



# **Smart Health Prediction Using Naïve Bayes Algorithm**

**A Report for the Evaluation 3 of Project 2**

*Submitted by*

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*in partial fulfillment for the award of the degree  
of*

**B TECH CSE in Business Analytics**

**Under the Supervision of**

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**School of Computing Science and Engineering  
Greater Noida, Uttar Pradesh  
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## Acknowledgement

We are pleased to present “Smart Health Prediction System” project and take this opportunity to express our profound gratitude to all those people who helped us in completion of this project.

We thank our college for providing us with excellent facilities that helped us to complete and present this project. We would also like to thank the staff members and lab assistants for permitting us to use computers in the lab as and when required.

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# PROJECT OVERVIEW

## Introduction

- It might have happened so many times that you or someone yours need doctors help immediately, but they are not available due to some reason.
- The Health Prediction system is an end user support and online consultation project.
- Here we propose a system that allows users to get instant guidance on their health issues through an intelligent health care system online.
- The system is fed with various symptoms and the disease/illness associated with those systems.
- The system allows user to share their symptoms and issues.
- It then processes user's symptoms to check for various illness that could be associated with it.
- Here we use Naïve Bayes and data mining techniques to guess the most accurate illness that could be associated with patient's symptoms.
- If the system is not able to provide suitable results, it urges users to go for blood test, x-ray, CTI scan or whichever report it feels user's symptoms are associated with, so next time user may be able to login and upload an image of those reports.
- The system also has a doctor login, these uploaded images are now sent to respective doctor along with patient contact details.
- The doctors may now contact the patient for further process.

## Modules and their Description

This system is having 4 Modules:

1. **User's Login**
2. **Doctor's Login**
3. **Upload Images**
4. **Send details of patient**

**Description:**

### **1. User's Login:**

- Here, user inserts his credentials to get the access of the website.

### **2. Doctor's Login**

- Here, Doctor inputs his credentials to the access to the website.

### **3. Upload Images**

- Here, the User can upload the patient's medical report to get the accurate solution on the illness/disease.

#### 4. Send details of patient

- Here, Doctor is able to send the details of the patient to other expertise doctors to get the accurate solution.

## Existing System & Proposed System

### ❖ **Problem with current scenario**

- Traditionally, there was no such system developed from which we would be able to get the details of various illness/disease on a single website.
- Someone needs to contact doctor to get the idea about the illness/disease or also may need to visit to visit doctors dispensary.
- People need to travel to doctor's dispensary wherever or how far it would be.
- No. of pages used to maintain the records of n no. of peoples.

- **Drawbacks of the existing system**

- o Maintenance of the system is very difficult.
- o There is a possibility for getting inaccurate results.
- o User friendliness is very less.
- o It consumes more time for processing the activities.

