SELF HEALTHCARE INFORMATION SYSTEM

Project Proposal

Group 29

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1.0 INTRODUCTION

1.1 PROBLEM

In the recent past, the world has been running through a tight situation due to the pandemic. Among all, the healthcare sector has been affected in many aspects. Especially patients face various difficulties starting from channeling to medical treatment. Patients in hospitals face a variety of problems, ranging from the mundane to the life-threatening. Many problems are due to the medical staff, such as communication difficulties, lack of information, and delays in care. Still, other problems are due to the hospital's policies or procedures, such as length of stay, discharge planning, and billing

According to experts, medication errors are the most serious risks in hospitals. Especially the surgeries. We need to agree that surgeries that are carried out could have a mortality risk due to surgical complications and negligence of the responsible authorities, which is a serious matter yet unspoken. Hence, we thoroughly believe that it is the patients' right to know about the history and the performance level of the doctors before they channel and make an appointment as it is visible to us that there's no measurement or criteria to evaluate the performance and the skills of the clinician related to operations. Therefore, we are proposing an unbiased channeling system and a rating scale to evaluate the doctors' medical skills, based on the patients' experiences and viewpoints.

1.2 AIM OF THIS PROJECT

The aim of this project is to develop and implement a comprehensive and efficient Self Healthcare Management System that will streamline and automate the various processes and functions of a hospital. This system will provide a unified platform for managing patient care, financial operations, and administrative tasks, and will improve the quality of care and the overall patient experience, while also increasing operational efficiency and reducing costs. The goal is to create a system that is user-friendly, reliable, and scalable, and that will meet the evolving needs of the hospital and its stakeholders."

1.3 RESEARCH GAP

The project's goal is to create a hospital system that includes a self-rating and booking system. We have developed a solution based on research conducted in some other countries that suggest the value of having a rating system for doctors because there are numerous indications that patient feedback is significant. (https://thescript.zocdoc.com/6-reasons-patient-feedback-is-important/) On the other hand,

- *A recent Johns Hopkins study claims more than 250,000 people in the U.S. die every year from medical errors. Other reports claim the numbers to be as high as 440,000.*
- *Medical errors are the third-leading cause of death after heart disease and cancer.*

https://www.cnbc.com/2018/02/22/medical-errors-third-leading-cause-of-death-in-america.html

According to the researchers, the third leading cause of death in the US is the medical errors. we discovered that medicals errors and certain medical professionals' negligence may result in the deaths of several patients https://journals.sagepub.com/doi/full/10.1177/0022018320946498

With the help of our solution, we can reduce the risk of the case and assign well-performed doctors at a higher rate and enable patients to choose wisely the best one among their ratings from themselves. Moreover, this will provide a thorough overview of doctors' performance and identify any instances of doctoral malpractice.

Further reviewing the assessments, it became clear, this will demonstrate that, instead of focusing on interpersonal skills, we would know the best doctors to channel if we had a decent grading system.

J Med Internet Res. 2019 Jun; 21(6): e11188.
Published online 2019 Jun 28. doi: 10.2196/11188

The Impact of Web-Based Ratings on Patient Choice of a Primary Care Physician Versus a Specialist: Randomized Controlled Experiment

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6625218/

The findings suggest that people place more weight on technical skills than interpersonal skills in their selection of a physician based on their ratings on the Web. Specifically, people are more likely to make a compromise on interpersonal skills in their choice of a specialist compared with a primary care physician. This study emphasizes the importance of examining Web-based physician ratings in a more nuanced way in relation to the selection of different types of physicians.

Nowadays these types of systems are rare and caught the attention and getting popularity and there are However, there have been fewer types of research done in this field, indicating a deficit.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3636311/

Reviewed by Guodong Gao and Felix Greaves
Martin Emmert, MSc, Ph.D,1 Uwe Sander, MD,2 and Frank Pisch, B.Sc
J Med Internet Res. 2013 Feb; 15(2): e24.
Published online 2013 Feb 1. doi: 10.2196/jmir.2360

