# Vision Document
# Hospital Management System

## 1. Introduction

The purpose of this document is to provide a complete overview of our Hospital Management System and the motivations behind building it. This vision document will capture the focus, stakeholder needs, goals and objectives, target markets, user environments, target platforms, and features of the proposed system. The purpose of the Hospital Management System is to manage and coordinate the different departments of a hospital.

## 2. Positioning

### 2.1. Problem Statement

| | |
|---|---|
| The problem of | Current manual system used in hospitals for managing day to day tasks |
| Affects | Patients, Doctors, Administrative team, employees |
| The impact of which is | Disruption for the stakeholders due to difficulty in accessing data and managing critical tasks |
| A successful solution would be | The system which can manage the clinical, financial and administrative aspects of a hospital. Main purpose is to provide fast and efficient services to improve the accessibility of the hospital and to analyze the patient's medical history. |

### 2.2. Product Position Statement

| | |
|---|---|
| For | Hospitals |
| Who | have difficulties in managing data and regular tasks manually |
| The Hospital Management System | is a Software |
| That | provides the ability to manage patients with ease, retrieve data faster, better inter coordination and needs less human intervention |
| Unlike | the manual way in which there is lack of immediate retrieval, prompt updating which generally leads to manual errors and is very expensive |

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|---|---|
| Our product | provides better services to all the key stakeholders by improving transparency in management process, personalized profile for stakeholders, better billing management, pharmacy management, paperless consultation, payroll management etc. |

# 3. Stakeholder Descriptions

## 3.1. Stakeholder Summary

| Name | Description | Responsibilities |
|---|---|---|
| Doctor | He is a healthcare professional who diagnoses patients and prescribe reports and medicines to patient | View the Patient details<br>Prescribe medications and tests<br>View the consultation information and schedule |
| Patient | Patient consults hospital for treatment of his illness or diseases. | Get the doctor appointment online<br>View the test reports<br>Adhere to prescribed reports and medications<br>Check and pay the bills |
| Administrator | He has full access to the system and responsible for managing users and their roles. | Adds and manages doctors and other employees of the hospital |
| Receptionist | Employed in the hospital to deal with the patients and other visitors in hospital | Verify the patient's appointment<br>Respond to the patient queries<br>Assist emergency cases |
| Helping Staff | Includes nurses and ward staff | Help Doctors<br>Provide assistance to the patients |
| Clerical Staff | A person employed to manage records and accounts, and to undertake routine administrative duties. | Payroll<br>Patient billing<br>maintain the patient health records |
| Pharmacy Department | A part of the health care team directly involved with patient's medication | Provide medications according to prescription<br>Update patient's profile with medication chart<br>Monitor the medicines supply and maintain the inventory. |

| | | |
|---|---|---|
| Laboratory Staff | A part of health care team that manages the lab equipment and performs the tests. | Perform the tests according to the prescription.<br>Generate the reports and add to the patient's profile<br>Update the billing details to clerical staff |
| Other Staff | Secondary staff responsible for maintaining the hospital premises and other services such as cleaning staff, ambulance staff. | Provide ambulance services in emergency situations<br>Maintain the hygiene and cleanliness in the hospital premises |

### 3.2. User Environment

The current environment allows the users to interact with the **Hospital management system (HMS)**.
A person with the user credentials can perform the following actions based on their role.
Booking of appointment through **HMS**.
Doctors can view the patient treatment history, treat patient accordingly and prescribe medications and reports.
Patient can view their bills and lab reports in personalized profile.

Currently, the system's operational tasks are as follows:

- Recording information about the Patients
- Maintaining personalized profile for stakeholders
- Generating bills by combining the charges of reports, medications and consultation
- Keeping record of the medications, immunization, reports provided to children/patients.
- Keeping information about various diseases and medicines available to cure them.

In future the system will be allowed to integrate with the mobiles by releasing application based on platform like Android, iOS.
A new touch-based system will be implemented in the hospital where user can directly book the appointments and get the doctor availability details through kiosk.

## 4. Product Overview

### 4.1. Product Perspective

This hospital management system is self-contained with an intention to treat more patients accurately. The system is an expedient way for hospitals which reduces the burden of storing and handling data and helps to manage different sections of hospital by providing better interoperability. The system improves the processing efficiency, saves a lot of time, increases productivity and help to make most out of available manpower.

