SOFTWARE REQUIREMENTS SPECIFICATION

For

Hospital Appointment Scheduler

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1. Introduction

1.1 Purpose

The Hospital Appointment Scheduler project aims to optimize the appointment scheduling process between medical practitioners and healthcare seekers. The system prioritizes user-friendly registration and login experiences for doctors and users, ensuring a seamless appointment setup. Upon successful login, doctors gain access to a comprehensive list of user-submitted appointments.For users, the platform offers an intuitive interface that facilitates easy registration, login, real-time tracking of appointment status, and access to medical reports. Crucially, the system distinguishes between general outpatients and specialized patients, providing tailored appointment procedures. Users can book appointments based on specific criteria such as hospital, doctor, specialty, and preferred date & time, generating a refined list of available doctors and hospitals. Once a preferred doctor is selected, users can send appointment requests.Moreover, the system includes a feature that allows users to view their health records and medical history, accessible to both attending doctors and relevant administrators. Handling doctors and their assistants can update users' medical records based on the checkup. Users can conveniently monitor appointment statuses within their login page and receive email confirmations upon successful booking.

1.2 Document Conventions

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Convention for Main title

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Convention for Sub title

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Convention for body

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1.3 Scope of Development Project

*UI Development: Create an intuitive and responsive user interface for both doctors and users, focusing on easy navigation and clear information display.

* Registration and Authentication: Implement secure registration and login functionalities for doctors and users, ensuring data privacy and authentication protocols .

* Appointment Booking System: Develop a comprehensive system allowing users to book the appointment based on hospital, doctor, specialty and date & time

*Appointment Management: Provide doctors with a dashboard to manage appointments, view user details, update appointment statuses, and synchronize their schedules

*Health Record Management: Create a secure database to store and manage users' health records. Allow doctors and authorized administrators to access and update these records.

*Real-time Tracking and Notifications: Implement real-time status updates for users regarding appointment confirmations, reminders, and any changes. Enable email notifications upon successful booking or rescheduling.

1.4 Definitions, Acronyms and Abbreviations

*JAVA -> platform independence
*SQL-> Structured Query Language
*ER-> Entity Relationship
*UML -> Unified Modeling Language
*IDE-> Integrated Development Environment
*SRS-> Software Requirement Specification
*UI -> User Interface

1.5 References

Books

- Software Requirements and Specifications: A Lexicon of Practice, Principles and Prejudices (ACM Press) by Michael Jackson
- Software Requirements (Microsoft) Second EditionBy Karl E. Wiegers
- Software Engineering: A Practitioner's Approach Fifth Edition By Roger S. Pressman

