**HOSPITAL MANAGEMENT SYSTEM**

**OBJECTIVE**

Our project is designed to achieve the following objectives:

* The system should be menu-driven and must have a user-friendly Graphical User Interface.
* When a patient comes for treatment and is admitted to the hospital his/her details should be filled which can be viewed if needed.
* It should be able to handle the test reports of patients conducted in the lab of the hospital.
* The details of the Outdoor patients should be kept up to date and there record should be kept in the system for historical purposes.
* The record and fee details of external doctors should be maintained and updated in billing page.
* Since the test results, treatment results and accounting information are crucial to the hospital there must be a good security mechanism in the software.
* The system must have digital image processing facilities to process ultra sound & other reports.

**PRESENT SITUATION**

Cost:

Many Hospitals do not have paperless Systems, they spend extra amount of money on paperwork and require more storage space.

Poor patient care:

Hospitals do not allow physicians to share vital patient data. When all physicians have the same information, they can improve the overall quality of care and avoid medical errors and confusion.

Time Consuming:

Hospital provides paper record which takes time to write or search for it and it does not have quick access to patient information and management.

**DESCRIPTION**

This application will have these activities: -

1. Sign Up user
2. Sign In as user
3. Patient CRUD

* Add a patient
* View patient by first name
* Update all fields of patient

1. Doctor CRUD

* Add doctor
* View all doctors

1. Appointment CRUD

* Make an Appointment
* View Appointment

1. Billing

* Generate Bill
* View bill

FRONT END

* React js
* HTML
* CSS
* Bootstrap
* javascript

BACK END

* Node js
* Express
* Npm
* Mongo DB

HARDWARE REQUIREMENTS

* Processor: Minimum 1 GHz; Recommended 2GHz or more
* Ethernet connection (LAN) or Wireless adapter (Wi-Fi)
* Hard Drive: Minimum 32 GB; Recommended 64 GB or more
* Memory: Minimum 1 GB; Recommended 4 GB or more

SOFTWARE REQUIREMENTS

* Windows 7 or higher
* MAC: OS X
* Linux: Ubuntu
* Browsers: Firefox, Chrome

FUTURE SCOPE OF THE PROJECT

It’s clear that the demand for Hospital Software Systems will continue to grow. The future of it is all about improving the interactions between patients and medical providers. Since demand for Hospital Software Systems is still growing, opportunities are also increasing. This project could become more clinically useful with additional features like AI capabilities. AI could quickly scan patients’ medical records and offer real-time medical recommendations to physicians based on that data.

CONCLUSION

The project hospital management system is for computerizing the working in a hospital. It is great improvement over the manual system. The computerizing of the system has to speed up the process. In the current systems the front managing is very slow. The software takes care of the requirements of an average hospital and is capable to provide easy and effective storage of information related to patients that come up to the hospital.

It generates test reports and also provides the facility for searching the details of the patient. It also provides billing facility on the basis of the patient’s status. The system also provides the facility of backup as per the requirement.

**CHAPTER 2**

SRS document

Table of contents

1. **Introduction**

* This is software requirement specifications (SRS) for the Hospital management system. It describes the functions, goals and tasks that the system can perform. This is used to describe the scope of the project and to plan for the systems design and implementation.
* The software is for the automation of hospital management
* It maintains two levels of users:

a. Administrator level

b. User level

* The software includes maintaining patient records.
* Provides doctor information and working schedule.
* Create and manage appointments
* Generate bills

1.2. **Purpose**

* The main purpose of our system is to make hospital tasks easy and to develop software that replaces the manual hospital system into automated hospital management system. It can be feasible and easily used by any employee with the basic knowledge of using a computer and the internet. This document serves as the unambiguous guide for the developers of this software system.

1.3. **Scope**

* The proposed software product is the Hospital management system. The system will be used to get the information from the patients, doctors which can be stored and the data is used for future.
* 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.
* Maintain and modify digitally stored data which can be stored for a very long period of time without any loss.
* The intentions of the system are to reduce over pay time and increase the number of patients that can be treated accurately.