### 4.2. Assumptions and Dependencies

| Assumptions | Dependencies |
|---|---|
| Compatible computers will be available | User interaction and operability |
| Trained will be Hospital Staff | Uniform work |
| Server downtime will be zero | High availability of infrastructure |
| User will have valid credentials | Access to the system |

### 4.3. Needs and Features

| Need | Priority | Features |
|---|---|---|
| Consult doctor by online appointments | High | Register Patient<br>Collect details<br>Allocate doctor |
| Payroll Handling | High | Track working hours<br>Calculate pay and taxes<br>Reflect net pay in user's profile |
| Billing | High | Combine lab, medication and consultation charges<br>Reflect due amount in user's profile |
| Manage Pharmacy | Medium | Provide Medications according to prescription<br>Update Medication chart and charges in user's profile<br>Send bill to Billing department<br>Manage pharmacy inventory |
| Maintain Patient's Medical history | Medium | Register new patients<br>Update details for existing patients<br>Maintain information in user's profile |
| Manage Laboratory workflow | Medium | Perform test according to prescription<br>Update reports and charges in user's profile<br>Send bill to Billing department<br>Manage the laboratory inventory |
| Handle emergency situations | High | Coordinate with the ambulance staff<br>Register and Assist patient<br>Allocate a doctor immediately |

### 4.4. Alternatives and Competition

N/A

## 5. Other Product Requirements

**Hardware Requirements:**

- Minimum 4 GB RAM
- Minimum 10 GB storage
- 64-bit Processor
- Webcam to capture a photo for user profile
- Multifunctional Printer and Scanner

**Platform Requirements:**

- Windows 8 or above

**Performance Requirements:**

- Privacy and Confidentiality of User's records

**Design Constraints:**

- Multi-language support

| | | |
|---|---|---|
| **HMS** | : | Hospital Management System |
| **Proposed System** | : | Major new systems and subsystems that are undergoing design and implementation |
| **Target Market** | : | A particular group of consumers at which a product or service is aimed |
| **Human Intervention** | : | When a human has to make efforts and involve manually in the system |
| **Inventory** | : | Comprehensive information about the stock of medications and other clinical artifacts |
| **Report** | : | Test report for patient based on test observations |
| **Clerical Staff** | : | A person employed to perform administrative, clerical tasks in the hospital |
| **Immunization** | : | The action of making a person immune to infection |
| **Kiosk** | : | User Interface of the system, allowing the patients to interact with the system at the hospital and book appointments |
| **iOS** | : | iPhone Operating System |
| **Interoperability** | : | The ability of computer systems or software to exchange and make use of information |
| **Available Manpower** | : | The number of people working or available in the hospital |
| **Server Downtime** | : | It refers to a period of time that a system fails to provide or perform its primary functions |
| **Credentials** | : | Username and password required to access the system |
| **Medication Chart** | : | Instructions about consuming prescribed medications |
| **UCM** | : | Use Case Model |
| **Throughput** | : | Transactions per second |
| **GUI** | : | Graphical User Interface |
| **NFRs** | : | Non-Functional Requirements |

## Revision History

| Date | Rev. | Description | Author(s) |
|---|---|---|---|
| 2018-11-03 | 1.0 | Use Case Model Document Actor-Goal list | Author |
| 2018-11-05 | 1.1 | Brief cases and fully dressed use case | Author |
| 2018-11-06 | 1.2 | Main success Scenario and use case Diagram | Author |
| 2018-11-10 | 1.3 | UCM Refinement | Author |