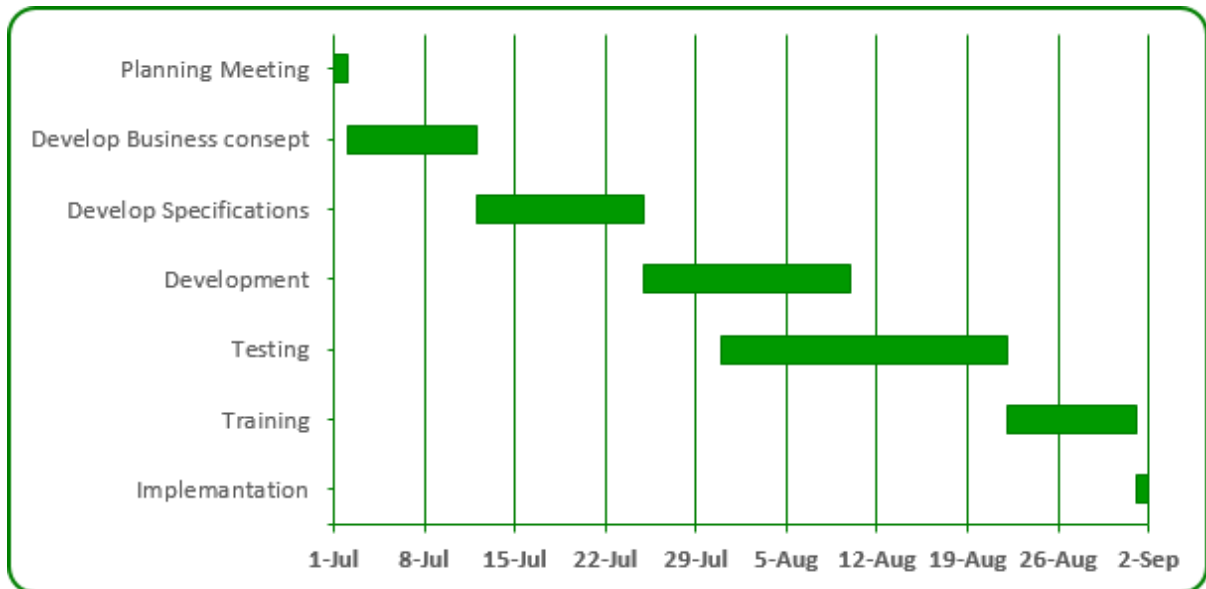
## PROPOSED SYSTEM

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- The system allows user to share their symptoms and issues.
- It then processes user's symptoms to check for various illness that could be associated with it.
- Here we use some intelligent data mining techniques to guess the most accurate illness that could be associated with patient's symptoms.
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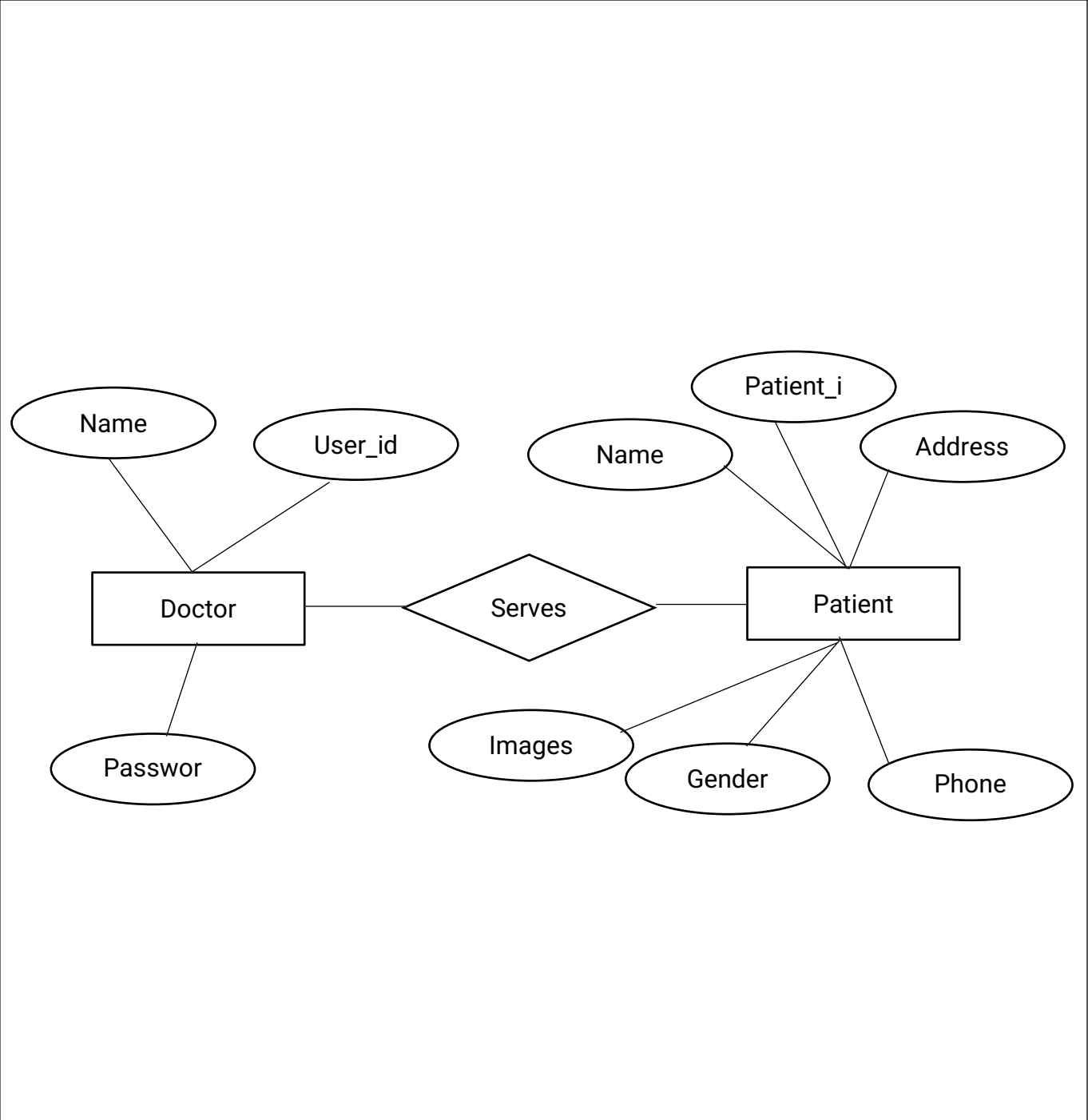


