MEDCARE

By

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Bachelor of Engineering
In
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Department of Computer Science and Engineering
Institute of Technology and Management Universe
Paldi Village, Vadodara - 390510

Certificate

This is to certify that the report submitted along with the project entitled "**MEDCARE**" has been carried out by "**Harshal Doshi, Jay Shah, Tarang Desai, Kapil Pandya**" under my guidance in partial fulfilment for the degree of Bachelor of Engineering in Computer Engineering – VIIIth Semester of Gujarat Technological University, Ahmedabad during the academic year 2017-18. These students have successfully completed the project activity under my guidance.

SIGNATURE (INTERNAL GUIDE)
April, 2018

HEAD OF DEPARTMENT
April, 2018

Declaration

We **Harshal Doshi, Jay Shah, Tarang Desai, Kapil Pandya,** the students of Computer Engineering, having Enrollment number **140950107024, 140950107082, 140950107100, 140950107110** enrolled at ITM Universe, Vadodara hereby certify and declare the following:

1. We have defined our project based on inputs at **Extended Horizon** and each of us will make significant efforts to make attempt to solve the challenges. We will attempt the project work at my college or at any location under the direct and consistent monitoring of **Mr. Sagar Patel.** We will adopt all ethical practices to share credit amongst all the contributors based on their contributions during the project work.

2. We have not purchased the solutions developed by any 3rd party directly and the efforts are made by us under the guidance of guides.

3. The project work is not copied from any previously done projects directly.

4. **Extended Horizon** to the best of my knowledge is a genuine industry engaged in the professional service/social organizations

5. We understand and accept that the above declaration if found to be untrue, it can result in punishment/cancellation of project definition to me/we including failure in the subject of project work.

Name(s): Harshal Doshi Signature:
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Place: Vadodara

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We would also like to acknowledge with much appreciation the crucial role of the Head and staff of Computer Science Department for their contribution in our project work.

We would like to thank our Internal Guide Pradeep Laxkar, who has given his/her full effort in guiding the team in achieving the goal as well as encouragement to maintain our progress in track. We would like to express our gratitude for the guidance given by other supervisors as well as the panels especially in our project presentation that has improved our presentation skills by their comments and tips.

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Table of contents

ABSTRACT

As the Indian, government declared a rule in medical domain specifying that each practicing doctor will have to prescribe generic medicines to their patients and in prescription, there should be elements/contents of each medicine.

Therefore, we found this rule headache for everyone practicing in medical domain. To solve this problem is the main goal to achieve also including the management modules for the hospital. Therefore, we are going to create an application, which will help patients, doctors, and hospital staff to manage whole treatment cycle of a patient. By using this application, the doctor will not have to remember the contents of the medicine. Doctors even do not have to prepare a prescription; with use of OCR, we are going to solve this problem. Patients' medical history will be there in the database including every prescription. Hospital staff can prepare patient's file as required by using his/her history.

1.0 INTRODUCTION

1.1 Project Summary

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 to keep track of its day to day activities & records of its patients, doctors, nurses and other staff personals that keep the hospitals running smoothly & successfully.

But keeping track of all activities and their records on paper is very cumbersome and error prone. It also is very inefficient and 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.

The system "**MedCare**" is powerful, flexible and easy to use and is designed to deliver real conceivable benefits to hospitals. It is designed for hospitals to cover a wide range of day-to-day processes of hospitals like patient registration, OPD management, communication of vital measurements, generation of prescription for generic drugs (as per suggestion of Indian Govt.) and to serve the admitted patient. This system will also keep the details of history of the patients and provide reliable environment for hospitals.

1.2 Purpose

The IT system has revolutionized the field of medicine. In this fast-paced world of medicine, it is a daunting task to manage a hospital. The Hospital Management System facilitates managing the functioning of the hospital or any medical set up. This application will help in making the whole functioning paperless. It integrates all the information regarding patients, doctors, staff, hospital administrative details etc. into one application. It has sections for various professionals that make up a hospital.

The main goal of this application is to ease up the ecosystem of a hospital, so they can serve more patients with more focus and reliability.

1.3 Scope

- Patient registration is done using mobile number as a primary key
- Patients are guided by application and their vitals are measured and listed into the application by staff member / nurse.
- The MEDCARE system will work in proper flow.
- The patients are checked by doctors and doctors have access to the patient's history and vitals measured just before getting into the doctor's room.
- Doctor recommends the medicines using the application and the application will have content salting by which the task will become easier for the doctors.
- There will be a prescription generated and which have generic drug information of the medicines prescribed by the doctors
- The system provides bed management of the admitted patients and their day-to-day diagnostics provided by the doctors.
- Patient can have access to granted information such that patient can view his/her past diagnostics and prescriptions and amount spend in hospital.
- The system will generate the bill of patient after OPD as well as if patient is discharged from hospital.

1.4 Technology and Literature Review

Patent No: US20030093296 A1

An integrated hospital information management system having an order communication system and an information management system which are connected on a network, the information management system including: an image information acquisition means having an image photographing device corresponding to an imaging system and an image control and compression device for controlling the image photographing device.

Patent No: US 11/286,905

This invention is for the benefit of patient which helps to save his time by displaying the waiting time for a particular examination. Because of which he can go to another examination having less waiting time.

Patent No: US 12/528,058

This invention relates to a personalized integrated healthcare ant counterfeit management system providing pack authentication, user feedback and compliance, documentation of the dosage uptake by the users, maintenance of user related data and displaying compliance and feedback information, liaising with the healthcare agencies, users' nominated persons/medical practitioner, providing real-time and authentic data in raw and analysed form to diverse agencies in the healthcare chain.

2.0 SYSTEM REQUIREMENT STUDY

2.1 User Characteristics

- Educational Level : At least able to read and used to with online systems
- Technical expertise: should be a high or middle level employee of the organisation comfortable with using general purpose applications on a device.

2.2 Hardware and Software Requirements

Hardware Requirements

- Tablet
- Smart phones
- Processor (quad core or more)
- Server System (min 1 TB data storage)
- Personal Computers

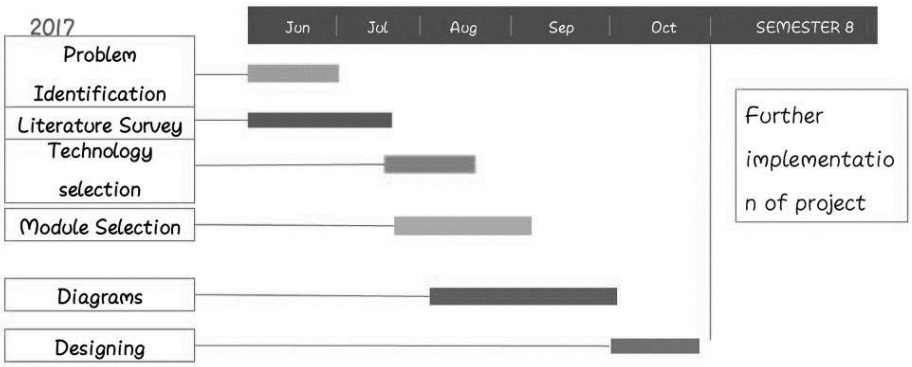
Software Requirements

- Operating System (windows / android)
- Database (MySQL)
- Development tools (eclipse, spring boot, angular JS, Themeleaf)
- Android studio
- Maven
- J2EE

2.3 Constraints

- System is wirelessly networked with an encryption
- System is only accessible within the hospital premises only.
- Database is password protected
- Should use less RAM and processing power.
- Each user should have individual ID and password.
- Only Administrator can access the whole system.

2.4 Timeline Chart



3.0 SYSTEM ANALYSIS

3.1 Study of Current System

The current system provides token management by which the system shows estimated time for the appointment of patient.

3.2 Problem and Weakness of Current System

- The current system does not provide synchronization for all hospitals.
- In current system, the option to generate prescription with medicine's contents is also not available.
- Offline Execution is not available in current systems.
- Alternate generic medicine listing is also not available in current systems.

3.3 Requirements of New System

- Disconnected Architecture
- Generic Medicine listing
- Medicine content auto fill-up
- Synchronization between all sub-systems

3.4 Feasibility Study

Technical feasibility

A study of resource availability that may affect the ability to achieve an acceptable system. This evaluation determines whether the technology needed for the proposed system is available or not.

1) Can the work for the project be done with current equipment existing software technology & available personal?
2) Can the system be upgraded if developed?
3) If new technology is needed then what can be developed?
4) This is concerned with specifying equipment and software that will successfully satisfy the user requirement.

The technical needs of the system may include:

Front-end and back-end selection

An important issue for the development of a project is the selection of suitable frontend and back-end. When we decided to develop the project, we went through an extensive study to determine the most suitable platform that suits the needs of the organization as well as helps in development of the project. The aspects of our study included the following factors.

Front-end selection:

1) It must have a graphical user interface that assists employees that are not from IT background.
2) Scalability and extensibility.
3) Flexibility.
4) Robustness.
5) According to the organization requirement and the culture.
6) Must provide excellent reporting features with good printing support.
7) Platform independent.
8) Easy to debug and maintain.
9) Event driven programming facility.
10) We choose some of popular front-end tools like angular JS, Bootstrap, JSP to provide better performance and scalability.

Back-end Selection:

We opt to implement backend in MySQL as of its popularity and advantages like

1. Data Security
2. On-demand Scalability
3. High performance
4. Comprehensive Transactional support
5. Complete Workflow Control
6. The flexibility of Open Source

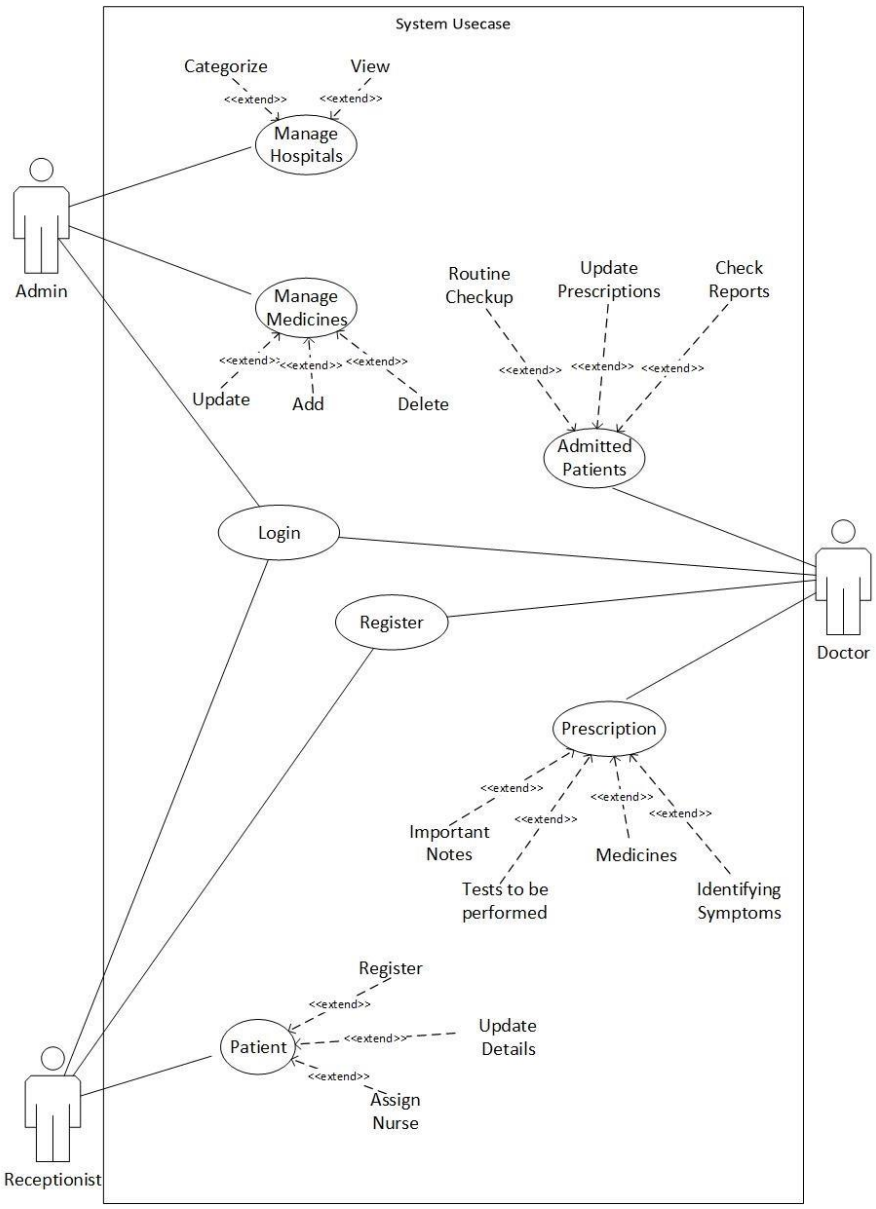
7. Robust
8. Integrity
9. Incredibly Inexpensive

In this system, we are using spring boot, hibernate, themeleaf, JSP to provide better performance in MVC pattern

Economic Feasibility

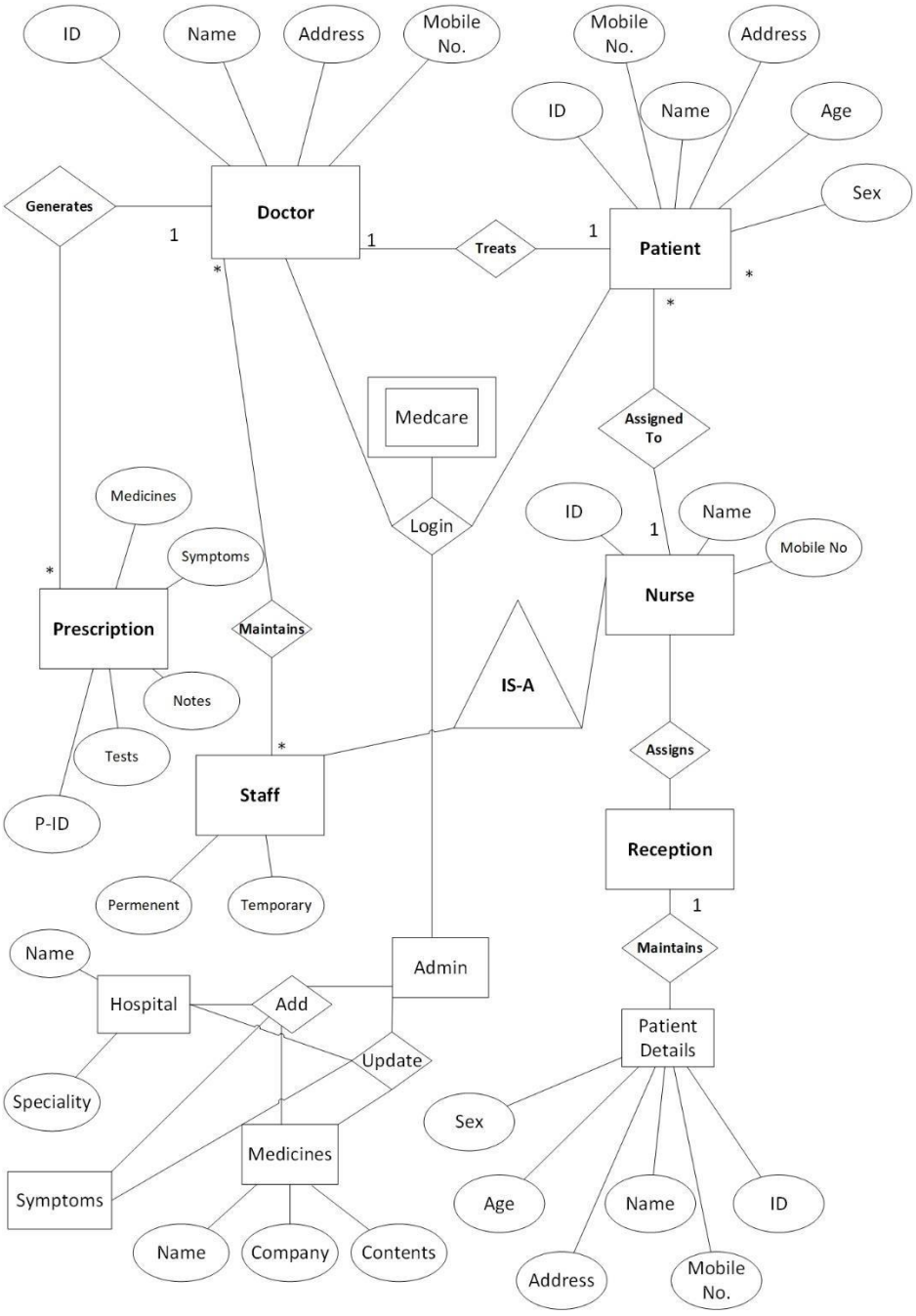
This system is developed comparatively at lower cost as economic relevance is one of the major causes of successful project making. And the system lead to better performance and reliable operation of the hospital so this system will lead to better satisfactory treatment of patients.

