

**FALL SEMESTER 2023, BSE-5B**

**SOFTWARE CONSTRUCTION LAB SEL-311**

**Lab-3 “SRS Document”**

**PROJECT TITLE: Hospital Management System**

**LAB INSTRUCTOR: Engr. HAMZA**

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Software Requirements Specification

for

Hospital Management System

Version 1.0 approved.

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Revision History

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| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
|  |  |  |  |
|  |  |  |  |

**Task No. 1:** Write SRS for your project and submit it.

**Solution:**

# Introduction

## Purpose

A hospital management system is software designed to manage all the areas of a hospital such as medical, financial, administrative and the corresponding processing of services.

## Document Conventions

Uppercase is used to denote abbreviations.

## Intended Audience and Reading Suggestions

Developers, testers, and project managers. It could also include stakeholders in other departments, including leadership teams, sales, and marketing.

## Product Scope

Daily functions like patient registration, managing admission and overall management of various departments can be easily performed with higher accuracy after the installation of hospital software. The modules of hospital management software are user-friendly and easy to access.

✓ The proposed software product is the Hospital Management System (HMS). The system will be used to get the information from the patients and then store that data for future usage.

✔The current system in use is a paper-based system. It is too slow and cannot provide updated lists of patients within a reasonable timeframe.

✓ The intentions of the system are to reduce over-time pay and increase the number of patients that can be treated accurately.

Requirements statements in this document are both functional and non-functional.

# Overall Description

## Product Perspective

This project gives the procedural approach how a patient gets treatment, details about date of treatment and finally depending on different criteria like room allocated, lab reports, treatment and medicine taken…. Etc., how billing is calculated. During billing health care facility is also considered.

**Quality Assurance:**

1. Receive Feedback online.
2. Auto Summarize Feedback
3. Report to Admin
4. Record Performance on Individual.

**Appointment/Scheduling:**

1. Book Online Appointment
2. Appointment SMS alert

**Cash/Billing Unit:**

1. Manage Cash
2. Print receipts and bills
3. Calculate services price.
4. Accept banks/insurance cards.

**Stock:**

1. Add items.
2. Update items
3. Track stocks availability
4. Order vendors online

**Facility management:**

1. Track room availability
2. Alert for survey
3. Patient Request necessary items

**Insurance Management**

1. Check insurance information.
2. Manage insurance agencies.
3. Alerts if issue

**Helpdesk:**

1. Request any info help.
2. Auto reply on similar queries.
3. Generate receiving on query.

## Product Functions

**Patient Module:**

1. Add patients.
2. Update Info.
3. Delete and Search patients.
4. Assign Patient ID

**Doctor Module**:

1. Update or add doctors.
2. Search availability

**Accounting**:

1. View daily payments.
2. Transfer salaries
3. Expenses manage.
4. Calculate sales tax.
5. Print salary sheets

**Pharmacy**:

1. Order Medicines
2. Stock management
3. Generate Sales Bills
4. Add/update medicines.

**Laboratory:**

1. Search Reports
2. Request Labs Equipment
3. Upload Reports Online
4. Print Reports

**Employees Module:**

1. Add/Update Information.
2. Assign Employee ID

## User Classes and Characteristics

The system will be used in the hospital. The administrators, front-desk staff will be the main users. Given the condition that not all the users are computer-literate. Some users may have to be trained in using the system.

## Operating Environment

Software requirements

* Windows 7 or above operating system
* JRE 1.8
* MySQL server

Hardware Requirements

* Core i3 processor
* 2GB Ram (4GB advisable)
* 1TB hard disk space in Server Machine

It describes all the details that the software developer needs to know for designing and developing the system. This is typically the largest and most important part of the document.

## Design and Implementation Constraints

Interface will be in English only.

System is working for single server.

GUI Features are available.

## User Documentation

User Manual

Vision Scope Document

SRS Document

## Assumptions and Dependencies

This product does require back-end database for storing Information of patient. User must be trained for basic computer functionalities, have basic knowledge of English and system must be able to respond to database software within reasonable time.

# External Interface Requirements

## User Interfaces

User interface is designed in a user-friendly manner and the user, in another end he must give the order, for that he will interface with keyboard and mouse.

