

Sri Lanka Institute of Information Technology

Health Care System

Programming Applications and Frameworks (IT 3030) 2020

Project ID: GroupS1151.9

Final Project Report

Submitted By:

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 IT18152760 Geethan Madurange Perera L

IT-3030

Contents

1.	. Members' Details and Workload Allocation	1
2.	. Clickable link to GitHub Repository	2
3.	. SE Methodologies/Methods	2
4.	. Gantt chart	3
5.	. Requirements	3
	5.1 Requirement analysis	3
	5.2 Stake Holder Analysis (Onion Diagram)	4
	5.3 Requirements Modelling (Use Case Diagram)	5
6.	. System's overall design	6
	6.1 Overall Architecture	6
	6.2 Class Diagram	7
7.	. Individual Section	8
8.	. System's integration details	30
9.	. References	30
Α	ppendix 01	31
Α	ppendix 02	33
Α	ppendix 03	35

1. Members' Details and Workload Allocation

IT Number	Name	Web Service	Description of the Web Service
IT16038806	Attanayaka J.A.E.P	Hospital Service	Add a new hospitalUpdate hospitalsDelete hospitalView all hospitals
IT18171198	Abeykoon M.G.T.N.K	Patient Service	Add a new patientUpdate a patientDelete a patientView all patients
IT17021944	Kaluarachchi T.T. D	Appointment Service	 Add a new appointment record Update an appointment record Delete an appointment record View all appointment records
IT18012620	Samarasiri V. Y	Payment Management Service	 Add a new payment record Update a payment record Delete a payment record View all payment records
IT18152760	Geethan Madurange Perera L	Doctor Management Service	 Add new prescriptions and operations Update prescriptions and operations Delete prescriptions and operations View all prescriptions operations

2. Clickable link to GitHub Repository

https://github.com/vidura21/HealthCareSystemPAF2020

3. SE Methodologies/Methods

V-Model

The V-Model is a type SDLC model where processes are executed in a sequential manner.it is an extension of waterfall mode.it is also called as verification and validation model.it is associated with a testing phase for each development stage and development phase is directly associated with testing phase. Development of the next phase starts only after the completion of previous phase.by using this model we gained lots of benefits to our project because we can correct the errors, bugs and test it before we enter the next stage. We can identify the defects in the early stages. It is better to identify the errors and bugs early as possible because when it comes to end of the project the team members have to put more effort and time to find and manage these errors. We applied this methodology to our project and gained the maximum out of it by reducing the disadvantages as much as we can.

The usage of V- Model

- More suitable for small to medium size projects
- Better to use when Software requirements are clear and well defined

Advantages of V-Model

- Simple and easy to use
- Helps the project management to track progress of the work
- Highly disciplined model

Disadvantages of V-Model

- High risk and uncertainty
- Not suitable for complex projects
- Not suitable for projects where project requirements are not well defined

4. Gantt chart

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Hospital Management and Crud Operations		We .						
Doctor Management and Crud Operations								
Patient Management and Crud Operations								
Appointment Management and Crud Operations			90					
Payment Management and Crud Operations				215				
Testing								
Intergartion								

5. Requirements

5.1 Requirement analysis

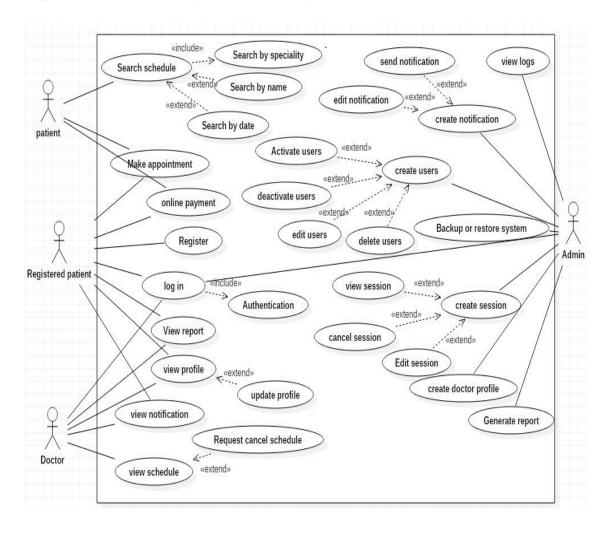
Micro-service	Functional Requirement	Non-Functional Requirement	Technical Requirement
Hospital Service	Add a new hospital	Security, usability,	admin can add, update,
	Update a hospital	performance	delete, view hospitals
	Delete a hospital		
	View all hospitals		
Patient Service	Add a new patient	Security, usability,	User can enroll to the
	Update a patient	performance	system and can
	Delete a patient		update, delete, view
	View all patients		patient details.
Appointment Service	Add a new	Security, usability,	Receptionist can add,
	appointment	performance	delete, View new
	Update appointment		appointment for
	Delete appointment		patients.
	View all appointment		Patients can add a new
			appointment.