1.3. **Definitions, acronyms, abbreviations**

* SRS- Software Requirement Specifications
* OS – operating system
* JS – Java Script
* HTML – HyperTextMarkUpLanguage
* NPM – Node Package Manager

1.4. **References**

* [*https://www.udemy.com/course-dashboard-redirect/?course\_id=2143416*](https://www.udemy.com/course-dashboard-redirect/?course_id=2143416)
* [*https://www.npmjs.com/products/orgs?utm\_source=adwords&utm\_medium=ppc&utm\_campaign=npmOrgs2019Q2&utm\_content=site&gclid=CjwKCAjw2qHsBRAGEiwAMbPoDBu3F-y-8xyYWNNuDn-UXe3L6K9HnLwOxkNnXxYJwH5B\_A9PYP3UaxoCEKcQAvD\_BwE*](https://www.npmjs.com/products/orgs?utm_source=adwords&utm_medium=ppc&utm_campaign=npmOrgs2019Q2&utm_content=site&gclid=CjwKCAjw2qHsBRAGEiwAMbPoDBu3F-y-8xyYWNNuDn-UXe3L6K9HnLwOxkNnXxYJwH5B_A9PYP3UaxoCEKcQAvD_BwE)
* [*https://fezvrasta.github.io/bootstrap-material-design/*](https://fezvrasta.github.io/bootstrap-material-design/)
* [*https://mongodb.github.io/node-mongodb-native/markdown-docs/queries.html*](https://mongodb.github.io/node-mongodb-native/markdown-docs/queries.html)

1.5. **Overview**

* Hospital management system is a process of implementing all the activities of the hospital in a computerized way to fasten the performance.
* The objective of this document therefore is to formally describe the systems high level requirements including functional requirements, non-functional requirement.

2. **Overall description**

Hospital are the essential part of our lives, providing best medical facilities to people suffering from various ailments, which may be due to change in climatic conditions, increased work-load, emotional trauma , stress , etc . It is necessary for the hospitals to keep track of its day-to-day activities and records of its patients, doctors, and other staff personals that keep the hospital running smoothly & successfully.

2.1. **Product Perspective**

* This hospital system is a self-contained system that manages activities of the hospital as patient info, doctor details, and bill-money transactions.
* It is better than the present system as it reduces paper work.
* It helps the patient get their results faster.

2.2. **Product features**

* Safe and secure patient details information.
* Provides the details of the patient.
* Provides doctor and patient records.
* MRI reports.
* Malaria detection using image processing.
* Online prescriptions for the patient.
* Billing system.

2.3. **User Characteristics**

* This software is developed in such a manner that it is user friendly, general users with basic computer skills can use this software.
* Username/password for reception, doctors and lab which provides data encapsulation i.e., the user is restricted to only his/her their department services.

2.4. **General constrains**

* Any update requiring for the patient’s information from the hospital is to be recorded, updated and corrected to have valid data.
* Constant connection to the server as the data will be hosted on a private server.

2.5. **Assumptions and dependency**

* All the data entered should be correct and the data should be updated from time to time. Front-end is designed using html and CSS and backend by using Nodejs, express.
* The end user should have sufficient knowledge to upload data correctly.

3. **Specific requirements**

User requirements: There will be an error message when there is no match between the user name and the password

3.1. **External Specific requirements:**

* User credentials
* Internet connectivity
* Web browser

3.2. **Hardware interface**

* Operating system: Windows, Linux, Mac OS X
* Ram: minimum 1 GB, recommended 4 GB or more
* NIC
* No storage required
* Since the application must run over the internet, all the hardware shall require to connect internet will be hardware interface for the system. As for e.g. Modem, WAN – LAN, Ethernet Cross-Cable.

