Automated Clinical System for Patients Using HQR System

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***Abstract*—** Effective patient queue management to minimize patient wait delays and patient overcrowding is one of the major challenges faced by hospitals. Unnecessary and annoying waits for long periods result in substantial human resource and time wastage and increase the frustration endured by patients. For each patient in the queue, the total treatment time of all the patients before him is the time that he must wait. It would be convenient and preferable if the patients could receive the most efficient treatment plan and know the predicted waiting time through a mobile application that updates in real time. Therefore, we propose a Patient Treatment Time Prediction (PTTP) algorithm to predict the waiting time for each treatment task for a patient. Based on the predicted waiting time, a Hospital Queuing-Recommendation (HQR) system is developed. HQR calculates and predicts an efficient and convenient treatment plan recommended for the patient. Because of the large-scale, realistic dataset and the requirement for real-time response, the PTTP algorithm and HQR system mandate efficiency and low-latency response. Android Platform is used for providing Graphical User Interface.

Key Words*: *Big data, Cloud computing, Hospital Queue Recommendation (HQR), Patient Treatment Time Prediction.

I INTRODUCTION

As mobile health technology gains steam, physicians are increasingly using smartphones, tablet PCs such as the iPad and other mobile devices to view and update patient records, fill prescriptions and even email patients. Hsealth (also written as m-health) is an abbreviation for mobile health, a term used for the practice of medicine and public health supported by mobile devices. The term is most commonly used in reference to using mobile communication devices, such as mobile phones, tablet and computer for health services and information

While health certainly has application for industrialized nations, the field has emerged in recent years as largely an application for developing countries, stemming from the rapid rise of mobile phone penetration in low-income nations. The field, then, largely emerges as a means of providing greater access to larger segments of a population in developing countries, as well as improving the capacity of health systems in such countries to provide quality healthcare. Within the health space, projects operate with a variety of objectives, including increased access to healthcare and health-related information (particularly for hard-to-reach populations); improved ability to diagnose and track diseases; timelier, more actionable public health information; and expanded access to ongoing medical education and training for health workers.

II LITERATURE SURVEY

Patient queue management and wait time prediction form a challenging and complex job because each patient might require different operations, such as a check-up, various tests, e.g., a sugar level or blood test, X-rays or a CT scan during treatment. So there are five major methodologies used in this system Big Data management with Historical Dataset, Pre-processing of data, Use Learning Algorithm PTTP (patient Treatment Time prediction) calculate the Waiting Time in Hospital Queue Recommendation. A random forest optimization algorithm is performed for the PTTP model. The queue waiting time of each treatment task is predicted using the trained PTTP model. A parallel HQR system is introduced, and an efficient and convenient treatment plan is recommended for each patient. The patient may undergo various treatment operations such as CT scan, MR scan and a payment task. These set of treatment operations are submitted to decision maker and recommendation module via mobile interface. The predicted waiting Time of all of the treatment tasks is calculated by PTTP model. After this a treatment recommendation with least waiting time is advised.

Most of the Smartphone's have built in sensors that can measure motion, location, orientation and various other environmental conditions. These sensors can provide raw data with high precision and accuracy for inferring and recognizing queuing behaviour. Furthermore we observed that people frequently carry smartphones when they are not at home. We can use a collaborative approach for queuing recognition based on smartphones by following queuing rules (First Come First Server). We can use a prototype of Queue Sense with clients on smartphones which uses Android platforms and a server in cloud. Smartphones make use of widely available sensors such as accelerometer, Bluetooth and compass to sense individual activities. Queuing features are calculated based on queuing properties in terms of individual activities and support vector machine(SVM) is used to

automatically detect whether the people are queuing or not on smartphones. The cloud backend process multi-lines scenarios and provide estimation of queue length and waiting time. Agglomerative hierarchical clustering is used on server side to divide queuer's into different lines based on changing rate of relative position of queuer's.