Doctor Service	Add a new	performance,	Doctors can add new
	prescription and	scalability,	prescriptions for their
	operations.	security, localization,	patients, and they can
	Update a prescription	usability	update, delete, and
	and operations.		view all the
	Delete prescription		prescriptions.
	and operations.		Doctors can add new
	View all prescriptions		operations and can
	and operations.		update, delete, and
			view all operations.
Payment Service	Add a new payment	Security and Privacy	User can add a new
	record	Performance.	payment when
	Update a payment	Response in time	checking out. User
	record	Maintainability	can, update, delete,
	Delete a payment		view the payment
	record		details.
	View the payment		
	record		

5.2 Stake Holder Analysis (Onion Diagram)

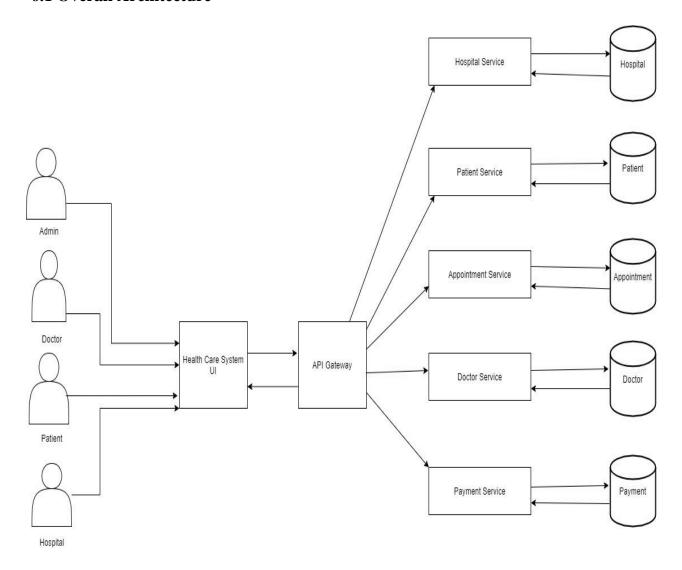


5.3 Requirements Modelling (Use Case Diagram)

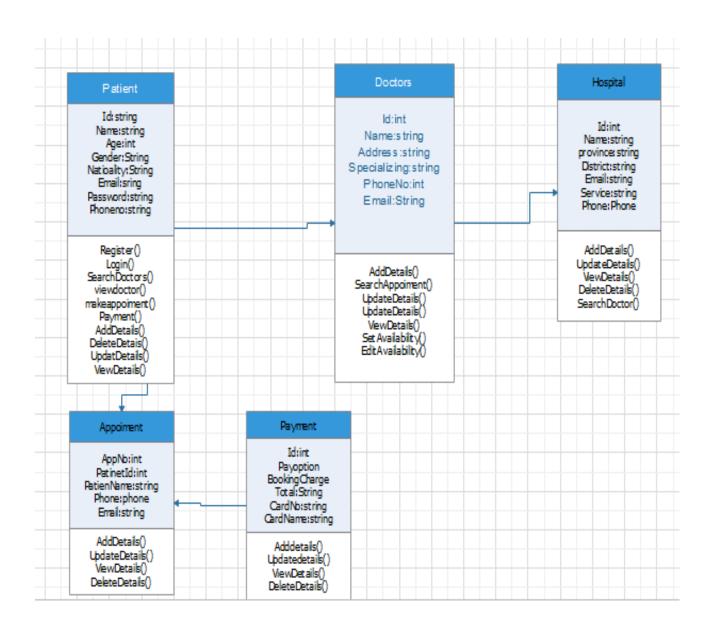


6. System's overall design

6.1 Overall Architecture



6.2 Class Diagram



7. Individual Section

IT Number: IT18012620

Name: V.Y Samarasiri

Description

Health care system is a system which can perform several tasks such as make an appointment, view hospitals and information about doctors. Making payments is an essential function for the system. The registered patients must have a way to do their payment online using the system. Our team has decided to implement the system based on micro services architecture, using RESTful web services.

API for get all the payment details in the database (GET Request)

URL:- http://localhost:8080/PAF_Project/PaymentServiceResource/Payments

```
Request
                 : -
                           {}
                           { paymentID = "auto generated integer value"}
Response
                 : -
                           { firstname = "vidura" }
                           { lastname = "yasiru" }
                           \{ ammount = "5000.0" \}
                           { cardnumber = "222145667890" }
                           \{ date = "12/4/20" \}
                           \{ \text{cvv} = \text{``}678\text{''} \}
Request
                 : -
                           { }
Response
                           { paymentID = "auto generated integer value " }
                 : -
                           { firstname = "saman" }
                           { lastname = "perera" }
                           \{ ammount = "4000.0" \}
                           { cardnumber = "234511239876" }
                           \{ date = "13/4/20" \}
                           \{ \text{cvv} = "345" \}
```

API for insert a new payment to the database (POST Request)

URL:- http://localhost:8080/PAF Project/PaymentServiceResource/Payments

```
Request :- { paymentID = "auto generated integer value " }
{ firstname = "kamal" }
{ lastname = "mendis" }
{ ammount = "7000.0" }
{ cardnumber = "567800003434" }
{ date = "3/4/20" }
{ cvv = "900" }

Response :- { result = "Inserted successfully" }
{ paymentID = "auto generated integer value"}
{ error = "Error while inserting the payment" }
```