If the user gets stuck in filling in the registration form, login form or booking form then the friendly error message will pop up. This message helps the user to identify what mistake is user making and help in solving the errors.

## Hardware Interfaces

Since the system is web based and requires internet connection all devices must have stable internet connection to access the system. As for e.g., Modem, WAN – LAN, Ethernet Cross-Cable, Wi-Fi etc.

For the devices that are accessing the system, a browser which supports HTML, CSS, JavaScript, and C# is required.

## Software Interfaces

Following are the software that used for Hospital Management website:

|  |  |
| --- | --- |
| **Software used** | **Description** |
| Operating system | We have chosen MS Windows operating system for its best support and user-friendliness. |
| Database Server | To save the patient records, and other related information we have chosen SQL database. |
| Client-Side Coding | To implement the project, we have chosen html, CSS for client-side coding and styling. |
| Client-Side scripting | We have chosen JavaScript for client-side scripting. |
| Server-Side Scripting | We have chosen C# for server-side scripting |
| Browser | Google Chrome. |

## Communications Interfaces

The communication interface will use the TCP/IP for data communication or transmission. SMTP/HTTP will be used to generate and send email regarding patient reports and other related information to the users. File Transfer Protocol (FTP) will be used to send these generated emails and documents to the user FTP server. If possible, all offline and online access will be monitored, for transparency purposes, and in order to reduce abuse and unauthorized access of the system. We will use the simple electronic forms for the reservation forms, ticket booking etc.

# System Features

## System Feature 1

### Description and Priority

The system needs high priority when data is to be updated. The guide should not be allocated to two same group at same day and same time.

### Stimulus/Response Sequences

The confirmation of the booking needs a quick response. Updating data at the same time needs a quick response.

## Functional Requirements

**REQ-1: User Account Management**

The system shall allow hospital administrators to create, manage, and deactivate user accounts for hospital staff, including doctors, nurses, and administrative personnel.

**REQ-2: Patient Information Management**

The system shall enable authorized healthcare providers to view and update patient information, including medical records, diagnoses, treatment plans, and prescription details.

**REQ-3: Appointment Scheduling**

The system shall facilitate the scheduling of patient appointments with healthcare providers, allowing for appointment creation, modification, and cancellation.

**REQ-4: Medical Records Management**

The system shall maintain and organize electronic medical records (EMR) for patients, ensuring data accuracy, confidentiality, and accessibility.

**REQ-5: Billing and Insurance**

The system shall generate and manage patient invoices, process insurance claims, and track financial transactions related to healthcare services.

**REQ-6: Inventory Management**

The system shall monitor and manage hospital inventory, including medical supplies, equipment, and pharmaceuticals, by tracking stock levels, reordering supplies, and managing expirations.

**REQ-7: Laboratory and Test Management**

The system shall facilitate the ordering, tracking, and reporting of laboratory tests and diagnostic procedures, including test scheduling, result retrieval, and integration with patient records.

**REQ-8: Prescription and Medication Management**

The system shall support healthcare providers in prescribing medications, maintaining a medication database, and tracking patient medication history.

**REQ-9: Patient Admission and Discharge**

The system shall streamline the admission and discharge processes, allowing for patient registration, room assignment, and discharge planning.

**REQ-10: Electronic Health Records (EHR) Integration**

The system shall integrate with existing Electronic Health Records (EHR) systems, enabling seamless data exchange and interoperability.

**REQ-11: Reporting and Analytics**

The system shall provide comprehensive reporting and analytics capabilities, allowing hospital administrators to analyze patient data, financial metrics, and operational performance.

**REQ-12: Staff Scheduling**

The system shall assist in scheduling hospital staff, including doctors, nurses, and support personnel, considering shift assignments, time-off requests, and workload distribution.

**REQ-13: Emergency Response and Alerts**

The system shall support emergency response by sending alerts and notifications to appropriate personnel in the event of critical situations or patient emergencies.

**REQ-14: Security and Access Control**

The system shall implement robust security measures, including user authentication, role-based access control, and encryption, to protect patient data and system integrity.

**REQ-15: Telemedicine Integration**

The system shall integrate with telemedicine platforms to enable remote consultations and telehealth services for patients.

**REQ-16: Mobile Access**

The system shall provide mobile access for healthcare providers to access patient information, make updates, and view schedules from smartphones and tablets.

