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Mobile Based Medical Appointment and OPD Management Technology

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ABSTRACT: OPD Management System is an organized computerized system designed and programmed to deal with day to day operations and management of the hospital activities. The program can look after inpatients, outpatients, records, database treatments, status illness, billings in the pharmacy and labs. It also maintains hospital information such as ward id, doctors in charge and department administering. The major problem for the patient nowadays to get report after consultation, many hospital managing reports in their system but it's not available to the patient when he / she is outside. In this project we are going to provide the extra facility to store the report in the database and make available from anywhere in the world.

KEYWORDS: OPD Management, doctor appointment data mining

I. INTRODUCTION

The project OPD Management System includes registration of patients, storing their details into the system, and also computerized billing in the pharmacy, and labs. The software has the facility to give a unique id for every patient and stores the details of every patient and the staff automatically. It includes a search facility to know the current status of each room. User can search availability of a doctor and the details of a patient using the id.

The OPD Management System can be entered using a username and password. It is accessible either by an administrator or receptionist. Only they can add data into the database. The data can be retrieved easily. The interface is very user-friendly. The data are well protected for personal use and makes the data processing very fast.

OPD Management System is powerful, flexible, and easy to use and is designed and developed to deliver real conceivable benefits to hospitals.

OPD Management System is designed for multispecialty hospitals, to cover a wide range of hospital administration and management processes. It is an integrated end-to-end OPD Management System that provides relevant information across the hospital to support effective decision making for patient care, hospital administration and critical financial accounting, in a seamless flow.

OPD Management System is a software product suite designed to improve the quality and management of hospital management in the areas of clinical process analysis and activity-based costing. OPD Management System enables you to develop your organization and improve its effectiveness and quality of work. Managing the key processes efficiently is critical to the success of the hospital helps you manage your processes

II. RELATED WORK

Scheduling

Scheduling can be described as the process of assigning jobs to resources for some duration. Scheduling problems are ubiquitous, ranging from computer systems and networks, to production factories and patient appointments. Many of such problems are either solved by manual operation or using heuristics specifically designed to the context[1]. According to [3], Patient appointment scheduling can be classified into three:

Single Batch Process : In this Appointment scheduling process, decisions are delayed until after receiving all appointment requests for a given period. This model is commonly used in surgery starting times, and allows scheduling with complete information, so that a perfect or near perfect solution can be found through discrete optimization or heuristic methods.

Unit Process Appointments: In this appointment scheduling model, the process are assumed to come one at a time and are scheduled at the time of the request arrival. Through this process, a perfect solution will unlikely be found, but may be approximated if the distribution of appointment request types is learned.

Periodic Process Appointment requests are kept in a buffer of fixed size and are scheduled once the buffer is full. This allows a better approximation to the optimal solution by considering optimal or near optimal solutions at each period.

Online Appointment Scheduling system

Online appointment scheduling system is a system through which a user or guest or simply, patients can access the website of the doctor, and through the online software, patients can easily make their appointments. In addition to that, patients can also provide additional information to the doctor, making the doctor aware of their situation and giving the doctor time to prepare the necessary information for when the patient's arrives. An online scheduling system allows individuals to conveniently and securely book their appointments online. Compared to the usual queuing method, the web-based appointment system could significantly increase patient's satisfaction with registration and reduce total waiting time effectively[10].

Waiting Time

Waiting time refers to a period of time which a patient must wait in order for a specific action to take place, after that action is triggered or requested. it is defined as "the length of time from when the patient entered the outpatient clinic to the time the patient actually received his or her prescription. It is also described as the total time expended by a patient from registration until consultation with a doctor.

[21] developed a decision support system Tool for Appointment Scheduling to Reduce Patient No-Show Rate in an Outpatient .

[5] proposed a smart appointment reservation system. The proposed system helps in managing appointments and also provides platform for patient to cancel or reschedule appointment by integrating distributed clinical systems into a set of consistent and convenient services accessible via a web browser.

[20] proposed a mobile application for booking appointment using Android .The authors developed a system that will ease the process of booking appointment of the doctor. The patient will book the appointment through his/her mobile phone. The doctor , at the other end could determine the number of patients he has to attend whole day.

[6] proposes an online patient appointment scheduling system based on the Web Services architecture. The analysis and implementation results show that the Web Services architecture provides an ideal design paradigm for the development of integrated health care information system in the primary care setting.