API for update a payment which is existing in database (PUT Request)

URL:- http://localhost:8080/PAF_Project/PaymentServiceResource/Payments

```
Request :- { paymentID = "auto generated integer value " }
{ firstname = "kamal" }
{ lastname = "mendis" }
{ ammount = "5500" }
{ cardnumber = "567800003434" }
{ date = "3/4/20" }
{ cvv = "900" }

Response :- { result = "Updated successfully" }
{ error = "error while updating the payment" }
```

API for delete a payment which is existing in database (DELETE Request)

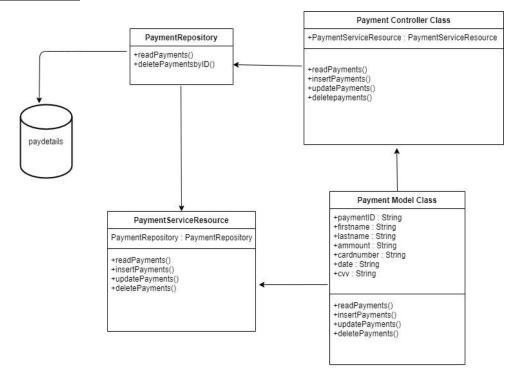
URL: - http://localhost:8080/PAF_Project/PaymentServiceResource/Payments

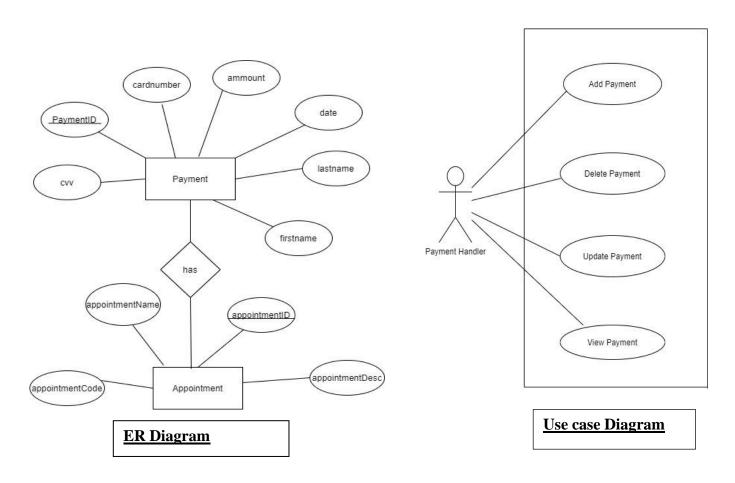
```
Request :- { paymentID = selected paymentID from the service }

Response :- { result = "Deleted successfully" }
 { error = "Error while deleting the payment" }
```

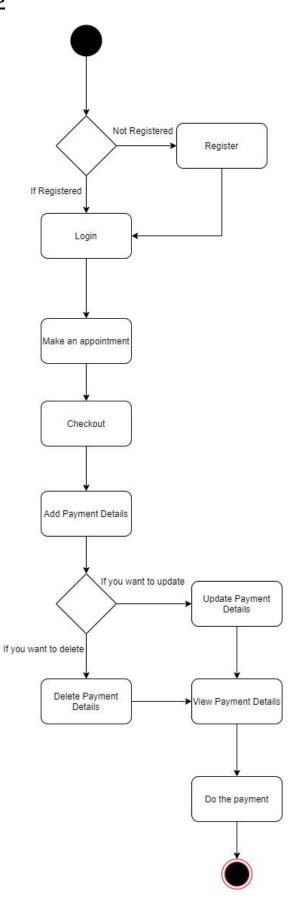
Service Design

Class Diagram->





Activity Diagram->



IT Number: IT18152760

Name: Geethan Madurange Perera L

Description

Health care system is a system which can perform several tasks such as make an appointment, view hospitals and information about doctors, Operations, and prescriptions management. Doctor services are one of the main functions of the system, from doctor services doctor can manage Patient's Operations and Prescriptions. Our team has decided to implement the system based on micro services architecture, using RESTful web services. This is my part <u>Doctor</u> services (Prescriptions management & operations management)

API for get all the <u>Prescriptions</u> & <u>Operations</u> details in the database (GET Request)

<u>Prescriptions</u>	<u>Operations</u>
URL:- http://localhost:8080/DoctorService/Doctor Service/DoctorsPrescriptions	URL:- http://localhost:8080/DoctorService/DoctorService/DoctorsOperations
Request :- {}	Request :- {}
Response :- { presID="auto generated integer value"} { presCode="2020001" }	Response :- { operID= "auto generated integer value"} { operCode= "30300001" }
Request :- { } Response :- { presID= "auto generated integer { presCode= "2020002" } { presName= "Kumara" } { presAge= "55" } { presDate= "2020/03/22" } { presDesc= "Vitamin C ,	Response :- { operID= "auto generated integer value"} { operCode= "30300002" }
Piriton" }	{ operDate="2020/03/13" } { operDesc="veins operation"}