3.3. **Software interface**

* It is a web-based application project
* Web browser with flash player and can run scripting languages

3.4. **Communication interface**

* HTTP protocol for communication for the internet
* TCP/IP for the intranet communication

3.5. **Functional requirements**

* User
* Signup
* Sign in
* Patient data
* Add new patient
* View patients
* Update patient
* Doctor data
* Add new doctor
* View doctors
* Billing details

- Generate bill

- Display bill

3.6. **Non-functional requirements:**

* The data can be saved and retrieved at optimal speed when there is request or response to the server from 10 users or less.
* It is highly reliable as the data is stored on a server and backup is always present.
* Data uploaded will be immediately stored into the server there is no time lag.
* Username/Password is hashed and stored in the database so no one can decode the password other than the server with the secret key.
* The data and programs are hosted on the server so any computer connected to the network would be able to access the data.
* It can be run on any computer with a browser and NIC.

3.7. **Standard complaints**

* This standard follows IEEE format

CHAPTER 3

3. Overall description

Hospital are the essential part of our lives, providing best medical facilities to people suffering from various ailments, which may be due to change in climatic conditions, increased work-load, emotional trauma , stress , etc . It is necessary for the hospitals to keep track of its day-to-day activities and records of its patients, doctors, and other staff personals that keep the hospital running smoothly & successfully.

But keeping track of all activities and their records on paper is very inefficient and a time-consuming process, observing the continuous increase in population and number of people visiting the hospital .Recording and maintaining all these records is highly unreliable, inefficient and error-prone. It is also not economically & technically feasible to maintain these records on paper.

Thus keeping the working of the manual system as the basis of our project, we have developed an automated version of the manual system, named as “Hospital Management System”.

The main aim of our project is to provide a paper-less hospital up to 90%. It also aims at providing low-cost reliable automation of the existing systems. The system also provides excellent security of data at every level of user-system interaction and also provides robust and reliable storage and back-up facilities.

The project “Hospital Management System” is aimed to develop to maintain day-to-day state of registration of the patients, Doctor’s appointments, billing .It is designed to achieve the following objectives:

1. To computerize all details regarding the patients details.
2. Scheduling the appointment of patient with doctors to make it convenient for both.
3. The billing of the patients.
4. The information of the patients should be kept up to date and there record should be kept in the system for historical purposes.

4. Specific requirements

Software Requirement specification

A software requirements specification (SRS), a requirements specification for a software system, is a complete description of the behaviour of a system to be developed and may include a set of use cases that describe interactions the users will have with the software. In addition it also contains non-functional requirements .Non –functional requirements impose constraints on the design or implementation.

1. INTRODUCTION

The following subsections of software requirement specifications document should facilitate in providing the entire overview of the Information system “Hospital Management System” under development. This document aims at defining the overall software requirements for admin. Efforts have been made to define the requirements of the Information system exhaustively and accurately.

* 1. PURPOSE

The main purpose of the Software Requirement Specifications Document is to describe in a precise manner all the capabilities that will be provided by the Software Application “Hospital Management System”. It also states the various constraints which the system will be abide to. This document further leads to the clear vision of the software requirements, specifications and capabilities. These are exposed to the end users of the software.

* 1. SCOPE

The proposed software product is the Hospital Management System. The system will be used in any hospital, Clinic, Dispensary or Labs in any Hospital to get information from the patients and then storing 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 numbers of patients that can be treated accurately. Requirements statements in this document are both functional and non-functional.