[23], proposes dentist online Reservation System. The aim of the proposed system is to save the time and effort of the users in safe and convenient ways. It enables patients to book and check their appointment schedule. administrator to maintain the database online easily. It enables the administrator to check the patient's requests, manage the appointment schedule, and manage the patient's information.

[24], in their paper titled "Dynamic Scheduling of Outpatient Appointments under Patient No-shows and Cancellations", proposed a framework for heuristic dynamic policies for scheduling patient appointments, taking into account the fact that patients may cancel or not show up for their appointments.

[12] developed a web-based appointment system by integrating with Intelligent System techniques. The system was designed to manage appointment and time reserved between students and Lecturer for any academic-related activities such as discussion and weekly meeting with lecturers. The main focus of the prototype is to manage appointment and calendar updating.

[26] proposed a framework for Appointment Systems with Patient Preferences. The authors developed a framework for the appointment systems that automatically update patients preferences to improve booking decisions.

[25] , reiterate that a local search procedure is derived that converges to the optimal schedule with a weighted average of expected waiting times of patients, idle time of the doctor and lateness as objective.

III. PROPOSED METHODOLOGY

OPD Management System is used to take the data from the patients and then store it for later use. The main goal of the OPD Management System is to accurately treat as well as decrease overtime pay.

There are various features included in the HMS. Some of the system functions include Registration, Patient check out, Report generation, and more. In this blog, let's check out the functional and non-functional requirements of the OPD Management System in depth.

Functional Requirements:

There are a lot of software requirements specifications included in the functional requirements of the OPD Management System, which contains various process, namely Registration, Check out, Report Generation, and Database.

Registration Process of SRS (Software Requirements Specification)

- Adding Patients: The OPD Management enables the staff in the front desk to include new patients to the system.
- Assigning an ID to the patients: The HMS enables the staff in the front desk to provide a unique ID for each patient and then add them to the record sheet of the patient. The patients can utilize the ID throughout their OPD stay.

Check Out of SRS:

- Deleting Patient ID: The staff in the administration section of the ward can delete the patient ID from the system when the patient's checkout from the OPD.
- Adding to beds available list: The Staff in the administration section of the ward can put the bed empty in the list of beds-available.

Report Generation of SRS:

- Information of the Patient: The OPD Management System generates a report on every patient regarding various information like patients name, Phone number, bed number, the doctor's name whom its assigns, ward name, and more.
- Availability of the Bed: The OPD Management system also helps in generating reports on the availability of the bed regarding the information like bed number unoccupied or occupied, ward name, and more.

Database of SRS:

- Mandatory Patient Information: Every patient has some necessary data like phone number, their first and last name, personal health number, postal code, country, address, city, 'patient's ID number, etc.
- Updating information of the Patient: The OPD management system enables users to update the information of the patient as described in the mandatory information included.

Non Functional Requirements

There are a lot of software requirements specifications included in the non-functional requirements of the OPD Management System, which contains various process, namely Security, Performance, Maintainability, and Reliability.

Security:

- Patient Identification: The system needs the patient to recognize herself or himself using the phone.
- Logon ID: Any users who make use of the system need to hold a Logon ID and password.

- Modifications: Any modifications like insert, delete, update, etc. for the database can be synchronized quickly and executed only by the ward administrator.
- Front Desk Staff Rights: The staff in the front desk can view any data in the OPD Management system, add new patients record to the HMS but they don't have any rights alter any data in it.
- Administrator rights: The administrator can view as well as alter any information in the OPD Management System.

Performance:

- Response Time: The system provides acknowledgment in just one second once the 'patient's information is checked.
- Capacity: The system needs to support at least 1000 people at once.
- User-Interface: The user interface acknowledges within five seconds.
- Conformity: The system needs to ensure that the guidelines of the Microsoft accessibilities are followed.

Maintainability:

- Back-Up: The system offers the efficiency for data back up.
- Errors: The system will track every mistake as well as keep a log of it.

Reliability:

- Availability: The system is available all the time.

IV. CONCLUSION

The appointment-scheduling process, has become a necessary burden in medical offices, healthcare facilities and wellness centers. An automated Appointment and scheduling software have been developed to address some of the challenges faced medial workers. The benefits of implementing this technology would touch everyone involved in the scheduling process, as administrators and staff can conduct their tasks more efficiently and accurately, while customers and clients have the ability to book their appointments and reservations quickly and more conveniently. The proposed system is aimed at simplifying the task of the patient and the doctor. It will reduce long waiting time for patients and eradicate long queue .Patient also have freedom to fix their appointment and also book an appointment according to their preference. The system will deliver timely and convenient access to health services for all patients.

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