Hospital Information generally contains information systems such as Electronic Medical Records (EMR) and Picture archiving And Communication System (PACS). Hospital data is centre generally stores the Structured and Unstructured Data. Most data used in the EMR is Structured Data which includes information of a patient, information of a treatment, diagnostic information and the reports. Data is Processed in the system we need to give a connection to the database then we need to check an existence of a table i.e. if a Table exists already then we need to add a Partition otherwise we need to create a Table and then we need to add a Partition. Then we need to check an availability of a data if an data is available then just update the data otherwise write the data and then we need to disconnect with the database.

III PROPOSED SYSTEM

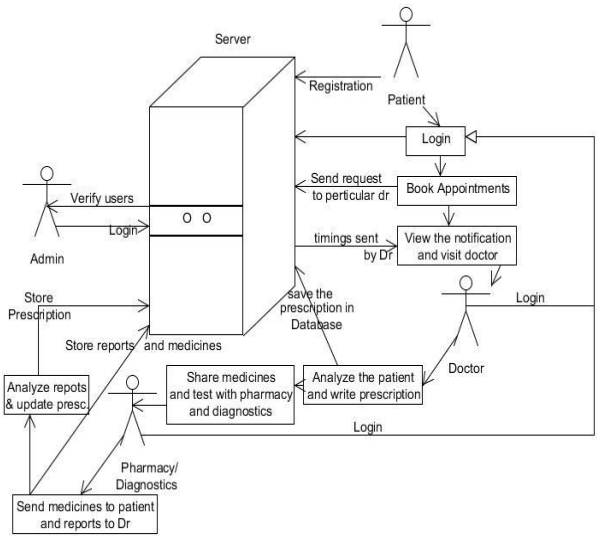
Based on the survey we have understood that the system will handle structured data including patient information, treatment information, diagnostic information and reports. Patients can see the recommended plan and predicted waiting time in real-time using a mobile application. Patients can see the recommended plan and predicted waiting time in real-time using a mobile application. Each patient can complete his treatments in the shortest waiting time. In PTTP algorithm based on big data and the Apache Spark cloud is proposed. The queue waiting time of each treatment is predicted based on the trained PTTP model. PTTP algorithm based on streaming data and a more convenient recommendation with minimized path-awareness. To improve the accuracy of the data analysis with continuous features, various optimization methods of classification and regression algorithms are proposed. To predict the waiting time for each treatment task, we use the random forest algorithm to train the patient treatment time consumption based on both patient and time characteristics and then build the PTTP model.

IV EXISTING SYSTEM

Presently in any clinic, there will be a peon or receptionist who takes appointment by attending calls. The doctors write prescription on papers and wait for patient to get the test reports and analyze it. Some time, Patients will be suffering allot, but they die before reaching the hospital. Some time, a doctor may not be available but patient wait allot. Patient should carry his all records with him when he changes the doctor.

V ARCHITECTURE OF THE SYSTEM

The present system used in clinic is manual where sometimes patient will not be guided exactly and sometimes doctor feel complex to manage and analyze the records of the records of the patient. So the proposed system is considered after the analysis made by researching about E-Health Systems. The proposed system will not only help individual to manage patients but also to monitor all body systems and help to introduce a new proposed system for patients. Also, helps to reduce the cost and time consumption by using the proposed system anytime and anywhere.



VI ADVANTAGES

The advantages of Clinical System are

- Increase in appointment booking accuracy.
- Reducing clumsiness' in the patient about their health by managing their pharmaceuticals and dialysis process with guidance.
- Providing E-Health Record management.
- Establishing better communication between doctor and patient.
- Managing health information of the patient.
- Reducing usage of papers to save trees and to use technology

VII CONCLUSION

Based on the survey, a PTTP algorithm based on big data cloud environment is proposed. A random forest optimization algorithm is performed for the PTTP model. The queue waiting time of each treatment task is predicted based on the trained PTTP model. A parallel HQR system is developed, and an efficient and convenient treatment plan is recommended for each patient. Extensive experiments and application results show that our PTTP algorithm and HQR system achieve high precision and performance.

Hospitals' data volumes are increasing every day. The workload of training the historical data in each set of hospital guide recommendations is expected to be very high, but it need not be. Consequently, an incremental PTTP algorithm based on streaming data and a more convenient recommendation with minimized path-awareness are suggested for future work.

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