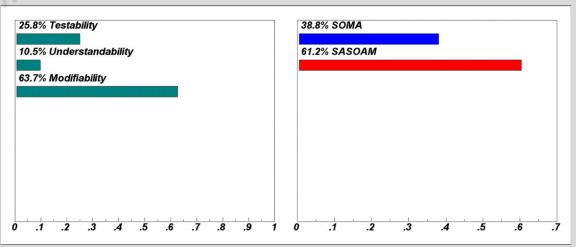
Scenario-based method

- Use the Boehm quality model
- Vote to scenarios by experts
- Maintainability of the proposed methodology is better than SOMA
- Maintainability depends on modifiability more than others

Case study

- The proposed method has been applied to a plug&play weapon system
- Represent practicability of the proposed method





Conclusions

- The proposed method improve self-adaptability of methodologies.
- It modifies quality of systems at runtime.
- It is independent of software development life cycle.
- It makes a meaningful bridge between domain and context of software.
- It improves maintainability of SOMA.
- It is applicable in real case studies.