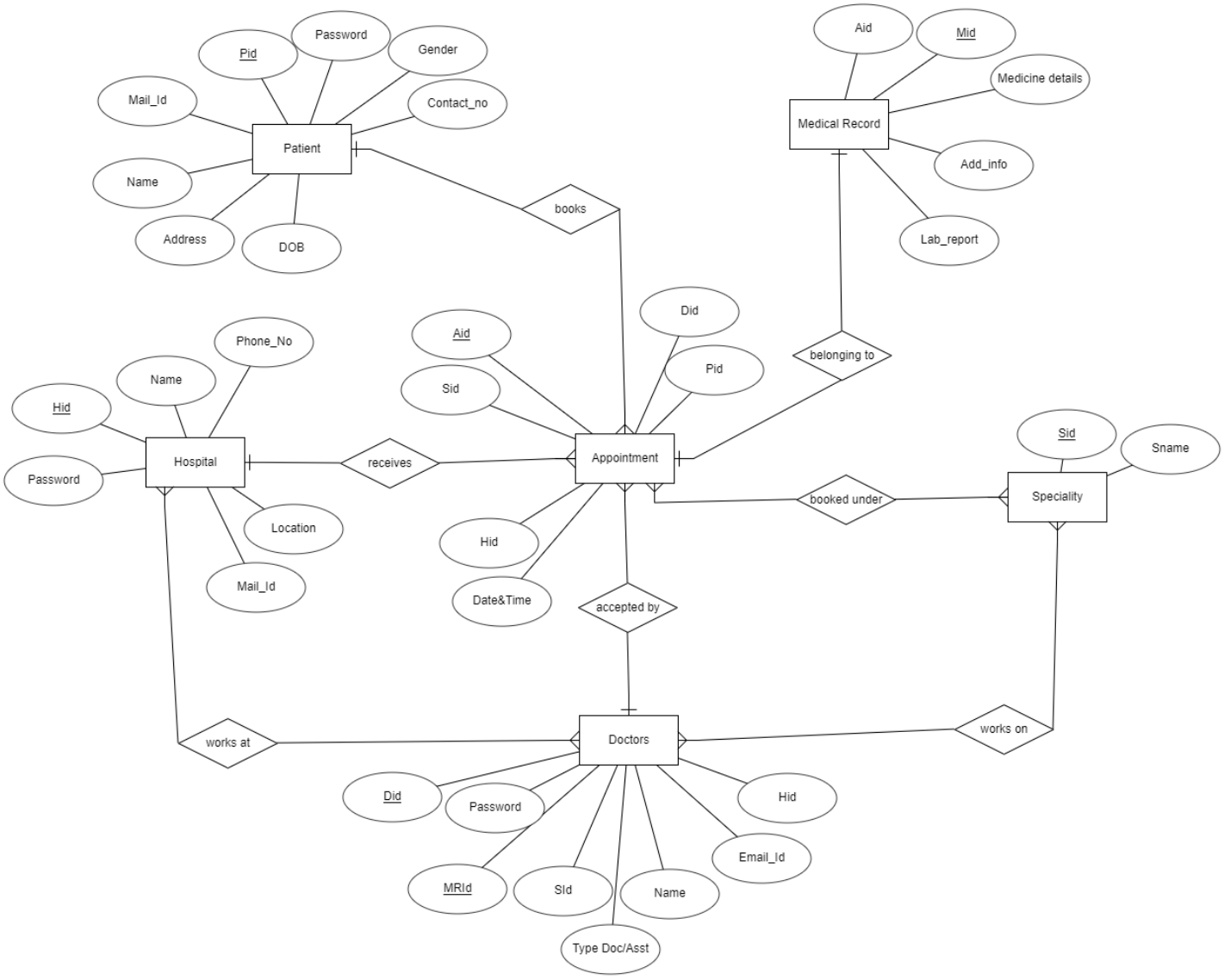
Websites

- **http://www.slideshare.net/**
- **https://www.psghospitals.com/book-an-appointment/**

2. Overall Descriptions

2.1 Product Function

EntityRelationship Diagram of Hospital Appointment Scheduler



2.3 User Classes and Characteristics

The system provides different types of services based on the type of users [Doctors/Patients/Admin/Assistants]. The admin has all the access to approving the appointments and to view the entire details of doctors' availability. Based on the appointment, the features will be accessible to the doctors and other members.

The features that are available to the Doctor are:

A Doctor can accept the appointment request from the user

- Can view the health records of the patients
- Will generate the prescription
- Can redirect to any other doctors based on the condition of the patients
- Can convert the outpatient to in-patient
- Can set the duration of the consultation
- Can do the automated updation of the medical records for generalized outpatients
- Can consider the emergency booking based on the IN and OUT status of the doctor
- can approve the appointments with the automated updation of the medical records for the specialized out-patients

The features that are available to the Patients are:

- Patients can send appointment requests based on hospital, doctor, date, time, and specialties.
- Generalized outpatients can book the appointment, 24 hours in advance
- Specialized outpatients have the flexibility to request appointments up to 1 week in advance
- Patients can view their medical records and access is provided for patients to review their complete medical history
- Specialized outpatients have access to different departments and generalized outpatients are restricted to access only general departments while booking appointments.

The features that are available to the admin are:

- Can manage the medical records of every patient
- Can provide the approval for the appointments requested by the specialized patients
- Can view the entire details of the doctor's availability and also access information regarding patient appointment slots and medical records.
- An additional feature of reception booking is facilitated in the admin section.

The features that are available to the Patients are:

- Can view the details of the particular doctor's patients
- Can update the records of the patients
- Can check with the doctor's appointments

2.4 Operating Environment:

The Hospital appointment system is designed as a desktop application specifically tailored for the Windows operating system. To ensure its smooth execution, the application necessitates the installation of Java Runtime Environment (JRE) as a prerequisite.The application requires a reliable network connection to access and synchronize with the latest database updates for seamless functionality and updates.

