

Design and Implementation of Online Advanced Hospital Management System using Modern Technology

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Abstract— “Design and implementation of online advanced hospital management system using modern technology” is Eco-friendly in use. The project’s motive is to do paperless work in hospitals. The data of patient were collected in database for better results. The unique think is that only patients Id is required for his/her contact and treatment information. Previously when the information was written on paper, it was very typical to handle and care for long time for hospital. If data is lost, we haven’t any corresponding options for that but when we save the data on database tables we easily fetch it.

Sometimes the patient’s previous information is also important for the new treatment, so were in project the enquiry of patients is also available to fulfill the consultant’s requirement about the history of the patient. Not only of patients information is fetched but doctors and staffs information like their contact details, salary, joining date, duty time, qualification etc. are available through their Ids from database. The information such as discount of any test given to particular patient at laboratory, then the accounts department was helpful for calculating their accounts according to the hospitals policies.

There are four modules in this project:

- Administrator Module
- Reception Module
- Treatment Module
- Laboratory Module

Initially, the project is started with the ADMIN. Admin have the authorities to register new user, he should register the account for new user like any doctor, laboratory staff and further staff members. He also provides username and password to the new registration except the patient. Furthermore the user should change their previous password accordingly.

Admin have some more authorities to operate in hospital, like number of rooms and their type and cost, and also he configures different Laboratory Diagnostic Test and their prices and etc.

Keywords— MIS (Management Information System), .NET Framework, SQL Server, SQL Client, ASP.NET, Microsoft Visual Studio

I. INTRODUCTION

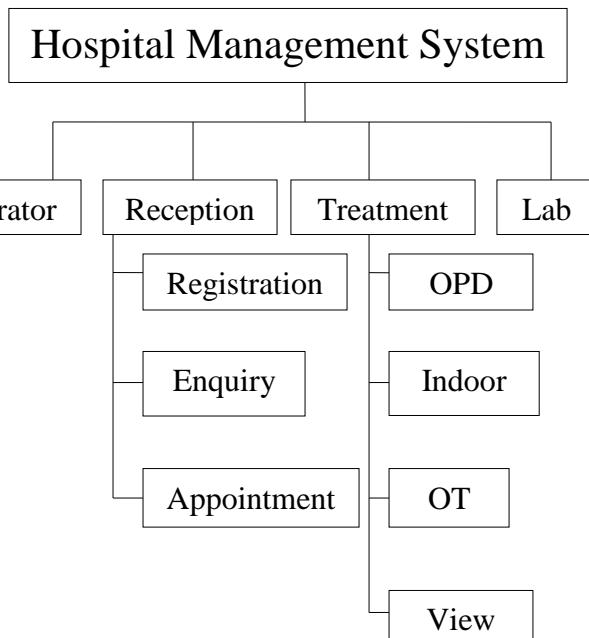
The purpose or objective of the project “Design and implementation of online advanced hospital management system use modern technology” is to make a basic working of hospitals easier, time consuming or better in many ways. This project creates an efficient and effective way to reduce or eliminate the paper work; it is good for environment also. There are some benefits of this project:

- Reduce the paper work:
Probably patient’s information was recorded on papers in hospitals, when a patient come to the hospital the receptionist write all the needed information about patient on a paper. In this system all the information recorded in the database so that the data is stored in a more organized manner and reduces the paper work. A database can store millions of records in an easy or managed way.
- Gives fast response of search engine:
In this we can search any data form database quickly. For example if receptionist or doctor wants to search any information about the patient they can search the information easily by only input some criteria such as the patient ID instead of search the patient record from a hundred or thousands of patient record from the cabinet. The system will immediately respond to the user with the patient information base on the criteria and it definitely can save up a lot of time and work on searching.
- Reduce the communication and transmission time:
In this project all the information saved in a database so all the staff of hospital share the same database so there is no need to pass the information each other. All the staff inside the hospital could get up to date information from the sharing database.
- High security and privacy:
Privacy is more important in any project. This project provides the privacy of the patient because a patient will visit only trusted hospital where his previous visited history keeps well and confidentially. Hospital management system provides a secure way towards the patient information.
- In this project doctor can easily fetch the past record or treatment or problem of patient so that he/she can easily

give the advice to the patient or give the proper treatment on the basis of his history.

II. PRODUCT FUNCTIONS

The project entitles “Hospital Management System” performs the management and maintenance of the hospital’s information. In this project mainly we have 4 modules:-



Block Diagram of Hospital Management System

A. Administration module

The most important module is administration module that is handled by administrator of the system. The administrator has all the rights to handle the project. She/he can control the information about user such as user’s name, user rights.

In this project administrator can do the following tasks:

- He can do the registration of any staff like doctor, receptionist.
- He can see the information of any patient or staff.
- He provides the username and password to the user that is further changed by user for privacy.
- He can control all the modules.

So the administration is the basic and most important module of the project.

B. Reception module

When a patient comes to the hospital first he/she registers himself/herself, it will be done by receptionist. Once the reception module is login, receptionist can register, do appointments, and contain enquiry of hospital.