API for Insert the $\underline{Prescriptions}$ & $\underline{Operations}$ details to the database (POST Request)

<u>Prescriptions</u>	<u>Operations</u>
URL:- http://localhost:8080/DoctorService/DoctorService/DoctorService/DoctorsPrescriptions	URL:- http://localhost:8080/DoctorService/DoctorSe rvice/DoctorsOperations
Request :- { presID= "auto generated integer value"} { presCode= "2020003" } { presName= "Jagath" } { presAge= "56" } { presDate= "2020/04/02" } { presDesc= "Vitamin D, Panadol" }	Request :- { operID= "auto generated integer value"} { operCode= "30300003" } { operName= "Shoulder Operation" } { operDate= "2020/04/01" } { operDesc= "Shoulder Inside operation"}
Response :- { result = "Inserted successfully" } { presID= "auto generated integer value"} { error = "Error while inserting" }	Response :- { result = "Inserted successfully" } { presID= "auto generated integer value"} { error = "Error while inserting" }

API for Update the <u>Prescriptions</u> & <u>Operations</u> details Existing in database (PUT Request)

<u>Prescriptions</u>	<u>Operations</u>
URL:- http://localhost:8080/DoctorService/DoctorService/DoctorService/DoctorsPrescriptions	URL:- http://localhost:8080/DoctorService/DoctorS ervice/DoctorsOperations
Request :- { presID= "auto generated integer value"} { presCode= "2020005" } { presName= "K.LKumara" } { presAge= "49" } { presDate= "2020/04/08" } { presDesc= "Vitamin E, Paracetamol" }	Request :- { operID= "auto generated integer value"} { operCode= "3030005" } { operName= "LEG operation" } { operDate= "2020/12/12" } { operDesc= "inside the leg" }

```
Response :-
{ result = "Updated successfully" }
{ error = "Error while updating!" }

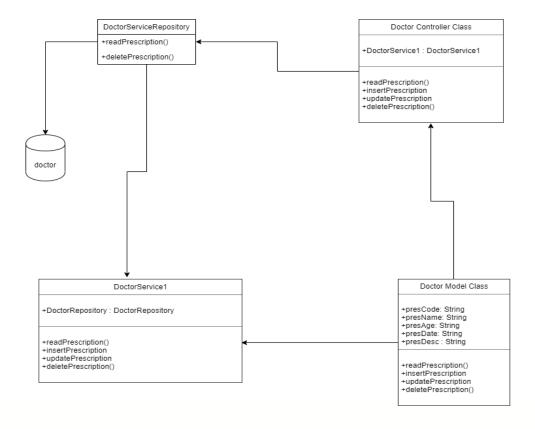
Response :-
{ result = "Updated successfully" }
{ error = "Error while updating!" }
```

API for Delete <u>Prescriptions</u> & <u>Operations</u> details in the database (DELETE Request)

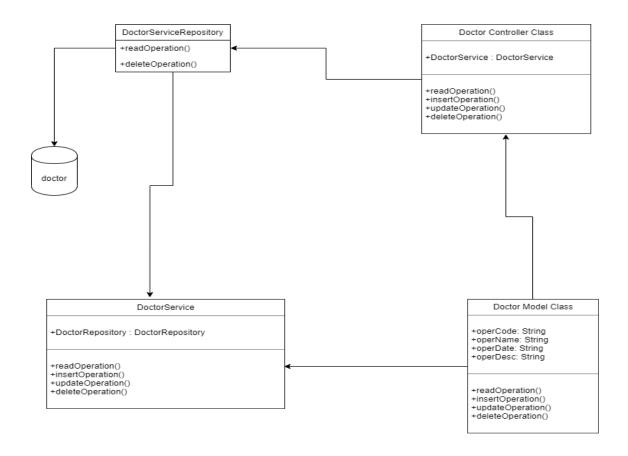
<u>Prescriptions</u>	<u>Operations</u>
URL:- http://localhost:8080/DoctorService/DoctorService/DoctorService/DoctorsPrescriptions	URL:- http://localhost:8080/DoctorService/DoctorS ervice/DoctorsOperations
Request :- { presID = selected presID from the service }	Request :- { operID= selected presID from the service }
Response :- { result = "Inserted successfully" } { presID= "auto generated integer value"} { error = "Error while inserting" }	Response :- { result = "Inserted successfully" } { operID= "auto generated integer value"} { error = "Error while inserting" }