# Gantt Chart

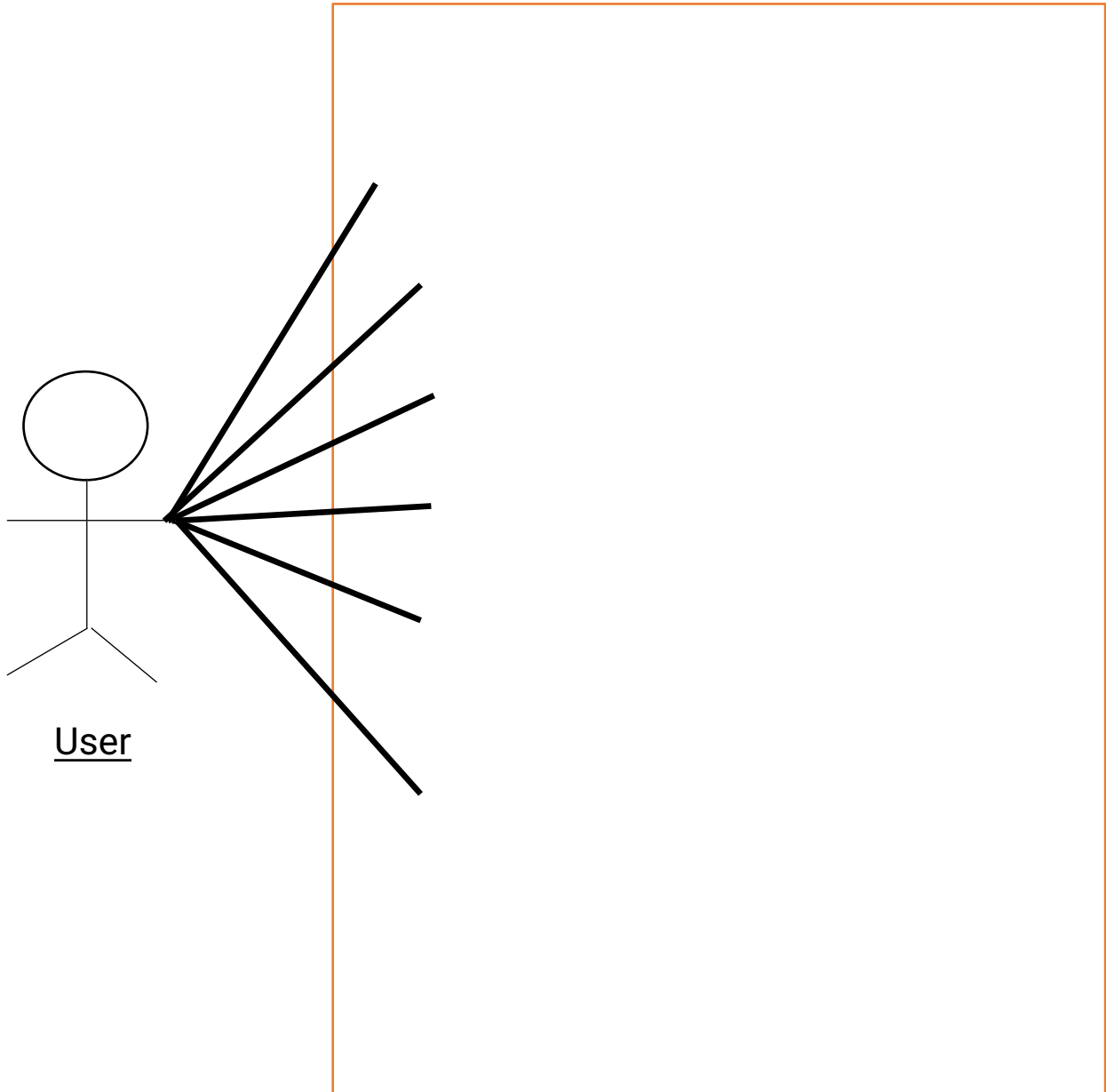


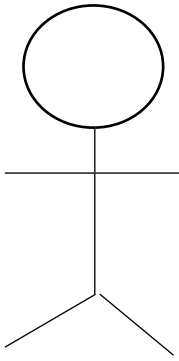
# PROJECT DESIGN

## E-R Diagram

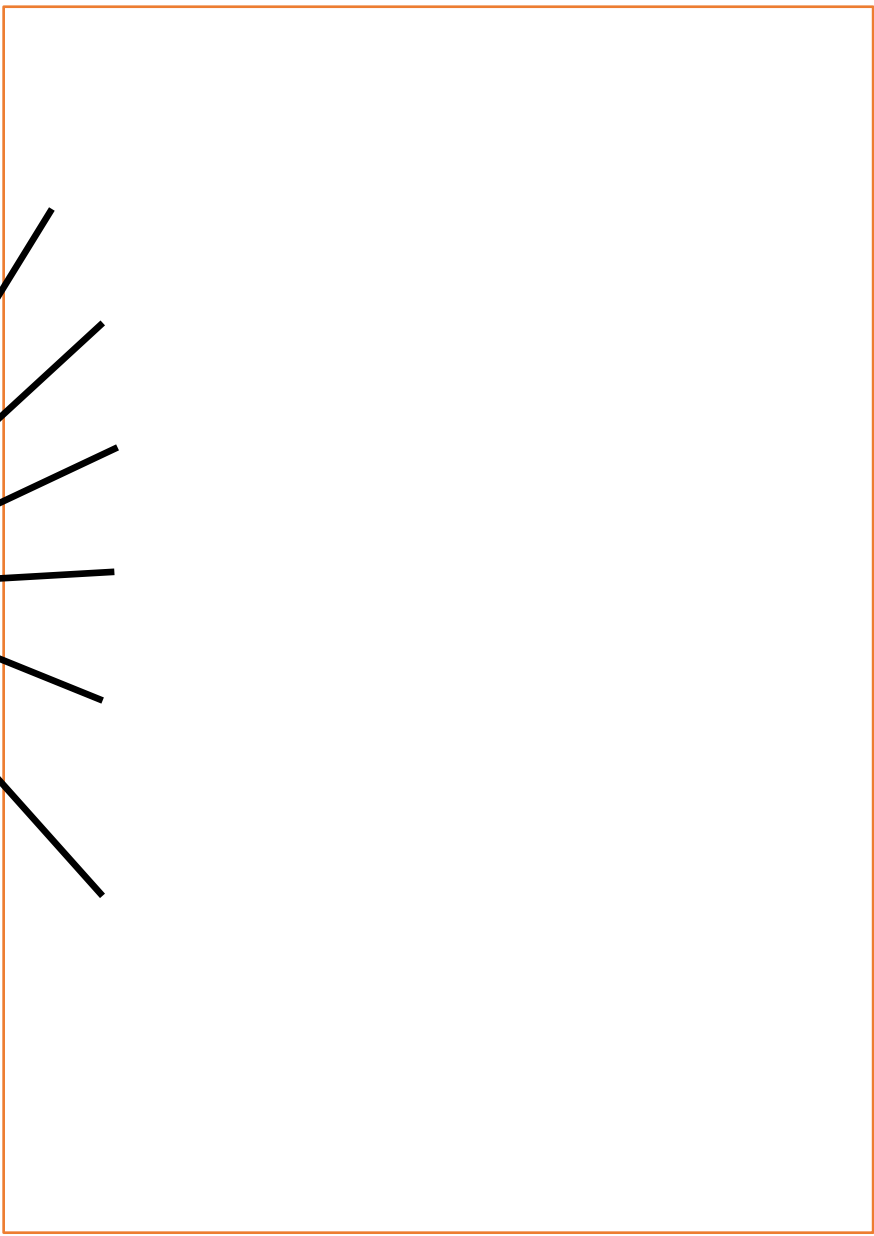


