

ABSTRACT

In today's digital landscape, the need for fast, scalable, and easy-to-manage website applications is increasing. Microservice Architecture (MSA) is a popular architectural model. To date, approximately 85% of developers have adopted MSA in software system development. MSA enables independent and modular system development, one of which is through the Laravel framework that supports the implementation of this architecture. However, MSA still has challenges that must be overcome, especially in optimal performance. This study aims to analyze the implementation of MSA design and test service performance on the backend of the Research and Community Service website. Testing was conducted on the DocBookAuthor and DocGarudaAuthor backend services, using the Load Testing method with the Postman and JMeter tools. The results showed that the MSA architecture performed slower than the monolithic architecture, with a difference of up to 200%. The implementation of API Caching in both architectures is one effort to significantly improve all three metrics. The combination of MSA and caching produces a more responsive and scalable system, with 50% better performance than the monolithic architecture that uses caching. Thus, implementing MSA on the PPM backend has great potential to improve performance, provided it is supported by the right caching strategy.

Keywords: *Microservice Architecture, Laravel, Backend Website, Load Testing, System Performance, Backend Research and Community Service Website.*