Service Diagrams

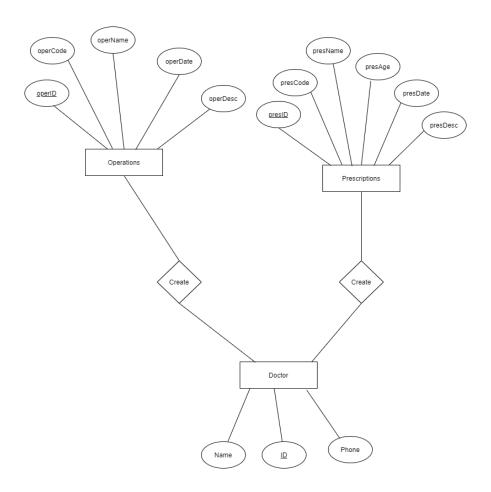
Class Diagram (Prescription)->



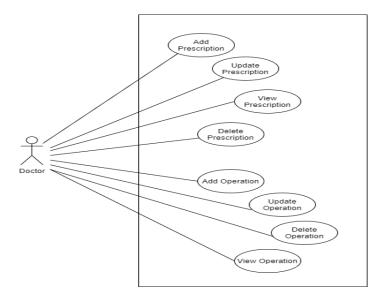
Class Diagram (Operation)->



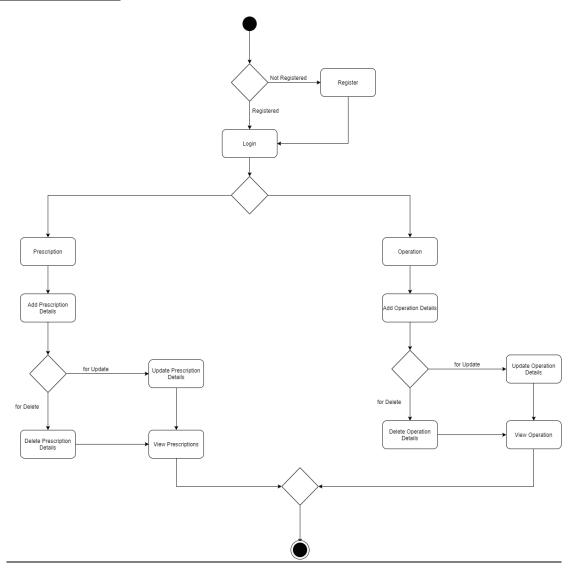
ER Diagram->



<u>Use case Diagram -></u>



Activity Diagram ->



Registration Number: IT17021944

Name: T.T.D.kaluarachchi Workload: Health care system

Group Name: S11 51.9

Description

Health care system is a system which can perform several tasks such as make an appointment. Making an appointment is a main function of a health care system. Users can register and login to the system and make their appointments such as add a new appointment, update an appointment, delete an appointment.

API for get all the appointment details in the database (GET Request)

```
url:- http://localhost:8080/Appoint/Appoint/Appointment

Request:- { }

Response:- { id = "auto generated integer value " }

{ Appointment_code = "001" }

{ Appointment_name = "Thimira" }

{ Appointment_description = "patient description" }

Request:- { }

Response:- { id = "auto generated integer value " }

{ Appointment_code = "002" }

{ Appointment_name = ""dilshan" }

{ Appointment_description = "494,mampe north piliyandala,heshan" }
```

API for insert a new appointment details to the database (POST Request)

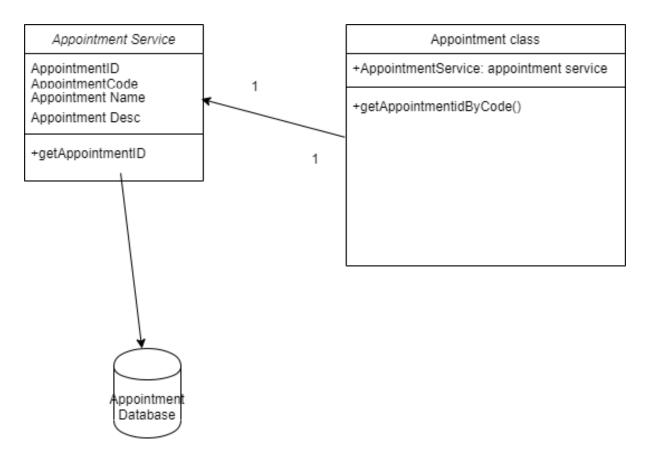
API for update an appointment detail which is existing in database (PUT Request)

```
Response :- { result = "updated successfully" 
 { error = "Error while updating items" }
```

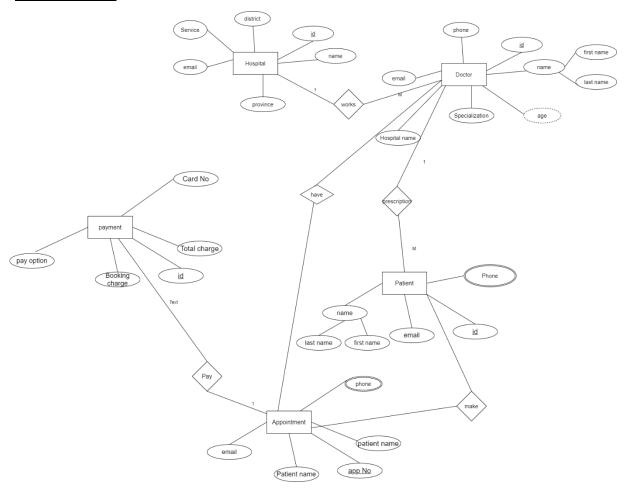
API for delete an appointment which is existing in database (DELETE Request)