## 1. Actor-Goal List

| Actor | Goal |
|---|---|
| Patient | Consult a doctor through online appointment<br>View personalized profile<br>Check the bills |
| Doctor | View consultation information and schedule<br>Treat the patient<br>Prescribe medications and tests<br>Check patient's medical history<br>View personalized profile<br>Receive payroll |
| Receptionist | Verify patient's appointment<br>Assist emergency situations<br>Respond to customer's queries<br>View personalized profile<br>Receive payroll |
| Administrator | Adds and manages doctors and other employees of the hospital |
| Clerical Staff | Payroll management<br>Patient billing<br>Maintain the patient health records<br>Maintain Employee's records<br>View personalized profile<br>Receive payroll |

| | |
|---|---|
| Pharmacy Staff | Provide medications according to prescription<br>Update the billing details to clerical staff<br>Update patient's profile with medication chart<br>Monitor the medicines supply<br>Maintain the inventory<br>View personalized profile<br>Receive payroll |
| Laboratory Staff | Perform the tests according to the prescription<br>Generate the reports<br>Update patient's profile with test reports<br>Update the billing details to clerical staff<br>View personalized profile<br>Receive payroll |
| Helping Staff | Help Doctors<br>Provide assistance to the patients<br>View personalized profile<br>Receive payroll |
| Ambulance Staff | Provide ambulance services in emergency situations<br>View personalized profile<br>Receive payroll |
| Cleaning Staff | Maintain the hygiene and cleanliness in the hospital premises<br>View personalized profile<br>Receive payroll |
| HMS | Help administrator to manage users<br>Manage online appointments<br>Manage stakeholder's records<br>Manage personalized profiles for patients and employees<br>Manage payroll system<br>Manage patient's billing<br>Manage pharmacy inventory<br>Manage emergency situations |

# 2. Use Case Model

**Use case:** Treat Patient
**Actor:** Patient, Receptionist and Doctor

**Description:** Before coming to the hospital, the patient books the appointment online. The receptionist verifies the appointment and allocates the available doctor. The doctor treats the patient and prescribe medication and reports.

**Use case:** Book Appointment
**Actor:** Patient, Receptionist
**Description:** The patient books an appointment online and comes at the given time to the hospital. The receptionist verifies the appointment and allocates the available doctor.

**Use case:** Handle emergency case
**Actor:** Patient, Doctor, Receptionist, Ambulance staff
**Description:** In emergency conditions, the patient can come directly without booking an appointment or can call ambulance for emergency. The ambulance staff is responsible for bringing the patient to the emergency room and inform the receptionist. The receptionist will call the in-house doctor to handle the situation. The doctor will treat the patient.

**Use case:** Add patient details
**Actor:** Patient, Receptionist
**Description:** Patient fills out online form, verifies all the details and submit form. System adds the patient record in the database and displays the Patient _id to the patient.

## 3. Package: Main

**Id**: UC- 1

**Use Case:** Treat patient

**Description:** Before coming to the hospital, the patient books the appointment online. The receptionist verifies the appointment and allocates the available doctor. The doctor treats the patient and prescribe medication and reports.

**Level:** User Goal

**Primary Actor**
Patient, Doctor

**Supporting Actors**
Receptionist, HMS, Pharmacy staff and Laboratory staff

**Stakeholders and Interests**

Patient: Book online appointment and get treatment.

Doctor: Views the patient's medical history, treat patient and prescribe medications and reports if applicable.

**Pre-Conditions**

The user is authenticated.

**Post Conditions**

Patient gets the treatment and pays the bill.

Success end condition

Patient should be able to book appointment online.
Patient should get the required treatment correctly.

Failure end condition:

Patient is not able to book appointment online.

Minimal Guarantee

If the patient is not able to book the appointment online then under emergency situations or exceptional case, patient will get the treatment.

**Main Success Scenario**

1. Patient has valid credentials and can login to the system.
2. Patient books online appointment to consult a doctor.
3. Patient comes to the hospital and the receptionist verifies the appointment.
4. Receptionist assigns a doctor and sends the patient to the assigned doctor.
5. Doctor checks the medical history and treats the patient accordingly.
6. Patient gets the medication from pharmacy with medication chart if any.
7. Patient gets the test done in the laboratory and get the reports, if any.
8. A bill is generated, and the patient pays the bill.