# Other Nonfunctional Requirements

## Performance Requirements

In this system the response time for loading and processing the task is very fast and can be triggered by a single click. If there is only one user who want to perform a task, then the performance time will be excellent. So, the system should have high performance and a low or no failure rate. The hardware and software should be integrated and able to send or receive the data from a database at a high rate.

## Safety Requirements

If there is an extensive impairment to a wide portion of the database due to any circumstances, such as a disk crash, the recovery method restores a past copy of the database that was backed up to archival storage and reconstructs a more current state by reapplying or redoing the operations of committed transactions from the backed-up log, up to the time of failure.

All offline and online access will be monitored, for transparency purposes, and to reduce abuse and unauthorized access of the system. Most actions will require a yes/no confirmation before it is performed.

## Security Requirements

Security is one of the important features of any online system. So, to ensure security, the user of the system should be registered to access any confidential information. The admin panel also asks for admin to first enter the login credentials then give access to the panel. Each password shall be required to be between 8-12 characters in length and shall be required to contain at least one capital letter, one number, and one special character. Passwords will need to be changed every half-year, with a unique password. The user data in the database should not be outsourced for any reason.

## Software Quality Attributes

* **Maintainability and Expandability:**

The system should be designed to be easily maintainable. So, if there is any need to add new functionality or correct errors then it does not take lot of time and effort to implement or handle errors. And the new functionality can be easily accessed from other parts of the system.

* **Reliability and Efficiency:**

The system responds to the request in a reasonable period at least before the session expires. Also, it should be able to give the valid result if no data is found. So, the system should not have crashed on generating the wrong query.

* **Usability:**

A consistent user interface should be developed to help the system to be user friendly. Therefore, the component should be in the right place and fashion to help the user interact easily with the system.

## Business Rules

* Want to take responsibility for failures due to hardware malfunctioning.
* The warranty period for maintaining the software would be one year.
* Additional payments will be analyzed and charged for further maintenance.
* If any error occurs due to a user’s improper use. The warranty will not be allocated to it.  No money back returns for the software.
* Trust bond placement should be done before designing and coding. An advance or an Agreement.
* **Patient registration:** A new patient must provide their personal and contact information, including name, address, phone number, and insurance information, to be registered in the system.
* **Unique patient ID:** Each patient must be assigned a unique ID that is generated by the system and can be used to identify and retrieve the patient's information.
* **Access control:** Only authorized personnel, such as administrators and receptionists, can access the system and add or modify patient data.
* **Data privacy:** Patient information must be protected and kept confidential, with strict access controls in place to prevent unauthorized access or misuse of data.
* **Average length of stay:** The system must be able to calculate and track the average length of stay for patients, from the time they are admitted to the time they are discharged.
* **Time to service:** The system must be able to track and measure the time it takes for patients to receive healthcare services after they arrive at the hospital.
* **Hospital incidents:** The system must be able to track and measure incidents that occur within the hospital, such as adverse events or medical errors, to improve the quality of care provided.
* **Patient satisfaction:** The system must be able to gather and track patient satisfaction data to assess the overall quality of care provided by the hospital.
* **Patient readmission rate:** The system must be able to track and measure the number of patients who are readmitted to the hospital after being discharged.

# Other Requirements

There are no other requirements for this system.

Appendix A: Glossary

* **FTP**
  + File Transfer Protocol
  + Protocol to send/receive files to/from an FTP server.
* **SQL**
  + Structured Query Language
  + A programming language used for making queries to a database, and setting/retrieving data to/from it.
* **TLS**
  + Transport Layer Security
  + A high-encryption security protocol for internet connection
* **TCP/IP**
  + Transfer Control Protocol/Internet Protocol

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* **TCP**
  + A protocol for transferring data to/from the internet.
* **IP**
  + A protocol for allowing computers/devices with this to connect to the internet.
* **Database**
  + Big memory address block which contains large set of data
  + With subsets and fields that can search for by filter, read, and written.
* **CFD:** Context Flow Diagram
* **DFD:** Data Flow Diagram
* **IDE:** Integrated Development Environment
* **Java:** Platform Independent,
* **OOP:** Object Oriented Programming
* **SRS:** Software Requirement Specification