

## Patient Queue Management System

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**Abstract**— A hospital is a health care institution providing patient treatment with specialized medical and nursing staff and medical equipment. Over the last few years, the number of seriously ill patients visit or admitted to hospitals has increased steadily which usually results in overcrowding. It may even contribute to violence in the hospitals and indirectly has effect on number of patients visiting hospitals. And here comes the need of Hospital Management System.[1] A Hospital Management System is a computer or web based system that facilitates managing the functioning of the hospital. Hospital Management System aims at digitization of patients data which is a need of an hour. Queue Management System is a part of Hospital Management System which can have direct effect on number of patients visiting the hospitals. The current Hospital Management System lacks waiting time prediction which results in wastage of patients' time. This drawback can be overcome by using effective Queue management system which considers symptoms of patient.[2] It would be convenient and preferable if the patients could receive the most efficient treatment plan and know the waiting time predicted based on features and data taken accurately through a mobile application that updates in real time. The proposed Patient Queue Management System aims at reducing large queues in hospitals which ultimately results in saving time of patients. For each patient in the queue, the total treatment time of all the patients before him is the time that he must wait. Thus, proposed system tries to predict waiting time of each patient and schedule the online appointment.

**Index Terms**— Digitization of patients data; Maintaining large queues at hospitals.

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### I. Introduction

The medical field has made remarkable progress in end of twentieth and the initial twenty first centuries. This emerges high specialized hospitals for serving patients. Nowadays most of the hospitals are overcrowded with patients. It may affect patients' symptoms, clinical outcome, and satisfaction. It can also affect physician's effectiveness, causing frustration among medical staff. This overcrowding is due to lack of effective queue management system in hospitals, which is due time required for each patient would be uneven based on how much time doctor takes and other tasks such as scanning, pharmacy, testing, etc. This is a challenging and complicated job because every patient in queue may come just for consultation of doctor or check-up or test etc. Each treatment task can have varying time requirements for each patient of different age groups. [3] The proposed system focuses on helping patients complete their treatment tasks in a predictable time and helping hospitals schedule each treatment task queue and avoid overcrowded and ineffective queues. In this system, algorithm model is trained based on hospitals historical data. The waiting time of each treatment task is predicted by this algorithm, which is the sum of all patients waiting times in the current queue. Then, according to each patients requested treatment tasks, this hospital system recommends an efficient and convenient treatment plan with the least waiting time for the patient. To compute all of the required treatment tasks in the shortest waiting time, the waiting time of each task is predicted in real-time. Because the waiting queue for each task updates, the queuing recommendation is recomputed in real-time. Therefore, each patient can be advised to complete his treatment activities in the most convenient way and with the accurate waiting time. [4] The proposed system starts with patient registering with the system, once registered he will login to the system where he can book an appointment of a particular date. The patient will get notified on his scheduled date through message alert. Once he consults with doctor and gets medicine prescription, he will receive medicine alerts on periodic basis until his medicine course gets completed.

### II. Related Work

To manage the pool of patients and large network of doctors effectively Apollo Hospital has digitized its token generation process through Xtreme Media Queue Management System. Xtreme Media Queue

Management System is next gen approach and position itself as much efficient option against conventional token management process. Xtreme Media Queue Management System at Apollo Hospital fetches the required data from HMIS and converts it into dynamic Xtreme Media Queue Management System templates. This is an integrated Queue Management System and digital signage solution, due to which Apollo Hospitals can re-enforce the branding too. [5] The system reduced the number of reception counters required from four to three, as well as reducing the waiting areas required by approximately 25 percent. [6]

### III. System Design

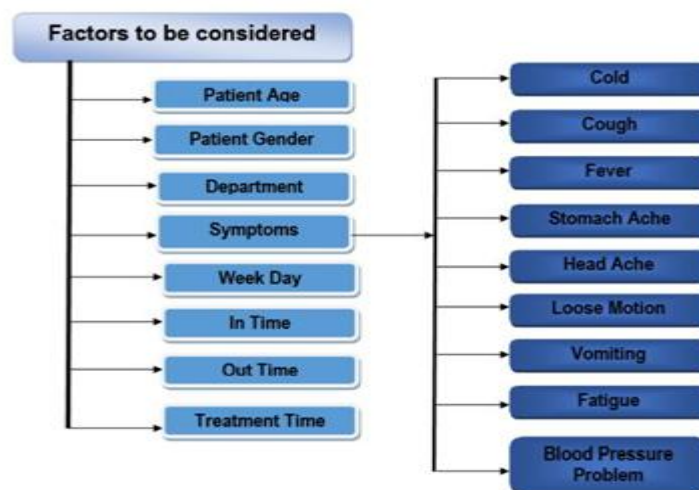
Patients Queue Management System is useful for managing the large queues at hospitals/clinics. The modules included in the proposed system are as follows:

**Login/Registration:** First the new user has to register in the system. Once registered, user can login with his unique ID and password. The system then asks user data like name, gender, date of birth, age, contact number, etc. Patient can directly go to hospital where receptionist will generate his unique id and password.

**Appointment Scheduler:** While booking an appointment, along with date, patient has to give his disease symptoms. Based on this data, patient's appointment gets scheduled. He can also cancel or reschedule his appointment.

**Queue Management System:** After scheduling appointment, system will predict the waiting time of patient based on the data taken from him. The appointment details and waiting time notification will be sent to the patient via message.

#### Factors Used for Prediction



**Medicine Alert:** Once patient consults with doctor and gets medicine prescription, he will receive medicine alerts on periodic basis until his medicine course gets completed. The block diagram for the same is as shown below.

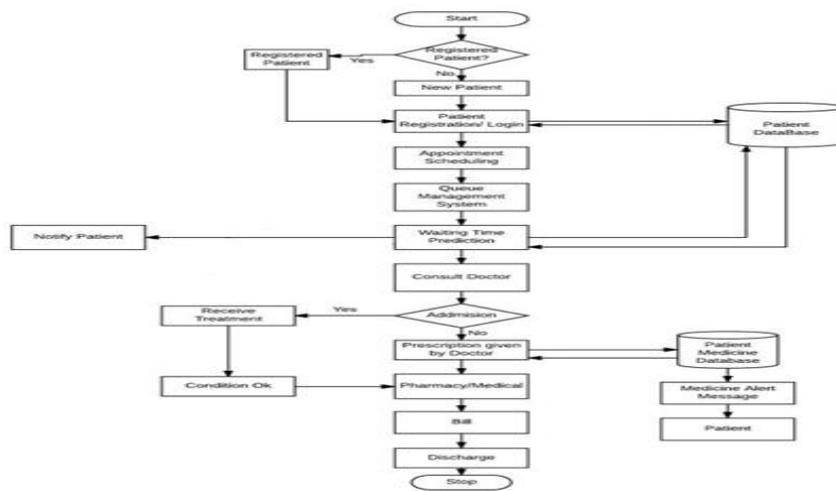


Fig: Flow Diagram

#### IV. Conclusion

The Patient Queue Management System mainly focuses on reducing overcrowding at hospitals. The system predicts waiting time of each patient. For each patient in the queue, the total treatment time of all the patients before him is the time that he must wait.

The system initially can be implemented in private clinics and in future it can be proved to be useful for government hospitals also.

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