url: - http://localhost:8080/Appoint/Appoint/Appointment

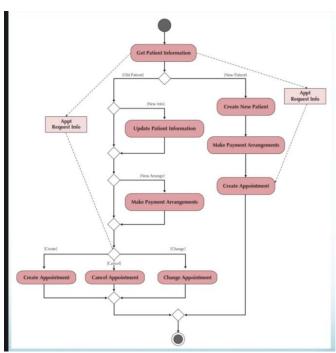
Class Diagram->



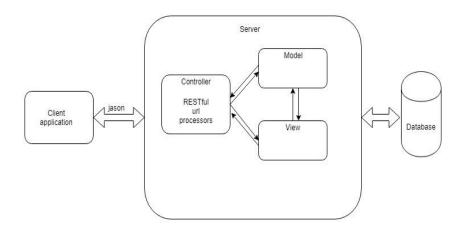
ER Diagram->



Activity Diagram->



Internal Workflow->



IT Number: IT18171198

Name: M.G.T.N.K.Abeykoon

Description

Health care system is a system which can perform several tasks such as make an appointment, patient registration, view hospitals and information about doctors. Registering patients is an essential function for the system. The registered patients can update, delete, and view their patient details

API for get all the patient details in the database (GET Request)

```
url: http://localhost:8050/PatientService/PatientService/patientRequest
                                                                                       { }
                          { pid = "auto generated integer value" }
Response
                          { pid = "P001" }
                          { name = "thilan" }
                          { asdress = "kandy road" }
                          { phoneNo = "075654" }
                          \{ year = "23" \}
                          {email="neth"}
Request
                          { }
                          { pid = "auto generated integer value " }
Response
                 :-
                          { pid = "P002" }
                          { name = "dananga" }
                          { asdress = "kandy road" }
                          { phoneNo = "0756545" }
                          \{ year = "20" \}
                          {email="dana@g"}
```

API for insert a new patient to the database (POST Request)

API for update a patient which is existing in database (PUT Request)

```
 \begin{aligned} \textit{url}:$-$ & \text{http://localhost:}8050/PatientService/PatientService/patient} \\ & \text{Request} & :- & \{ & \text{pid} = \text{``auto generated integer value''} \} \\ & \{ & \text{pid} = \text{``P003''} \} \\ & \{ & \text{name} = \text{``kumara''} \} \\ & \{ & \text{address} = \text{``malabe''} \} \end{aligned}
```

```
{ phoneNo = "07758984" }
{ year = "21" }
{email="kumara@gmail.com"}
Response :- { result = "Updated successfully }
{ error = "Error while updating the patient" }
```

API for delete a patient which is existing in database (DELETE Request)

url: - http://localhost:8050/PatientService/PatientService/patient

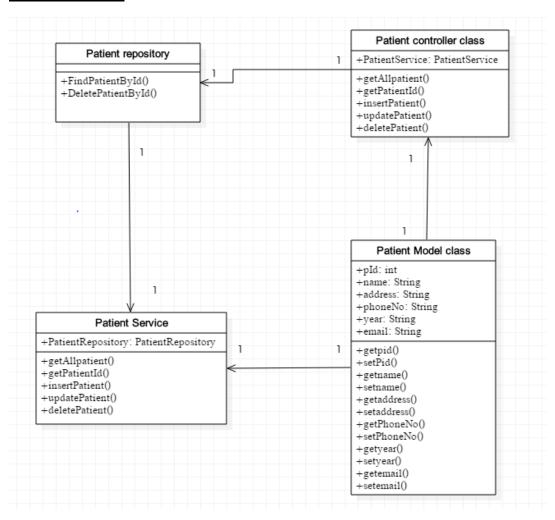
```
Request :- { p id = selected id from the service }

Response :- { result = "Deleted successfully" }

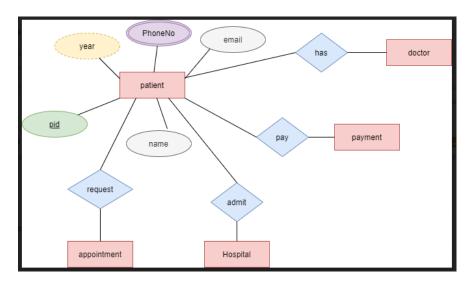
{ error = "Error while deleting the patient" }.
```

Service design

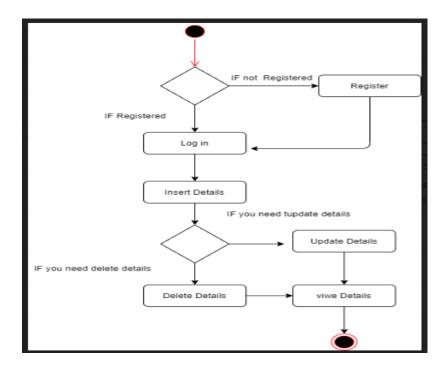
Class Diagram->



ER Diagram->



Activity Diagram->



IT Number: IT16038806

Name: Attanayaka.J.A.E.P.

