An Integrated and Centralized Umrah and Hajj Management System

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Abstract

The annual Umrah and Hajj pilgrimages entail highly complex logistical arrangements to accommodate millions of pilgrims (jemaah) from diverse backgrounds. Due to limited familiarity with the environment and the overwhelming scale of the spiritual journey, many pilgrims become disoriented or lost, resulting in considerable distress and additional challenges for the travel agencies. To address these challenges, the Umroo project proposes a comprehensive system designed to address real-time location tracking, emergency communication, and streamlined pilgrimage management, enhancing the overall experience for all stakeholders involved. Using the Agile software development methodology, the system integrates all the requirements into two different platforms, which are (1) web-based application, and (2) mobile application. The Umroo in general (covers mobile app and web-based platforms) aims to enhance safety, communication, and the

overall management of pilgrimage activities for pilgrims, mutawwifs, and travel agencies, while addressing challenges posed by network limitations. © 2025 IEEE.

Author keywords

Islamic tourism solution; location-based services; pilgrimage location tracking; Pilgrimage management; web-based application

Indexed keywords

Engineering controlled terms

Application programs; Civil defense; Location; Mobile applications; Software design; Telecommunication services; Tourism; Tracking (position); Websites

Engineering uncontrolled terms

Centralised; Comprehensive system; Islamic tourism solution; Location-based services; Management systems; Pilgrimage location tracking; Pilgrimage management; Real-time location; Travel agency; Web-based applications

Engineering main heading

Location based services

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