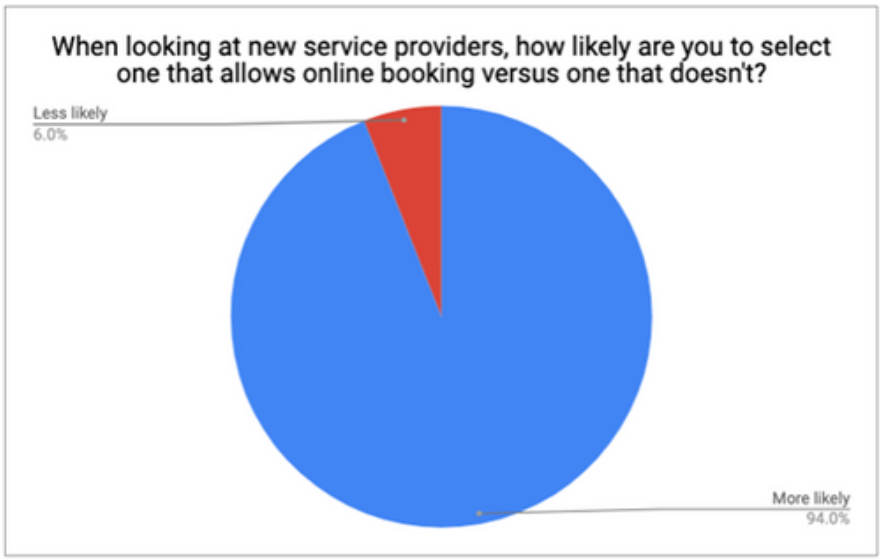
Physician-rating websites are currently gaining in popularity because they increase transparency in the health care system. However, research on the characteristics and content of these portals remains limited.

Conclusions

Although the number of publications is still low, physician-rating websites are gaining more attention in research. But the current condition of physician-rating websites is lacking. This is the case both in the United States and in Germany. Further research is necessary to increase the quality of the websites, especially from the patients' perspective.

After conducting a thorough investigation into appointment scheduling systems, we discovered that the complex systems used by the healthcare industry have a great deal of appointment scheduling issues (https://www.hindawi.com/journals/jhe/2022/5819813/). As a result, we decided to develop a self-booking service that takes patients' preferences into consideration.

This graph will illustrate the likelihood of patient go for a online booking.



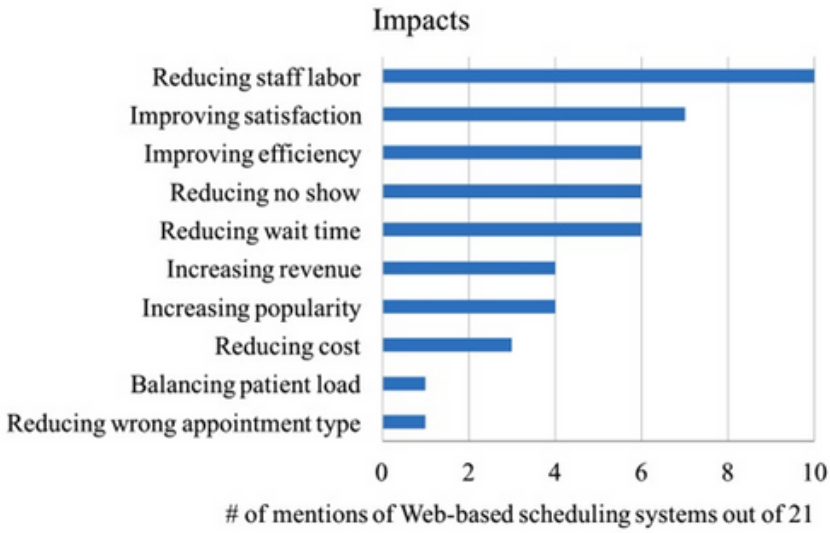
Additionally, studies reveal that our primary self-booking and channeling system has some untapped potential benefits (https://www.commusoft.co.uk/online-appointment-system-benefits/) and changes may affect to the field and also have a certain trend.

