

ABSTRAK

Perkembangan aplikasi *mobile* berbasis lokasi menuntut sistem *backend* yang mampu mengelola data pengguna, lokasi, dan informasi rute secara efisien serta aman. Penelitian ini bertujuan untuk membangun Sistem Database Aplikasi *Satria Route Finder* dengan memanfaatkan *Firebase* sebagai *Backend-as-a-Service* (BaaS). *Firebase Authentication* digunakan untuk proses autentikasi akun berbasis email dan password, sedangkan *Cloud Firestore* dan *Realtime Database* dimanfaatkan untuk penyimpanan data statis serta sinkronisasi data dinamis secara *real-time*.

Metodologi pengembangan yang digunakan mengacu pada model *Software Development Life Cycle* (SDLC) dengan tahapan perencanaan, analisis kebutuhan, desain, implementasi, dan pengujian sistem. Sistem database dirancang dengan arsitektur berbasis UID (User ID) hasil autentikasi, yang digunakan sebagai *primary key* dalam struktur data *Firestore* dan *Realtime Database*.

Hasil pengujian menunjukkan bahwa sistem berhasil menjalankan seluruh fungsionalitas dengan tingkat keberhasilan 100%. Pengguna dapat melakukan registrasi dan login dengan aman, data pengguna tersimpan secara otomatis di *Firestore*, lokasi bus dapat diperbarui secara *real-time* di *Realtime Database*, dan akses data dibatasi dengan aturan *Firebase Security Rules* yang sesuai.

Penelitian ini menyimpulkan bahwa *Firebase* merupakan solusi *backend* yang efektif untuk mendukung pengembangan aplikasi *mobile* berbasis lokasi dengan kebutuhan sinkronisasi data *real-time* dan keamanan autentikasi pengguna.

Kata Kunci: *Firebase, Authentication, Firestore, Realtime Database, Satria Route Finder, UID, Black Box Testing.*

ABSTRACT

The development of location-based mobile applications requires a backend system capable of efficiently and securely managing user data, location, and route information. This study aims to build the Satria Route Finder Application Database System by utilizing Firebase as a Backend-as-a-Service (BaaS). Firebase Authentication is used for email and password-based account authentication, while Cloud Firestore and Realtime Database are utilized for storing static data and synchronizing dynamic data in real-time.

The development methodology follows the Software Development Life Cycle (SDLC) model, comprising the stages of planning, requirements analysis, design, implementation, and system testing. The database system is designed with an architecture based on the UID (User ID) resulting from authentication, which is used as the primary key in the Firestore and Realtime Database data structures.

Testing results show that the system successfully performs all functionalities with a 100% success rate. Users can register and log in securely, user data is automatically stored in Firestore, bus locations can be updated in real-time in the Realtime Database, and data access is restricted by appropriate Firebase Security Rules.

This study concludes that Firebase is an effective backend solution for supporting the development of location-based mobile applications with real-time data synchronization and user authentication security requirements.

Keywords: *Firebase, Authentication, Firestore, Realtime Database, Satria Route Finder, UID, Black Box Testing.*