IT3030
Programming Applications and Frameworks

3rd Year, 1st Semester

Assignment

Group Project

Submitted to

Sri Lanka Institute of Information Technology

Group No: 2022S1-IT3030PAF-GroupProject-Y3.S1.WE.IT.01.02-GID:2

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1.<u>Introduction</u>

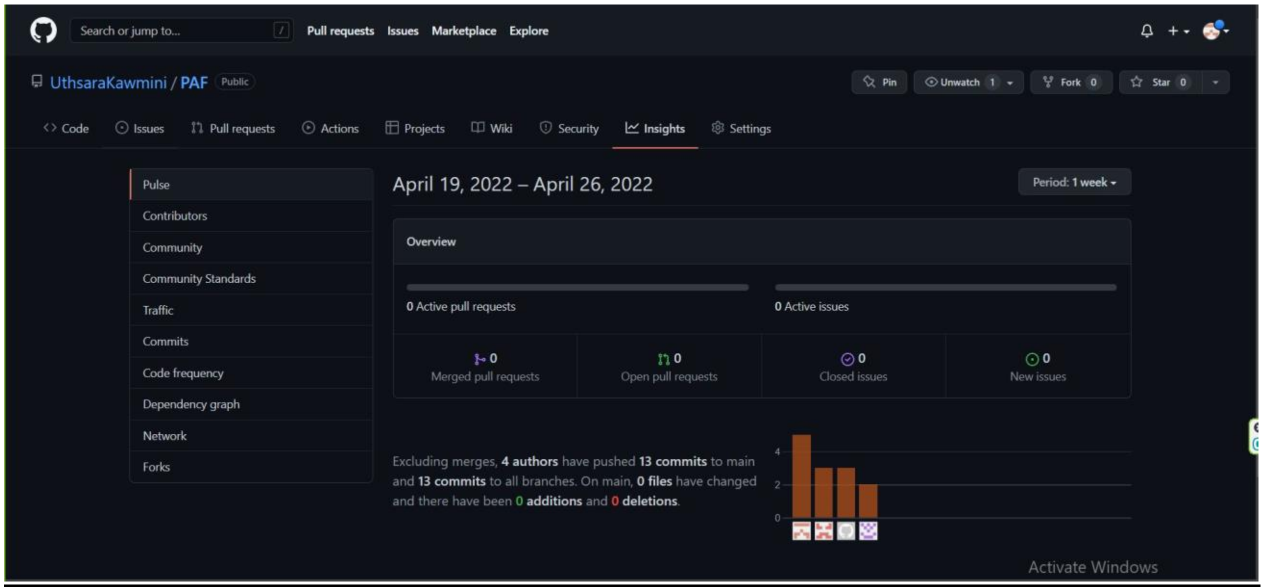
ElectroGrid (EG) is an online system that stores a country power grid. have a system that monitors the power consumption of users, make monthly bills and automatically send them to users, and receive online payments from users. first,users must register with the system as a valid user and then be able to view system. Through this system and our system have complaint management , Customer can enter all details of the Complaint. And This system can manage all the details of Payments in ElectroGrid. And also customer can enter all bill details to the system. This system makes a smooth and safety connection with clients and payments. Because of the user friendliness clients would like to use it. There is some authorize persons. They can view and do the corrections. It makes an efficient service to the client.

2.<u>Member's Details</u>

Student ID	**Name**	**Micro Service**	**Work Allocated**
IT20275792	Kawmini P.W.U	Payment Management	• Add, delete, update, view and validatePayments

IT20244002	Madhushani E.A.Y.C	User Management	• Add, delete, update and view User.
IT20234720	Elpitiya S.N	Bill Management	• Add, delete, update and view bill management.
IT20249748	Thamaraka G.I	Complaint Management	• Add, delete, update and view complains.

<u>3.VCS repo management</u> – Commit log



April 19, 2022 – April 26, 2022

0 Active pull requests

0 Active issues

0 Merged pull requests

0 Open pull requests

0 Closed issues

0 New issues

Excluding merges, **4 authors** have pushed **13 commits** to main and **13 commits** to all branches. On main, **0 files** have changed and there have been **0 additions** and **0 deletions**.

