

SYNOPSIS REPORT

Implementation and Impact Assessment of an Automated Queue Management
System in Reducing OPD Waiting Time in Hospitals

NAME – Shikha Singh

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COURSE – M.B.A. HEALTH MANAGEMENT

ORGANISATION NAME – LIVINGNEEDS HEALTHCARE

DEPARTMENT – INSTITUTE OF HEALTH AND RESEARCH

MENTOR GUIDE – DR. SWAPNIL GADHAVE

FACULTY – ASSISTANT PROFESSOR

Introduction:

The long waiting time in hospital outpatient departments (OPD) is a global issue, causing inconvenience to patients and inefficiencies in hospital workflow. The lack of real-time queue updates, delayed doctor availability, and the absence of effective patient flow tracking contribute to extended waiting periods. LivingNeeds Healthcare proposes an Automated Queue Management System (QMS) integrated with AI-based appointment scheduling, data analytics, and AR-based indoor navigation to streamline patient flow and reduce waiting times. This study aims to assess the effectiveness of the system in improving OPD efficiency and patient satisfaction.

Objectives:

1. To evaluate the reduction in OPD waiting time after implementing the Automated Queue Management System.
2. To analyze the impact of the system on patient satisfaction and hospital workflow efficiency.
3. To assess the accuracy of AI-based appointment forecasting in predicting high-rush periods.
4. To determine the economic benefits of integrating advertisement-based revenue models within hospital OPDs.

Hypothesis:

H0:

The implementation of the Automated Queue Management System does not significantly reduce OPD waiting time.

H1:

The implementation of the Automated Queue Management System significantly reduces OPD waiting time.

Materials and Methods:

- **Study Design:**

Prospective observational study.

- **Settings:**

Multi-specialty hospitals with high OPD footfall.

- **Study Population:**

Patients visiting OPD departments, hospital staff, and administration.

- **Duration of Study:**

6 months.

- **Sample Size:**

500 patients before and after system implementation.

- **Sampling Technique:**

Randomized sampling of OPD patients across different departments.

Data Collection Procedure:

- Pre-implementation data collection on current waiting times and patient feedback.
- Deployment of the Automated QMS with real-time tracking.
- Post-implementation data collection using digital logs and patient surveys.

Operational Definitions:

- **OPD Waiting Time:** Time from patient registration to consultation.
- **Patient Satisfaction:** Measured through a structured questionnaire.
- **Workflow Efficiency:** Reduction in idle time and patient turnaround time.

Data Analysis Plan:

- Descriptive statistics to summarize patient demographics and OPD wait times.
- Paired t-test to compare pre- and post-implementation waiting times.
- Regression analysis to determine factors affecting patient flow efficiency.
- Sentiment analysis of patient feedback to assess satisfaction levels.

Ethical Considerations:

- Approval from the hospital ethics committee before study initiation.
- Informed consent from all participants.
- Ensuring confidentiality of patient data in compliance with data protection regulations.

Implications of Research:

- Enhancing hospital OPD efficiency through technological interventions.
- Improving patient experience by reducing waiting times and enhancing navigation within hospitals.
- Providing insights into AI-based appointment scheduling and predictive analytics.
- Exploring revenue models through targeted healthcare advertising.

References:

1. American Institute of Medicine. (2023). Recommended OPD Waiting Time Standards.
2. Researchgate.net, Academia.edu, NCBI.nlm.nih.gov. (2024). Studies on Hospital Queue Management Systems.
3. Times of India, The Print. (2024). Reports on Healthcare Efficiency and Patient Satisfaction.