INTISARI

Meskipun telah melalui digitalisasi, aplikasi layanan publik *e-Government* seperti M-Paspor sering dihadapkan pada ulasan negatif karena kurangnya fokus pada pengalaman pengguna yang mendalam. Penelitian ini bertujuan mengevaluasi dan merancang ulang antarmuka M-Paspor dengan mengintegrasikan pengukuran beban kognitif pengguna, sebuah faktor yang diabaikan dalam studi sebelumnya.

Metode yang digunakan adalah pendekatan campuran (*mixed-methods*). Tahap awal melibatkan analisis sentimen dan pemodelan topik (LDA) terhadap 5.756 ulasan untuk mengidentifikasi enam masalah desain utama. Berdasarkan temuan ini, antarmuka aplikasi dirancang ulang menggunakan kerangka kerja *Five Planes of UX*.

Evaluasi dilakukan pada 36 mahasiswa UGM terhadap prototipe desain baru, menggunakan kuesioner NASA-TLX untuk mengukur beban kognitif dan *Retrospective Think Aloud* (RTA) untuk wawasan kualitatif. Hasil kuantitatif menunjukkan tingkat penyelesaian Tugas (*Task Completion Rate*) sempurna (100%) di semua skenario. Analisis *Mixed ANOVA* membuktikan bahwa beban kognitif pengguna meningkat signifikan seiring kompleksitas tugas ($p < 0.001$), namun tidak terpengaruh oleh variabel pengalaman sebelumnya dengan aplikasi ($p = 0.595$).

Temuan ini menyiratkan bahwa desain baru memiliki tingkat *learnability* yang baik. Data NASA-TLX dan RTA mengidentifikasi Tuntutan Mental (*Mental Demand*) dan Usaha (*Effort*) sebagai sumber beban utama, yang dipicu oleh panjangnya alur tugas kompleks dan masalah *discoverability* pada elemen navigasi. Penelitian ini menyumbangkan model evaluasi yang kuat dengan mengintegrasikan analisis sentimen, UX, dan analisis beban kognitif untuk pengembangan aplikasi *e-Government* yang lebih intuitif dan berpusat pada pengguna.

Kata kunci : Beban Kognitif, E-Government, M-Paspor, NASA-TLX, Antarmuka Pengguna, Pengalaman Pengguna

ABSTRACT

Despite the ongoing digitalization of public services in Indonesia, many applications from e-Government still face challenges in delivering a seamless user experience. One such example is the M-Paspor application, which serves as a digital platform for online passport services under the Directorate General of Immigration. Previous evaluations of M-Paspor have focused primarily on functional aspects and traditional usability metrics, often overlooking cognitive load as a crucial factor in understanding the depth of user experience. This study aims to address these limitations by integrating cognitive load measurement into the evaluation process to enhance the quality of public service applications.

A mixed-methods approach was employed. Initially, sentiment analysis and topic modeling using Latent Dirichlet Allocation (LDA) were applied to user reviews to identify six key design issues. Subsequently, the user interface (UI) was redesigned based on the Five Planes of UX framework. The redesigned prototype was then evaluated through usability testing involving 36 UGM students, using the Maze platform, the NASA-TLX questionnaire to assess subjective cognitive workload, and the Retrospective Think Aloud (RTA) method.

The quantitative results demonstrate a Task Completion Rate of 100% across all tasks. Statistical analysis using Mixed ANOVA revealed a highly significant effect of Task Category on perceived workload ($p < 0.001$). Crucially, the analysis found no significant effect for Prior Experience with the old application ($p = 0.595$), suggesting that the new interface exhibits strong learnability. Qualitative data confirmed that the primary source of workload was Mental Demand and Effort, stemming from the length of high-complexity flows and issues with discoverability.

In conclusion, this research successfully integrates cognitive load assessment (NASA-TLX) into the evaluation of public service applications. The findings provide data-driven recommendations for enhancing the M-Paspor application and contribute a robust mixed-methods evaluation model that utilizes sentiment analysis, UX principles, and quantitative analysis to guide the development of more intuitive and user-centered e-Government services.

Keywords : Cognitive Load, E-Government, M-Paspor, NASA-TLX, User Interface, User Experience