**Digital Queue Management System for Clinics and Hospitals**

**Abstract**

Long waiting times in hospitals and clinics have been a major concern, leading to inefficiencies and patient dissatisfaction. This paper presents the design and implementation of a **Digital Queue Management System (DQMS)** aimed at optimizing patient flow and reducing waiting times. The system leverages modern technologies such as web-based scheduling, real-time queue monitoring, and automated notifications to enhance patient experience and streamline hospital operations. This study evaluates the effectiveness of the system and its potential impact on healthcare facilities.

**Introduction**

Queue management is a critical challenge in healthcare facilities, where unstructured patient flow leads to overcrowding, long waiting times, and administrative inefficiencies. Traditional manual queuing systems often result in frustration for both patients and hospital staff. A **Digital Queue Management System (DQMS)** provides a technology-driven approach to optimize queue handling, improve patient satisfaction, and enhance operational efficiency in hospitals and clinics.

**Problem Statement**

Many hospitals still rely on manual or token-based queuing, leading to:

* Increased patient frustration due to long waiting times.
* Inefficient utilization of hospital resources.
* Increased workload for hospital staff managing queues manually.
* Potential spread of infections in crowded waiting areas.

**Objectives**

The primary objectives of this study are:

1. To develop a web-based queue management system for hospitals and clinics.
2. To integrate real-time queue tracking and automated notifications.
3. To analyze the impact of digital queuing on patient waiting times and hospital efficiency.

**Literature Review**

Several studies have highlighted the importance of digital queue management systems in healthcare. Other research has explored how SMS and mobile app notifications help patients manage their time better. However, there is limited research on integrating queue management with hospital information systems, which this project aims to address.

**Methodology**

This study follows a **system development life cycle (SDLC)** approach to design and implement the Digital Queue Management System. The methodology consists of the following phases:

**1. System Design & Architecture**

* **User Roles:** Patients, Receptionists, Doctors, Administrators.
* **Technology Stack:** HTML, CSS, JavaScript (frontend), Python/Django or Node.js (backend), MySQL/MongoDB (database).
* **Features:**
  + Online patient registration.
  + Real-time queue status tracking.
  + Automated notifications via SMS or app alerts.
  + Integration with hospital records for efficient scheduling.

**2. Implementation**

* Developing a **web-based interface** for patient check-in and queue monitoring.
* Using **database management** to store patient information and queue status.
* Implementing **notification systems** to update patients about their turn.

**3. Testing & Evaluation**

* Conducting usability tests with hospital staff and patients.
* Analyzing queue efficiency before and after system implementation.
* Collecting patient feedback on the new digital queuing system.

**Expected Results**

* **Reduction in patient waiting times by at least 30%.**
* **Improved hospital efficiency** due to automated queue management.
* **Enhanced patient experience** through real-time updates and structured queuing.
* **Decreased congestion in waiting areas**, minimizing infection risks.

**Conclusion**

The implementation of a Digital Queue Management System in hospitals and clinics presents a **practical solution** to address long waiting times and administrative inefficiencies. By integrating real-time monitoring, automated notifications, and online scheduling, this system enhances both patient experience and hospital operations.