API for get all the patient details in the database (GET Request)

```
url :- http://localhost:8050/Hospital/ItemService/Hos
tRequest
                 :-
Response
                          { HospitalID= "auto generated integer value " }
                 :-
                          { HospitalCode="Host3"}
                          { HospitalName= "Co-op" }
                          { HospitalAddress="Kurunegala" }
                          { HospitalPhoNo="372050348" }
Request
                          { }
Response
                          { HospitalID = "auto generated integer value " }
                 :-
                          { HospitalCode = "Host4" }
                          { HospitalName = "Durdans" }
                          { HospitalAddress = "Kurunegala" }
                          { HospitalPhoNo = "372037521" }
                          { error = "Error while reading the Hospital." }
```

API for insert a new patient to the database (POST Request)

url: http://localhost:8050/Hospital/ItemService/Hos

API for update a patient which is existing in database (PUT Request)

url:- http://localhost:8050/Hospital/ItemService/Hos

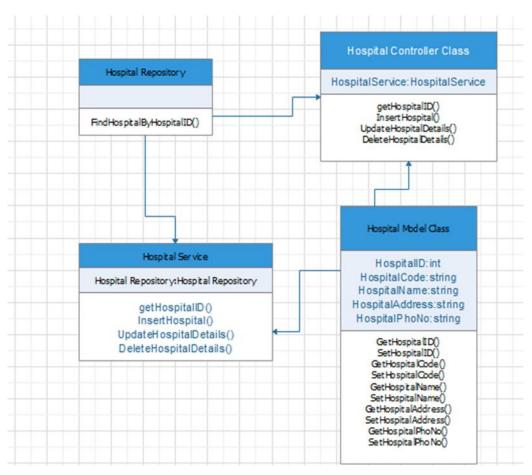
```
Request :- { HospitalID = "7" }
{ HospitalCode = "Host10" }
{ HospitalName = "Lanka" }
{ HospitalAddress = "Kiribathgoda" }
{ HospitalPhoNo = "0112568342" }

Response :- { result = "Updated successfully" }
{ error = "Error while updating the Hospital Dataset." }
```

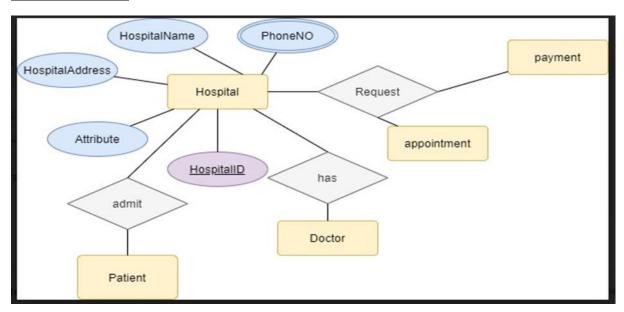
API for delete a patient which is existing in database (DELETE Request)

url :- http://localhost:8050/Hospital/ItemService/Hos

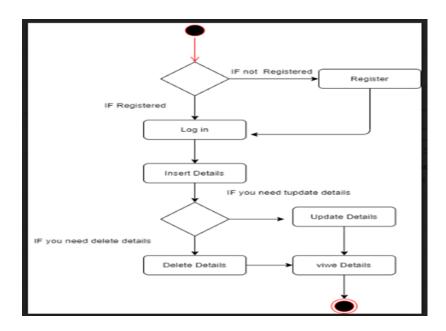
Class Diagram

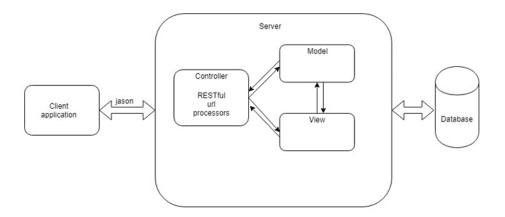


ER Diagram->



Activity diagram->





Software references

- Framework –J Query 3.2.1
- Scripting language –Java Script 1.6
- Database MySQL 8.0
- Other- HTML, CSS v3.0

8. System's integration details

We developed the whole system as micro services and after the completion of micro services we integrated and combined our project using git hub. The integrated git hub repository is available in report. For testing purposes of the system, we used several tools such as selenium, SonarQube. Selenium is an ideal tool for testing web applications. Finally, we used postman tool to test the client components

9. References

https://eclipse-ee4j.github.io/jersey/

https://www.javatpoint.com/jax-rs-example-jersey

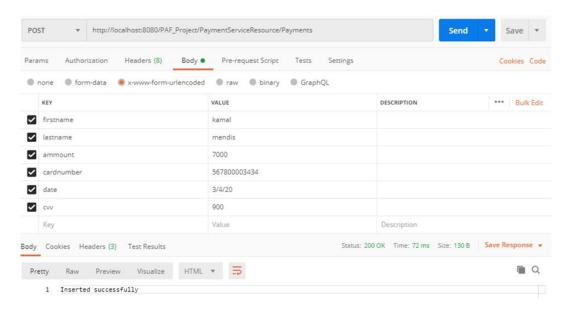
https://www.vogella.com/tutorials/REST/article.html