3.5 Functions of System

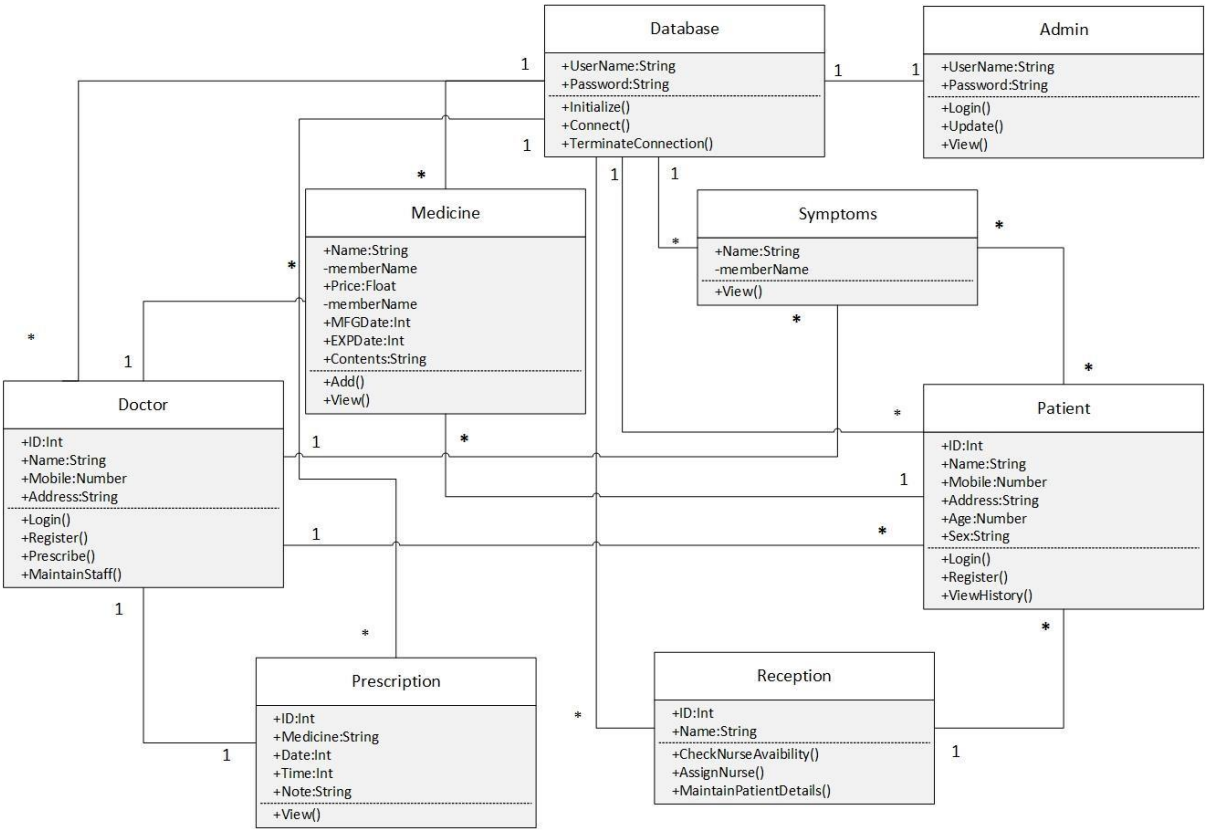


3.6 Data Modelling

3.6.1 Class Diagram/ E-R Diagram



3.6.2 **System Activity or Object Interaction Diagram**



3.6.3 **Data Dictionary**

Medicine

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	**id**	int(11)			No	*None*		AUTO_INCREMENT
2	**name**	text	latin1_swedish_ci		No	*None*		
3	**contents**	text	latin1_swedish_ci		No	*None*		
4	**usedfor**	text	latin1_swedish_ci		No	*None*		
5	**price**	text	latin1_swedish_ci		No	*None*		
6	**tablets**	text	latin1_swedish_ci		No	*None*		

Nurse_details

#	Name	Type	Collation	Attributes	Null	Default	Comments
1	id	int(11)			No	None	
2	post	text	latin1_swedish_ci		No	None	
3	is_available	tinyint(1)			No	None	

Patient_details

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	id	int(5)			No	None		AUTO_INCREMEI
2	doctor_id	int(11)			No	None		
3	status	text	latin1_swedish_ci		No	None		

Patient_payment

#	Name	Type	Collation	Attributes	Null	Default	C
1	id	int(4)			No	None	
2	patient_id	int(4)			No	None	
3	date	timestamp			No	CURRENT_TIMESTAMP	
4	payment_type_id	int(4)			No	None	
5	payment_mode	text	latin1_swedish_ci		Yes	NULL	

Payment_type

#	Name	Type	Collation	Attributes	Null	Default	Comments	Ext
1	id	int(4)			No	None		AUT
2	reason	text	latin1_swedish_ci		No	None		

Prescription

#	Name	Type	Collation	Attributes	Null	Default	Comm
1	id	int(5)			No	None	
2	date	timestamp		on update CURRENT_TIMESTAMP	No	CURRENT_TIMESTAMP	
3	note	text	latin1_swedish_ci		No	None	
4	patient_id	int(5)			No	None	
5	doctor_id	int(5)			No	None	

Prescription_medicine

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	id	int(5)			No	*None*		AUTO
2	medicine_id	int(5)			No	*None*		
3	prescription_id	int(5)			No	*None*		
4	description	text	latin1_swedish_ci		No	*None*		

User

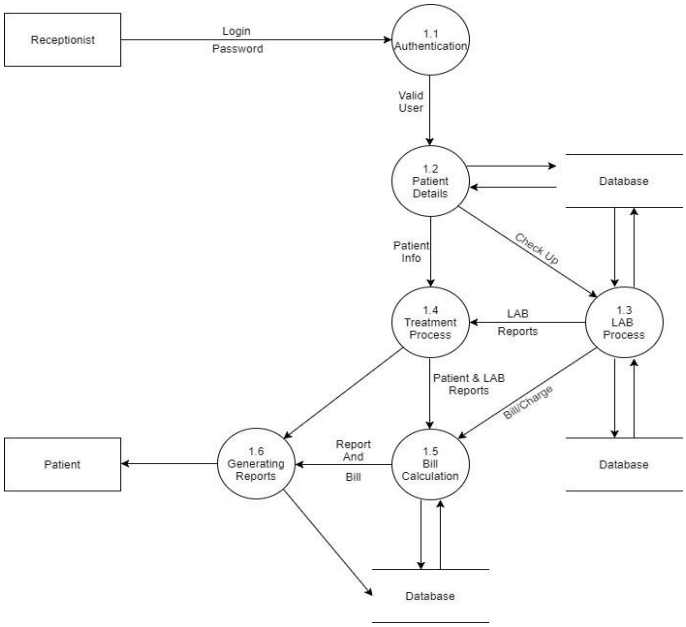
#	Name	Type	Collation	Attributes	Null	Default
1	id	int(4)			No	*None*
2	password	text	latin1_swedish_ci		No	*None*
3	phno	bigint(20)			No	*None*
4	type	text	latin1_swedish_ci		No	*None*
5	user_name	text	latin1_swedish_ci		No	*None*
6	address	text	latin1_swedish_ci		No	*None*
7	sex	text	latin1_swedish_ci		No	*None*
8	birthdate	timestamp		on update CURRENT_TIMESTAMP	No	CURRENT_TIMESTAMP
9	email	text	latin1_swedish_ci		No	*None*

3.7 Functional and Behavioural Modelling

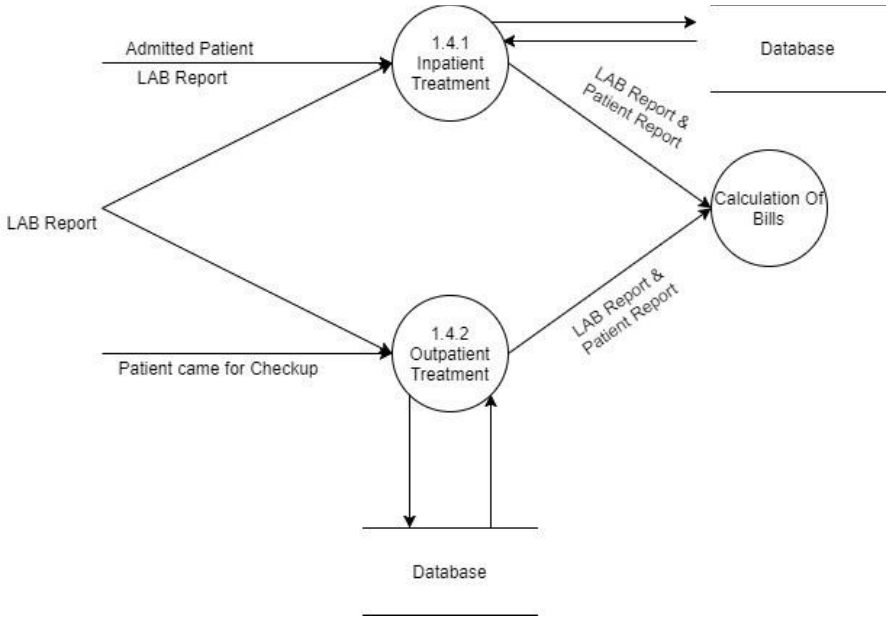
3.7.1 Context Diagram

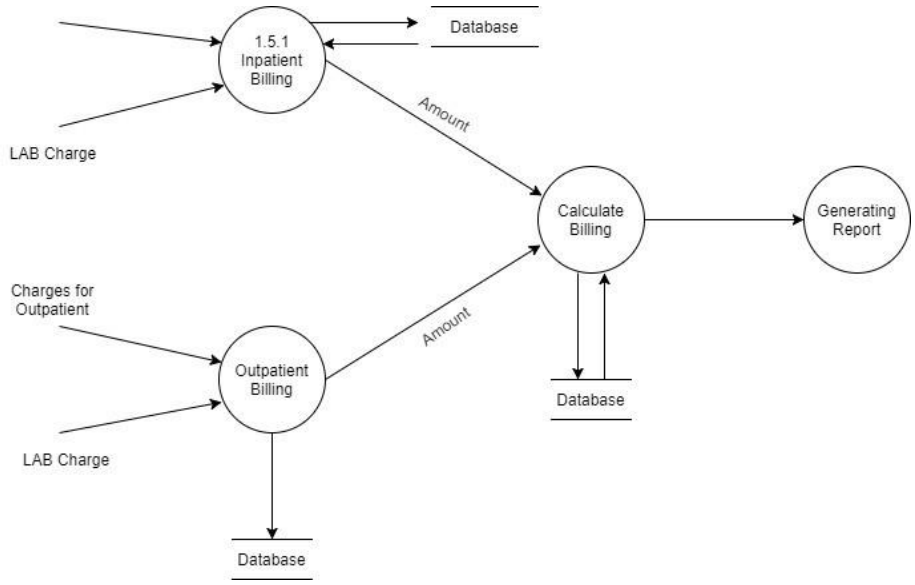
3.7.2 **Data Flow Diagram**

DFD 1.0



DFD 1.1





3.8 Main Modules of New System

- Login:
  a. Patient
  b. Doctor
  c. Staff
- Signup:
  a. Patient
  b. Doctor
  c. Staff
- Staff Login – Receptionist a. Patient registration
  b. Money collection
  c. Bill generation
  d. Assign nurse
- Staff Login -Nurse
  a. Notification of work
  b. Vital measurement
- Doctor Login
  a. Admitted Patient record on home page
  b. Prescription
  c. Generation
- Patient Login

a. History will be seen

3.9 Selection of Hardware and Software Justification

JAVA:

Spring Boot:

- Provides easy configuration
- Nourishes the functionality of spring
- Provides functionalities like: Dependency Injection, Auto wiring
- Follows modern IOC design pattern
- Replacement of EJB

Hibernate:

- Relational Persistence for JAVA
- Database dependent code
- Maintenance Cost
- Automatic Versioning and Time Stamping
- Open-Source, Zero-Cost Product License

Angular-JS:

- Security
- Declarative User Interface
- Integration
- Data Binding
- Less Coding

Server:

- To run web-services

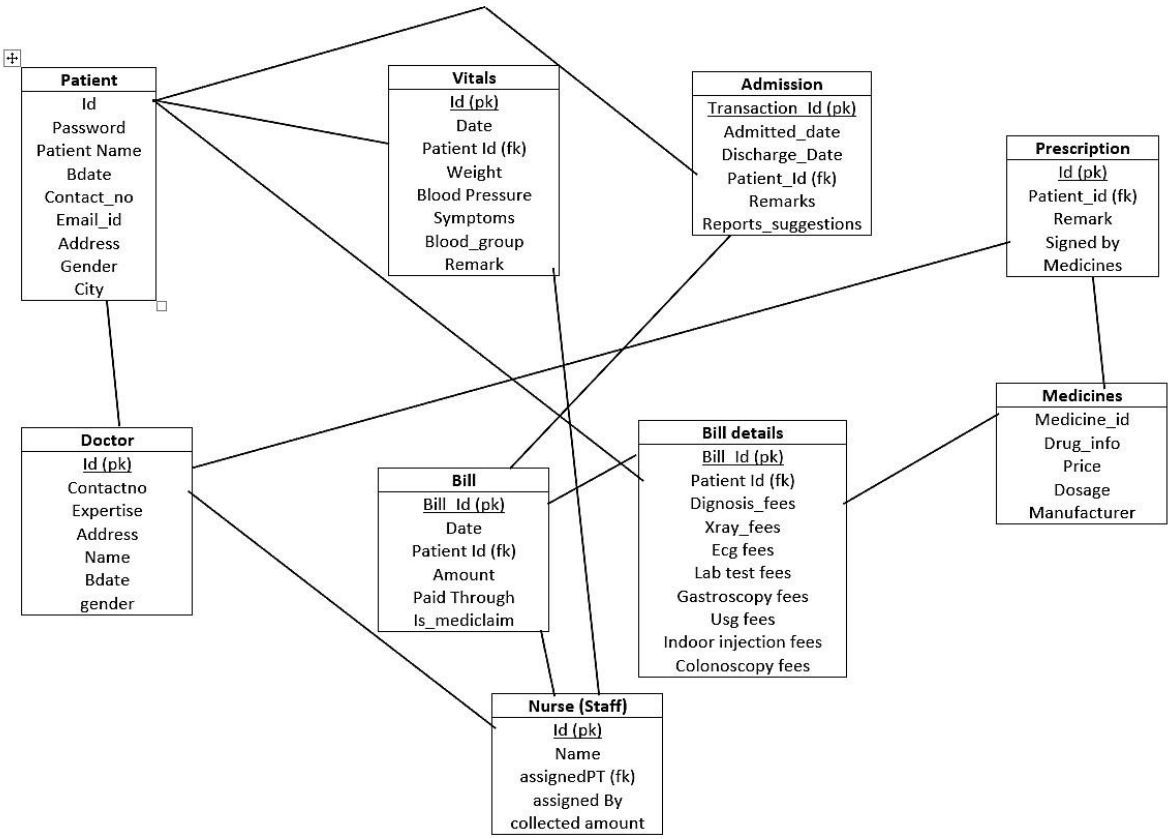
Personal Computer:

- To provide localhost server as per every hospital

4.0 SYSTEM DESIGN

4.1 Database Design / Data Structure Design

4.1.1 Tables and Relationships



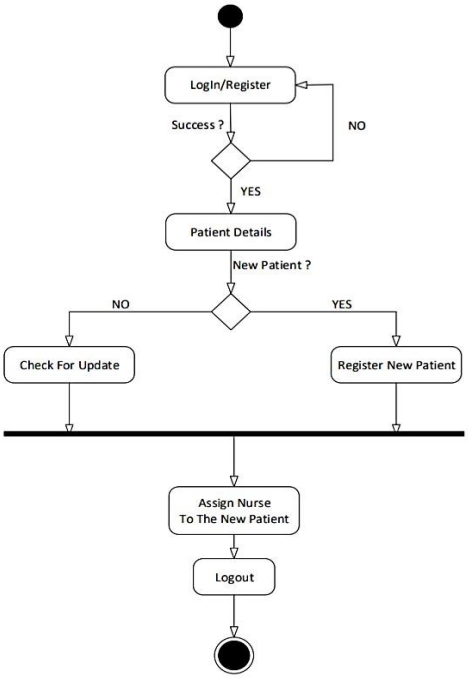
4.2 Input / Output and Interface Design

4.2.1 Access Control and Security

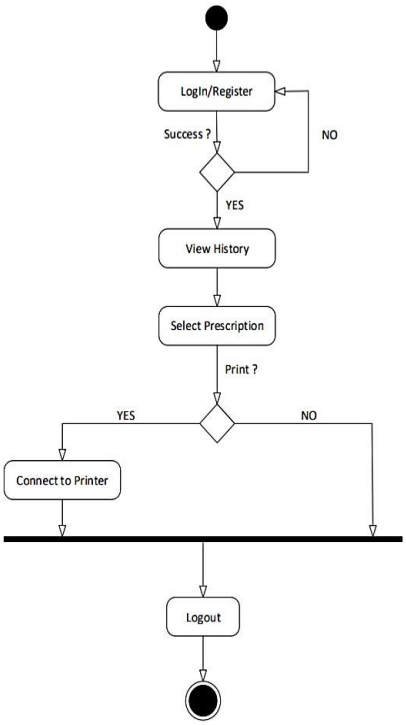
For security purpose, we are providing support of OAuth API. For password security, we are providing MD5 encryption algorithm.