<u>Clickable link - https://github.com/UthsaraKawmini/PAF.git</u>

<u>4.SE Methodology</u>

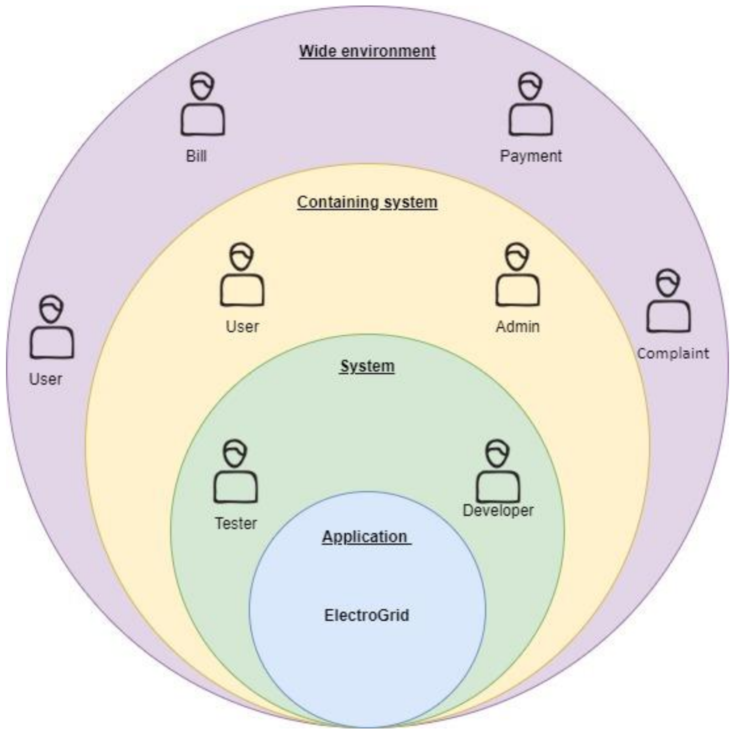
In this project, the waterfall method was used to develop the system. We picked this methodology because it is Manageable enough to control as the model is hard and simple to understand and functional. In the waterfall model, it is easy for measuring and analysis. Our project was petite. But we had a bound period to develop the system. The waterfall method was selected as it protects a notable amount of time.

<u>7.Time schedule (Gantt chart)</u>

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
1)Gathering of information and requirements	■									
2)Installation of Software		■								
3)Designing the Database			■	■						
4)Implementation					■	■	■	■		
5)Integration and Testing								■	■	
6)Finalizing system and documents										■

System's overall design

 Stakeholder analysis (onion diagram)



Requirements analysis (Functional, Non-functional, Technical requirements) Functional Requirements

1. Payment Management: Add, delete, update and view Users

2. User Management: Add, delete, update and view Products
3. Bill Management: Add, delete, update and view Researches
4. Compliant Management: Add, delete, update and view Payments

