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# **Introduction**

My project Hospital Management system includes registration of patients, storing their disease details into the system. My software has the facility to give a unique id for every patient and stores the details of every patient. The Hospital Management System can be used by entering respective username and password. It is accessible either by an administrator or receptionist. Only the respective person can add data in the database. The data can be retrieved easily. The interface is very user-friendly. The data are well protected and data processing is very fast, accurate and relevant.

# Purpose

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

# Project 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.

# 1.4 SUCCESS METRICS:

# 1.4.1 Average Length of Stay

This metric tracks how long a patient stays at a hospital, from time admitted through discharge.Average length of stay is important because it can provide a measure of efficiency within each hospital..

# 1.4.2 Time to service

This metric measures the time it takes from when the patient arrives at the hospital to when the patient receive healthcare services, including the amount of time it takes to see either a nurse or a doctor. Time to service is important because it provides useful information on a hospital’s ability to provide prompt services to its patients.

# 1.4.3 Hospital Incidents

This metric measures the ability of a hospital to provide quality care for its patients. Tracking hospital incidents is important because it provides data on the quality of care patients are receiving via a specific hospital.

1.4.4 Patient Satisfaction

This metric measures the satisfaction level of a patient’s hospital stay and care provided. If patient satisfaction is high, patients may recommend the hospital to family and friends. This metric may also have an impact on how hospitals market themselves.

# 1.4.5 Patient Readmission Rate

This metric provides data on the number of patients that must return to the hospital after a short period of being discharged.

# Definition,Acronyms,Abbreviations

**CFD**: - Context Flow Diagram

**DFD**: - Data Flow Diagram

**IDE**: - Integrated Development Environment

**Java**:- Platform Independent,

**OOP**:- Object Oriented Programming

**SQL**: - Structured Query Language

**SRS**: - Software Requirement Specification

# Intended audience

The intended audience of this document would be the client and specific employees like Manager and Receptionist, consultants and System Operators, and project team, supervisor with the objective to refer and analyze the information. The SRS document can be used in any case regarding the requirements of the project and the solutions that have been taken. The document would finally provide a clear idea about the system that is building.

# **Standard Overview**

# Product Scope

Currently, Al-Hayaat Medical Centre is using manual system to handle the hospital process. Every operation was being done manually. As system is file-based, as management face difficulties to save records. It causes an issue for organizing information and processing operations.

As HMS will be covering all basic processes that will resolve the issues that are being faced by management. This system will move around patient, doctors and hospital staff. It would handle patient records, Staff members records and their salaries, pharmacy management, laboratory management, finance management, Insurance management, stock management, Quality assurance, facilities management, and appointment/scheduling management.

Our goal is to make a client satisfied system by full filling the client requirements and improving the current manual system with client needs.

# Product Prespective

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.

# References

Lauesen, S, (2003), *Task Descriptions as Functional Requirements*, IEEE Computer Society,

Available: <http://www.itu.dk/~slauesen/Papers/IEEEtasks.pdf>

# Product Function

**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

**Quality Assurance**:

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

**Employees Module:**

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

**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.

**Campus Security:**

1. Receive security complains
2. Update security guidelines
3. Manage cameras recording
4. Scan thumbs

# Graphical Representation of Product Function

# 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 on using the system.

# **SPECIFIC REQUIREMENTS**

# **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 need to know for designing and developing the system. This is typically the largest and most important part of the document.

# **External Interface Requirements**

# User Interface

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

# **Hardware Interface**

* OS – Windows XP
* Hard disk – 80 GB
* RAM – 1 GB
* Keyboard – Standard QWERTY keyboard for interface
* Mouse – Standard mouse with 2 buttons

These requirements are basic requirements to run product which is acceptable for patients.

# Display Unit (LED/LCD):

Display is for to display the product.

# Laser Printer (B/W)

Simply this device is for printing bills and view reports.