4.2.2 State transition Diagrams

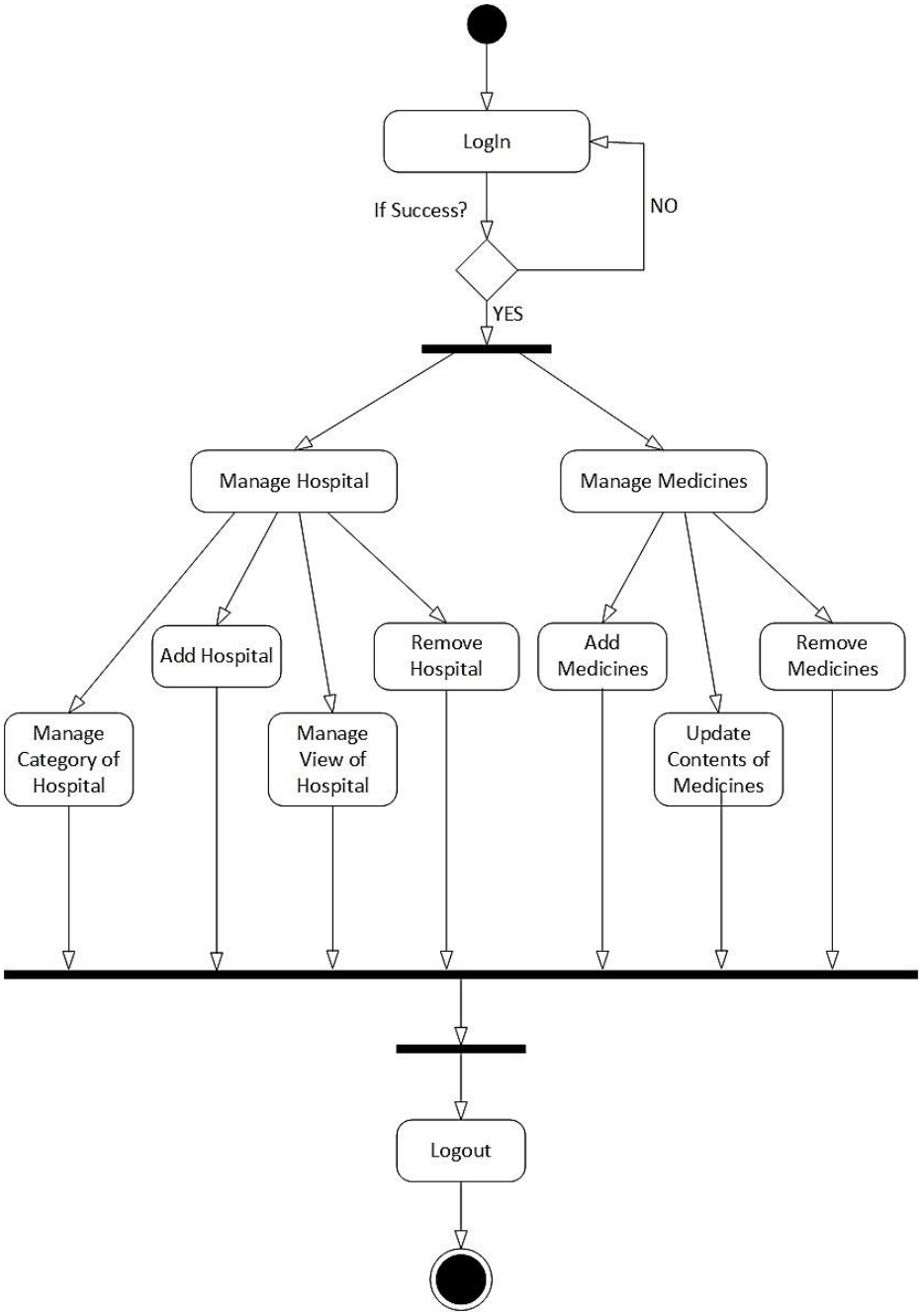
Reception Activity



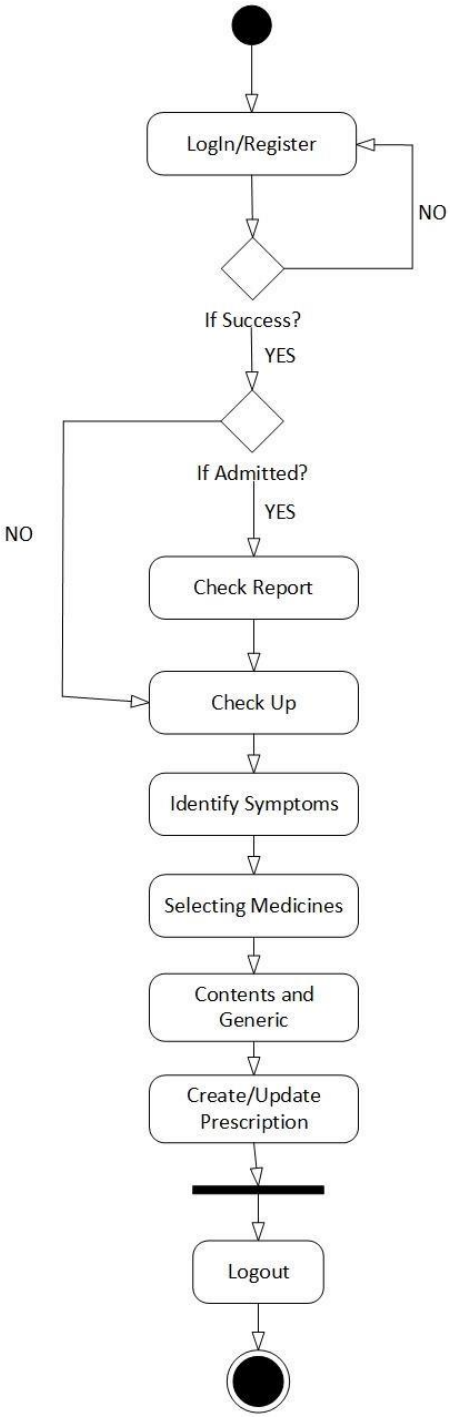
Patient Activity



Admin Activity



OPD Activity



5.0 IMPLEMENTATION PLANNING AND DETAILS

5.1 Implementation Environment

The system is having multiuser environment having Web App GUI.

The GUI is developed using material design and it is responsive.

We have multiuser so that the system can become pure ERP and it is a GUI which provide better User Experience.

The Doctor can login and can view the OPD patients as well as Admitted Patients and Doctor can do the activities like prescribing medicines to patient, view past report history and can record the patient history.

On other side doctor can assign tasks to nurses to perform any medical tasks for particular user.

The patient can view his/her medical history and can download the prescription which contains dynamically generated Generic Drug information suggested.

The nurses can measure vitals and can perform task assigned by the doctor and can update the information regarding particular patient and can report to the doctor.

The nurses can register new patient and can make patient's file on the go.

Admin can view edit and add new doctor/ Nurses as well as patients.

5.2 Program / Module Specification

We are following MVC pattern for coding.

We are following modularity approach and we have services, controller, models and ORM which makes our project a complete modular approach.

We have Module approach in front end using AngularJS as well as in backend using Spring Framework of Java and Hibernate in Database.

We have the following modules:

- Login for all users
- Doctor Dashboard
- Tabular view of patients
- Create new prescription
- View historical prescription
- Assign for admit
- Patient can download prescription
- Generate billing
- Nurse can receive task and provide confirmation

5.3 Security Features

All passwords are encrypted and then stored in Database.

Doctor only can generate prescriptions

The database are switched to secure network and are password protected

No patient can access private information of other patient

All task can be analyse by the admin

The payment is done using secure gateway

5.4 Coding Standards

All backend Java code are divided in controller, services, model and dao.

Controller accepts the request and ask the service to provide the requested operation which is done on model classes and from databases using DAO classes.

The data members are set to private and implemented the interfaces to make the system abstract, to provide encapsulation, modularity, security as well as robustness.

Same as backend the front end is also having Controller, Services and the views.

Controller handle the request generated by the events of the user and invoke the services to handle the request and it converts the request to the backend and returns the response to the controller which renders the specific view to the user.

5.5 Sample Coding

prescriptionController.js

```
var prescriptionController = angular.module('prescription-
controller',[]);

prescriptionController.controller('prescriptionController',
      function($scope, $rootScope, $location,$state,$http,
            PrescriptionAPI,$uibModal,$stateParams,$cookieStore){

    $scope.meds = [{"medicineId":"","description":""}];
    $rootScope.globals = $cookieStore.get('globals');

    $scope.patient;
    $scope.doctor;

    console.log($stateParams.id + "state p id"+$rootScope.globals);
    console.log($stateParams.patient);

    PrescriptionAPI.getPatientById($stateParams.patient.id).
      success(function (response){
        $scope.patient = response.user;
```

```
}).error(function(data, status, headers, config){
  console.log("Error")
});

PrescriptionAPI.getDoctorById($stateParams.patient.doctorId).
  success(function (response){
    $scope.doctor = response.user;
}).error(function(data, status, headers, config){
  console.log("Error");
});

$scope.addNewMedicine = function()
{
    $scope.meds.push({"medicineId":"","description":""});
    $scope.medicines = [];
}

$scope.submitPrescription = function()
{
    for(var i = 0; i < $scope.meds.length; i++)
    {
        $scope.meds[i].medicineId = $scope.meds[i].medicine.id;
    }

    PrescriptionAPI.prescriptionInsertion(
       {
             "IdDescriptionList":$scope.meds,
             "patientId":$stateParams.id,
             "note":$scope.note
       }
       ).success(function (response){
        console.log(response);
        $state.go('doctordash');
    }).error(function(data, status, headers, config){
             console.log("Error");
       });
}

if ($('[data-action="print"]')[0]) {
    $('body').on('click', '[data-action="print"]', function(e){
        e.preventDefault();
        var originalContents = document.body.innerHTML;
        window.print();
        document.body.innerHTML = originalContents;
    })
}

$scope.getLocation = function(val) {
    $scope.medicines;

$http.get('doctor/medicineSuggestion/'+val).then(function(response){
            console.log(response);
            $scope.medicines = response.data.medicines;
        });
```

```
        return $scope.medicines;
    }
});
```

prescritionService.js

```
var prescriptionService = angular.module('prescription-service',[]);

prescriptionService.factory('PrescriptionAPI', function ($http) {
    var PrescriptionAPI = {};
    PrescriptionAPI.prescriptionInsertion = function(data){
    console.log(data);
        return $http({
            method : 'POST',
            url : 'doctor/prescriptionInsertion',
            data : data
        });
    };

    PrescriptionAPI.getPatientById = function(id) {
        return $http({
            method : 'GET',
            url : 'doctor/getUserById/' + id,
        });
    };

    PrescriptionAPI.getDoctorById = function(id) {
        return $http({
            method : 'GET',
            url : 'doctor/getUserById/' + id,
        });
    };

    return PrescriptionAPI;
});
```

Prescription Generation flow code:

Controller:

```
@RequestMapping(value="/prescriptionList",method=RequestMethod.P
OST, produces = "application/json")
    @ResponseBody
    public Map<String, Object> prescriptionList(@RequestBody
Map<String,Object> req){
        return
patientService.prescriptionList(Integer.parseInt(req.get("patien
tId").toString()));
    }
```

```
    @RequestMapping(value="/prescriptionInsertion",method =
RequestMethod.POST, produces = "application/json")
    @ResponseBody
    public Map<String, Object> prescriptionDoctor(@RequestBody
Map<String, Object> req, HttpServletRequest hReq){
        List<Map<String, Object>> IdDescription =
(List<Map<String, Object>>) req.get("IdDescriptionList");
        currentSession = hReq.getSession();
        int patientId =
Integer.parseInt(req.get("patientId").toString());
        int doctorId =
Integer.parseInt(currentSession.getAttribute("user").toString())
;
        String note = (String) req.get("note");
        Map<String, Object> prescriptionData = new HashMap<>();
        prescriptionData.put("pId",patientId);
        prescriptionData.put("dId",doctorId);
        prescriptionData.put("note",note);
        List<PrescriptionMedicineModel> prescription = new
ArrayList<>();
        for(int i = 0; i < IdDescription.size(); i++) {
            prescription.add(new
PrescriptionMedicineModel(Integer.parseInt(IdDescription.get(i).
get("medicineId").toString()),

IdDescription.get(i).get("description").toString()));
        }
        prescriptionData.put("medicines",prescription);
        return
patientService.prescriptionInsertion(prescriptionData);
    }


@RequestMapping(value="/medicineSuggestion/{medicine}",method =
RequestMethod.GET, produces = "application/json")
    @ResponseBody
    public Map<String, Object>
medicineSuggestion(@PathVariable("medicine") String medicine){
        return patientService.medicineSuggestion(medicine);
    }
```

Service:

```
@Override
    public Map<String, Object> prescriptionInsertion(Map<String,
Object> prescriptionData) {
        Map<String, Object> map = new HashMap<>();
        if (prescriptionData.isEmpty()) {
            map.put("status", false);
        } else {
            map.put("prescriptionDetails",
patientDaoI.prescriptionInserting(prescriptionData));
            map.put("status", true);
        }
        return map;
    }

    @Override
    public Map<String, Object> medicineSuggestion(String
medicine) {
        Map<String, Object> map = new HashMap<>();
        if(medicine.equals(null)){
            map.put("status", false);
        }
        else{
            map.put("medicines",
patientDaoI.medicineSuggesting(medicine));
            map.put("status", true);
        }
        return map;
    }

    @Override
    public Map<String, Object> patientPrescriptionId(Integer
prescriptionId) {
        Map<String, Object> map = new HashMap<>();

map.put("genericPrescriptionsList",patientDaoI.patientPrescripti
onId(prescriptionId));
```

```
        System.out.println("Prescription ID: " +
prescriptionId);
        map.put("status",true);
        return map;
    }
```

Data Access Object:

```
 public Boolean prescriptionInserting(Map<String,Object>
prescriptionData) {
        session = sessionFactory.openSession();
        tx = session.beginTransaction();
        PrescriptionModel idData = new PrescriptionModel();
        PatientDetailsModel patient = new PatientDetailsModel();
        DoctorDetailsModel doctor = new DoctorDetailsModel();
        patient.setId((Integer) prescriptionData.get("pId"));
        doctor.setId((Integer) prescriptionData.get("dId"));
        idData.setPdmod(patient);
        idData.setDdmod(doctor);
        idData.setDate(new Date());
        idData.setNote((String) prescriptionData.get("note"));

        try{
            session.save(idData);
            List<PrescriptionMedicineModel> prescriptions =
(List<PrescriptionMedicineModel>)
prescriptionData.get("medicines");
            for(PrescriptionMedicineModel prescription :
prescriptions) {
                prescription.setPmObj(idData);
                session.save(prescription);
            }
            session.close();
            tx.commit();
            return true;
        }catch (Exception ex){
            ex.printStackTrace();
        }
        return false;
```

```
    }

    @Override
    public List<Medicine> medicineSuggesting(String medicine) {
        session = sessionFactory.openSession();
        tx = session.beginTransaction();
        try {
            medicine = medicine+"%";
            query = session.createSQLQuery("SELECT * FROM
medicine where name LIKE '"+medicine+"'");
            query.addEntity(Medicine.class);
            medicines = query.list();
            session.close();
            tx.commit();
            return medicines;
        }catch (Exception e) {
            e.printStackTrace();
        }
        session.close();
        tx.commit();
        return null;
    }
    @Override
    public Object patientPrescriptionId(Integer prescriptionId)
{
        session = sessionFactory.openSession();
        tx = session.beginTransaction();
        query = session.createSQLQuery("SELECT * FROM
prescription WHERE id = " + prescriptionId);
        query.addEntity(PrescriptionModel.class);
        prescriptionModels = query.list();
        PrescriptionModel prescriptionModel =
prescriptionModels.get(0);
        query = session.createSQLQuery("SELECT p.id
id,p.medicine_id
medicineId,p.description,m.name,m.contents,m.usedfor,m.price,m.t
ablets FROM prescription_medicine p INNER JOIN medicine m ON
p.medicine_id=m.id WHERE p.prescription_id = "+prescriptionId);
        query.addEntity(TemporaryBufferModel.class);
```

```
            temporaryBufferModels = query.list();
            session.close();
            tx.commit();
            alternates = new HashMap<>();
            for(TemporaryBufferModel temp : temporaryBufferModels)
            {
                query = session.createSQLQuery("SELECT * FROM
medicine WHERE contents ='"+temp.getContents()+"'");
                query.addEntity(Medicine.class);
                medicines = query.list();
                Medicine LowCost = medicines.get(0);
                float unitPrice =
Float.parseFloat(medicines.get(0).getPrice());
                unitPrice /=
Float.parseFloat(medicines.get(0).getTablets());
                for(Medicine m : medicines)
                {
                    float cunitPrice =
Float.parseFloat(m.getPrice());
                    cunitPrice /= Float.parseFloat(m.getTablets());
                    if(unitPrice > cunitPrice)
                    {
                        LowCost = m;
                        unitPrice = cunitPrice;
                    }
                }
                alternates.put(temp.getMedicineId(),LowCost);
            }
            return alternates;
        }
```