Non-Functional Requirements

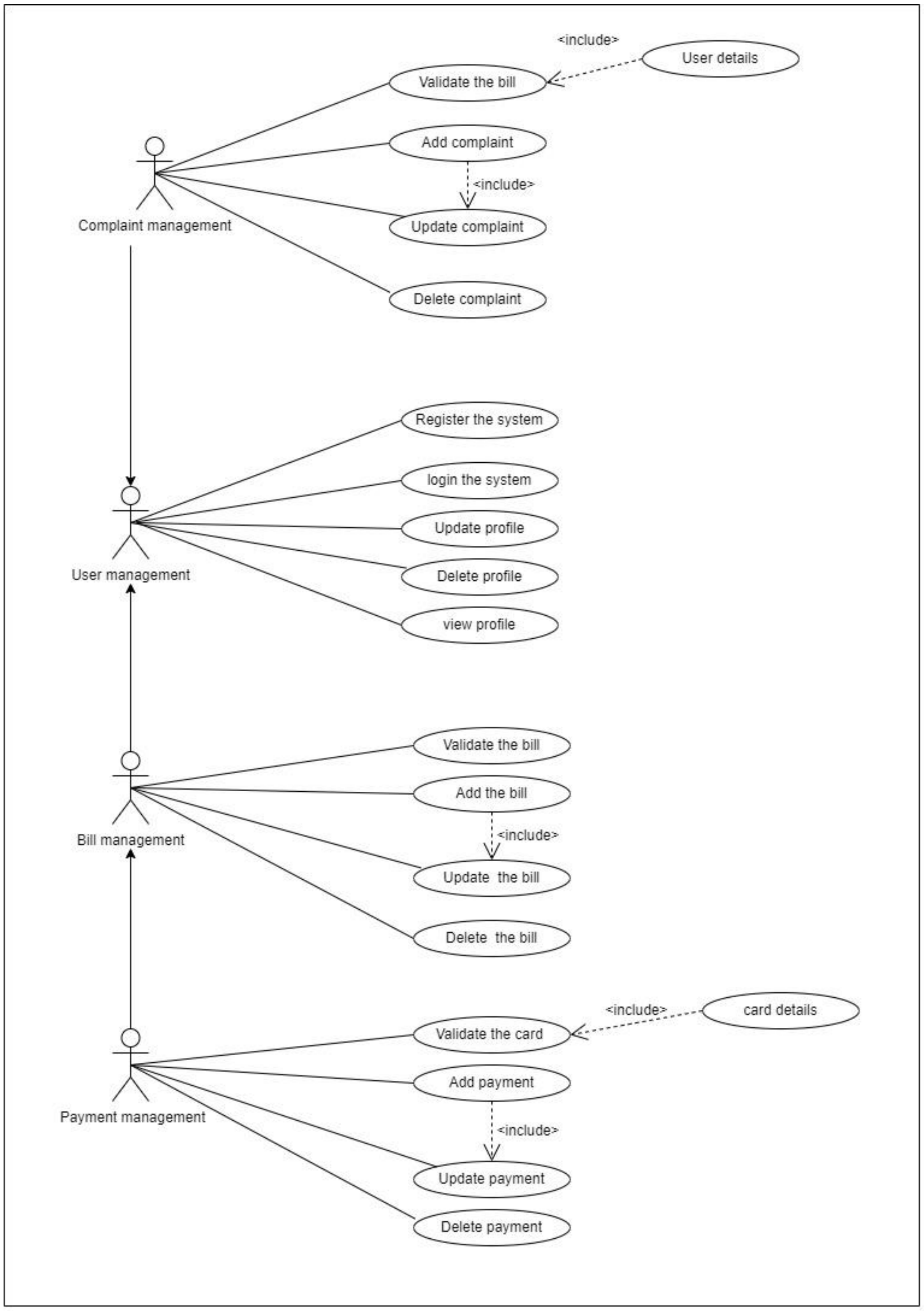
1. Usability
2. Scalability
3. Maintainability
4. Performance
5. Reliability
6. Security
7. Quality
8. Efficiency
9. Accessibility
10. Compatibility
11. Extensibility