# Wi-Fi router

Wi-Fi router is used to for internetwork operations inside of a hospital and simply data transmission from pc’s to sever.

# **Software Interface**

Front end – Window Foam (C#)

OS – Net Beans IDE 6.9.1 3)

Database – SQL Server 2005

Back end – C# language

# **Communications Interfaces**

* NIC (Network Interface Card) - Itis a computer hardware component that allows a computer to connect to a network. NICs may be used for both wired and wireless connections.
* CAT 5 network cable- for high signal integrity
* TCP/IP protocol-Internet service provider to access and share information over the Internet
* Ethernet Communications Interface- Ethernet is a frame-based computer network technology for local area networks (LANs)
* Ubiquitous, easy to set up and easy to use. Low cost and high data transmission rates.

# **Functional Requirements**

* Administration module:-

This module enables the user to insert, update, view and delete the patient information.

* Patient module:-

PatientId,Name,Age,Sex,Address,Phone Number,Weight

This module has following 2 sub modules:-

* Inpatient module:-

This sub module is used to store information about patients who were admitted in the hospital on doctors advice.

PatientId, Dept depending on disease, Doctor, Room no, Date of admitted, Advance, Date of discharge.

Updation like deletion and modification is done.

* Outpatient module:-

PatientId,New\_Case,Old\_Case,Date,Deptdependingon disease,Doctor .

Updation like deletion and modification is done.

* Lab module:-

This module used to store or produce the laboratory reports.

PatientId, Weight, Category, Doctor, Inpatient/Outpatient, Date.

Updation like deletion and modification is done.

* Billing module:-
* Inpatient module:-

PatientId, doctors charge, health card amount, room bill, medicine bill, total amount, No of days, Service charge, Operation theatre,Nursing care, Lab bill

# **System Features**

# USE CASE DIAGRAM

Diagram

Description automatically generated

USE CASE SCENARIOS

|  |  |
| --- | --- |
| **Name** | **Add patient** |
| Description | This function get details of a patient and add record to the patient file and generate a patient registration number |
| Actors | receptionist |
| Pre-conditions | The operator should login with user account |
| Main flow of events | 1. User selects “add patient entry “at home page 2. Patient entry form displayed 3. Users enter data to required fields 4. User selects “Add entry” button 5. “Successfully record added” message displayed. 6. System generates a patient Id and display. |

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| **Name** | **View patient records** |
| Description | This function view the patient personal information and visits records. |
| Actors | Receptionist, Admin, doctor, patient, lab engineer |
| Pre-conditions | Patient must register to the system |
| Main flow of events | 1. User selects “view patient info” 2. Enter Patient ID in search 3. You can now access the patient info. |

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| **Name** | **Add cash and Generate bills** |
| Description | This function calculate and add cash to account cash and print bill of paid cash |
| Actors | Receptionist |
| Pre-conditions | The patient must be added to system. |
| Main flow of events | 1. User select the “services” tab 2. Select the medical services patient need 3. Software will auto calculate the services amount 4. Receptionist enter the given amount by clicking “add cash” 5. On clicking software will auto print the bill. |

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| --- | --- |
| **Name** | **Monitor system activities** |
| Description | This function monitor daily activities |
| Actors | admin |
| Pre-conditions | The admin must login into the system |
| Main flow of events | 1. The user click on “monitor operations” tab 2. In this section, summary reports of each department operations will be displayed 3. By this user can analyze the daily performance of hospital. |

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| **Name** | **Generate reports** |
| Description | this function enable user to generate performance reports |
| Actors | admin |
| Pre-conditions | User should login with the user account |
| Main flow of events | 1. The user click on “monitor operations” tab 2. In this section, summary reports of each department operations will be displayed 3. Here you click “print report” 4. System will print the report. |
| **Name** | **Manage staff** |
| Description | This function enable to order and communicate with staff |
| Actors | admin |
| Pre-conditions | User should login with the user account |
| Main flow of events | 1. User click on tab “manage staff”. 2. Select the user from list to whom you want to communicate 3. Type the commanding message 4. The alert will be displayed to targeted user. |