Model:

```
@Entity
@Table(name="prescription")
public class PrescriptionModel {
    @Id
    @GeneratedValue
    private int id;
```

```
    @Column(name = "date")
    private Date date;
    @Column(name = "note")
    private String note;

    @ManyToOne(fetch = FetchType.EAGER)
    @JoinColumn(name = "patient_id")
    private PatientDetailsModel pdmod;

    @ManyToOne(fetch = FetchType.EAGER)
    @JoinColumn(name = "doctor_id")
    private DoctorDetailsModel ddmod;

    @OneToMany(mappedBy = "pmObj" , fetch = FetchType.EAGER)
    private List<PrescriptionMedicineModel> pmmList = new
ArrayList<>();

    public PatientDetailsModel getPdmod() {
        return pdmod;
    }

    public void setPdmod(PatientDetailsModel pdmod) {
        this.pdmod = pdmod;
    }

    public DoctorDetailsModel getDdmod() {
        return ddmod;
    }

    public void setDdmod(DoctorDetailsModel ddmod) {
        this.ddmod = ddmod;
    }

    public List<PrescriptionMedicineModel> getPmmList() {
        return pmmList;
    }
```

```
    public void setPmmList(List<PrescriptionMedicineModel>
pmmList) {
        this.pmmList = pmmList;
    }

    public int getId() {
        return id;
    }

    public void setId(int id) {
        this.id = id;
    }

    public Date getDate() {
        return date;
    }

    public void setDate(Date date) {
        this.date = date;
    }

    public String getNote() {
        return note;
    }

    public void setNote(String note) {
        this.note = note;
    }
}
```

6.0 TESTING

6.1 Testing Plan

1. Analyze the product
2. Design the Test Strategy
3. Define the Test Objectives
4. Define Test Criteria
5. Resource Planning
6. Plan Test Environment
7. Schedule & Estimation
8. Determine Test Deliverables

6.2 Testing Methods

1. Unit Testing
2. Integration Testing
3. System Testing
4. Regression Testing
5. Acceptance Testing
6. Alpha Testing
7. Beta Testing

6.3 Test Cases

1. Test Case: Registration

SR. NO	SCENARIO	EXPECTED RESULT	OBTAINED RESULT TRUE/FALS
1.	Registration Page Loading	All components should load and be ready to use	True
2.	Any Field Left Empty	Alert is generated if field remains empty	True
3.	Registration Validation Check	Alert is generated if any validation format is not proper	True
4.	Insertion of Records in Database	Records should be inserted into the database only when it meets integrity constraints	True

2. Test Case: Login Criteria

SR. NO	SCENARIO	EXPECTED RESULT	OBTAINED RESULT TRUE/FALSE
1.	Login Page Loading	All components should load and be ready to use	True
2.	Login Credentials Check	Access should be denied in case the login is performed other than registered users	True
3.	Blank Username and Password	Alert is generated if either username or password is left empty	True
4.	Main Page Loading	All components and menu items should be loaded and ready to use	True

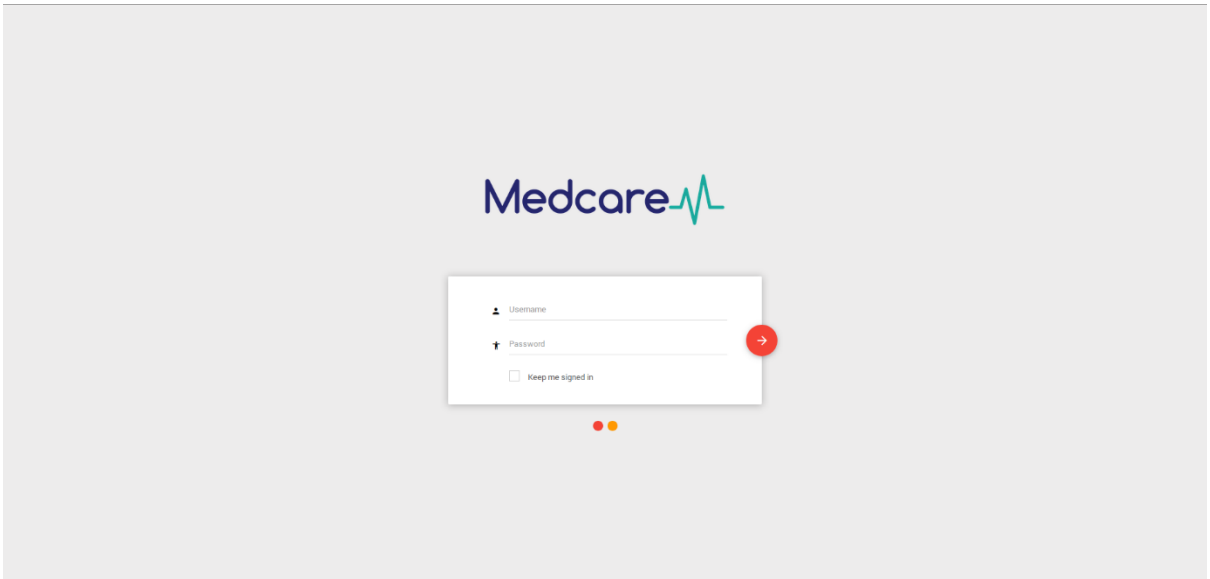
3. Test Case: Insert Details

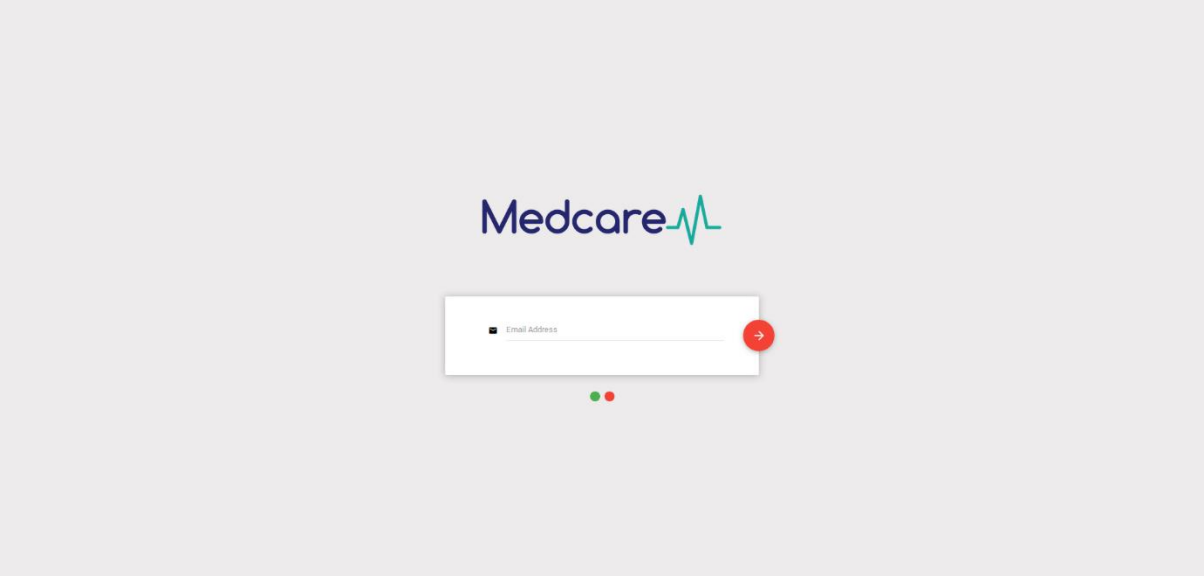
SR. NO	SCENARIO	EXPECTED RESULT	OBTAINED RESULT TRUE/FALSE
1.	Page Loading	All components should load and be ready to use	True
2.	Drop down list	All the data should be displayed properly and accessible	True
3.	Insertion of records in Masters	Records should be inserted into the database only when it meets integrity constraints	True
4.	Updating of records in Database	Records should be updated in the database only when it meets integrity constraints	True
5.	Any Field Left Empty	Alert is generated if field remains empty	True
6.	Displaying Details	Display recorded	True
7.	Proper Date Formats	Date should be presented in the prescribed format	True

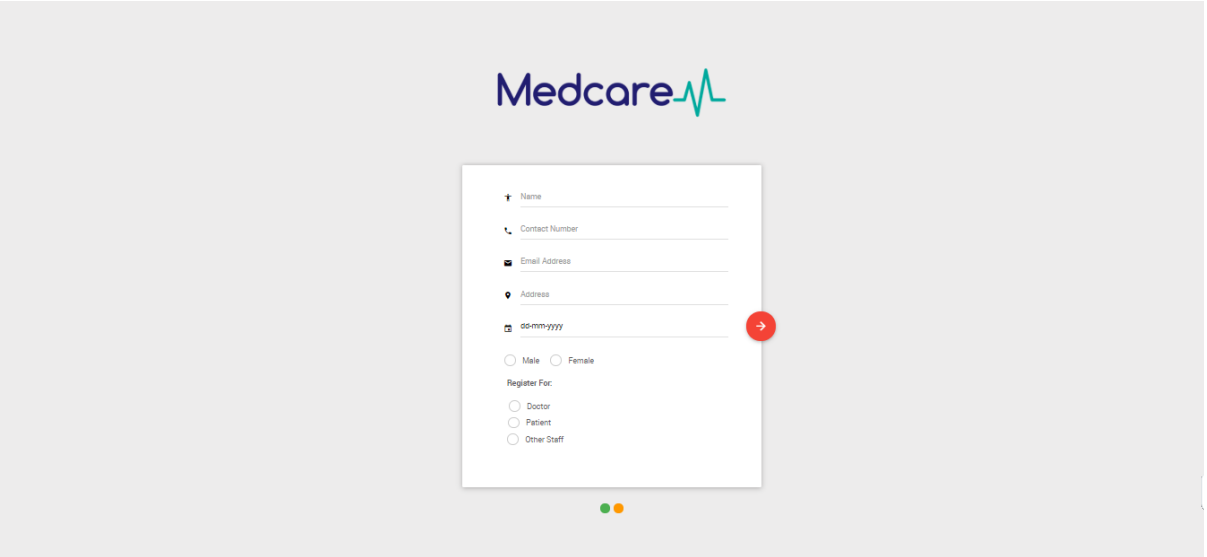
4. Test Case: Show Patient details

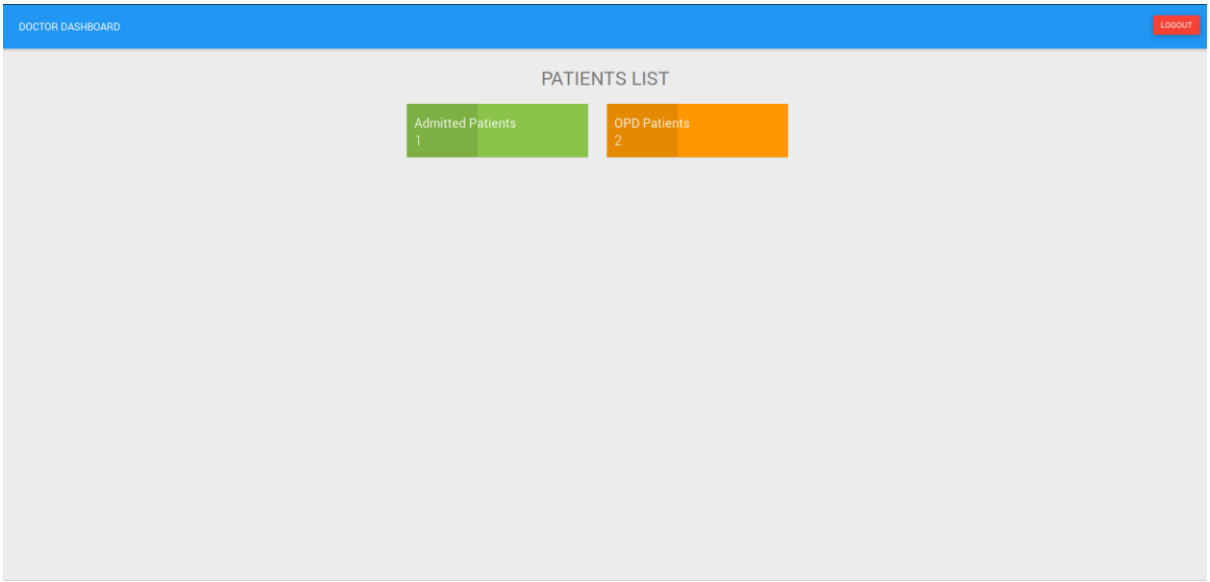
SR. NO	SCENARIO	EXPECTED RESULT	OBTAINED RESULT TRUE/FALSE
1.	User Page Loading	User components should load and be ready to use	True
2.	User see status	It should show current status of the patient	True