Technical Requirements

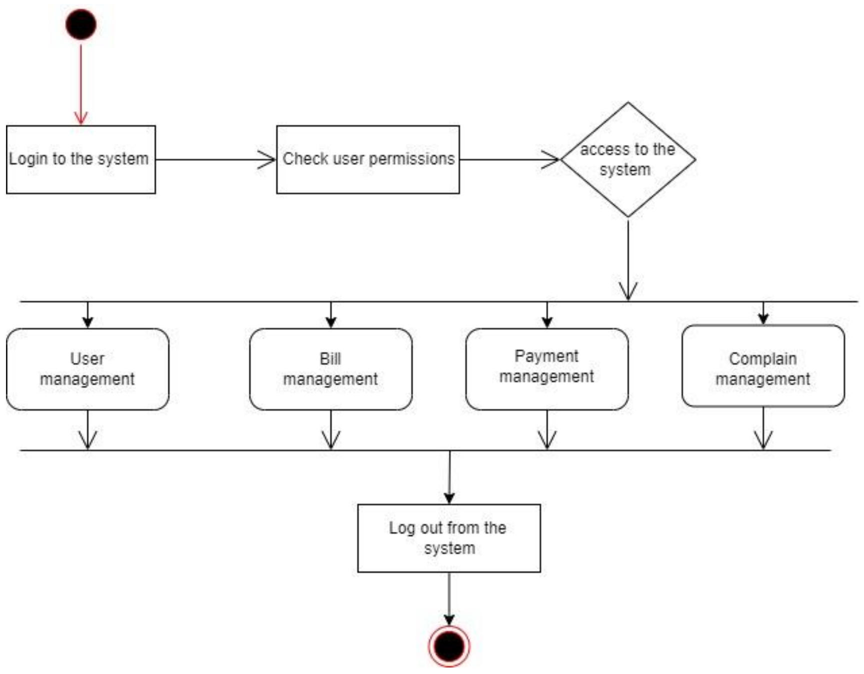
Backend Development - **JAX-RS, Jersey, Java** via Eclipse IDE in a windows operating system
Database - MySQL Workbench
accessed - computer of minimum 4GB RAM and a 500 GB Hard Disk through operating systems such as Windows.
browsers - Chrome.

Requirements modelling (diagrams)