J Med Internet Res. 2017 Apr; 19(4): e134.
Published online 2017 Apr 26. doi: 10.2196/jmir.6747
Web-Based Medical Appointment Systems: A Systematic Review
Reviewed by David Miller, Ping Yu, and Xiaojun Zhang
Peng Zhao, MSc,1 Illhoi Yoo, PhD,1,2 Jaie Lavoie, PharmD, MS,3 Beau James Lavoie, PharmD, MS,4 andEduardo Simoes, MSc, DLSHTM, MPH, MD1,2
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5425771/

Health care is changing with a new emphasis on patient-centeredness. Fundamental to this transformation is the increasing recognition of patients' role in health care delivery and design. Medical appointment scheduling, as the starting point of most non-urgent health care services, is undergoing major developments to support active involvement of patients. By using the Internet as a medium, patients are given more freedom in decision making about their preferences for the appointments and have improved access.

Conclusions

Overall, the literature suggests a growing trend for the adoption of Web-based appointment systems. The findings of this review suggest that there are benefits to a variety of patient outcomes from Web-based scheduling interventions with the need for further studies.



Impacts after implementing the 21 Web-based scheduling systems.

2.0 Requirements Analysis and Design

2.1 Requirements

2.1.1 Functional Requirements Data Requirements

Functional requirements of a Hospital Management System are the specific features and capabilities that a system must have in order to meet the needs of a hospital. Here are some of the most common functional requirements:

1. Patient Management: Patient Management is about managing patient's private information when patient enrolled for this healthcare system.

Data Requirements

- PatientID
- PatientName
- PatientAddress
- PatientAge
- PatientGender
- Email
- Phonenumber
- Username
- Password

2. Clinician Management: Clinician Management is about storing physician's information including the physician's specialization.

Data Requirements

- DoctorID
- DoctorName
- Specialization
- SpecializationId

3. Appointment Scheduling Management: Appointment Scheduling Management is about scheduling appointments, track patient visits and manage the availability of the doctors.

Data Requirements

- AppointmentId
- Date
- PatientId
- DoctorId
- Location

4. Billing and Financial Management: Billing and Financial Management is about managing financial information, including billing for prescribed medicine and consultation fee.

Data Requirements

- PatientId
- PatientName
- DoctorId
- DoctorName
- ConsultationFee
- HospitalCharges
- TotalFee

5. Revenue Management: Revenue Management is about managing and displaying the salaries earned by the physicians after the consultations.

Data Requirements

- DoctorId
- DoctorName
- PatientId
- ConsultationFee
- TotalProfit

6. Rating Management: Rating Management is the ability to rate the services that the patients received from the hospital staff and physicians which is essential for the hospital management to get to know about the patient satisfaction and to improve the system.

Data Requirements

- PatientId
- DoctorName
- Comments
- OptionalComments

2.1.2 Nonfunctional requirements

- Security: Ensure the confidentiality and availability of sensitive patient information.
- Usability: The system should be user-friendly and easy to use for both patients and hospital staff.
- Performance: The system should respond quickly to user requests, even during high usage times.
- Scalability: The system should be able to accommodate an increasing number of users and handle larger amounts of data.
- Reliability: The system should be available and always functioning properly.
- Compliance: The system should meet industry standards and regulations.
- Maintainability: The system should be easy to maintain, update, and fix when needed.
- Accessibility: The system should be accessible to all users, including those with disabilities.
- Disaster Recovery: The system should have a plan for disaster recovery in case of system failures or data loss.

2.1.3Hardware Requirements

- Servers: High-performance servers are needed to run the hospital management system, store patient data, and support networked devices.
- Mobile devices: Devices such as desktop computers or laptops are needed for hospital staff to access the system and perform their tasks.
- Network Equipment: The hospital's network infrastructure should be capable of supporting the hospital management system, by providing a secure, reliable, and fast network.
- Scanners: Scanners can be used to digitize paper-based records and integrate them into the hospital management system.
- Medical Devices: The hospital management system should be able to integrate with various medical devices, such as X-ray machines, MRI machines, and electrocardiogram (ECG) machines.