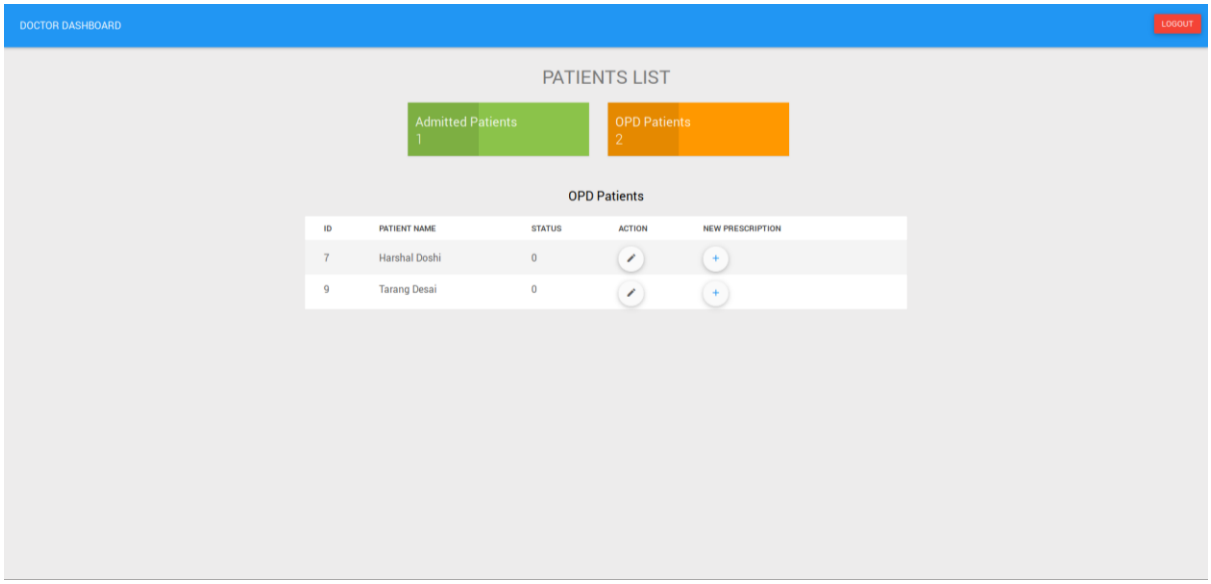
7. SCREEN SHOTS AND USER MANUAL

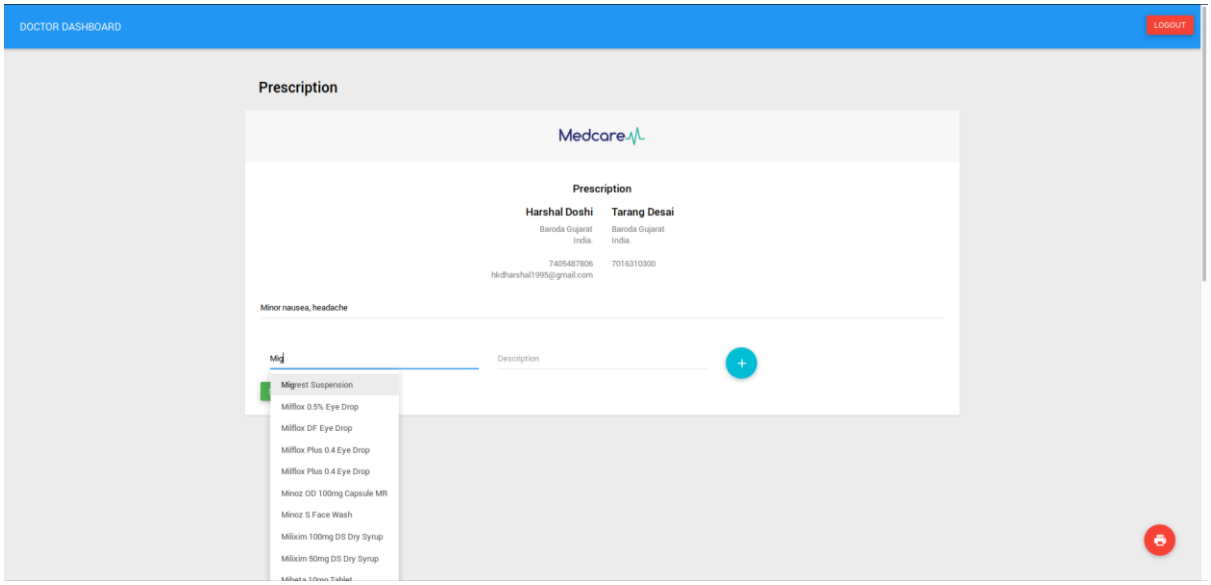


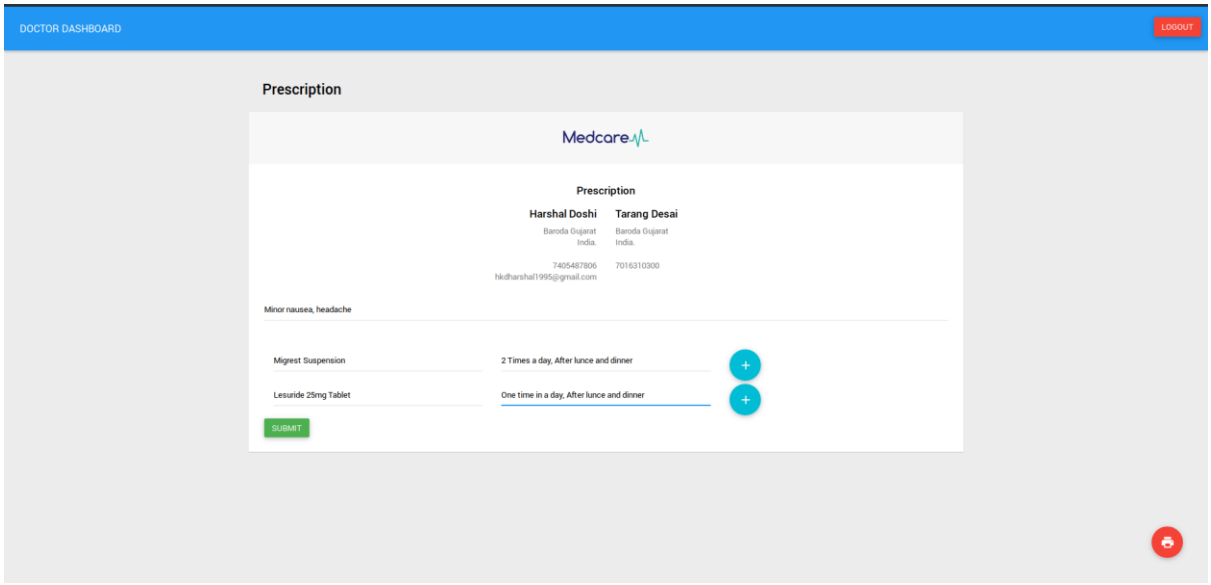


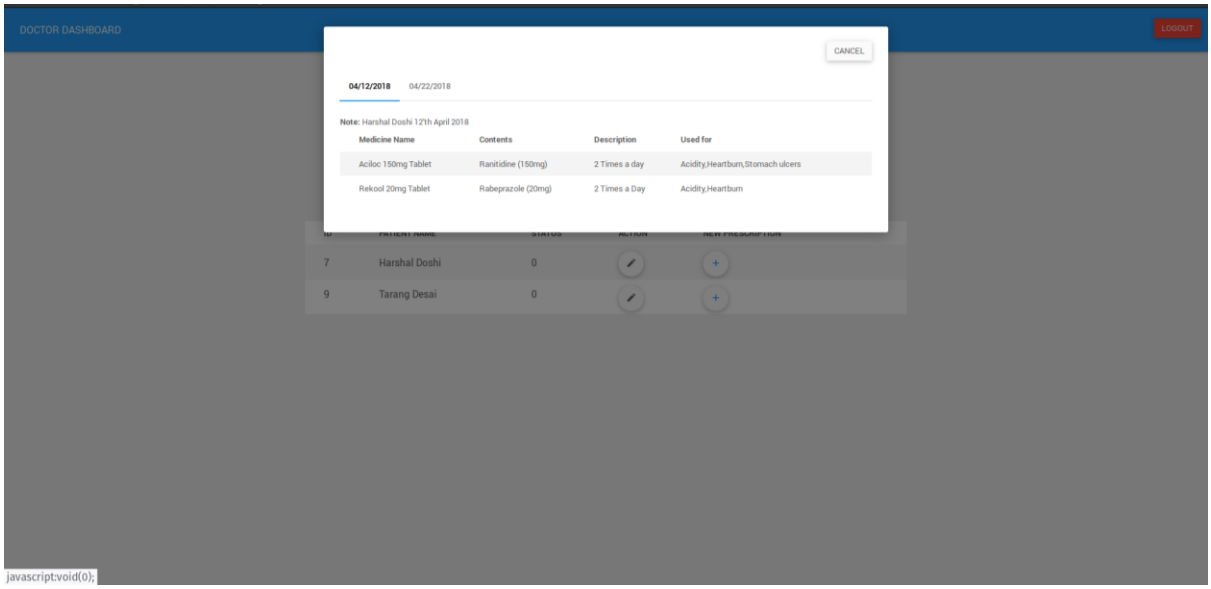

Medcare
Name
Contact Number
Email Address
Address
dd-mm-yyyy
Male
Female
Register For:
Doctor
Patient
Other Staff

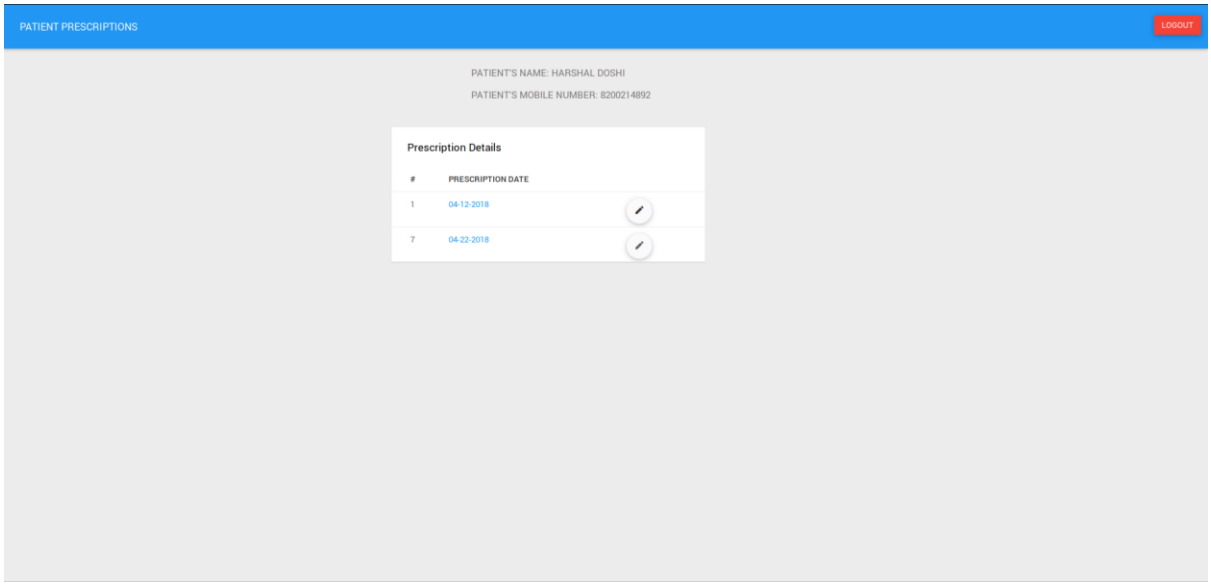

DOCTOR DASHBOARD
LOGOUT
PATIENTS LIST
Admitted Patients
1
OPD Patients
2

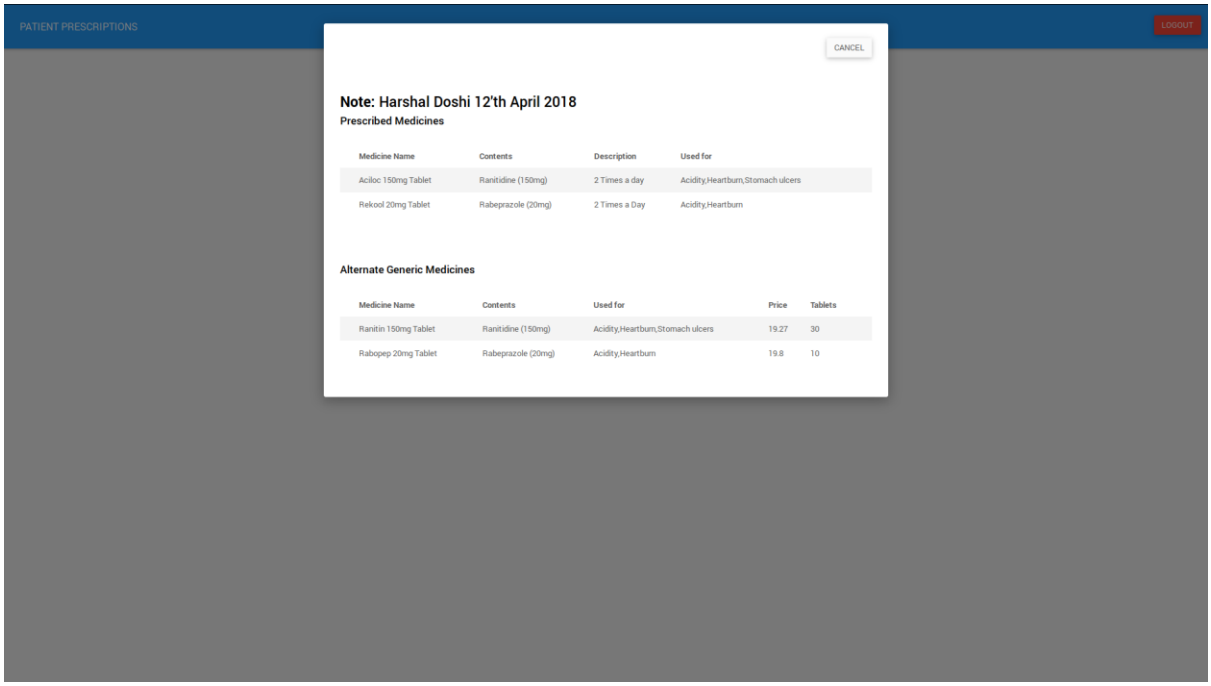

DOCTOR DASHBOARD
LOGOUT
PATIENTS LIST
Admitted Patients
1
OPD Patients
2
OPD Patients
ID
PATIENT NAME
STATUS
ACTION
NEW PRESCRIPTION
7
Harshal Doshi
0
9
Tarang Desai
0


DOCTOR DASHBOARD
LOGOUT
Prescription
Medcare
Prescription
Harshal Doshi
Baroda Gujarat
India.
7405487806
hkdharshal1995@gmail.com
Tarang Desai
Baroda Gujarat
India.
7016310300
Minor nausea, headache
Description
Migrest Suspension
Milflox 0.5% Eye Drop
Milflox DF Eye Drop
Milflox Plus 0.4 Eye Drop
Milflox Plus 0.4 Eye Drop
Minoz OD 100mg Capsule MR
Minoz S Face Wash
Milixim 100mg DS Dry Syrup
Milixim 50mg DS Dry Syrup

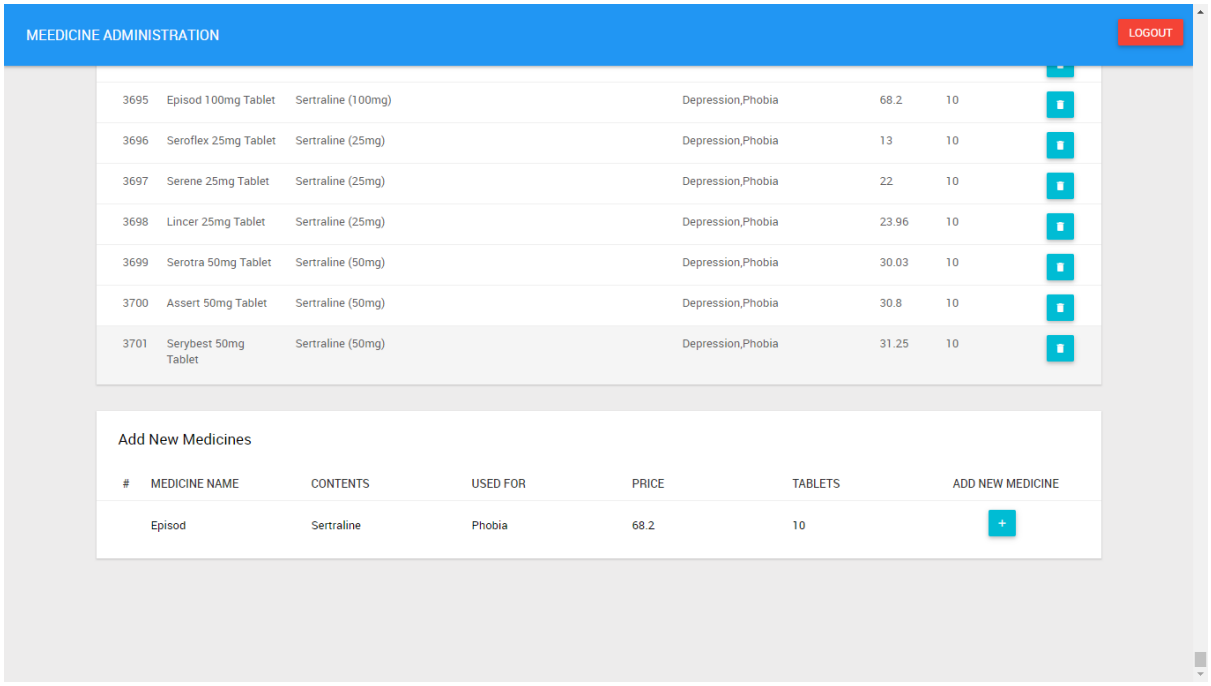

DOCTOR DASHBOARD
LOGOUT
Prescription
Medcare
Prescription
Harshal Doshi
Baroda Gujarat India.
7405487806
hkdharshal1995@gmail.com
Tarang Desai
Baroda Gujarat India.
7016310300
Minor nausea, headache
Migrest Suspension
2 Times a day, After lunce and dinner
Lesuride 25mg Tablet
One time in a day, After lunce and dinner
SUBMIT

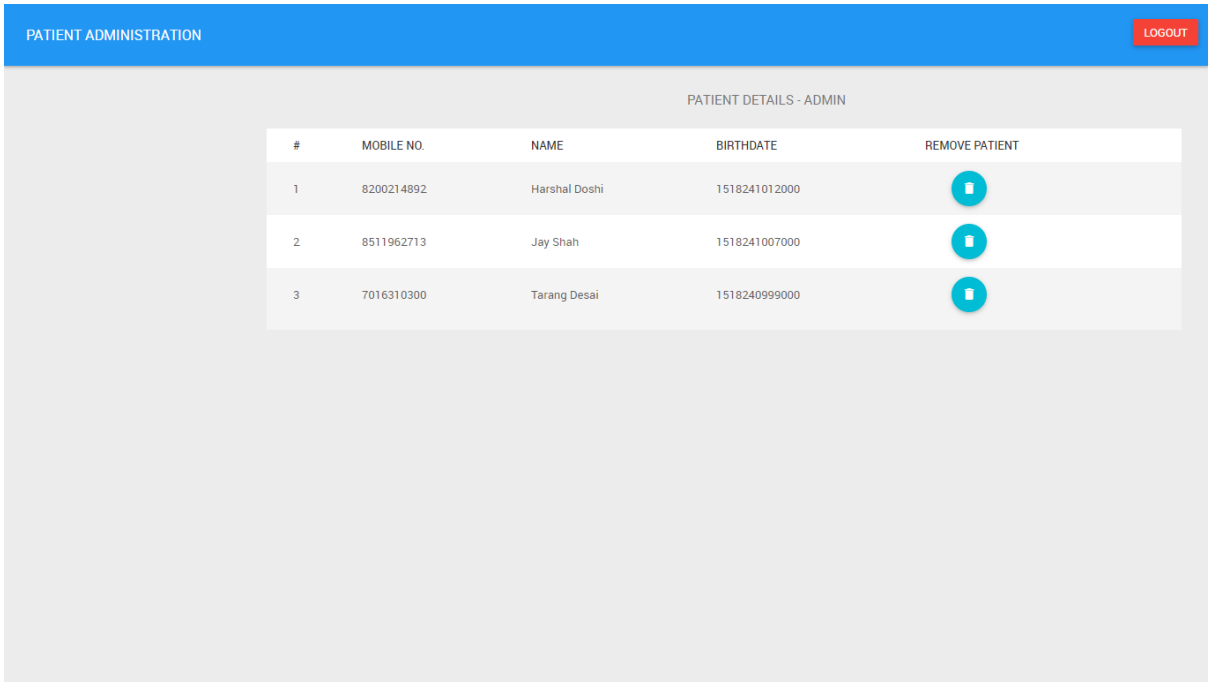

DOCTOR DASHBOARD
LOGOUT
CANCEL
04/12/2018
04/22/2018
Note: Harshal Doshi 12th April 2018
Medicine Name
Contents
Description
Used for
Aciloc 150mg Tablet
Ranitidine (150mg)
2 Times a day
Acidity,Heartburn,Stomach ulcers
Rekool 20mg Tablet
Rabeprazole (20mg)
2 Times a Day
Acidity,Heartburn
7
Harshal Doshi
0
9
Tarang Desai
0
javascript:void(0);