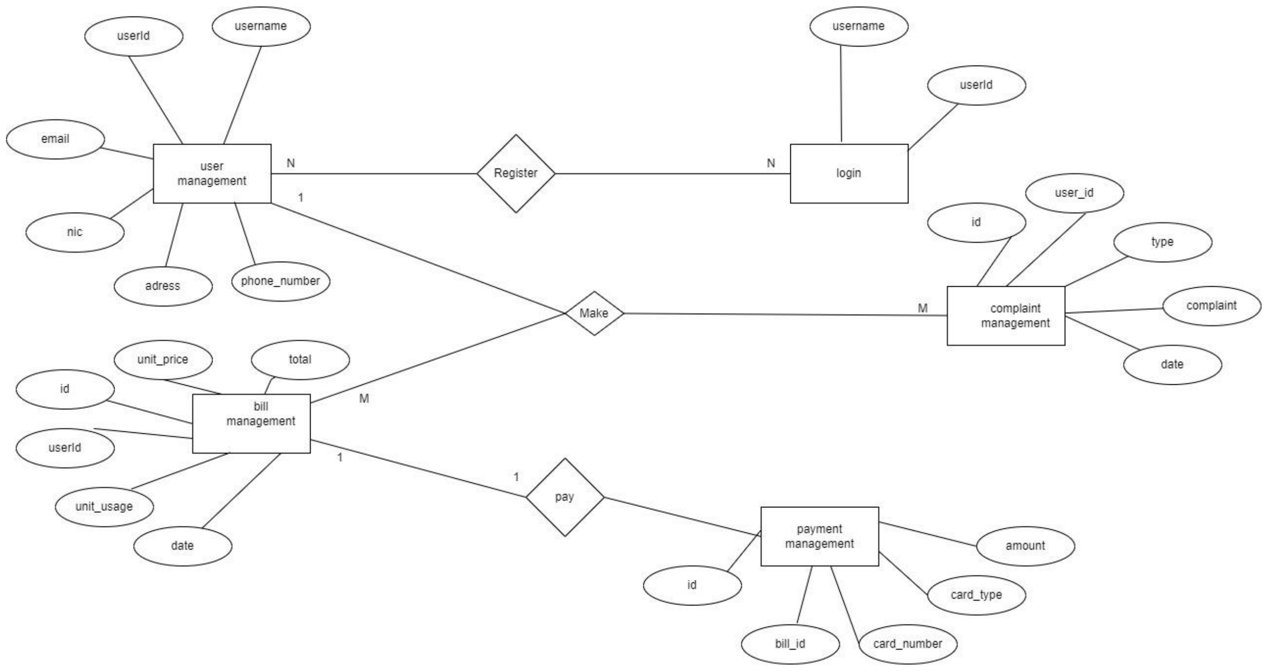
❖ Use case diagram



❖ Activity Diagram



❖ ER diagram



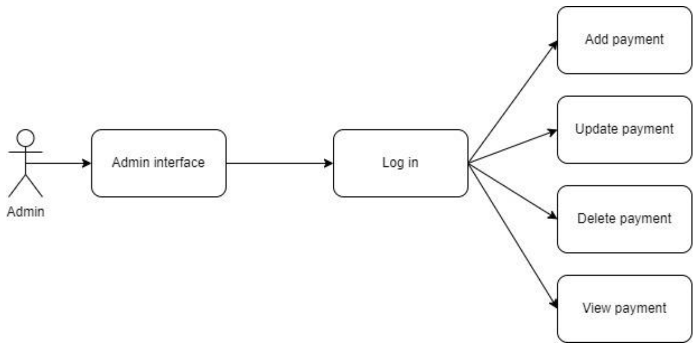
➢ Individual Section

IT20275792 – Kawmini P.W.U

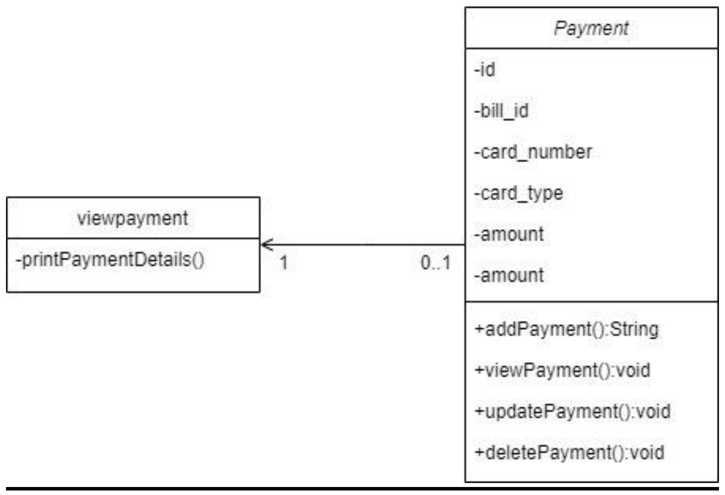
Payment Management

This system is meant to manage all the details of Payments in ElectroGrid. This Payment Management System is operated by the admin. Admin can enter all details of Payments. Also, they will update and delete the added details as needed. also, because the system can perform all the inserted payment details for users. Registered users can view details.

