ABSTRAK

Proses peminjaman sarana dan prasarana di Universitas Pembangunan Nasional "Veteran" Jakarta (UPNVJ) yang konvensional menghadapi kendala efisiensi, transparansi, dan keterlambatan layanan, terbukti dari rendahnya kepuasan pengguna. Penelitian ini bertujuan merancang layanan Telegram Bot interaktif menggunakan algoritma *rule-based* dengan integrasi *webhook* untuk meningkatkan efisiensi serta keteraturan proses peminjaman sarana dan prasarana di UPNVJ. Metode Research and Development (R&D) digunakan pada penelitian ini, meliputi analisis kebutuhan melalui wawancara dan kuesioner, desain sistem, pengembangan, implementasi dan uji coba, serta evaluasi. Hasil penelitian menunjukkan keberhasilan pengembangan Telegram Bot yang memfasilitasi alur peminjaman secara terstruktur. Algoritma *rule-based* efektif memvalidasi aturan yang telah ditetapkan terhadap input pengguna, sementara integrasi webhook menghasilkan komunikasi yang efisien dengan waktu respons rata-rata sekitar 479 ms untuk perintah dasar. Telegram Bot terbukti berhasil menyederhanakan proses peminjaman menjadi layanan digital yang lebih terstruktur dan efisien. Hal ini secara langsung meningkatkan efisiensi operasional dan mempermudah akses layanan bagi mahasiswa.

Kata Kunci : Algoritma *Rule-Based*, Integrasi *Webhook*, Peminjaman Sarana, *Telegram Bot.*

ABSTRACT

The conventional process for borrowing facilities and infrastructure at Universitas Pembangunan Nasional "Veteran" Jakarta (UPNVJ) faces challenges in efficiency, transparency, and service delays, as evidenced by low user satisfaction. This research aims to design an interactive Telegram Bot service using a rule-based algorithm with webhook integration to enhance the efficiency and streamline the facility and infrastructure borrowing process at UPNVJ. The Research and Development (R&D) method was employed in this study, encompassing needs analysis through interviews and questionnaires, system design, development, implementation and testing, and evaluation. The research findings indicate the successful development of the Telegram Bot, which facilitates a structured borrowing workflow. The rule-based algorithm effectively validated user input against predefined rules, while webhook integration enabled efficient communication, with an average response time of approximately 479 ms for basic commands. The Telegram Bot proved successful in streamlining the borrowing process into a more structured and efficient digital service. This directly enhances operational efficiency and facilitates easier service access for students.

Keywords: *Rule-Based Algorithm, Webhook Integration, Facility Borrowing, Telegram Bot.*