6. **Project plan**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Task Name | Start | Finish | Duration |
| 1. | Select project to preview | 11-07-2019 | 13-07-2019 | 2 days |
| 2. | Scope | 15-07-2019 | 16-07-2019 | 1 day |
| 3. | Resources | 17-07-2019 | 17-07-2019 | 1 day |
| 4. | Benefits | 18-07-2019 | 18-07-2019 | 1 day |
| 5. | Strategy | 18-07-2019 | 18-07-2019 | 1 day |
| 6. | External Assistance | 19-07-2019 | 9-07-2019 | 1 day |
| 7. | Finalize scope | 22-07-2019 | 22-07-2019 | 1 day |
| 8. | Define desired input output | 23-07-2019 | 23-07-2019 | 1 day |
| 9. | Risk Assessment | 24-07-2019 | 24-07-2019 | 1 day |
| 10. | Critical success factor | 25-07-2019 | 25-07-2019 | 1 day |
| 11. | Project Requirement | 25-07-2019 | 26-07-2019 | 1 day |
| 12. | Roles | 26-07-2019 | 26-07-2019 | 1 day |
| 13. | Schedules | 26-07-2019 | 26-07-2019 | 1 day |
| 14. | Work Plan | 26-07-2019 | 26-07-2019 | 1 day |
| 15. | Review of software versions | 27-07-2019 | 1-08-2019 | 5 days |
| 16. | Downloads from internet | 1-08-2019 | 3-08-2019 | 3 days |
| 17. | Distribution of Software among the team | 3-08-2019 | 6-08-2019 | 3 days |
| 18. | Object Oriented analysis | 6-08-2019 | 12-08-2019 | 6 days |
| 19. | Study of Modules | 12-08-2019 | 14-08-2019 | 2 days |
| 20. | Login pages | 14-08-2019 | 17-08-2019 | 3 days |
| 21. | Menus | 15-08-2019 | 17-08-2019 | 2 days |
| 22. | Patient handling pages,  Doctor handling pages,  Appointment handling pages | 14-08-2019 | 24-08-2019 | 10 days |
| 23. | Coding | 14-08-2019 | 4-09-2019 | 20 days |
| 24. | Development of test cases | 5-09-2019 | 5-09-2019 | 1 day |
| 25. | Validation and verification | 7-09-2019 | 7-09-2019 | 1 day |
| 26. | beta version testing | 8-09-2019 | 8-09-2019 | 1 day |
| 27. | Maintenance | 10-09-2019 | 10-09-2019 | 1 day |
| 28. | Final report generation | 11-09-2019 | 11-09-2019 | 1 day |

6.2: Project management approach

6.3: Project role and responsibility

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| --- | --- | --- |
| Role | Responsibility | Particular |
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7. Design document

7.1: Introduction

The purpose of design phase is to plan a solution for problem specified by the requirements. System design aims to identify the modules that should be in the system, the specification of those modules and how to interact with each other to produce the results. The goal of the design process is to produce a model that can be used later to build that system. The produced model is called design of the system.

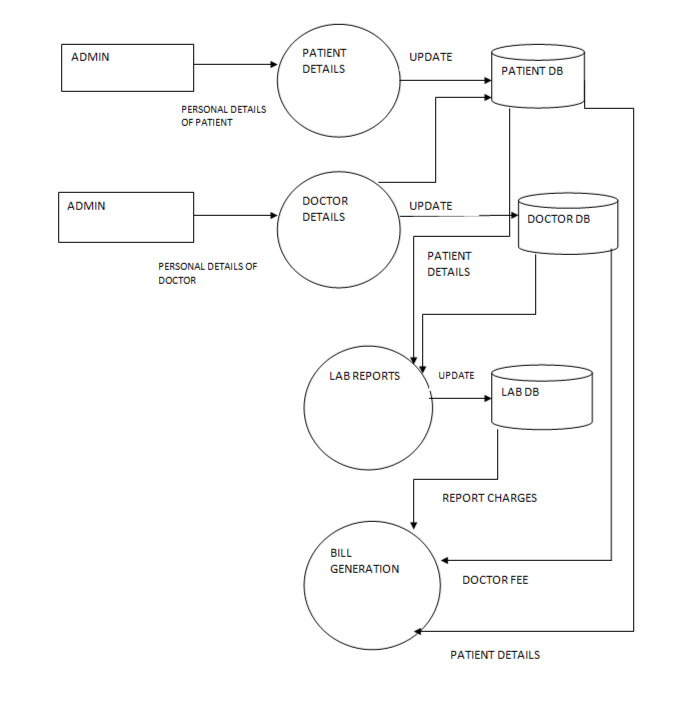
This application will be web-based, self-contained and independent software product. The system will allow access only to authorized users with specific roles (Administrator, Operator). Depending upon the user’s role, he/she will be able to access only specific modules of the system.

Major functions that the software will perform:

1. A login facility for enabling only authorized access to the system
2. When a patient is admitted, the front-desk checks to see if the patient is already registered with the hospital .If registered then name is entered into the computer. Otherwise a new Patient ID is given to the patient.
3. If a patient checks out, the administrative staff shall delete his patient ID from the system.
4. The system generates the bill while checking out of the patient.