- In Registration, Reception can do new registration, search patient information, and register indoor required information.

- In Appointment, he/she can add, modify, and view the appointments of patient.

C. Treatment module

We have to start the treatment of the patient of OPD; the treatment of patient will start to that doctor to whom he has concern in his last visit. In OPD treatment we will firstly put the ID of the patient which hospital has provided to the patient at the time of OPD treatment started and then we will fetch all the basic information of that patient.

D. Laboratory Module

This module is used for laboratory work.

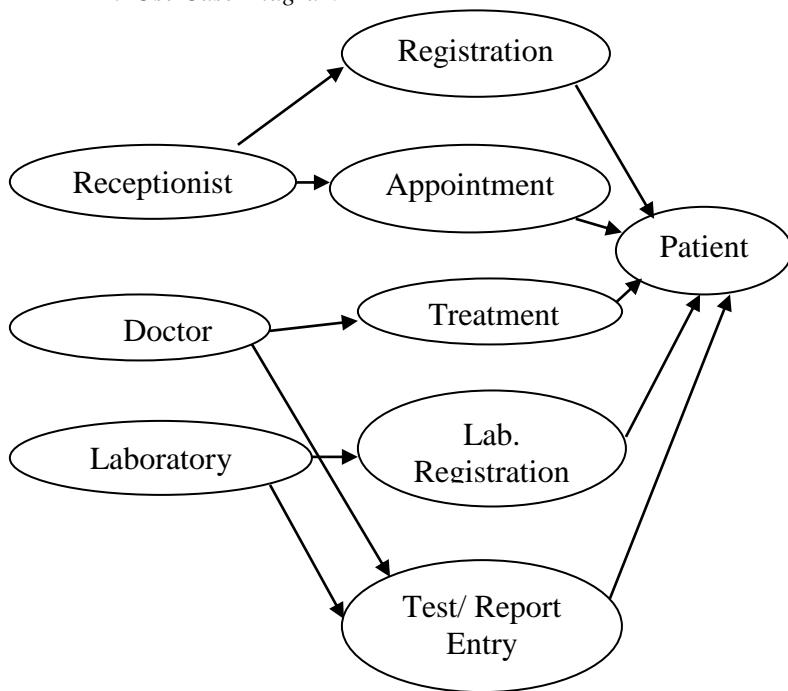
- In this for indoor patients the basic information is fetched through the database so there is no need to register that patient again.
- If a patient comes to the outside for tests only then first he registered himself then goes to the further processing.
- After that a diagnostic center number that is a unique and auto generated number provide to the patient.
- Then he goes for test. The amount, sample etc. of test is fetched according to the test from database.
- A bill is generated according to the number of tests. Discount option is also applicable for the patient according to the requirement.
- After that we goes to the Report Entry page in this when a doctor enter the Patient ID then the needed information about patient is automatically fetched from database. Then the doctor fills the report according to the tests of the patient.
- A doctor can also view the basic information, tests and history of patients when he is needed.

III. SYSTEM DESIGN

A. E-R Diagram

When we develop any project or system then there are some relations between its modules, attributes or entities, to describe this relationship we create the E-R (Entity-Relationship) diagram of the system. This is the easiest way to understand the system. In this we represent the entities by rectangle, attributes by ellipse or relationship by diamond shape.

B. Use Case Diagram



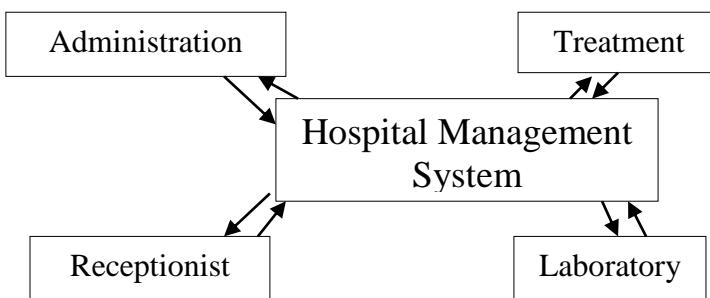
C. DataBase Design

Database Tables:-

LoginNew:-

Column Name	Data Type	Not Null/ Null	Key
UserName	varchar(10)	not null	
Password	varchar(15)	not null	
Role	varchar(10)	not null	

D. Data Flow Diagram



IV. TESTING

Testing is done when we complete our work to know that how well our system works. There are many phases when we do a project. Testing is the most important phase. In this phase we test our system that it is working properly or not. There are many types of testing performed for the system before it is ready to be used.

Testing objectives:-

- It is a process of executing a program to find out that it worked properly or not.
- There are many test cases that are performed on a program or system, a test that has high probability to find an error in a program called as good test case.
- When a test uncovers an undiscovered error then it is a successful test.

Testing principles:-

- Tests should be planned before we start testing.
- When we start testing then it should be on a small scale than it starts progressing on a large scale.
- Testing that is Exhaustive is not possible.