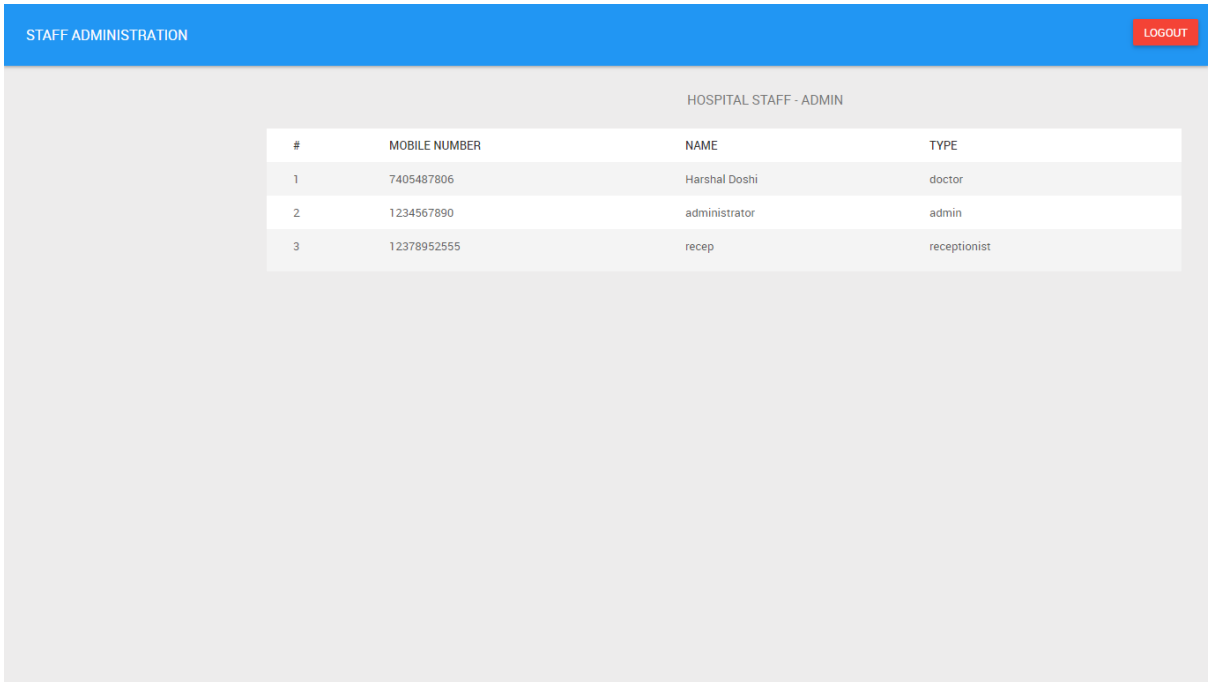

PATIENT PRESCRIPTIONS
LOGOUT
PATIENT'S NAME: HARSHAL DOSHI
PATIENT'S MOBILE NUMBER: 8200214892
Prescription Details
PRESCRIPTION DATE
1 04-12-2018
7 04-22-2018


PATIENT PRESCRIPTIONS
LOGOUT
CANCEL
Note: Harshal Doshi 12'th April 2018
Prescribed Medicines
Medicine Name Contents Description Used for
Aciloc 150mg Tablet Ranitidine (150mg) 2 Times a day Acidity,Heartburn,Stomach ulcers
Rekool 20mg Tablet Rabeprazole (20mg) 2 Times a Day Acidity,Heartburn
Alternate Generic Medicines
Medicine Name Contents Used for Price Tablets
Ranitin 150mg Tablet Ranitidine (150mg) Acidity,Heartburn,Stomach ulcers 19.27 30
Rabopep 20mg Tablet Rabeprazole (20mg) Acidity,Heartburn 19.8 10


MEDCARE ADMINISTRATION
LOGOUT
ADMIN PANEL
Medicines
3701
Hospital Staff
3
Patient Details
3


MEEDICINE ADMINISTRATION
LOGOUT
3695 Episod 100mg Tablet Sertraline (100mg) Depression,Phobia 68.2 10
3696 Seroflex 25mg Tablet Sertraline (25mg) Depression,Phobia 13 10
3697 Serene 25mg Tablet Sertraline (25mg) Depression,Phobia 22 10
3698 Lincer 25mg Tablet Sertraline (25mg) Depression,Phobia 23.96 10
3699 Serotra 50mg Tablet Sertraline (50mg) Depression,Phobia 30.03 10
3700 Assert 50mg Tablet Sertraline (50mg) Depression,Phobia 30.8 10
3701 Serybest 50mg Tablet Sertraline (50mg) Depression,Phobia 31.25 10
Add New Medicines
MEDICINE NAME CONTENTS USED FOR PRICE TABLETS ADD NEW MEDICINE
Episod Sertraline Phobia 68.2 10


PATIENT ADMINISTRATION
LOGOUT
PATIENT DETAILS - ADMIN
MOBILE NO. NAME BIRTHDATE REMOVE PATIENT
1 8200214892 Harshal Doshi 1518241012000
2 8511962713 Jay Shah 1518241007000
3 7016310300 Tarang Desai 1518240999000


STAFF ADMINISTRATION
LOGOUT
HOSPITAL STAFF - ADMIN
MOBILE NUMBER NAME TYPE
1 7405487806 Harshal Doshi doctor
2 1234567890 administrator admin
3 12378952555 recep receptionist

8. LIMITATION AND FUTURE ENHANCEMENT

The system can be enhanced by providing Artificial Intelligence which can get symptoms from the patient and can suggest the medicine and if the symptoms are severe then the system can suggest the patient to visit the doctor and book an appointment on the available date.

This system can be further centralised to all hospitals for interoperability of the patient history and then it may have the unique Id of all citizens so that the medical history of the citizen can be stored, recorded, analysed and can also predict the dieses so that precautions can be taken and which makes the person life easier in the context of medical domain and can live healthy and better life and this can be first step towards better and digital India.

CONCLUSION

The project "**MEDCARE"** is for minimizing the work in a hospital. The application takes care of all the requirements of an 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; provide prescription details including various tests, and medicines prescribed to patient and doctor – which includes all constraints of given medicines. It also provides billing facility on the basis of patient's status. Our application also provides the facility of backup as per the requirement. Our application can work with or without internet, which includes the functionality if disconnected architecture.

APPENDIX

PPR

College	:	INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA			
StudentName	:	Doshi Harshal Kaushikkumar			
EnrollmentNo	:	140950107024	Department	:	Computer Engineering
MobileNo	:	7405487806	Discipline	:	BE
Email	:	hkdharshal1995@gmail.com	Semester	:	Semester 8

PPR Details

Periodic Progess Report : First PPR

Project : MedCare

Status : Submitted

1. What Progress you have made in the Project ?

Build the conceptual understanding of AngularJS, Spring and Hibernate frameworks. Performed generalization on project modules. Optimized the working flow of the system.

2. What challenge you have faced ?

Mapping the MVC backend with AngularJS frontend was a challenging task. Handling relationships between database tables via Hibernate framework.

3. What support you need ?

Support for UI designing AngularJS implementation

4. Which literature you have referred ?

AngularJS Documentation Hibernate Documentation Spring Documentation

---

Print Back

College	:	INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA			
StudentName	:	Doshi Harshal Kaushikkumar			
EnrollmentNo	:	140950107024	Department	:	Computer Engineering
MobileNo	:	7405487806	Discipline	:	BE
Email	:	hkdharshal1995@gmail.com	Semester	:	Semester 8

PPR Details

Periodic Progess Report : Second PPR

Project : MedCare

Status : Submitted

1. What Progress you have made in the Project ?

Handled management of patients for authorizing a specific doctor. Rendered the patient list by its category in AngularJS view. Started to develop the prescription history module in frontend MVC.

2. What challenge you have faced ?

Rendering in AngularJS. Changes in module flow. A problem in storing multiple prescriptions and its information of a particular patient through Hibernate models.

3. What support you need ?

Normalizing the database. Understanding design patterns. Cookie management in AngularJS.

4. Which literature you have referred ?

Tutorials for design patterns. Tutorials for spring-boot MVC.

Print Back

College : INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA
StudentName : Doshi Harshal Kaushikkumar
EnrollmentNo : 140950107024 Department : Computer Engineering
MobileNo : 7405487806 Discipline : BE
Email : hkdharshal1995@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : Third PPR

Project : MedCare

Status : Submitted

1. What Progress you have made in the Project ?

Implemented MVC modules regarding the project using AngularJS and Spring. Mangement of prescriptions datewise is completed. Static pages for all modules have been made.

2. What challenge you have faced ?

Mail server for forget password system. External project mentor refused to help in getting medicine data.

3. What support you need ?

Need of free mail server. Getting the list of medicins from the local pharmacist. Understanding the concepts of web scrapping.

4. Which literature you have referred ?

JSoup documentation and tutorial. HTML parser documentation and tutorial.

Print Back

College : INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA
StudentName : Doshi Harshal Kaushikkumar
EnrollmentNo : 140950107024 Department : Computer Engineering
MobileNo : 7405487806 Discipline : BE
Email : hkdharshal1995@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : Forth PPR

Project : MedCare

Status : Submitted

1. What Progress you have made in the Project ?

Successfully scraped the medicine data in a week. Medicine content salting is done. The algorithm has been developed for suggesting low-cost generic medicines by comparing its drug information. 65% of modules are completed. Unstructured medicine data parsed into structured form.

2. What challenge you have faced ?

The data related to medicines was not easily available in a large set so we have to crawl it from an online resource. JSON parsing. Parsing unstructured data to structured data. Limited resources for crawling.

3. What support you need ?

Support for optimizing logical implementations. Implementing best practices for modules. Real-time synchronization in AngularJS.

4. Which literature you have referred ?

JSON parsing tutorial. Java Collections framework tutorial. Generic Medcines: http://janaushadhi.gov.in/list_of_medicines.html Sunpharma products: http://www.sunpharma.com/indiaproducts

Print Back

College : INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA
StudentName : Shah Jay Rajendrakumar
EnrollmentNo : 140950107082 Department : Computer Engineering
MobileNo : 8511962713 Discipline : BE
Email : jrggs07@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : First PPR

Project : MedCare

Status : Reviewed

1. What Progress you have made in the Project ?

Build the conceptual understanding of AngularJS , Spring and Hibernate frameworks. Performed generalization on project modules. Optimized the working flow of the system.

2. What challenge you have faced ?

Mapping the MVC backend with AngularJS front end was a challenging task. Handling relationships between Database Tables via Hibernate framework.

3. What support you need ?

Support for UI designing and AngularJs implementation.

4. Which literature you have referred ?

AngularJs documentation. Hibernate documentation. Spring Boot documentation.

Print Back

College : INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA
StudentName : Shah Jay Rajendrakumar
EnrollmentNo : 140950107082 Department : Computer Engineering
MobileNo : 8511962713 Discipline : BE
Email : jrggs07@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : Second PPR

Project : MedCare

Status : Reviewed

1. What Progress you have made in the Project ?

Handled management of patients for authorizing a specific doctor. Rendered the patient list by its category in angularJS view. Started to develop prescription history module in front end MVC.

2. What challenge you have faced ?

Rendering in AngularJS. Changes in module flow. Problem in storing multiple prescription and its information of particular patient through hibernate models.

3. What support you need ?

Normalizing of database tables. Understanding design pattern. Cookie Management in AngularJs.

4. Which literature you have referred ?

Tutorial for SpringBoot MVC. Tutorial for design patterns.

Print Back

College : INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA
StudentName : Shah Jay Rajendrakumar
EnrollmentNo : 140950107082 Department : Computer Engineering
MobileNo : 8511962713 Discipline : BE
Email : jrggs07@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : Third PPR

Project : MedCare

Status : Reviewed

1. What Progress you have made in the Project ?

Implemented MVC modules regarding project using AngularJs and SpringBoot. Date wise Saving and Viewing prescription is completed. Static pages for all modules have been made.

2. What challenge you have faced ?

Mail server for forgot password system. External project mentor refused to help in getting Medicine Data.

3. What support you need ?

Getting list of medicines from local pharmacist. Understanding the concepts of Web Scarping. Need of free mail server.

4. Which literature you have referred ?

Jsoup documentation and tutorial. HTML parser documentation and tutorial.

Print Back

College : INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA
StudentName : Shah Jay Rajendrakumar
EnrollmentNo : 140950107082 Department : Computer Engineering
MobileNo : 8511962713 Discipline : BE
Email : jrggs07@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : Forth PPR
Project : MedCare
Status : Reviewed

1. What Progress you have made in the Project ?

Successfully Scraped the medicine data in a week. Medicine content salting. Algorithm has been developed for suggesting low cost generic medicines by comparing its drug info. 65 percent of modules are completed. Unstructured medicine data parsed into structured form.

2. What challenge you have faced ?

The data related to medicines were not easily available in a large set so we have to crawl it from online resource. JSON parsing. Parsing unstructured data into structured form. Limited resources for crawling.

3. What support you need ?

Optimizing logical implementations. Support for implementing best practices for Modules. Real time synchronization in AngularJs.

4. Which literature you have referred ?

Tutorial for JSON parsing. Java Collection framework. http://janaushadhi.gov.in/ - Jan Aushadhi https://www.sunpharma.com/indiaproducts - Sun Pharma Medicines list

Print Back

College : INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA
StudentName : Tarang Desai
EnrollmentNo : 140950107100 Department : Computer Engineering
MobileNo : 7405284345 Discipline : BE
Email : tarangdesai3@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : First PPR
Project : MedCare
Status : Submitted

1. What Progress you have made in the Project ?

Login page, Registration page for all modules is completed with all the constraints. Dashboard of doctor is ready with database connectivity with static entries.

2. What challenge you have faced ?

Validation techniques. Setting up the responsive user interface. Connectivity with the database and the queries.

3. What support you need ?

Some database related knowledge about the queries. To obtain the data for database that meet our requirement.

4. Which literature you have referred ?

Some websites that relate to our module to gain knowledge about the user interface and understand their working.

Print Back

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MobileNo : 7405284345 Discipline : BE
Email : tarangdesai3@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : Second PPR
Project : MedCare
Status : Submitted

1. What Progress you have made in the Project ?
Doctor Dashboard with the list of patients and a button creating a new prescription and another one to view the historical data of the patients.
2. What challenge you have faced ?
Placing the buttons in place and linking their action with the database.
3. What support you need ?
Help to fetch the medicine data with its contents and other requirements.
4. Which literature you have referred ?
Referred to different websites related to our modules.

Print Back

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StudentName : Tarang Desai
EnrollmentNo : 140950107100 Department : Computer Engineering
MobileNo : 7405284345 Discipline : BE
Email : tarangdesai3@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : Third PPR
Project : MedCare
Status : Submitted

1. What Progress you have made in the Project ?
Module to generate prescription and to print the prescription completed. Dashboard of receptionist also completed.
2. What challenge you have faced ?
Auto-completion of fields while filling the prescription.
3. What support you need ?
Making payment of bill that is generated.
4. Which literature you have referred ?
Web-apps and websites related to our project.

Print Back

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StudentName : Tarang Desai
EnrollmentNo : 140950107100 Department : Computer Engineering
MobileNo : 7405284345 Discipline : BE
Email : tarangdesai3@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : Forth PPR
Project : MedCare
Status : Submitted

1. What Progress you have made in the Project ?

Module of the doctor including the prescription generation is completed. The module of patient to show the prescriptions and the suggested generic medicines is completed.

2. What challenge you have faced ?

Implementation of matching the contents of medicines to suggest the generic medicines.

3. What support you need ?

Implementing the payment gateway.

4. Which literature you have referred ?

Different websites related to our project. Also, some tutorial websites to help us complete the project.

Print Back

College : INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA
StudentName : Pandya Kapil Harish
EnrollmentNo : 140950107110 Department : Computer Engineering
MobileNo : 7405184889 Discipline : BE
Email : kapilpandyafifa19@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : First PPR
Project : MedCare
Status : Submitted

1. What Progress you have made in the Project ?

As far as the process consider, we finalize some modules with their designing. Login page, Registration page for all modules is completed with all the constraints. Dashboard of doctor is ready with database connectivity with static entries.

2. What challenge you have faced ?

Some connectivity issues regarding to validation techniques, Setting up the responsive user interface. Connectivity with the database and the queries.

3. What support you need ?

Basic and prior knowledge database & the queries. To obtain the data for database that meet our requirement.

4. Which literature you have referred ?

Look out at some websites for a better understanding. Some websites that relate to our module to gain knowledge about the user interface and understand their working.

Page 1 / 1

Print Back

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StudentName : Pandya Kapil Harish
EnrollmentNo : 140950107110 Department : Computer Engineering
MobileNo : 7405184889 Discipline : BE
Email : kapilpandyafifa19@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : Second PPR
Project : MedCare
Status : Submitted

1. What Progress you have made in the Project ?

Doctor-Dash Board with list of patients and button creating a new prescription and another one to view the historical data of the patients.

2. What challenge you have faced ?

Placing the buttons in place and linking their actions with the database. Plus, fetching other important data to some web pages.

3. What support you need ?

Help to fetch the medicine data with its contents and other requirements.