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| **Name** | **Edit/Delete Patient record** |
| Description | This function enable user to edit/delete patient record |
| Actors | admin |
| Pre-conditions | Any staff/patient requested editing/deletion of record |
| Main flow of events | 1. user selects “edit/delete” tab 2. here requests will be viewed in order 3. so he click on “edit” or “delete” button for required editing/deletion 4. then “save” to save editing/deletion |

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| --- | --- |
| **Name** | **Upload lab reports** |
| Description | This function enable user to upload lab reports online |
| Actors | Lab engineer |
| Pre-conditions | User should login with user account |
| Main flow of events | 1. User selects “ upload report” tab 2. Enter “patient ID” in ID section 3. Then click on “upload” button 4. Then the prompt show “uploaded” |

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| **Name** | **Print lab records** |
| Description | The user can print lab reports that has been uploaded in system on request |
| Actors | Lab engineer |
| Pre-conditions | User sound login to the system |
| Main flow of events | 1. user selects “Print” tab 2. enter report number which will be print on receipt 3. now reports will be visible 4. click on “Print” button |
| extensions | 5 ) a) system generates total visit hours  5 ) b) 1 ) system prompts time period and field (lab tests, ECG, all) to generate shares  5) B) 2) user select period and field.  5 )b) 3) system generates total share amount |

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| **Name** | **View payments /Generate transaction** |
| Description | The user can view daily payments and generate payment history on daily or monthly basis |
| Actors | Finance officer |
| Pre-conditions | User should login to the system |
| Main flow of events | 1. user selects “Payments” tab 2. here you can find two options “View Payments” and “Generate monthly history” 3. The user can click one of these option 4. On clicking, the system will view payment or generate transaction history |

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| **Name** | **Lab Equipment** |
| Description | This function enables user to request lab equipment which is registered to supplier |
| Actors | Lab engineer |
| Pre-conditions | The supplier must be connected to system |
| Main flow of events | 1. User click on “Equipment’ tab 2. Here user can view list of supplier 3. So user select supplier 4. Now he filled the available form in which he mention the required items 5. On clicking “submit” the form will be emailed to supplier. |

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| **Name** | **Transfer salaries** |
| Description | The bank system api is connected to your system through which you can transfer payments to another staff accounts. |
| Actors | Finance Officer |
| Pre-conditions | Bank system api is connected to your system |
| Main flow of events | 1. user selects “Salary” tab 2. here user can operate hospital account 3. here user enter the staff member ID and account number 4. then he can transfer the payment 5. system will auto print salary sheet |

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| **Name** | **Print sales tax** |
| Description | This function generate the sales tax amount and bill to be paid by hospital |
| Actors | Finance officer |
| Pre-conditions | Tax percent must be entered by user |
| Main flow of events | 1. User click “TAX” tab 2. Here user select the option “daily”, “monthly” or “yearly”. 3. System will ask to enter tax percent 4. On entering value system will auto calculate the tax and generate the bill of tax amount 5. User can also print it for any purpose |

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| **Name** | **Appointment/ view doctor schedule** |
| Description | This user can book an online appointment |
| Actors | Patient |
| Pre-conditions | The user must registered to system |
| Main flow of events | 1. User login into account 2. Now he select “appointment” tab 3. Here he can see the doctors schedule 4. Upon doctors schedule he fill the appointment form including doctor name. 5. The system will show a prompt mentioning doctor name and visit time |

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| **Name** | **View medical reports** |
| Description | This user can view medical reports |
| Actors | Patient, Doctor |
| Pre-conditions | Lab reports must be uploaded by lab engineer |
| Main flow of events | 1. User select patient records section 2. Doctor has to enter patient ID while patient not. 3. On clicking “view medical reports” user can view the medical reports |