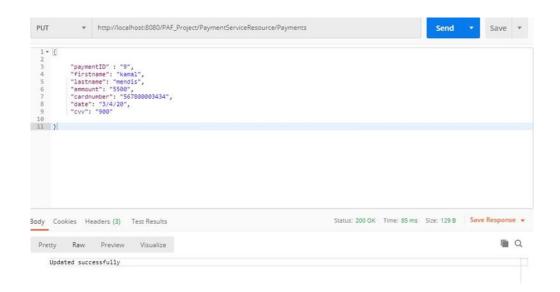
https://www.mysql.com/

https://dev.mysql.com/downloads/connector/j/5.1.html

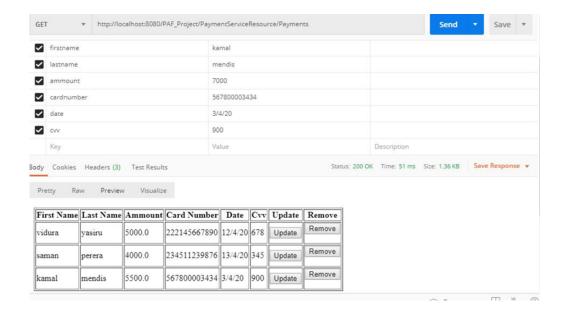
Appendix 01

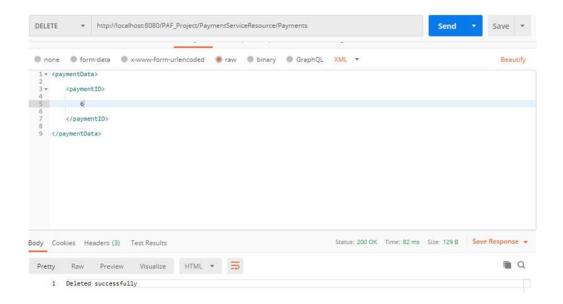
IT Number: IT18012620





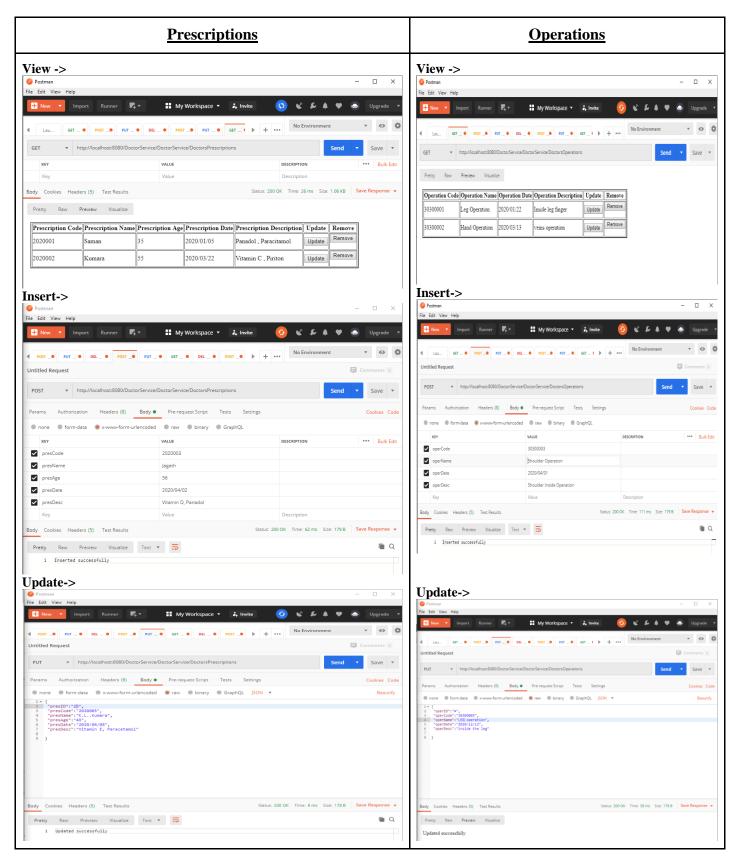
IT-3030



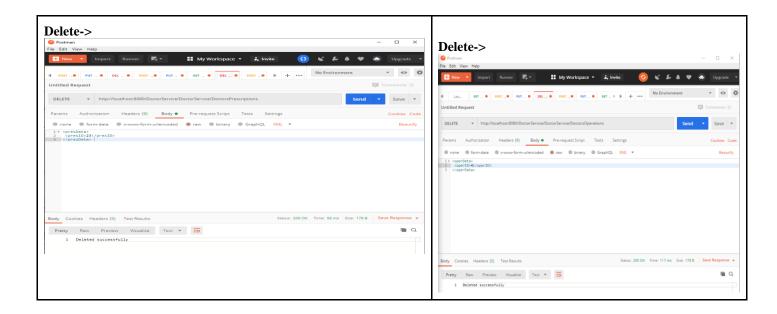


Appendix 02

IT Number: IT18152760



IT-3030



Appendix 03

IT Number: IT16038806