**Extensions**

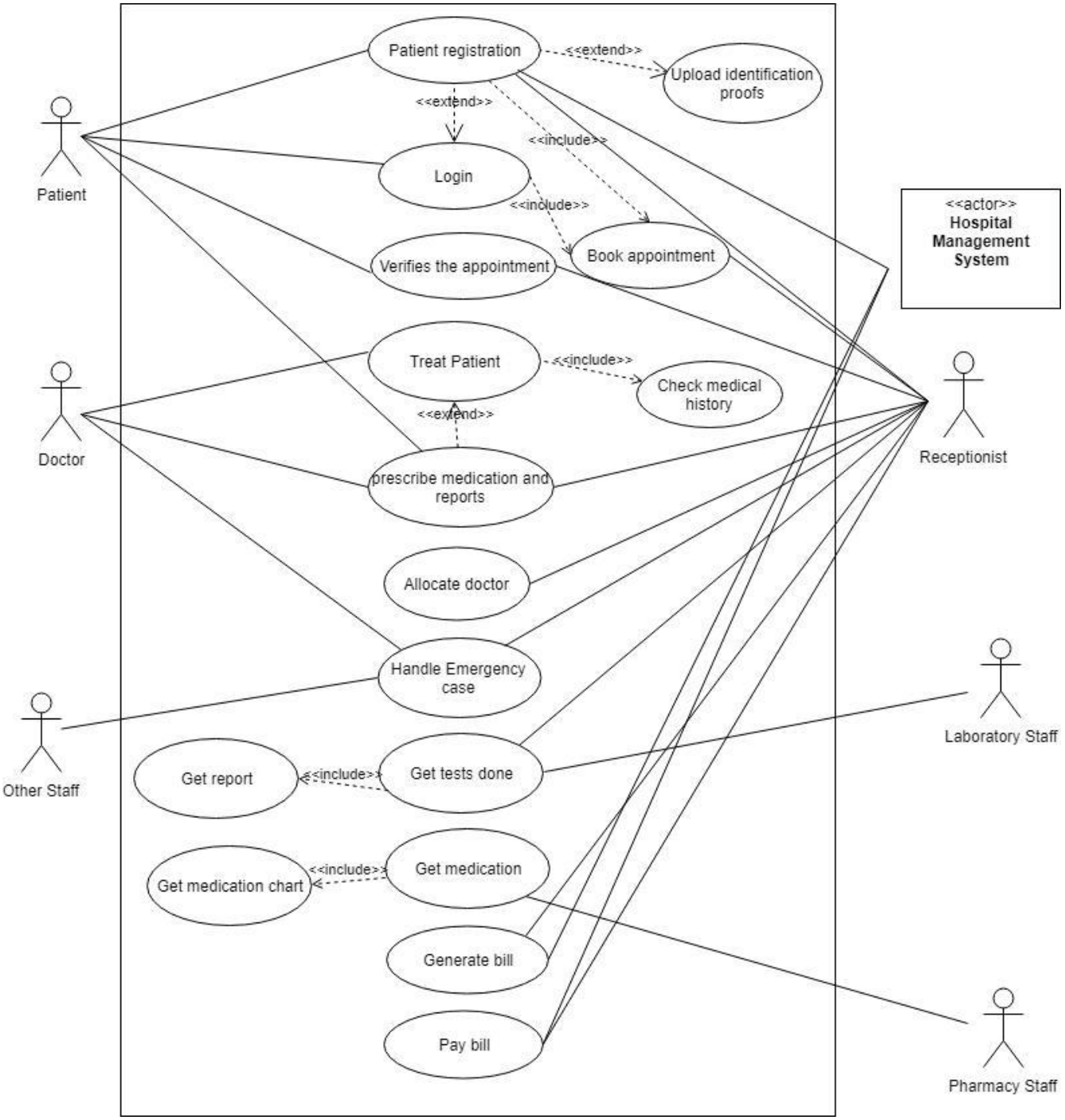
1a. If the patient is not registered, then the patient will not be able to login
- Patient needs to register in the system.

5a. Doctor prescribe medications and reports if applicable.
- Doctor will check the test reports and treat the patient accordingly.

## Special Requirements

1. Any user should have valid credentials to access the system.
2. Unauthorized person cannot access the private information of patients and employee's details.

## Use case diagram



# Hospital Management System
# Supplementary Specification and Glossary
**Version <1.2>**

## Revision History:

| Date | Rev. | Description | Author(s) |
|---|---|---|---|
| 2018-11-02 | 1.0 | SRS 1.0 | Author |
| 2018-11-08 | 1.1 | SRS 1.1 | Author |
| 2018-11-11 | 1.2 | SRS 1.2 | Author |

# Table of Contents

# Supplementary Specification

## 1. Introduction

### 1.1. Purpose

The purpose of this document is to describe the information about HMS that is not captured in the use-cases.