# Use Case Diagram

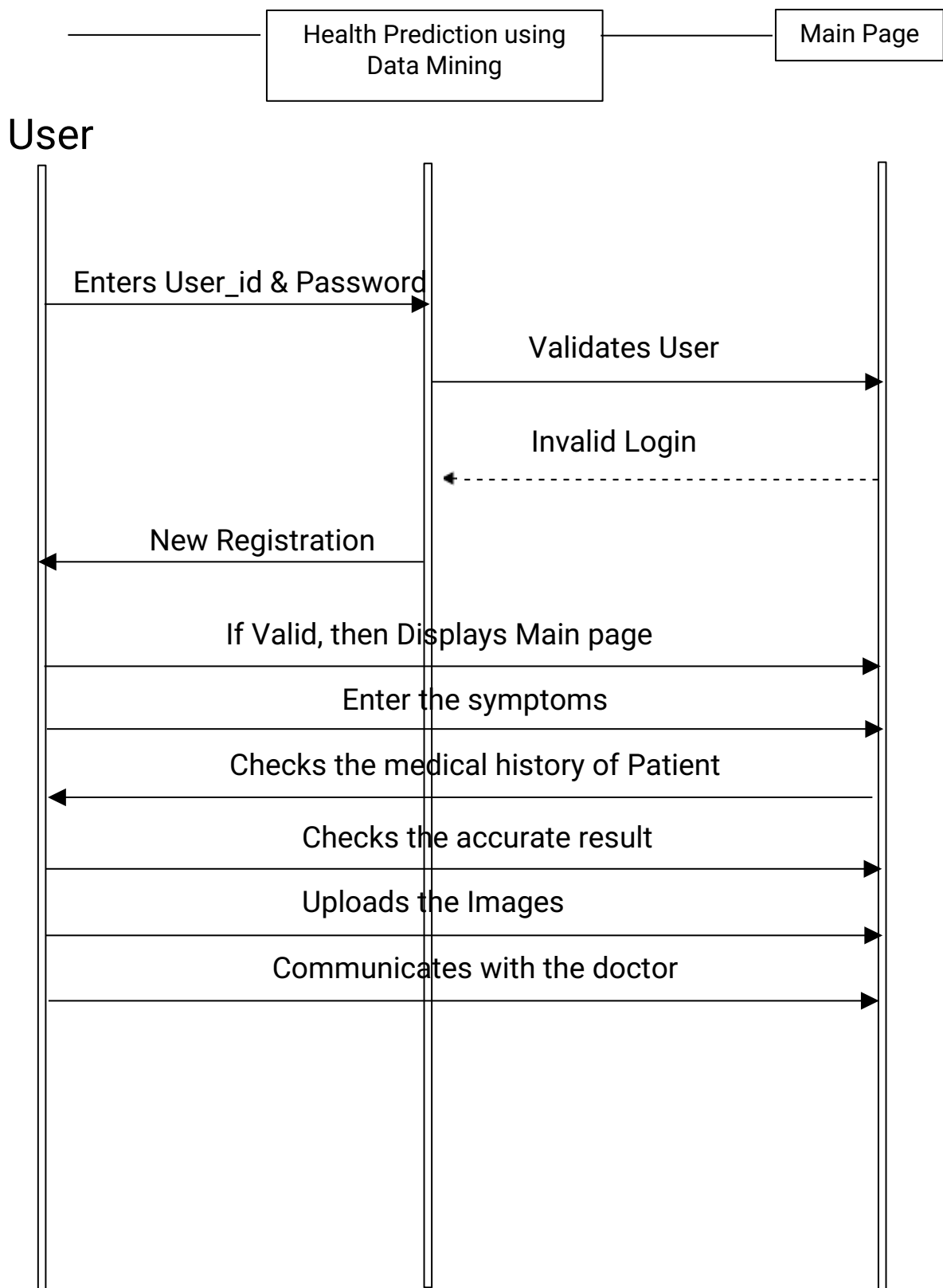


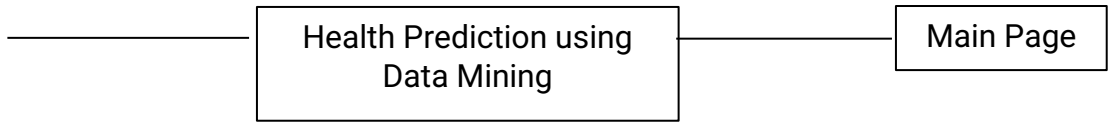


Doctor

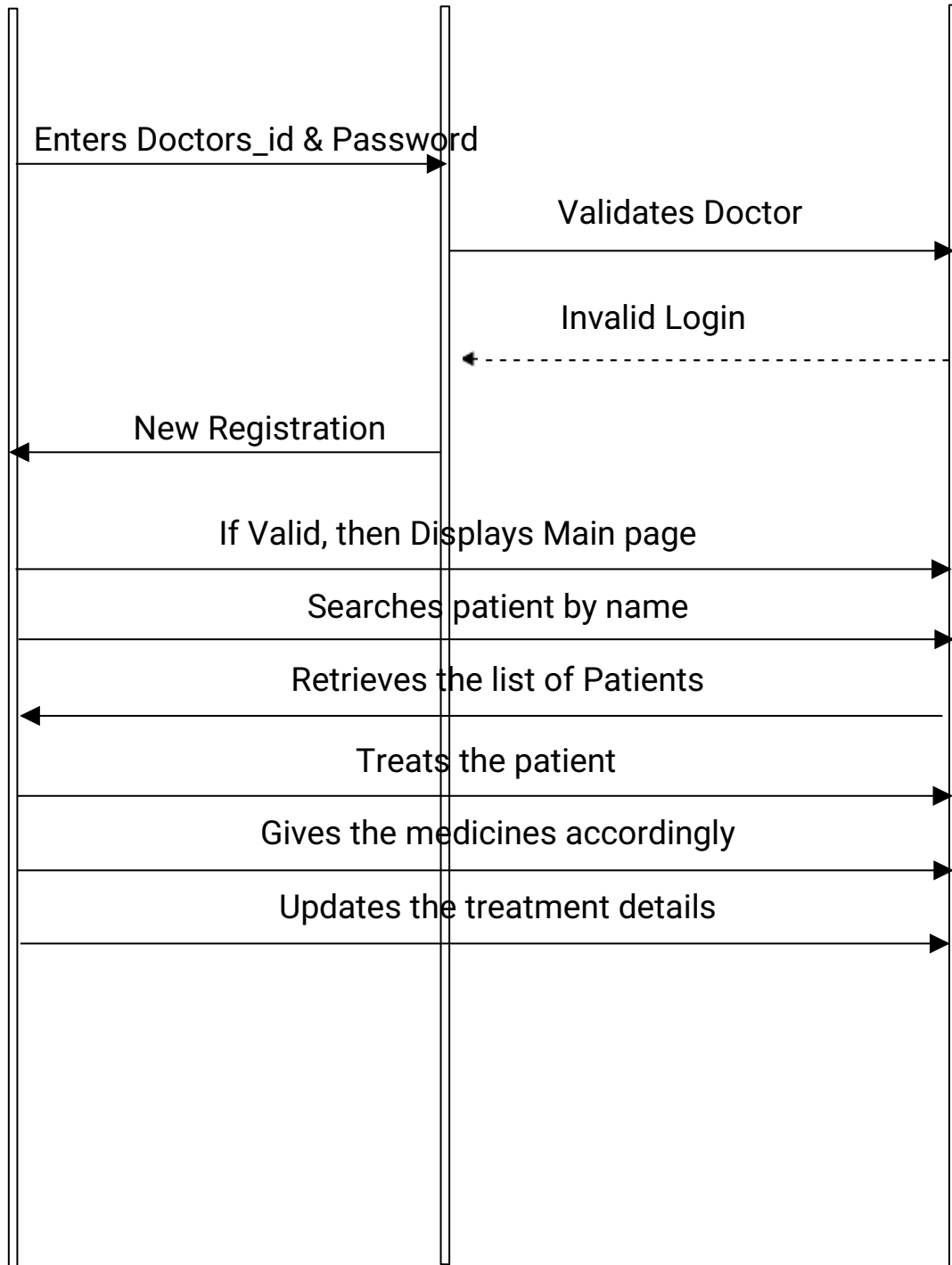


# Sequence Diagram





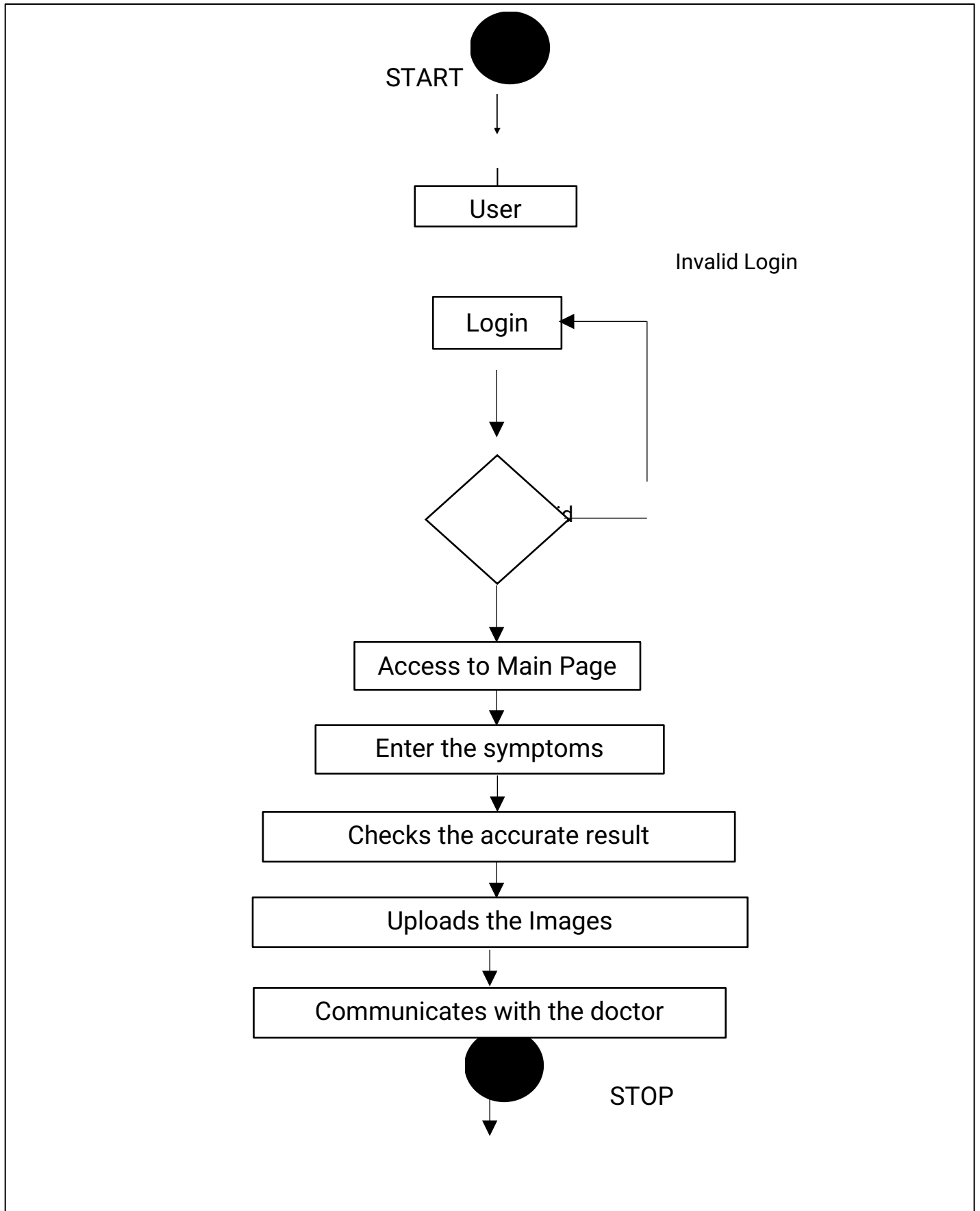