7.2: Architecture

Data flow diagram: It is a graphical representation of the flow of data through an information system. Data flow diagrams are used by systems analysts to design information-processing systems but also as a way to model whole organizations.



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7.3: Code

// need to fill this

7.4: Interface

This application will have a user friendly and convenient interface. Following will be provided.

1. A login screen for entering username, password and role (Administrator, operator) will be provided. Access to different screens will be based upon the role of the user.
2. A Web page for displaying details of the patient.
3. A web page for creating a new patient record will contain text fields where the patient id will be machine generated and the rest of the details will have to be filled up.
4. The web page to produce a bill will create fields such as patient ID, Appointment number, Doctors Charges, Hospital charges which will be filled up.

7.4.1: External interface

7.4.2: User interface

1. Educational Level: At least graduate and should be comfortable with English language.
2. Technical Expertise: Should be a high or middle level employee of the organization comfortable with using general purpose applications on a computer.

7.4.3: Hardware interface

Processor:

RAM:

Hard disk:

Input devices: Keyboard, Mouse

Output devices: Monitor, Laptop

7.4.4: Communicational interface

Operating System: Windows 10

Front end: React JS

Back end: Node JS

8: Testing

8.1: Test plan

8.2: Introduction

Test plans helps in assuring software quickly. The purpose of test procedure is quality assurance, verification and validation. Basically testing procedure is an investigation conducted to provide information about quality of product and services. It ensures that doctors can access their id anytime and patient can check or update his treatment detail any time. Testing is the process of executing a program with a intention of finding errors. It is used to represent the ultimate review of specification, design and coding. Different test conditions should be thoroughly checked and the bugs detected should be fixed.

8.3: Risk factor

Any update requiring for the patient’s information from the hospital is to be recorded, updated and corrected to have valid data. Constant connection to the server as the data will be hosted on a private server.

8.4: Features tested

9. Test procedure

9.1.1: Black box testing

Black box testing is a software testing technique in which functionality of the software under test (SUT) is tested without looking at the internal code structure, implementing details and knowledge of internal paths of the software. This type of testing is based entirely on the software requirements and specifications.

9.1.2: Integration testing

The main function or goal of integration testing is to test the interfaces between the modules. The individual module is first tested in isolation. Once the modules are unit tested, they are integrated one by one, till the modules are integrated to check the combinational behavior and validate whether the requirements are implemented correctly or not.

Here we understand that integration testing does not happen at the end of the cycle, rather it is conducted simultaneously with the development. So in most of the times all actually available to test and here is what the challenge comes to test something which does not exist.

9.1.3: Regression testing

Regression testing is done after code fixes upgrades or any other system maintenance to check the new code has not affected the existing code.

10. Text case

|  |  |  |  |
| --- | --- | --- | --- |
| Test case | Test date | Expected results | Action taken |
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|  |  |  |  |
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11. Miscellaneous

11.1: Security

Every member staff of the hospital requires a username and password to log on to the system. The administrator of this system registers each member staff allotting username and password to each and he/she can also revoke access if it is deemed fit for any reason. The data of Data-Base are protected through multiple layers of security which includes but not limited to pass-words which are encrypted (should the hospital decide to take the software online with net-working available but since this is a stand-alone software, the password is not encrypted) but each member is required to protect their password and change on the first logging when created by the administrator.

11.2: Open source

11.3: Enhancement of the project

The proposed software product is the Hospital management system. The system will be used to get the information from the patients and then storing the data for future use. 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 pay time and increase the number of patients that can be treated accurately. To allow a direct communication between the doctors and patients so that patients can view the reports as fast as possible.

11.4: Conclusion

The project hospital management system is for computerizing the working in a hospital. It is great improvement over the manual system. The computerizing of the system has to speed up the process. In the current systems the front managing is very slow. The software takes care of the requirements of an average hospital and is capable to provide easy and effective storage of information related to patients that come up to the hospital.

It generates test reports and also provides the facility for searching the details of the patient. It also provides billing facility on the basis of the patient’s status. The system also provides the facility of backup as per the requirement.

12: Bibliography