Testing scope:-

- Main purpose of testing is to find out the software failures so that we can correct and uncover these failures and errors.
- Reason of doing testing is not to find out whether a system works properly or not, it is used to know that a system works properly under specific conditions and circumstances.
- In the current software development environment we have a separate team of testing because it is a very important phase of software development.

Testing methods:-

Testing phase has various methods of testing. There are 2 ways of testing:-

- Black box testing
- White box testing

Black box testing:-

When we validate the functional requirement without any internal working of the program then we use the white box testing. It is basically used to find out the interface error, data structure error, functional logic errors, missing functions, incorrect function etc.

White box testing:-

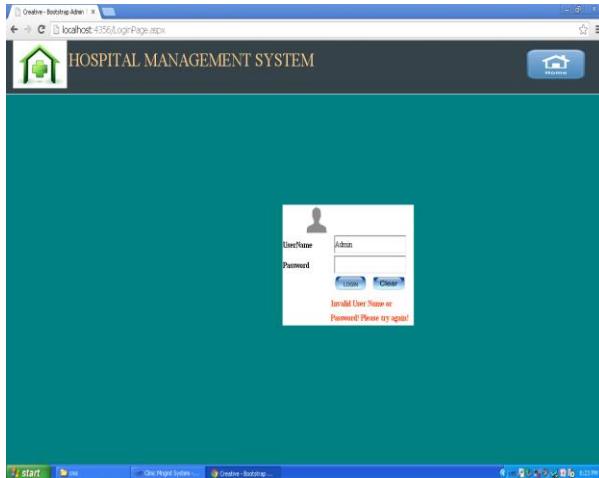
When we check the control structure of the program then we do the white box testing.

The test cases of white box testing ensure that during testing every statement of the program have been executed at least once.

V. USER INTERFACE



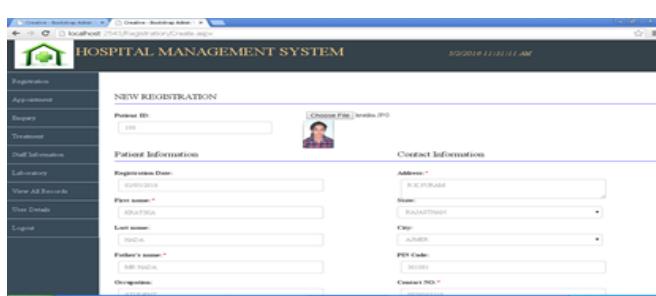
HOME PAGE



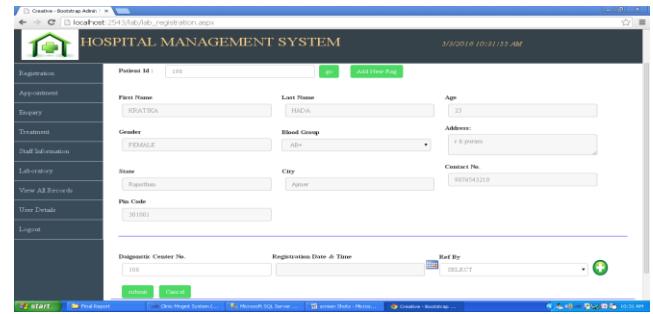
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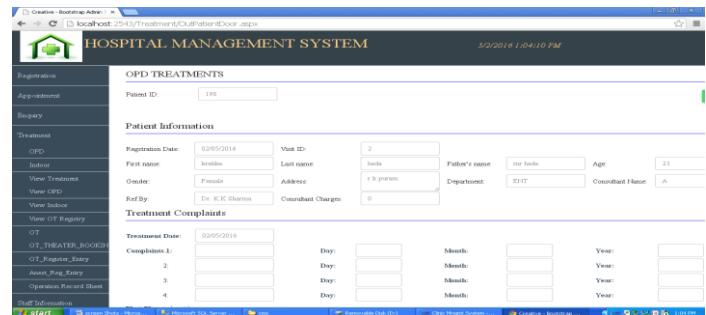
ADMIN PAGE



REGISTRATION PAGE



LAB REGISTRATION PAGE



TREATMENT PAGE

VI. CONCLUSION

Whenever we evaluate and build any software mostly we think of 4 Term -

1. Accessibility or Ease of use
2. Technically scalable
3. Functionally Scalable
4. Security

HMS, being a web project, totally serving requirement of a hospital by easing access to the project from anywhere just by having a web browser on client machine, we don't need to hang up with any extra software by using it.

Secondly, from technical architecture point of view MVC pattern provides easy decoupling between Model, View and controller layer.

Thirdly, from functional point of view we had developed the project keeping the user ease on first priority. In this area, existing scalation of this project made in FOXPRO language helped us much. We were able to see how project is behaving in real time and did some needed enhancement meanwhile doing the migration stuff.

From security point of view we had created multiple roles and granted required access according to role. This will help in accidental damage to data by unauthorized user.

HMS, Still seeing some more enhancement and hopefully will come up with a new version and functionality.

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