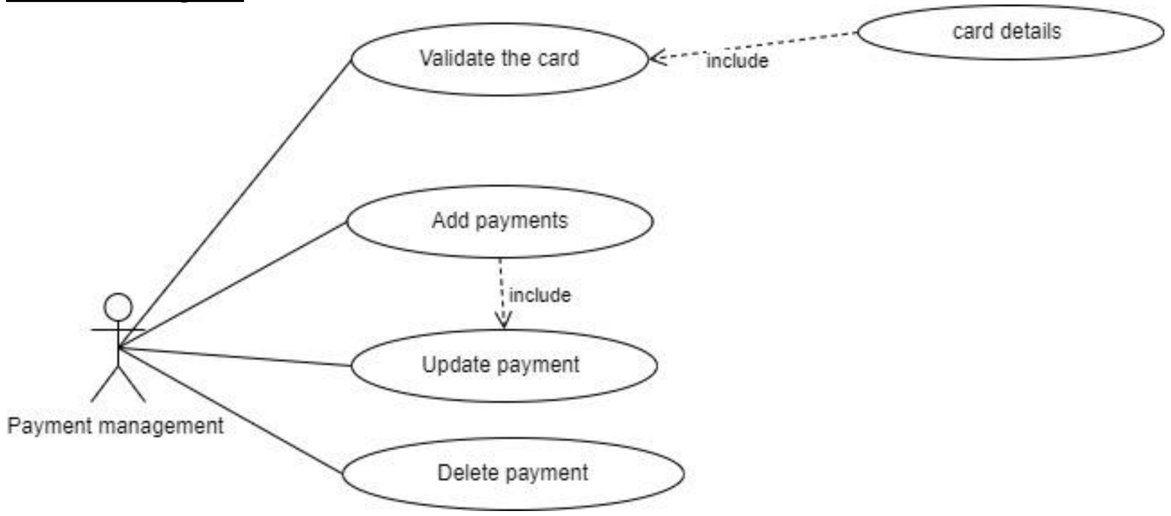
1.API of the service



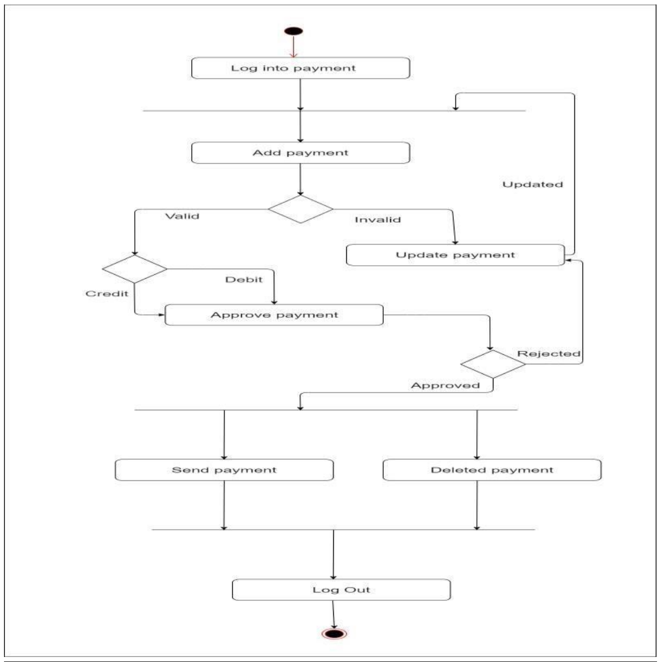
2.Class Diagram



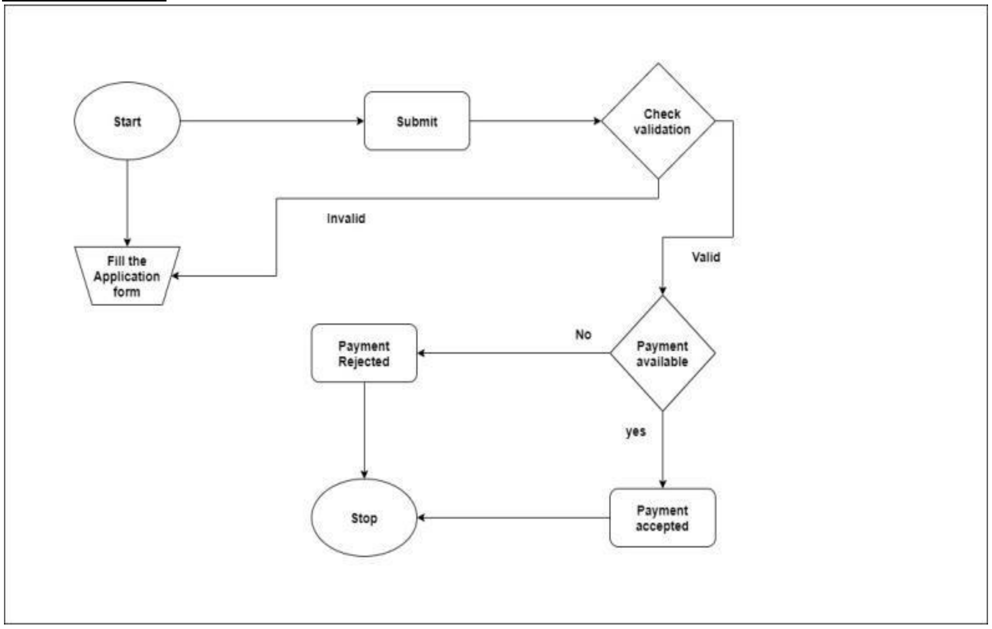
3.Usecase Diagram



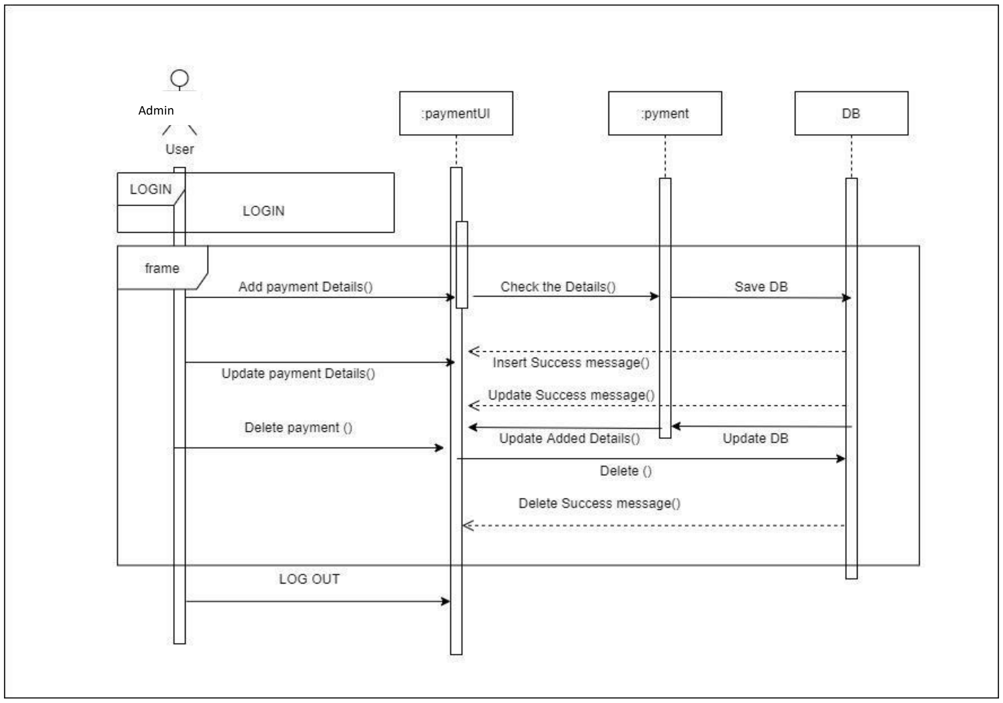
4.Activity Diagram



5.Flowchart



6.Sequence Diagram



7. Service Development and Testing

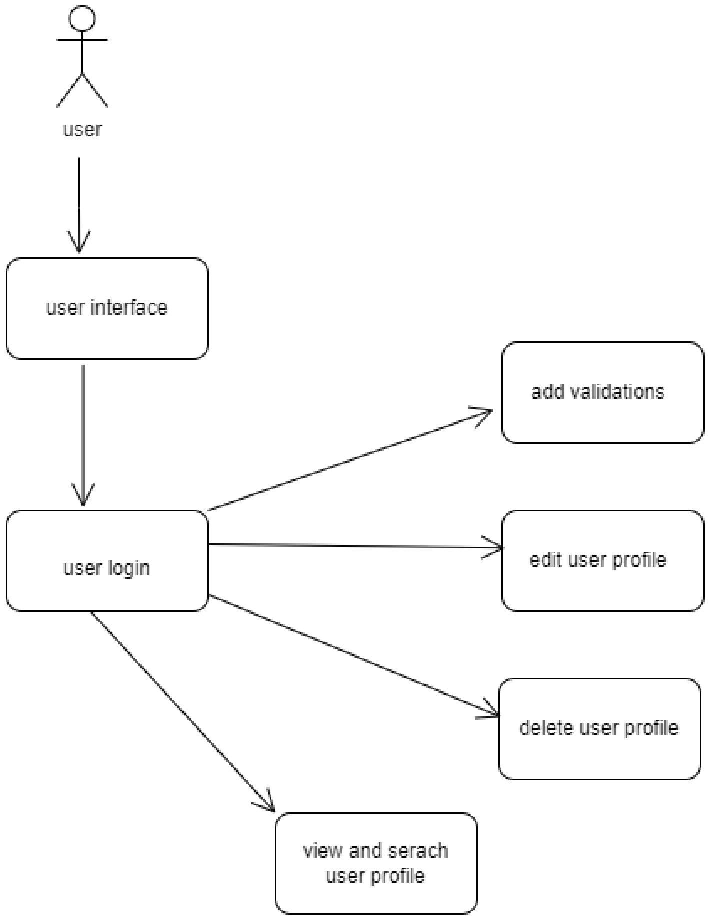
No	Test Description	Test input	Exception output	Actual out
01	Insert payment details	paymentCardNo: 012 paymentcvv: 1012 expiredate:2023 cardHolderName: debit	“Inserted successfully”	“Inserted successfully”
02	Update details	url	“Updated successfully”	“Updated successfully”
