

ABSTRAK

Perpustakaan sekolah memiliki peran strategis sebagai pusat sumber belajar dan pendukung kegiatan literasi bagi siswa. Namun, pengelolaan perpustakaan di SMA Negeri 3 Bojonegoro masih dilakukan secara manual, khususnya dalam pencatatan data buku, anggota, serta transaksi peminjaman dan pengembalian, sehingga layanan perpustakaan belum berjalan secara optimal. Penelitian ini bertujuan untuk merancang dan membangun sistem informasi perpustakaan berbasis website guna membantu pengelolaan data perpustakaan secara lebih terstruktur dan mudah digunakan. Metode pengembangan perangkat lunak yang diterapkan adalah *Waterfall*, yang meliputi tahapan analisis kebutuhan, perancangan sistem, implementasi, pengujian, hingga pemeliharaan. Untuk memastikan sistem berjalan sesuai dengan kebutuhan pengguna, pengujian dilakukan menggunakan *Black Box Testing* guna memvalidasi fungsi sistem, serta Apache JMeter untuk mengukur kinerja sistem dari segi kecepatan respons dan kestabilan saat diakses secara bersamaan. Hasil pengujian *Black Box Testing* terhadap 13 skenario menunjukkan tingkat keberhasilan 100%, membuktikan seluruh fitur berjalan sesuai dengan yang diharapkan. Hasil pengujian Apache JMeter dengan beban 5, 10, dan 20 user menunjukkan sistem mampu menangani beban pengguna secara bersamaan dengan stabil, dengan *error rate* 0,000% pada seluruh skenario. Dengan demikian, sistem informasi perpustakaan yang dibangun telah berhasil meningkatkan efisiensi pengelolaan data, pencarian informasi buku, serta layanan perpustakaan di SMA Negeri 3 Bojonegoro.

Kata Kunci: Sistem Informasi, Perpustakaan, *Waterfall*, *Black Box Testing*, Apache JMeter.

ABSTRACT

School libraries play a strategic role as centers for learning resources and as supporters of literacy activities for students. However, library management at Bojonegoro State High School 3 is still carried out manually, particularly in the recording of book data, member information, and borrowing and return transactions, resulting in library services that have not yet been optimized. This study aims to design and develop a web-based library information system to facilitate more structured and user-friendly library data management. The software development method applied is the Waterfall model, which includes the stages of requirements analysis, system design, implementation, testing, and maintenance. To ensure the system operates according to user needs, testing was conducted using Black Box Testing to validate system functions, as well as Apache JMeter to measure system performance in terms of response speed and stability when accessed simultaneously. The results of Black Box Testing across 13 scenarios showed a 100% success rate, proving that all features functioned as expected. Apache JMeter test results with loads of 5, 10, and 20 users showed that the system was able to handle simultaneous user loads stably, with an error rate of 0.000% across all scenarios. As a result, the library information system that has been developed has successfully improved the efficiency of data management, book information searches, and library services at Bojonegoro State High School 3.

Keywords: Information System, Library, Waterfall, Black Box Testing, Apache JMeter.