Hardware Requirements:

In terms of hardware requirements, the desktop application will efficiently run on systems with a 40 GB hard disk, a 15” color monitor, and a standard 122-key keyboard. The essential input devices needed are a keyboard and a mouse, while output devices like monitors and printers will be supported for various functionalities. By meeting these hardware and software prerequisites, users can experience the application's full functionality while ensuring optimal performance and compatibility with the Windows operating system.

2.5 Assumptions and Dependencies

The assumptions are:

- The coding should be error-free
- The system should be user-friendly so that it is easy to use for the users
- The information of all users, users' details, and medical history of the users must be stored in a database that can be accessed through the application.
- The system should have more storage capacity and provide fast access to the database
- The system should provide a search facility for Hospitals and doctors.
- Users may access from any computer that has an internet connection
- Access to online accounts requires the accurate entry of users' designated UserID and password for performing actions.

The dependencies are:

- The specific software by which the project will run
- Based on listing requirements and specifications the project will be developed and run
- The end users (admin) should have a proper understanding of the product
- The system should have stored the patient’s report and details
- The information of all the users must be stored in a database that is accessible by the Hospital System
- Any update regarding the medical details of the user is to be recorded in the database and the data entered should be correct.

2.6 Requirement

Software Configuration:

This software package is developed using JavaFX as the front end which is supported by sun microsystem. Microsoft SQL Server as the back end to store the database.

*Operating System: Windows NT, Windows 98, Windows XP

*Language: Java Runtime Environment, JavaFX (front end)

/Database: MS SQL Server (back end)

2.7 Data Requirement

The system operates on a query-based input, where users submit requests to the database. The output comprises solutions to these queries, including specific account details for users. Within the project scope, inputs encompass user-initiated actions such as account creation, hospital and doctor selection, and appointment bookings.When users send requests to the server, the output furnishes pertinent information, such as real-time data, presenting the available doctors open for booking at that moment.

3. External Interface Requirement

3.1 GUI

This software boasts a user-friendly graphical interface, ensuring smooth interactions for both users and administrators. The administrator holds the capability to perform essential tasks like creating, updating, and viewing user details and medical histories. Key functionalities include:

- Enabling users to conveniently schedule appointments with doctors based on their availability.
- Offering a robust search feature allowing appointments to be booked by hospitals, doctors, department specialties, and more.
- The customizability of the user interface by the administrator to tailor the experience.
- Integration of all software modules within the graphical user interface, aligning with defined standards.
- Seamless interaction between the user interface and the user management module, with a dedicated section for login/logout operations.
- Adherence to a simplified design approach, ensuring a standardized template across all interfaces for consistency and ease of use.

Login Interface:

The registered users can log in using this feature. If a user is new to the application, they will be prompted to sign up with the application and then log in.

Search:

The patients can book the appointment concerning certain constraints like hospital, doctor, department specialty, etc. This function is facilitated through the search option. On the other hand, the admin can also check the details of patients and doctors concerning this search option.

Categories View:

The category's view shows the categories of hospitals and provides the doctor's details.

Admin's Control Panel:

This control panel serves as a comprehensive tool for user management, enabling actions such as adding or removing users, editing user details, and managing schedules. It offers the capability to view intricate user information, facilitating seamless administration of user accounts and schedules. Here, the users are doctors and patients.

Assistant's Control Panel:

The Control panel includes additional accounts that handle Specialty outpatients, limited to specific doctors. It enables viewing user details, updating records, and checking appointments of the doctor, but lacks the authority to approve appointments.

4. System Features

The users of the system should be provided with the assurance that their account is secure. This is possible by providing: -

- User authentication and validation of members using their unique member ID.
- Proper administrator monitoring involves updating account status and displaying popup messages to users.
- Proper accountability includes not allowing a user to see another user's account. Only the administrator will see and manage all user accounts

5. Other Non-functional Requirements

5.1 Performance Requirement

The proposed system is used in appointment scheduling, which interacts with the patients with various hospitals and doctors. Therefore, it is expected that the database would perform functionally all the requirements that are specified by the hospital.