## Doctor





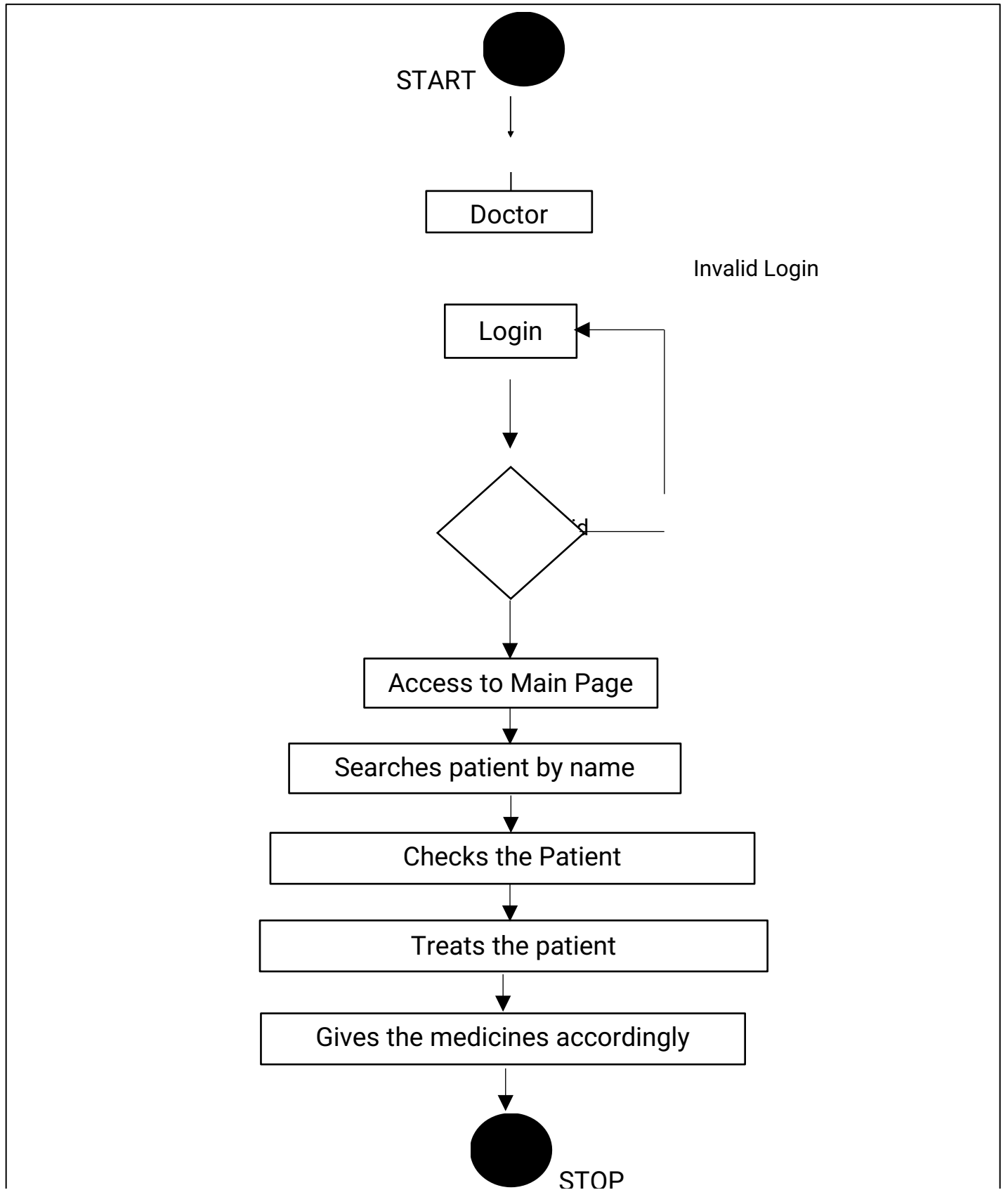
# Activity Diagram

User





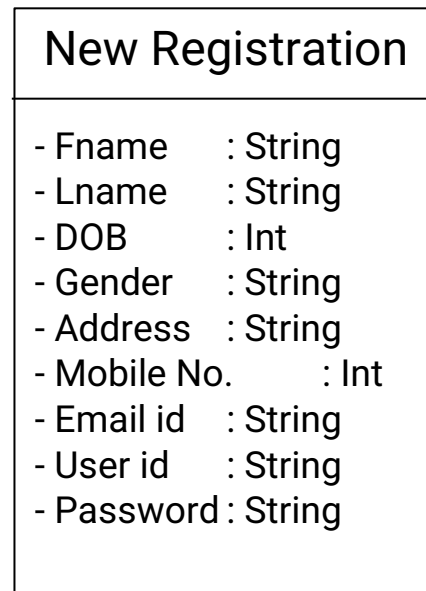
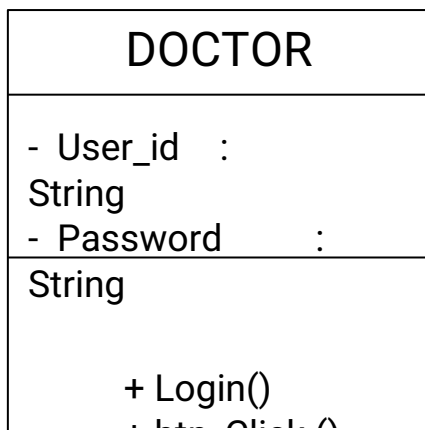
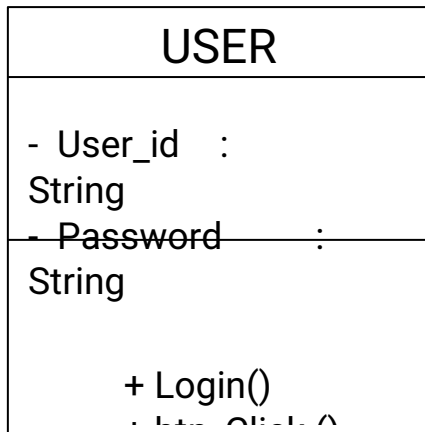
# Doctor