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| **Name** | **Payment online** |
| Description | The user can pay online services bills through bank cards |
| Actors | Patient |
| Pre-conditions | The bank card supports online transaction |
| Main flow of events | 1. The user book an online appointment 2. Now system ask for payment which will be optional 3. Then user will enter the card details 4. Then user will receive the confirmation email of payment |

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| **Name** | **Request query** |
| Description | The user can request any query in form of query |
| Actors | Patient |
| Pre-conditions | The user registered to a system |
| Main flow of events | 1. The user go to “suggestion” tab 2. Here he will select “query” 3. Then he will fill the form 4. Then he will click on submit button. |

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| **Name** | **Give feedback** |
| Description | The user can fill feedback form on the end of month |
| Actors | Patient, Doctor |
| Pre-conditions | The form will be created quality officer |
| Main flow of events | 1. The user go to “quality assurance” tab 2. Here he will found the form at the end of month 3. Here he will fill the form and save it |

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| **Name** | **Prescribed medicines online** |
| Description | This user can prescribed medicines online |
| Actors | Doctor |
| Pre-conditions | The patient registered to system |
| Main flow of events | 1. The user will go to “prescribed medicines” 2. User enter the patient ID 3. Here he prescribed medicines 4. And it will shown to patient |

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| **Name** | **Request reschedule** |
| Description | The user can request reschedule of his timings which will approved by admin |
| Actors | Doctor |
| Pre-conditions | The hospital must have vacant space rooms |
| Main flow of events | 1. The doctor will go to “suggestion box” 2. Here he select “query” 3. Then user ask for rescheduling of time with keyword “TIME” 4. With this keyword it will sort to admin with reschedule request |

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| --- | --- |
| **Name** | **Manage complains/ Report to admin** |
| Description | The user can manage complains reported in feedback forms and report it top admin |
| Actors | Quality officer |
| Pre-conditions | The complain requested by any user |
| Main flow of events | 1. The user goto quality assurance tab 2. Here complains which has been mentioned in feedback , listed separately 3. He will arrange the valid complains in order form and emailed it o admin |

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| --- | --- |
| **Name** | **Record personal performance** |
| Description | The user can record performance of each staff member |
| Actors | Quality officer |
| Pre-conditions | The staff member must be registered to system |
| Main flow of events | 1. The user will click on “staff” tab 2. Here he can view the summary reports of feedbacks of each department on individual 3. Upon those records he will draw the performance chart of staff members |

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| --- | --- |
| **Name** | **Track item** |
| Description | The user track item which is barrowed to someone |
| Actors | stockist |
| Pre-conditions | The item is registered to system |
| Main flow of events | 1. The user will entered the Staff member info while giving him any item 2. The user will enter the issue date and item code 3. the email send to staff member for confirmation and he reply back 4. then he will issue staff member with the deadline of one day |

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| --- | --- |
| **Name** | **Order suppliers** |
| Description | The user order suppliers for needed items |
| Actors | Stockist |
| Pre-conditions | The supplier registered to system |
| Main flow of events | 1. the stockiest will click on “suppliers” tab 2. here user will click on concerned supplier 3. fill the form with needed items list 4. on clicking “order” a email is to supplier |