### 1.2. Scope

This document is associated with HMS which is an expedient way for hospitals which reduces the burden of storing and handling data and helps to manage different sections of hospital by providing better interoperability.

### 1.3. Definitions, Acronyms and Abbreviations

Refer to the Glossary at the end of this document.

### 1.4. References

- P. K. A. (2013). *Hospital Management System.* Rajkot.
- Srikanth, R. (2010). *Software Requirement Specification.*

### 1.5. Overview

This Supplementary requirement document formally specifies Hospital Management System. The first section of this document specifies the additional functional requirements which are not specifies in the UCM and the later section describes the NFRs.

## 2. Functionality

### 2.1. Allocate room:

Before a patient is admitted, room is allocated as per the availability.

### 2.2. Generate report:

Lab staff can generate the report for the patients by entering the observed values for the required fields.

### 2.3. Generate Bill:

The system will calculate the total bill amount by summing up consultation charges, pharmacy bills and laboratory charges.

## 3. Usability

User should be familiar with the general use of browsers to use the system. The system is user friendly and self-explanatory.

# 4. Reliability

### 4.1. Availability:

The system shall be available all the time, except in the case of failure and system maintenance.

### 4.2. Mean Time Between Failures (MTBF)

The MTBF shall be as less as once in duration of six months.

### 4.3. Mean Time to Repair (MTTR)

The MTTR shall be maximum three hours.

### 4.4. Accuracy

N/A

### 4.5. Maximum bugs or defect rate

N/A

### 4.6. Bugs or defect rate

System may contain minor bugs, but no critical bug will be present.

# 5. Performance

### 5.1. Response Time

The average response time shall be as less as 2 seconds after interacting with the system.

### 5.2. Throughput

The system throughput shall be as high as possible.

### 5.3. Capacity

The HMS will be able to accommodate 5000 users at a time.

### 5.4. Degradation modes

N/A

### 5.5. Resource Utilization

The system will require at least 1.6 GB of storage space and 500 MB RAM to run efficiently.

# 6. Supportability

### 6.1. Internet Protocols

The system shall be complying with the TCP/IP protocol standards and shall be designed accordingly.

### 6.2. Information Security Requirement

The system shall support the UHCL information security requirements and use the same standard as the UHCL information security requirements.

### 6.3. Standards

The coding standards and naming conventions will be as per the American standards.

# 7. Design Constraints

### 7.1. Database

The system shall use RDBMS

### 7.2. Operating System

Windows 7/8/10 is required to install the system.

### 7.3. Language Support

The system shall provide multi language support.

### 7.4. Camera support

The system shall be compatible with external camera to capture user photos for the profile.

# 8. Online User Documentation and Help System Requirements

N/A

# 9. Purchased Components

N/A

# 10. Interfaces

### 10.1. User Interfaces

All the interactions with the HMS will occurs through a GUI.

### 10.2. Hardware Interfaces

HMS should support Web Camera and Printer.

### 10.3. Software Interfaces

HMS will use an external Payment gateway and a text calculator as per the government standards. A firewall will be used with the server to prevent unauthorized access to the system.

### 10.4. Communications Interfaces

The HMS is connected via LAN and WWW for communication.

# 11. Licensing Requirements

The HMS shall be installed and activated by a license key generated by developers.

# 12. Legal, Copyright and Other Notices

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## 13. Applicable Standards

HMS will follow government standards to calculate tax for the employee's payroll.

## 14. Glossary

| | |
|---|---|
| **HMS** | Hospital Management System |
| **PUHN** | Personal Unique Health Number |
| **Login ID** | A user identification number to enter the system |
| **GUI** | Graphical user Interface |
| **Password** | A word or string of characters used for user authentication to prove identity to system gain access to HMS |
| **Report** | Test report for patient based on test observations |
| **Clerical staff** | A person employed to perform administrative, clerical tasks in the hospital |
| **NFRs** | Non-Functional requirements |
| **UCM** | Use Case Model |
| **RDBMS** | Relational Database Management |
| **LAN** | Local Area Network |
| **WWW** | World Wide Web |