Updates the treatment details



## Class Diagram



## Data Flow Diagram

- ❖ The DFD is also called as bubble chart. It is a simple graphical formalism that can be used to represent a system in terms of the input data to the system, various processing carried out on these data, and the output data is generated by the system
- ❖ The data flow diagram (DFD) is one of the most important modeling tools. It is used to model the system components. These components are the system process, the data used by the process, an external entity that interacts with the system and the information flows in the system.
- ❖ DFD shows how the information moves through the system and how it is modified by a series of transformations. It is a graphical technique that depicts information flow and the transformations that are applied as data moves from input to output.
- ❖ DFD is also known as bubble chart. A DFD may be used to represent a system at any level of abstraction. DFD may be partitioned into levels that represent increasing information flow and functional detail.

## NOTATION:

### SOURCE OR DESTINATION OF DATA:

External sources or destinations, which may be people or organizations or other entities.



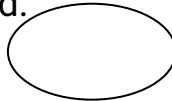
### DATA SOURCE:

Here the data referenced by a process is stored and retrieved.



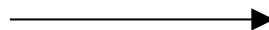
### PROCESS:

People, procedures or devices that produce data. The physical component is not identified.



### DATA FLOW:

Data moves in a specific direction from an origin to a destination. The data flow is a "packet" of data.

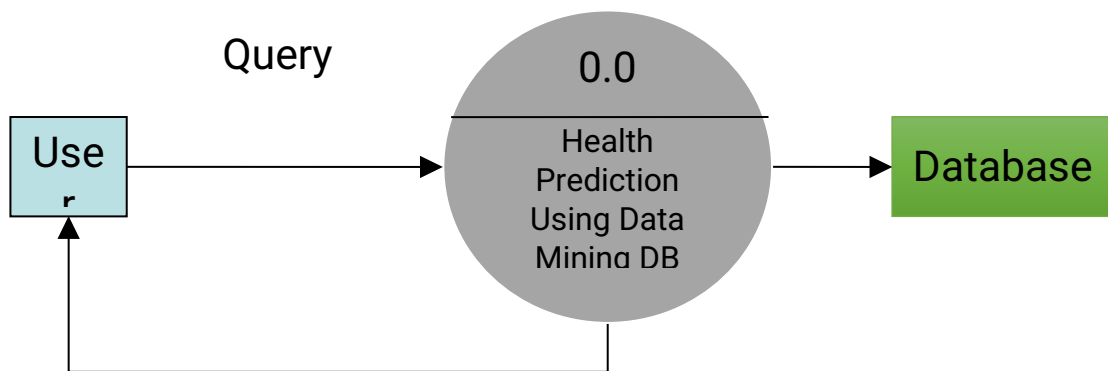


## MODELING RULES:

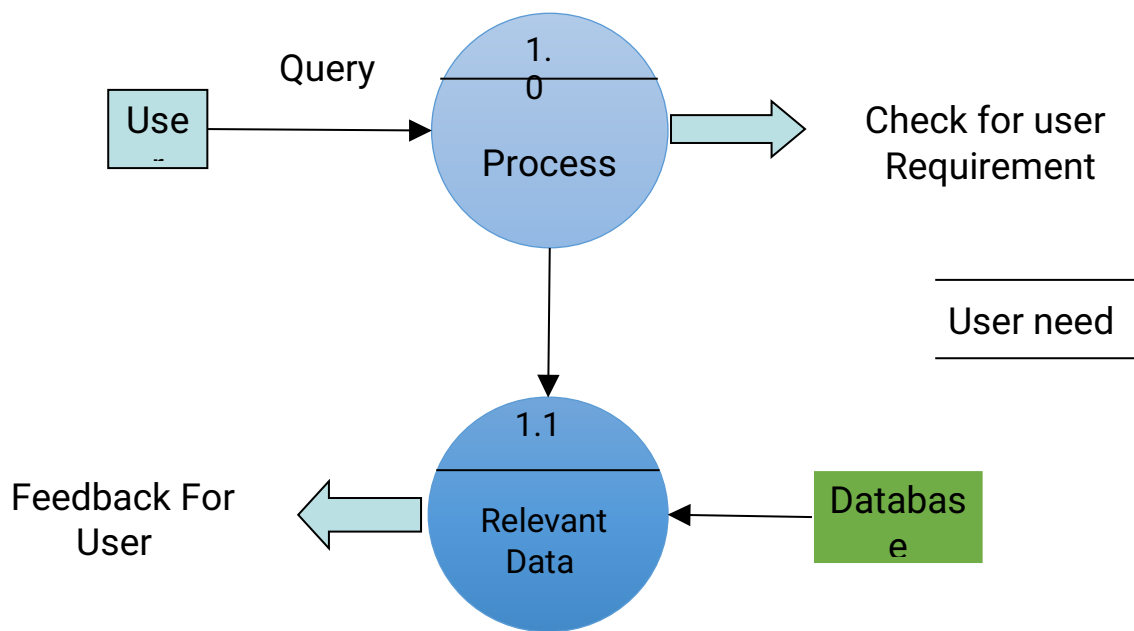
There are several common modeling rules when creating DFDs:

1. All processes must have at least one data flow in and one data flow out.
2. All processes should modify the incoming data, producing new forms of outgoing data.
3. Each data store must be involved with at least one data flow.
4. Each external entity must be involved with at least one data flow.
5. A data flow must be attached to at least one process.