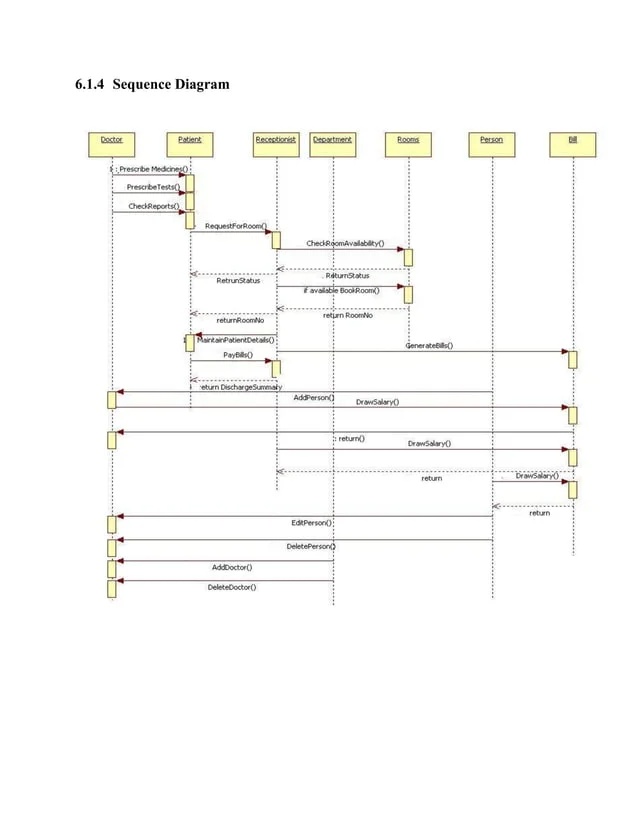
|  |  |
| --- | --- |
| **Name** | **View order/ available item list** |
| Description | The user view ordered item history and available item list |
| Actors | Stockist |
| Pre-conditions | The supplier must be connected to system |
| Main flow of events | 1. the user select “order history” tab 2. here he will be viewed the order history and item list |

|  |  |
| --- | --- |
| **Name** | **Order medicines** |
| Description | The user can order medicines to supplier |
| Actors | Pharmist |
| Pre-conditions | The supplier must be connected to system |
| Main flow of events | 1. the pharmist will click on “suppliers” tab 2. here user will click on concerned supplier 3. fill the form with needed items list 4. on clicking “order” a email is to supplier |

|  |  |
| --- | --- |
| **Name** | **Add/ update medicines** |
| Description | The user add/update medicines in system |
| Actors | Pharmist |
| Pre-conditions | The user login into system |
| Main flow of events | 1. the user go to “add” tab 2. here you view the list of medicines 3. on clicking tab “add” he will add the number of medicnes 4. on clicking “update” user will update the number of medicines or expiry date. |

|  |  |
| --- | --- |
| **Name** | **Print sales bills** |
| Description | The user print sales bills of sale medicines |
| Actors | Pharmist |
| Pre-conditions | The supplier must be connected to system |
| Main flow of events | 1. on clicking the “print bills” the user can print bill after entering the medicines and their amount. |

# SEQUENCE DIAGRAM



# ER DIAGRAM

Shape

Description automatically generated

# **Non-Functional Requirements**

# Security

**Patient Identification**

The system requires the patient to identify himself /herself using PIN

**Logon ID** Any user who uses the system shall have a Logon ID and Password.

**Modification** Any modification (insert, delete, update) for the Database shall be synchronized and done only by the administrator in the ward.

**Front Desk staff Rights** Front Desk staff shall be able to view all information in HPIMS, add new patients to HPIMS but shall not be able to modify any information in it.

**Administrators ' Rights** Administrators shall be able to view and modify all information in HPIMS.

# Safety Requirements

If there is extensive damage to a wide portion of the database due to catastrophic failure, 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.

# Performance Requirements

**Response Time** The system shall give responses in 1 second after checking the patient’s information.

**Capacity** The System must support 1000 people at a time.

**User-interface** The user-interface screen shall respond within 5 seconds.

**Conformity** The systems must conform to the Microsoft Accessibility guidelines.

# Maintainability

**Back Up** The system shall provide the capability to back-up the Data

**Errors** The system shall keep a log of all the errors.

# Reliability

**Availability** The system shall be available all the time

# Business Rules

* Want take the responsibility of failures due to hardware malfunctioning.
* Warranty period of maintaining the software would be one year.
* Additional payments will be analysed and charged for further maintenance
* If any error occur due to a user’s improper use. 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.