ANALYSIS AND PRACTICAL APPLICATION OF WEB FRAMEWORK AND CRUD OPERATION FOR WEB APPLICATION DEVELOPMENT

This research provides an overview of Web Application Framework (WAF) CRUD operation in providing code automation and features comparison (CakePHP, Laravel, CodeIgniter, Symfony) to support Web Application (WA) development using various criteria. A CRUD operation and performance test is executed to determine the CRUD features, performance and framework effectiveness. An Electronic Document Management System (EDMS) is developed as an artefact for the CRUD and performance testing purposes. The CRUD operation will be executed and the performance test is administered using Apache Bench (ab). Recommendations are given based on the comparative findings, which allows developers to select a framework for developing a web application project together with the suggestion of integrated features in CRUD operation.

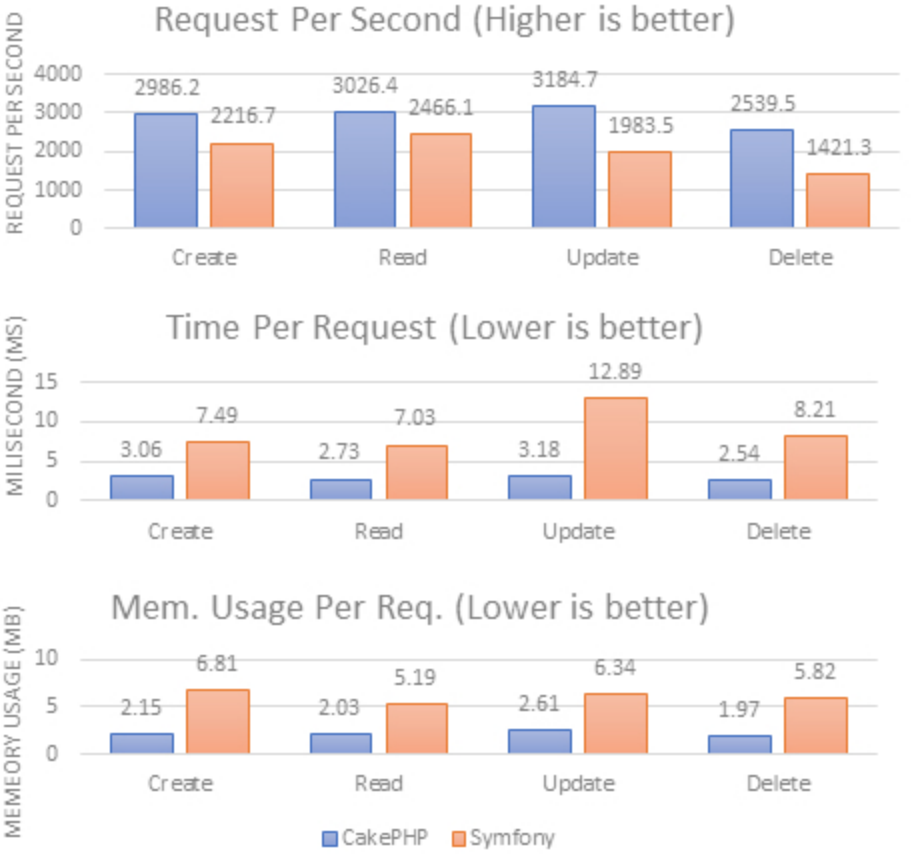
LITERATURE REVIEW

WAF is a software framework that is designed to facilitate WA development by automating the common activities performed during the development and provides better resource management. WAF is a bunch of source code organized into a certain architecture that can be used for the rapid development of WA. WAF also promotes a standard method for WA development by using Model View Controller (MVC) architecture and Rapid Application Development (RAD) method.

CRUD is the four basic functions that manage the WA resources. The CRUD paradigm is common among the WA developer as it enables the developer to generate basic WA routine code to all functions such as create, read, update, delete objects and define how objects are related to each other in WA. CRUD enables the developer to create a quick-start application to work as the foundation of the WA solution.

METHODOLOGY AND RESULTS

EDMS is developed and used as a testing artefact. The testing objective is to determine the performance and efficiency of the CakePHP and Symfony WAF. Figure 1 shows the Apache Benchmark test method applied in this study. Both WAF used the same data structure and the EDMS development is executed using CRUD operation to ensure both outputs have identical features and functions (based on the CRUD output). The test was executed using Apache Benchmark (AB). Each of the WAF is loaded with 1000 requests with 10 simultaneous connections. The test is executed for each of the CRUD modules/operations and several components will be measure, i) request per second, it measures how many requests can be handled by each of the CRUD components per second; ii) time per request, it measures the time each of the CRUD components takes to respond to a request and; iii) memory usage per request, it measures the memory consumption for each of the CRUD components take to respond.



CONCLUSION

At the first stage of testing, CakePHP shows that it can handle more light-weighted requests compared to Symfony. The ability to handle the request is important in the WA environment to ensure that the WA can respond and deal with several requests at the same time provide the right response to the users. In the second test, the time per request is measured. It shows that CakePHP has a better response in processing each of the requests in the CRUD operation. On average, CakePHP requires 2-3 ms to complete the request. Based on the performance test, it shows that CakePHP process and response with very minimal time frame. Based on the performance test result, it is clear that CakePHP outperforms Symfony in terms of performance. This research may help a developer to decide on which WAF to be used for WA development.

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