## Data Flow Diagrams

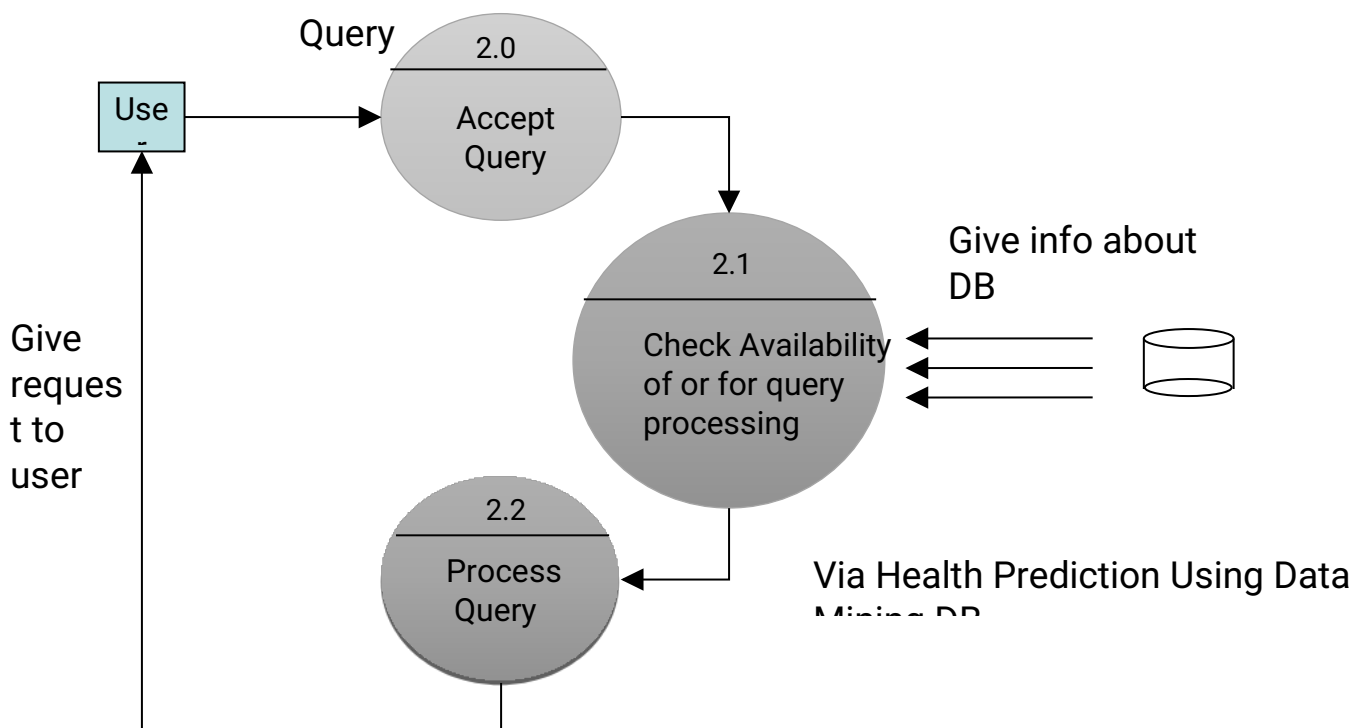


DATABASE



LEVEL 1 DFD





LEVEL 2 DFD: PREDICTION

## Snapshots









# PROJECT IMPLEMENTATION

## Project Implementation Technology

The Project is loaded in Visual Studio 2010. We used Visual Studio for Design and coding of project. Created and maintained all databases into SQL Server 2008, in that we create tables, write query for store data or record of project.

### ❖ Hardware Requirement:-

- Dual Core Processor Based Computer
- 1GB-Ram
- 50 GB Hard Disk

### ❖ Software Requirement:

- Windows XP, Windows 7(ultimate & enterprise)
- Visual studio 2010.
- SQL Server 2008.

## CODING











## FEASIBILITY REPORT

Feasibility Study is a high level capsule version of the entire process intended to answer a number of questions like: What is the problem? Is there any feasible solution to the given problem? Is the problem even worth solving? Feasibility study is conducted once the problem clearly understood. Feasibility study is necessary to determine that the proposed system is Feasible by considering the technical, Operational, and Economical factors. By having a detailed feasibility study the management will have a clear-cut view of the proposed system.

The following feasibilities are considered for the project in order to ensure that the project is variable and it does not have any major obstructions. Feasibility study encompasses the following things:

- Technical Feasibility
- Economic Feasibility
- Operational Feasibility

In this phase, we study the feasibility of all proposed systems, and pick the best feasible solution for the problem. The feasibility is studied based on three main factors as follows.

## ❖ Technical Feasibility

In this step, we verify whether the proposed systems are technically feasible or not. i.e., all the technologies required to develop the system are available readily or not.

Technical Feasibility determines whether the organization has the technology and skills necessary to carry out the project and how this should be obtained. The system can be feasible because of the following grounds:

- All necessary technology exists to develop the system.
- This system is too flexible and it can be expanded further.
- This system can give guarantees of accuracy, ease of use, reliability and the data security.
- This system can give instant response to inquire.

Our project is technically feasible because, all the technology needed for our project is readily available.

**Operating System** : Windows XP, 7(ultimate & enterprise)

**Languages** : Asp.Net with C# (.Net 2010)

**Database System** : MS-SQL Server 2008

**Documentation Tool** : MS - Word 2010

## ❖ Economic Feasibility

Economically, this project is completely feasible because it requires no extra financial investment and with respect to time, it's completely possible to complete this project in 6 months.

In this step, we verify which proposal is more economical. We compare the financial benefits of the new system with the investment. The new system is economically feasible only when the financial benefits are more than the investments and expenditure. Economic Feasibility determines whether the project goal can be within the resource limits allocated to it or not. It must determine whether it is worthwhile to process with the entire project or whether the benefits obtained from the new system are not worth the costs. Financial benefits must be equal or exceed the costs. In this issue, we should consider:

- The cost to conduct a full system investigation.
- The cost of h/w and s/w for the class of application being considered.
- The development tool.
- The cost of maintenance etc...

Our project is economically feasible because the cost of development is very minimal when compared to financial benefits of the application.

## ❖ Operational Feasibility

In this step, we verify different operational factors of the proposed systems like man-power, time etc., whichever solution uses less operational resources, is the best operationally feasible solution. The solution should also be operationally possible to implement. Operational Feasibility determines if the proposed system satisfied user objectives could be fitted into the current system operation.

- The methods of processing and presentation are completely accepted by the clients since they can meet all user requirements.
- The clients have been involved in the planning and development of the system.
- The proposed system will not cause any problem under any circumstances.

Our project is operationally feasible because the time requirements and personnel requirements are satisfied. We are a team of four members and we worked on this project for three working months.