- ➢ The performance of the system should be fast and accurate.
- ➢ The hospital appointment Scheduler shall handle expected and non-expected errors in ways that prevent loss of information and long downtime periods.

- Thus it should have built-in error testing to identify invalid username/password.
- The system should be able to handle large amounts of data. Thus it should accommodate a high number of users of different hospitals and users without any fault.

5.2 Safety Requirement

- The database may crash at any certain time due to a virus or operating system failure.
- Therefore, it is required to take the database backup so that the database is not lost.
- A proper UPS/inverter facility should be there in case of power supply failure.

5.3 Security Requirement

- The system will use a secured database
- Normal users can just read information, but they cannot edit or modify anything except their personal and some other information.
- The system will have different types of users and every user has access constraints
- Proper user authentication should be provided
- No one should be able to hack a user's password
- There should be separate accounts for admin and members such that no member can access the database and only the admin has the right to update the database.

5.4 Requirement attributes

- There may be multiple admins creating the project, and all of them will have the right to create changes to the system. But the members or other users cannot make changes
- The project should be open source. However, the details in the database must be confidential.
- The Quality of the database is maintained in such a way that it can be very user-friendly to all the users of the database.
- The user be able to easily download and install the system

5.5 Business Rules

A business rule is anything that captures and implements business policies and practices. A rule can enforce business policy, plan, or infer new data from existing data. This includes the rules and regulations that the System users should abide by. This includes the cost of the project, and the discount offers provided. The users should avoid illegal rules and protocols. Neither the admin nor the member should cross the rules and regulations.

5.6 User Requirement

The users of the system are members and the Admin of each hospital acts as administrator to maintain the system. The members are assumed to have basic knowledge of computers and internet browsing. The administrators of the system should have more knowledge of the internals of the system and can rectify the small problems that may arise due to disk crashes, power

failures, and other catastrophes to maintain the system. The proper user interface, user manual, online help and the guide to install and maintain the system must be sufficient to educate the users on how to use the system without any problems.

The admin provides certain facilities to the users in the form of: -

- Backup and Recovery
- Data replication i.e. if the data is lost in one branch, it is still stored with the server
- Forgot Password
- Maintaining files i.e. File Organization
- Auto Recovery i.e. frequently auto-saving the information
- Data migration i.e. whenever a user registers for the first time then the data is stored in the server
- The server must be maintained regularly, and it must be updated from time to time

6. Other Requirements

6.1 Data and Category Requirement

There are different categories of users namely patients, Doctors, Admin, Assistants etc. Depending upon the category of user the access rights are decided. It means if the user is an admin, then he can be able to modify the data, delete, append etc. All other users except the Doctor and Assistants only have the rights to retrieve the information about database. Similarly, there will be different departments available. According to the categories of the hospital the doctor's availability should be displayed. The categories and the data related to each category should be coded in a particular format.

6.2 Appendix

A: Admin, Abbreviation, Acronym, Assumptions, Assistant; B: Books, Business rules; C: Class, Conventions; D: Data requirement, Dependencies, Doctor; G: GUI; N: Non-functional Requirement; O: Operating environment; P: Performance, Perspective, Purpose, Patient; R: Requirement, Requirement attributes; S: Safety, Scope, Security, System features; U: User, User class and characteristics, User requirement;

6.3 Glossary

The following is the list of conventions and acronyms used in this document and the project as well:

- User: A general login ID assigned to most users
- Administrator: A login ID representing a user with user administration privileges to the software
- Client: Intended users for the software(patient)
- SQL: Structured Query Language; used to retrieve information from a database
- SQL Server: A server used to store data in an organized format

- Layer: Represents a section of the project
- User Interface Layer: The section of the assignment referring to what the user interacts with directly
- Application Logic Layer: The section of the assignment refers to the Web Server. This is where all computations are completed
- Data Storage Layer: The section of the assignment referring to where all data is recorded
- Use Case: A broad-level diagram of the project showing a basic overview
- Class diagram: It is a type of static structure diagram that describes the structure of a system by showing the system's cases, their attributes, and the relationships between the classes
- Interface: Something used to communicate across different mediums
- Unique Key: Used to differentiate entries in a database

6.4ClassDiagram