2.1.4 Software Requirements

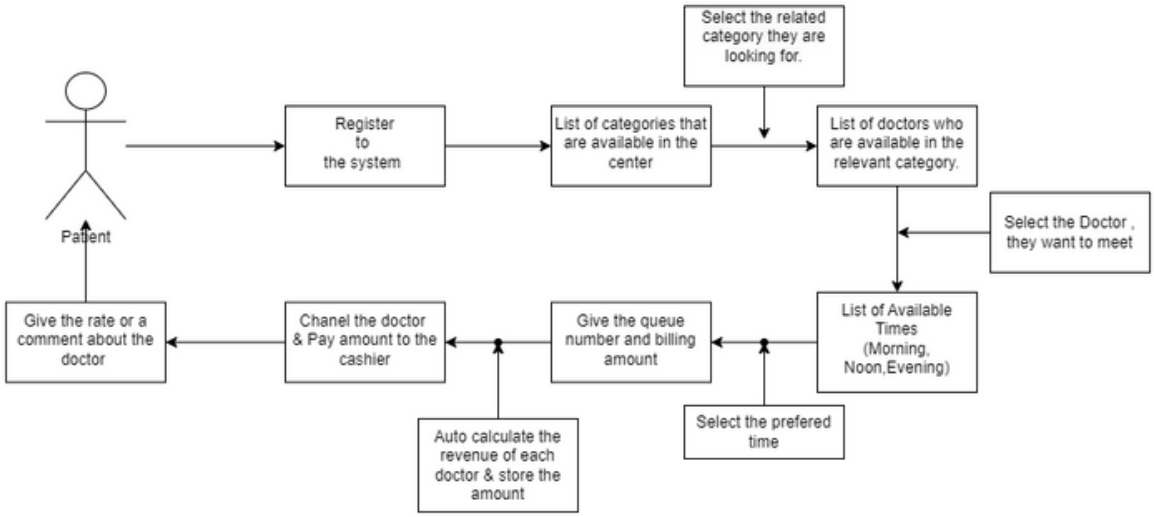
- Operating System: The healthcare management system is running on a commonly used Windows operating system.
- Database Management System: Java Arrays to store data related to the system and to act as the database.
- Java Development Kit (JDK): The JDK is a software development environment that includes the Java Runtime Environment (JRE) and the Java Compiler. It is required for developing, compiling, and executing Java code.
- Integrated Development Environment (IDE): An IDE provides a user-friendly interface for writing,
- Security: The system is using built-in security features, such as encryption and authentication, to protect sensitive patient information.
- Figma: Figma software for producing the wireframes and display the sketched GUI for the users before implementing the system.

2.2 DESIGN

2.2.1 Proposed System

Based on the information and research providesin previous sections,some considerable problemsoccurred in medical centers that make patients to feel more inconvenience. To reduce some problems in this scenario we can implement a software which worked as follows. The system is used to select the appropriate doctors, get queue numbers, get the billing amount and to rate the doctors by patients with themselves. In the commencement, the patient should enter whether he/she is a returning patient of the medical center. If it's not he/she directed to the interface to register himself /herself to the system. After the registration process, he/she will get a unique id for themselves. Here after, they directed to the main menu which displays the categories of channeling that are available in medical center. (For the patients who are returning patients of the medical center already having a id with them.) Then they must enter their id an select the appropriate category which they are looking for. Then the system will show them who are the doctors availablein the medical center for that day for relevantcategory. The patientshould select the doctor who they want to channel.Later they will ask for the whichtime they preferto meet the doctor (morning, noon, or evening). After this whole process system automatically calculate the billing amount and the queue number with previous channeling bookings. The revenue amount of the specific doctor will be added parallelly. Then the system will provide the patient a receipt which contains their User Id, Doctor Id, Queue Number, and the amount that they want to pay. After the channeling, the patients who want to rate their doctor can use their id and doctor id to give their rating. The system will calculate the rating and displays on the doctor's profile.

2.2.2 Diagram


Select the related category they are looking for.
Register to the system
List of categories that are available in the center
List of doctors who are available in the relevant category.
Select the Doctor , they want to meet
Patient
Give the rate or a comment about the doctor
Chanel the doctor & Pay amount to the cashier
Give the queue number and billing amount
List of Available Times (Morning, Noon,Evening)
Auto calculate the revenue of each doctor & store the amount
Select the prefered time

3.0 TEAM WORK

PS NUMBER	NAME	ASSIGNED WORK
PS/2020/103	H.R.A.L.N.Ranasinghe	Requirements
PS/2020/150	R.Y.W Ekanayaka	Problem
PS/2020/215	R.N.R.Fonseka	Research Gap
PS/2020/192	M.R.T Fernando	Design
PS/2020/174	J.A.D.N Jayakody	Aim and combining all work together