## TESTING

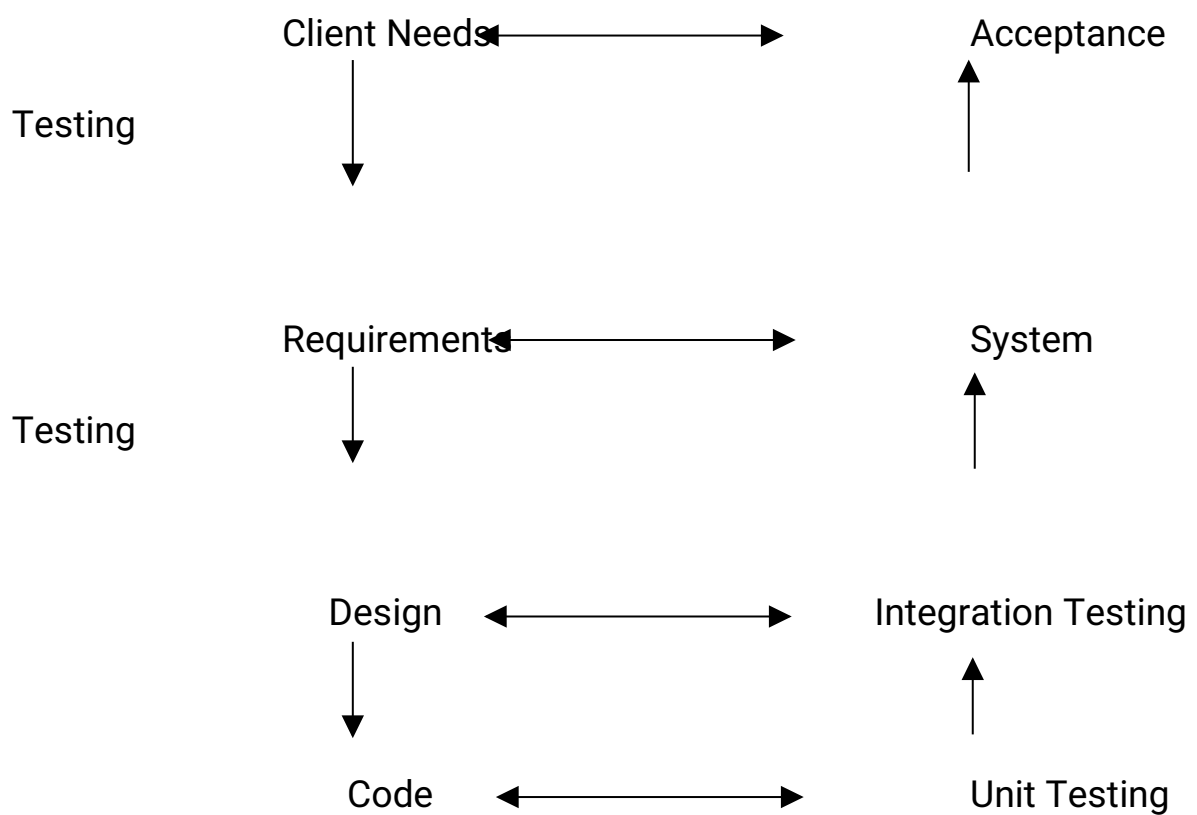
As the project is on bit large scale, we always need testing to make it successful. If each components work properly in all respect and gives desired output for all kind of inputs then project is said to be successful. So the conclusion is-to make the project successful, it needs to be tested.

The testing done here was System Testing checking whether the user requirements were satisfied. The code for the new system has been written completely using ASP .NET with C# as the coding language, C# as the interface for front-end designing. The new system has been tested well with the help of the users and all the applications have been verified from every nook and corner of the user.

Although some applications were found to be erroneous these applications have been corrected before being implemented. The flow of the forms has been found to be very much in accordance with the actual flow of data.

## Levels of Testing

In order to uncover the errors present in different phases we have the concept of levels of testing. The basic levels of testing are:



A series of testing is done for the proposed system before the system is ready for the user acceptance testing.

The steps involved in Testing are:

### ✓ Unit Testing

Unit testing focuses verification efforts on the smallest unit of the software design, the module. This is also known as “Module Testing”. The modules are tested separately. This testing carried out during programming stage itself. In this testing each module is found to be working satisfactorily as regards to the expected output from the module.

### ✓ Integration Testing

Data can be grossed across an interface; one module can have adverse efforts on another. Integration testing is systematic testing for construction the program structure while at the same time conducting tests to uncover errors associated with in the interface. The objective is

to take unit tested modules and build a program structure. All the modules are combined and tested as a whole. Here correction is difficult because the isolation of cause is complicated by the vast expense of the entire program. Thus in the integration testing step, all the errors uncovered are corrected for the next testing steps.

### ✓ **System testing**

System testing is the stage of implementation that is aimed at ensuring that the system works accurately and efficiently for live operation commences. Testing is vital to the success of the system. System testing makes a logical assumption that if all the parts of the system are correct, then goal will be successfully achieved.

### ✓ **Validation Testing**

At the conclusion of integration testing software is completely assembled as a package, interfacing errors have been uncovered and corrected and a final series of software tests begins, validation test

begins. Validation test can be defined in many ways. But the simple definition is that validation succeeds when the software function in a manner that can reasonably expected by the customer. After validation test has been conducted one of two possible conditions exists.

One is the function or performance characteristics confirm to specifications and are accepted and the other is deviation from specification is uncovered and a deficiency list is created. Proposed system under consideration has been tested by using validation testing and found to be working satisfactorily.

### ✓ Output Testing

After performing validation testing, the next step is output testing of the proposed system since no system could be useful if it does not produce the required output in the specified format. Asking the users about the format required by them tests the outputs generated by the system under consideration. Here the output format is considered in two ways, one is on the screen and other is the printed format. The output format on the screen is found to be correct as the format was designed in the system designed phase according to the user needs.

For the hard copy also the output comes as the specified requirements by the users. Hence output testing does not result any

corrections in the system.

## ✓ User Acceptance Testing

User acceptance of a system is the key factor of the success of any system. The system under study is tested for the user acceptance by constantly keeping in touch with the prospective system users at the time of developing and making changes wherever required.

## ADVANTAGES OF PROJECT

- o User can search for doctor's help at any point of time.
- o User can talk about their illness and get instant diagnosis.
- o Doctors get more clients online.

### Disadvantages:

The system is not fully automated, it needs doctors for full diagnosis.

### Application:

This system can be used by all patients or their family members who need help in emergency.

## Website is:

### 1) Load Balancing:

Since the system will be available only the admin logs in the amount of load on server will be limited to time period of admin access.

### 2) Easy Accessibility:

Records can be easily accessed and store and other information respectively.

### 3) User Friendly:

The Website will be giving a very user friendly approach for all user.

### 4) Efficient and reliable:

Maintaining the all secured and database on the server which will be accessible according the user requirement without any maintenance cost will be a very efficient as compared to storing all the customer data on the spreadsheet or in physically in the record books.

### 5) Easy maintenance:

Health Prediction Using Data Mining system is design as easy way. So maintenance is also easy.



## **CONCLUSION**

The Health Prediction Using Data Mining Website, historically viewed as a necessary burden in medical offices, healthcare facilities and wellness centers, can be completely automated through an inefficient online software program. The benefits of implementing this technology touch everyone involved in the scheduling process, as administrators and staff can conduct their tasks more efficiently and accurately, while customers and clients have the ability to book their appointments and reservations quickly and more conveniently.

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- ✓ <http://www.asp.net/>: This is the official Microsoft ASP.NET web site. It has a lot of: tutorials, training videos, and sample projects.