4. Which literature you have referred ?

Referred to different websites related to our modules and analyze them for further progress.

Print Back

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Email : kapilpandyafifa19@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : Third PPR
Project : MedCare
Status : Submitted

1. What Progress you have made in the Project ?

Module to generate prescription and to print prescription is completed. Dashboard of receptionist is completed.

2. What challenge you have faced ?

Auto completion of fields while filling the prescription.

3. What support you need ?

Making payment of bills that is generated

4. Which literature you have referred ?

Web applications and websites related to our project, which helps us to progress further.

Print Back

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StudentName : Pandya Kapil Harish
EnrollmentNo : 140950107110 Department : Computer Engineering
MobileNo : 7405184889 Discipline : BE
Email : kapilpandyafifa19@gmail.com Semester : Semester 8

PPR Details

Periodic Progess Report : Forth PPR
Project : MedCare
Status : Submitted

1. What Progress you have made in the Project ?

Major modules like doctor-dash board & prescription generation is completed. We, also includes generic medicine module which generates output for alternate medicine.

2. What challenge you have faced ?

Fetching the medicine data into the database & then to the server for further implementation.

3. What support you need ?

We have to go through the contents of medicine for the best and accurate result of our module. We also have to match the contents of different medicines.

4. Which literature you have referred ?

We refer some of the websites which stores the information related to medicines and their contents.

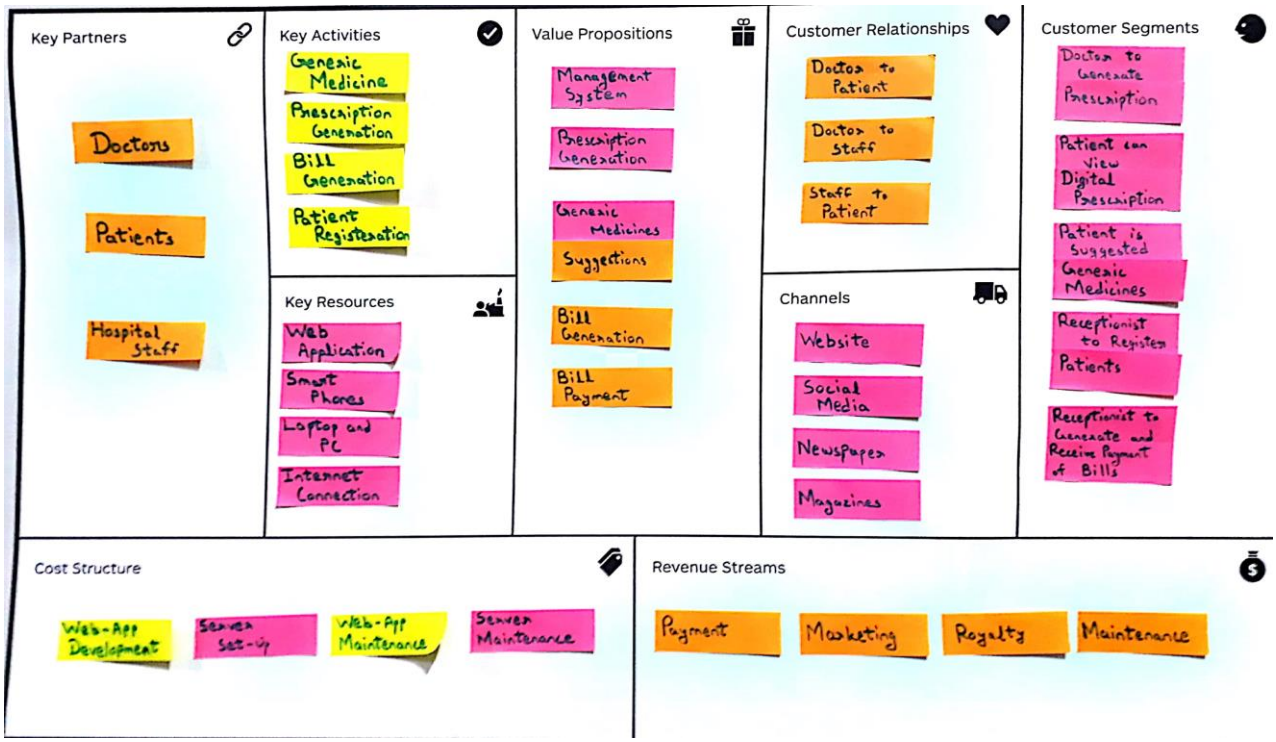
CANVASES

BMC REPORT AND CANVAS

NAMING: Extended Horizon Software Pvt. Ltd.

CONTEXT: Extended Horizon is a small-scale start-up company, which provides software development service in various streams like Web, Mobile, Standalone and much more. The company is situated for about 6 years now and is growing and accomplishing success at a slow but a steady pace. Client relation and trustworthiness is the main key factors for this company. Understanding between the company's employees and their clients is important because as they are a software development and a software service provider company who has to understand their client's requirements and complete the project as per the requirements and timeline.

Our project "**MEDCARE**" is one such project that they have to complete for one of their client and the company have trusted us with their project. There are a few challenges that are afoot related to the project like a few functionalities that are not quite understood by us, hence after we give the project, they will have to implement that particular functionality and hand over the complete project to the client.



CANVAS ELEMENTS

I. WHAT

- **Value Proposition:** Value propositions contains the features that a customer receive. Following are the value propositions:
    1. Whole Management System
    2. Prescription Generation
    3. Generic Medicines Suggestions
    4. Bill Generation
    5. Bill Payment

II.WHO

- **Customer Segments**: Customer segments contains the list of possible ways for customer to use the web-app according to his/her convenience. Following are the customer segments required:
    1. Doctor to generate prescription
    2. Patient to view the prescription from his own device
    3. Patient is suggested generic medicines when views the prescription
    4. Receptionist to register patients
    5. Receptionist to generate and receive bills

- **Customer Relationships:** Customer relationships contains the direct relationship between the two parties. Following are the customer relationships:
    1. Doctor to Patient
    2. Doctor to Hospital Staff
    3. Hospital Staff to Patient

- **Channels:** Channels contains the sources that are required to represent. Following are the channels required:
    1. Website
    2. Social Media Marketing
    3. Newspaper or Magazines

III.HOW

- **Key Partnerships:** Key partners are those who are going to use the system directly or indirectly. The partners of our system are:
    1. Doctors
    2. Patient
    3. Hospital Staff

- **Key Activities:** Key activities contain the functionalities that the users are provided with. Following are the functionalities:

1. Generic Medicine
2. Prescription Generation
3. Bill Generation
4. Patient Registration

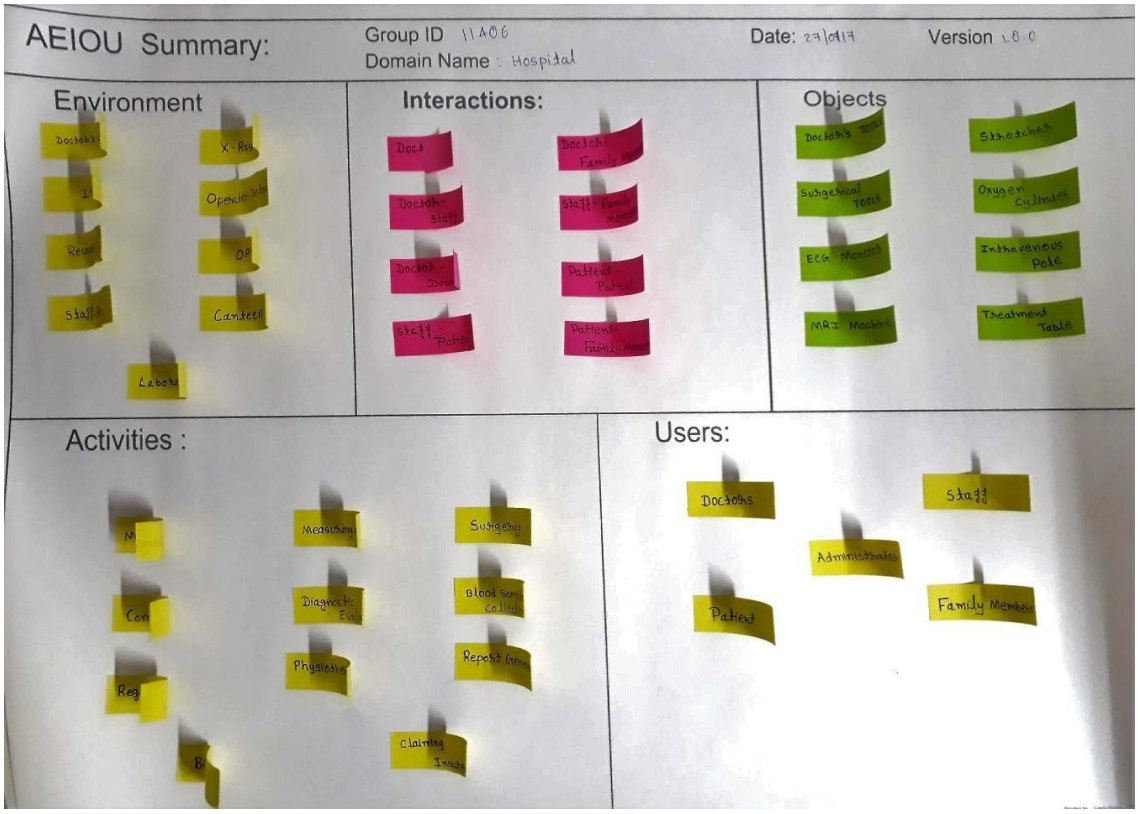
- **Key Resources:** Key resources are the things that are required to access the website. Following are the key resources required:
    1. Web Application
    2. Tablet, PC and Mobile Phones
    3. Internet Connection

IV. HOW MUCH

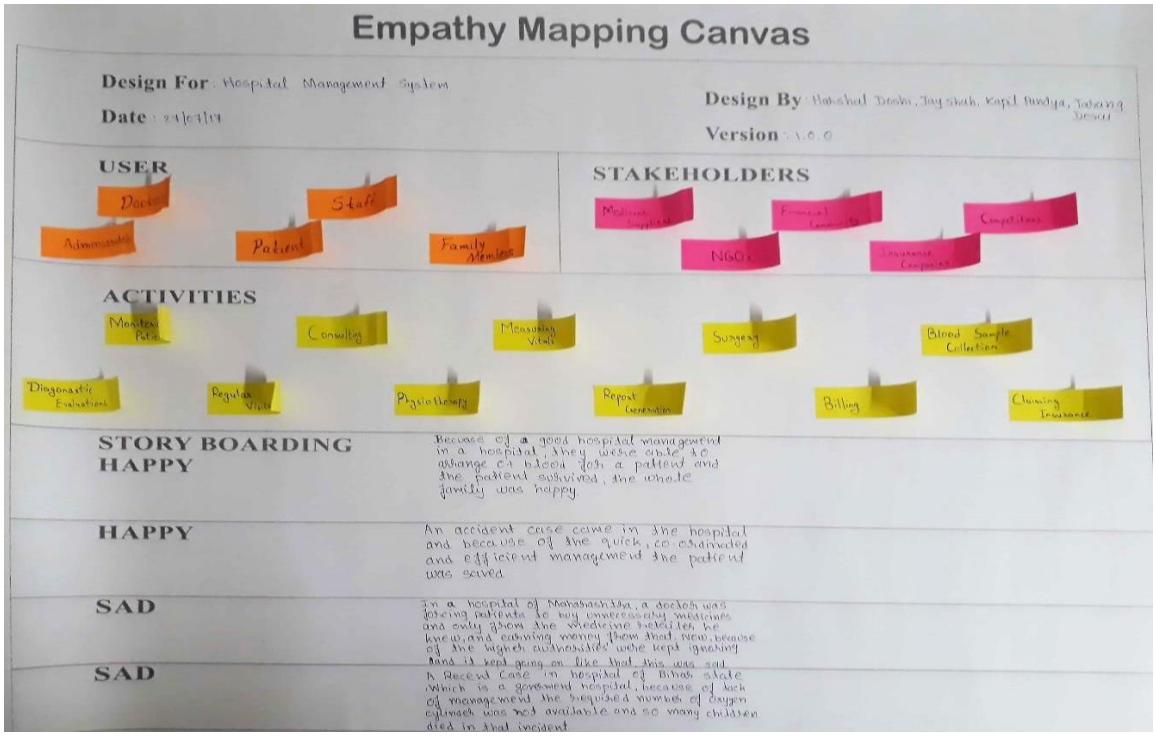
- **Revenue Streams:** Revenue streams contains the different ways to earn revenues through it. Following are the revenue streams:
    1. Payment Revenue
    2. Marketing Revenue
    3. Royalty from the hospital
    4. Maintenance Revenue

- **Cost Structure:** Cost structure contains of the different costing required for the website. Following are the cost structure:
    1. Web-application development
    2. Web-application maintenance
    3. Server maintenance
    4. Server set-up

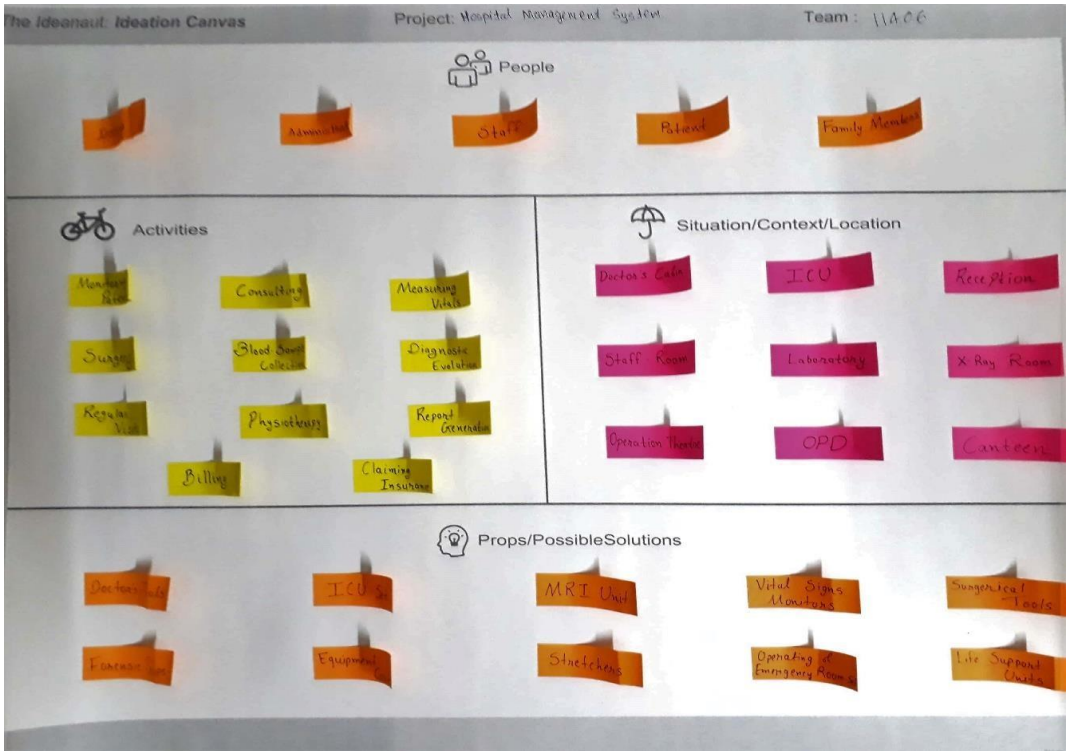
AEIOU:



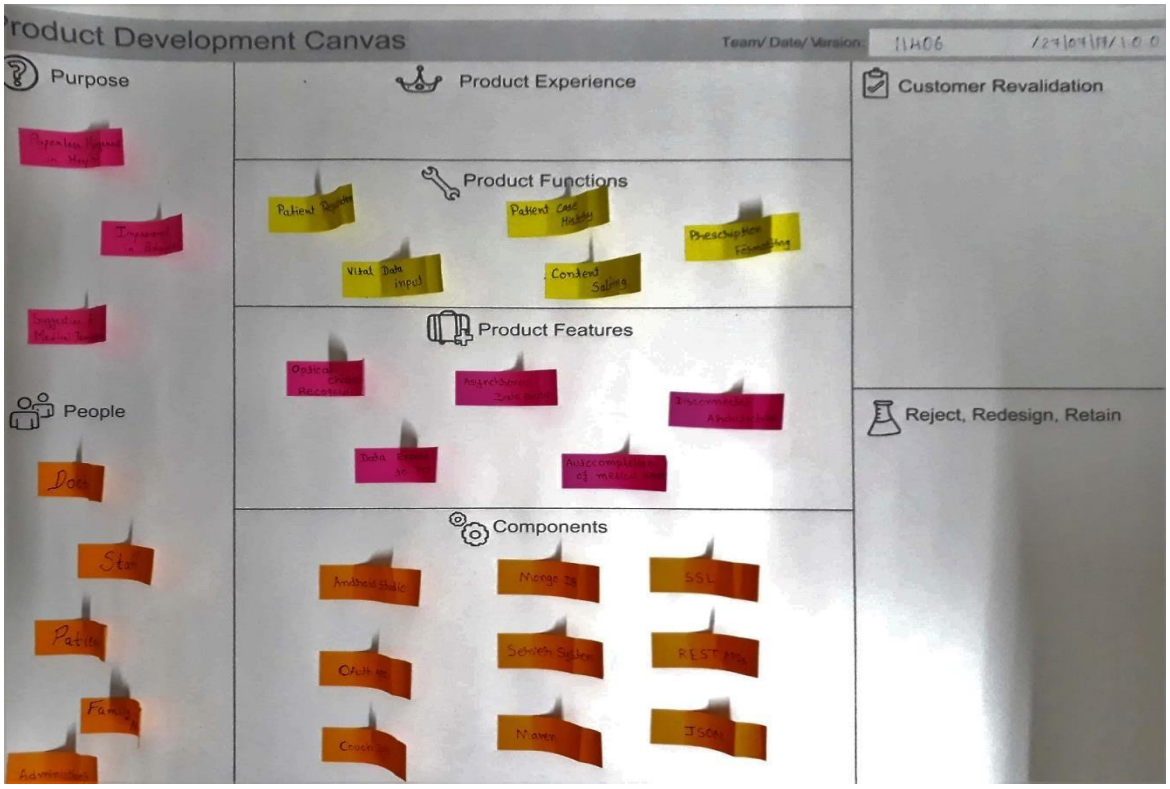
Empathy Mapping:



Ideation Canvas:



Product Development Canvas (PDC):



PATENT DRAFTING EXERCISE (PDE)

College : INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA
Department : Computer Engineering
Discipline : BE
Semester : Semester 8
Project Name : MedCare
Team ID : 19925

Form 1 – APPLICATION FOR GRANT OF PATENT

Applicants :

Sr. No	Name	Nationality	Address	Mobile No.	Email Id
1	Pandya Kapil Harish	Indian	Computer Engineering , INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA , Gujarat Technologycal University.	7405184889	kapilpandyafifa19@gmail.com
2	Tarang Desai	Indian	Computer Engineering , INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA , Gujarat Technologycal University.	7405284345	tarangdesai3@gmail.com
3	Shah Jay Rajendrakumar	Indian	Computer Engineering , INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA , Gujarat Technologycal University.	8511962713	jrggs07@gmail.com
4	Doshi Harshal Kaushikkumar	Indian	Computer Engineering , INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA , Gujarat Technologycal University.	7405487806	hkdharshal1995@gmail.com

Inventors :

Sr. No	Name	Nationality	Address	Mobile No.	Email Id
1	Pandya Kapil Harish	Indian	Computer Engineering , INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA , Gujarat Technologycal	7405184889	kapilpandyafifa19@gmail.com

2	Tarang Desai	Indian	Computer Engineering , INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA , Gujarat Technologycal University.	7405284345	tarangdesai3@gmail.com
3	Shah Jay Rajendrakumar	Indian	Computer Engineering , INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA , Gujarat Technologycal University.	8511962713	jrggs07@gmail.com
4	Doshi Harshal Kaushikkumar	Indian	Computer Engineering , INSTITUTE OF TECHNOLOGY & MANAGEMENT, UNIVERSE TECHNICAL CAMPUS,VADODARA , Gujarat Technologycal University.	7405487806	hkdharshal1995@gmail.com

I/We, the applicant(s) hereby declare(s) that:

Following are the attachments with the applications :

Form 2 - PROVISIONAL/COMPLETE SPECIFICATION

1 . Title of the project/invention :

MedCare

2. Preamble to the description :

Provisional

3. Description

2/4

4/22/2018 PDE Details

a) Field of Project / Invention / Application :

The application of this system is to digitize the hospital environment and to generate prescription digitally and also to suggest generic medicines.

b) Prior Art / Background of the Project / Invention :

The background of MedCare is to help the doctor generate a prescription digitally by auto-suggestions and also to suggest generic medicines which are similar to private companys medicine and also much cost effective.

c) Summary of the Project / Invention :

MedCare is a hospital management system which will digitize the hospital environment. Its main purpose is generate and show prescription to the doctors and patients respectively. The patients will also be suggested generic medicines similar to the medicines that are prescribed by the doctor.

d) Objects of Project / Invention :

MedCare will help the doctor to generate a digital prescription using the auto-suggestions and will also digitize a few areas of the hospital environment. It will also enable the patient to view their prescription which will have suggestions of generic medicines similar to the medicines prescribed by the doctor.

e) Drawings :

f) Description of Project / Invention : (full detail of project) :

The idea behind MedCare is to develop a consistent, robust, responsive and user-friendly web-app which will allow the doctors to generate the prescription digitally with the use of auto-suggestions and will also digitize a few areas of hospital environment. The patient will also be able to view his prescription on his smart-phone by logging in his account and he will be given suggestions of generic medicines which would be similar to the medicines prescribed by the doctor.

g) Examples :

h) Claims (Not required for Provisional Application) / Unique Features of Project

Generate prescription digitally using auto-suggestions.
Suggesting generic medicines.
Auto generation of password for patients to login.
Machine learning algorithm to match the contents of medicines to suggest generic medicines.

4. Claims

5. Date and signature

6. Abstract of the project / invention :

The main purpose of MedCare web-app is to allow the doctors to generate the prescription digitally with the use of auto-suggestions and will also digitize a few areas of hospital environment like bill generation and payment and much more. The patient will also be able to view his prescription on his smart-phone by logging in his account and he will be given suggestions of generic medicines which would have similar contents to the medicines prescribed by the doctor.

Form 3 – STATEMENT AND UNDERTAKING UNDER SECTION 8

Name of the applicant(s) :	I/We, Pandya Kapil Harish ,Tarang Desai ,Shah Jay Rajendrakumar ,Doshi Harshal Kaushikkumar
	Hereby declare :
Name,Address and Nationality of the joint applicant :	(i) that I/We have not made any application for the same/substantially the same victim invention outside India.
	(ii) that the rights in the application(s) has/have been assigned to

3/4

4/22/2018 PDE Details

Name of the Country	Date of Application	Application Number	Status of the Application	Date of Publication	Date of Grant

4/22/2018 PDE Details

Name of the Country	Date of Application	Application Number	Status of the Application	Date of Publication	Date of Grant
N/A	N/A	N/A	N/A	N/A	N/A

(iii)That I/We undertake that upto the date of grant of the patent by the Controller, I/We would keep him informed in writing the details regarding corresponding applications for patents filed outside India within three months from the date of filing of such application.

Dated this 22 day of April 2018

To be signed by the applicant or his authorised registered patent agent :	Signature.....
Name of the Natural Person who has signed :	Pandya Kapil Harish ,Tarang Desai ,Shah Jay Rajendrakumar ,Doshi Harshal Kaushikkumar

To,
The Controller of Patents,
The Patent Office,
At Mumbai

PLAGIARISM SCAN REPORT

Summary	
Report Genrated Date	24 Apr, 2018
Plagiarism Status	**78% Unique**
Total Words	1000
Total Characters	6576
Any Ignore Url Used	

Content Checked For Plagiarism:

1. PURPOSE

The IT system has revolutionized the field of medicine. In this fast-paced world of medicine, it is a daunting task to manage a hospital. The Hospital Management System facilitates managing the functioning of the hospital or any medical set up. This application will help in making the whole functioning paperless. It integrates all the information regarding patients, doctors, staff, hospital administrative details etc. into one application. It has sections for various professionals that make up a hospital.

The main goal of this application is to ease up the ecosystem of a hospital, so they can serve more patients with more focus and reliability.

1.3 Scope

- Patient registration is done using mobile number as a primary key
- Patients are guided by application and their vitals are measured and listed into the application by staff member / nurse.
- The MEDCARE system will work in proper flow.
- The patients are checked by doctors and doctors have access to the patient's history and vitals measured just before getting into the doctor's room.
- Doctor recommends the medicines using the application and the application will have content salting by which the task will become easier for the doctors.
- There will be a prescription generated and which have generic drug information of the medicines prescribed by the doctors
- The system provides bed management of the admitted patients and their day-to-day diagnostics provided by the doctors.

- Patient can have access to granted information such that patient can view his/her past diagnostics and prescriptions and amount spend in hospital.

- The system will generate the bill of patient after OPD as well as if patient is discharged from hospital.

1.4 Technology and Literature Review Patent No: US20030093296 A1

An integrated hospital information management system having an order communication system and an information management system which are connected on a network, the information management system including: an image information acquisition means having an image photographing device corresponding to an imaging system and an image control and compression device for controlling the image photographing device.

Patent No: US 11/286,905

This invention is for the benefit of patient which helps to save his time by displaying the waiting time for a particular examination. Because of which he can go to another examination having less waiting time.

Patent No: US 12/528,058

This invention relates to a personalized integrated healthcare ant counterfeit management system providing pack authentication, user feedback and compliance, documentation of the dosage uptake by the users, maintenance of user related data and displaying compliance and feedback information, liaising with the healthcare agencies, users' nominated persons/medical practitioner, providing real-time and authentic data in raw and analysed form to diverse agencies in the healthcare chain.

2.0 SYSTEM REQUIREMENT STUDY

2.1 User Characteristics

- Educational Level: At least able to read and used to with online systems

- Technical expertise: should be a high or middle level employee of the organisation comfortable with using general purpose applications on a device.

2.2 Hardware and Software Requirements Hardware Requirements

- Tablet

- Smart phones

- Processor (quad core or more)

- Server System (min 1 TB data storage)

- Personal Computers Software Requirements
- Operating System (windows / android)
- Database (MySQL)
- Development tools (eclipse, spring boot, angular JS, Themeleaf)
- Android studio
- Maven
- J2EE

2.3 Constraints

- System is wirelessly networked with an encryption
- System is only accessible within the hospital premises only.
- Database is password protected
- Should use less RAM and processing power.
- Each user should have individual ID and password.
- Only Administrator can access the whole system.

3.0 SYSTEM ANALYSIS

3.1 Study of Current System

The current system provides token management by which the system shows estimated time for the appointment of patient.

3.2 Problem and Weakness of Current System

- The current system does not provide synchronization for all hospitals.
- In current system, the option to generate prescription with medicine's contents is also not available.
- Offline Execution is not available in current systems.
- Alternate generic medicine listing is also not available in current systems.

3.3 Requirements of New System

- Disconnected Architecture

- Generic Medicine listing
- Medicine content auto fill-up
- Synchronization between all sub-systems

3.4 Feasibility Study Technical feasibility

A study of resource availability that may affect the ability to achieve an acceptable system. This evaluation determines whether the technology needed for the proposed system is available or not.

1) Can the work for the project be done with current equipment existing software technology & available personal?

2) Can the system be upgraded if developed?

3) If new technology is needed then what can be developed?

4) This is concerned with specifying equipment and software that will successfully satisfy the user requirement.

The technical needs of the system may include: Front-end and back-end selection

An important issue for the development of a project is the selection of suitable frontend and back-end. When we decided to develop the project, we went through an extensive study to determine the most suitable platform that suits the needs of the organization as well as helps in development of the project. The aspects of our study included the following factors. Front-end selection:

1) It must have a graphical user interface that assists employees that are not from IT background.

2) Scalability and extensibility.

3) Flexibility.

4) Robustness.

5) According to the organization requirement and the culture.

6) Must provide excellent reporting features with good printing support.

7) Platform independent.

8) Easy to debug and maintain.

9) Event driven programming facility.

10) We choose some of popular front-end tools like angular JS, Bootstrap, JSP to provide better performance and scalability.

Back-end Selection:

We opt to implement backend in MySQL as of its popularity and advantages like

1. Data Security
2. On-demand Scalability
3. High performance
4. Comprehensive Transactional support
5. Complete Workflow Control
6. The flexibility of Open Source
7. Robust
8. Integrity
9. Incredibly Inexpensive

In this system, we are using spring boot, hibernate

Summary	
Report Genrated Date	24 Apr, 2018
Plagiarism Status	80% Unique
Total Words	974
Total Characters	6255
Any Ignore Url Used	

Content Checked For Plagiarism:

3.2 Problem and Weakness of Current System

- The current system does not provide synchronization for all hospitals.
- In current system, the option to generate prescription with medicine's contents is also not available.
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1. Data Security
2. On-demand Scalability
3. High performance
4. Comprehensive Transactional support
5. Complete Workflow Control
6. The flexibility of Open Source
7. Robust
8. Integrity
9. Incredibly Inexpensive

In this system, we are using spring boot, hibernate, themeleaf, JSP to provide better performance in MVC pattern

Economic Feasibility

This system is developed comparatively at lower cost as economic relevance is one of the major causes of successful project making. And the system lead to better performance and reliable operation of the hospital so this system will lead to better satisfactory treatment of patients.

3.8 Main Modules of New System

- Login:

a. Patient

b. Doctor

c. Staff

- Signup:

a. Patient

b. Doctor

c. Staff

- Staff Login – Receptionist a. Patient registration

b. Money collection

c. Bill generation

d. Assign nurse

- Staff Login -Nurse

a. Notification of work

b. Vital measurement

- Doctor Login

a. Admitted Patient record on home page

b. Prescription

c. Generation

- Patient Login

a. History will be seen

3.9 Selection of Hardware and Software Justification JAVA:

Spring Boot:

- Provides easy configuration
- Nourishes the functionality of spring
- Provides functionalities like: Dependency Injection, Auto wiring
- Follows modern IOC design pattern
- Replacement of EJB Hibernate:
- Relational Persistence for JAVA

- Database dependent code
- Maintenance Cost
- Automatic Versioning and Time Stamping
- Open-Source, Zero-Cost Product License Angular-JS:
- Security
- Declarative User Interface
- Integration
- Data Binding
- Less Coding Server:
- To run web-services Personal Computer:
- To provide localhost server as per every hospital

4.0 SYSTEM DESIGN

4.1 Database Design / Data Structure Design

4.1.1 Tables and Relationships

4.2 Input / Output and Interface Design

4.2.1 Access Control and Security

For security purpose, we are providing support of OAuth API. For password security, we are providing MD5 encryption algorithm.

4.2.2 State transition Diagrams

5.0 IMPLEMENTATION PLANNING AND DETAILS

5.1 Implementation Environment

The system is having multiuser environment having Web App GUI. The GUI is developed using material design and it is responsive.

We have multiuser so that the system can become pure ERP and it is a GUI which provide better User Experience.

The Doctor can login and can view the OPD patients as well as Admitted Patients and Doctor can do the activities like prescribing medicines to patient, view past report history and can record the patient history.

On other side doctor can assign tasks to nurses to perform any medical tasks for particular user.

The patient can view his/her medical history and can download the prescription which contains dynamically generated Generic Drug information suggested.

The nurses can measure vitals and can perform task assigned by the doctor and can update the information regarding particular patient and can report to the doctor.

The nurses can register new patient and can make patient's file on the go. Admin can view edit and add new doctor/ Nurses as well as patients.

5.2 Program / Module Specification

We are following MVC pattern for coding.

We are following modularity approach and we have services, controller, models and ORM which makes our project a complete modular approach.

We have Module approach in front end using AngularJs as well as in backend using Spring Framework of Java and Hibernate in Database.

We have the following modules:

- Login for all users
- Doctor Dashboard
- Tabular view of patients
- Create new prescription
- View historical prescription
- Assign for admit
- Patient can download prescription
- Generate billing
- Nurse can receive task and provide confirmation

5.3 Security Features

All passwords are encrypted and then stored in Database. Doctor only can generate prescriptions

The database are switched to secure network and are password protected No patient can access private information of other patient

All task can be analyse by the admin

The payment is done using secure gateway

Summary	
Report Genrated Date	24 Apr, 2018
Plagiarism Status	75% Unique
Total Words	433
Total Characters	2667
Any Ignore Url Used	

Content Checked For Plagiarism:

Coding Standards

All backend Java code are divided in controller, services, model and dao.

Controller accepts the request and ask the service to provide the requested operation which is done on model classes and from databases using DAO classes.

The data members are set to private and implemented the interfaces to make the system abstract, to provide encapsulation, modularity, security as well as robustness.

Same as backend the front end is also having Controller, Services and the views. Controller handle the request generated by the events of the user and invoke the services to handle the request and it converts the request to the backend and returns the response to the controller which renders the specific view to the user.

6.0 TESTING

6.1 Testing Plan

1. Analyse the product
2. Design the Test Strategy
3. Define the Test Objectives
4. Define Test Criteria

5. Resource Planning

6. Plan Test Environment

7. Schedule & Estimation

8. Determine Test Deliverables

6.2 Testing Methods

1. Unit Testing

2. Integration Testing

3. System Testing

4. Regression Testing

5. Acceptance Testing

6. Alpha Testing

7. Beta Testing

6.3 Test Cases

1. Test Case: Registration

LIMITATION AND FUTURE ENHANCEMENT

The system can be enhanced by providing Artificial Intelligence which can get symptoms from the patient and can suggest the medicine and if the symptoms are severe then the system can suggest the patient to visit the doctor and book an appointment on the available date.

This system can be further centralised to all hospitals for interoperability of the patient

history and then it may have the unique Id of all citizens so that the medical history of the citizen can be stored, recorded, analysed and can also predict the dieses so that precautions can be taken and which makes the person life easier in the context of medical domain and can live healthy and better life and this can be first step towards better and digital India.