

A Review on Smart Healthcare Integration System for Optimizing OPD Queues

Shraddha S. Diware¹, Sneha R. Dahapute², Megha R. Bhide³,
Laxmi C. Karale⁴, Dr. Leena K. Guatam⁵

Students, Department of Information Technology^{1,2,3,4}

Professor, Department of Information Technology⁵

SIPNA College of Engineering & Technology, Amravati, India

Abstract: *Healthcare facilities experience growing patient volumes which produces overcrowding and extended delays and operational challenges in their Outpatient Departments. The Smart Healthcare Integration System for Optimizing OPD Queues implements an AI-based robust platform to enhance hospital workflows and improve patient satisfaction in response to these operational challenges. The project develops an intelligent solution which includes patient registration functions and real-time queue management and appointment scheduling and electronic health records (EHR) integration capabilities.*

The system uses queue optimization algorithms including First-Come-First-Serve and Priority Queuing and Approximation Algorithms to dynamically sort patients into emergency and senior citizen and regular and follow-up categories for time slot distribution. The platform features multiple user roles that include Admin and Doctor and Receptionist and Patient roles which have specific dashboards to enhance operational effectiveness. The system provides real-time SMS and mobile application notifications which show patient queue positions and estimated consultation durations while AI modules analyze historical data to optimize doctor assignments during predicted peak periods.

The system uses Java technologies JSP and Servlets and JDBC with a MySQL backend to create a scalable solution that can be deployed on cloud platforms for city-wide healthcare coordination. The system will integrate AI chatbots for appointment scheduling and automated billing systems and public healthcare database integration in future developments. This project establishes a connection between hospital operational efficiency and patient expectations to provide a contemporary smart and accessible management solution for OPDs.

Keywords: OPD Queue Optimization, Real-time Appointment Scheduling, Priority Queuing, Artificial Intelligence (AI), Research, Development