03	Delete details	url	“Deleted successfully”	“Deleted successfully”
04	Read details	url	Display User Table	Display User Table

	Tool Used	Reason for Selection
Back end	JAX-RS, Jersey, Java	Easy configuration
Database	MySQL	Creation of database and connection is easy
Server	Tomcat server	Easy configuration
Build Tool	Maven	Knowledge gathered at lab sessions
IDE	Eclipse IDE	familiarity with former usage and experiences collected. also debugging, integration, and combining to git is very easy with Eclipse IDE
Testing Tool	Postman	postman may be a useful gizmo when trying to dissect restful API made by others for test one you've got made yourself

IT20244002 - E.A.Y.C.Madhushani
User Management

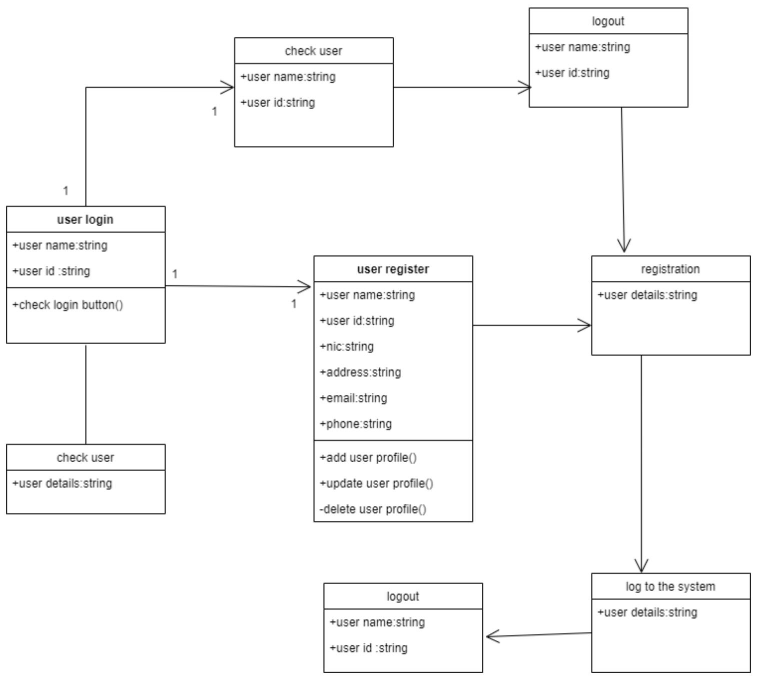
From this ,system intend to control all of the user info of Electro Grid system. consumer can insert the all details of customers. additionally, they are able to replace and delete their person profile as they required. the device can display all the inserted profile info of customers. Registered customers can view consumer's profile information. Likewise, now not registered user can create a new user profile by adding user information. in the end, users can logout inside the system definitely by clicking logout button.

1.API of the service

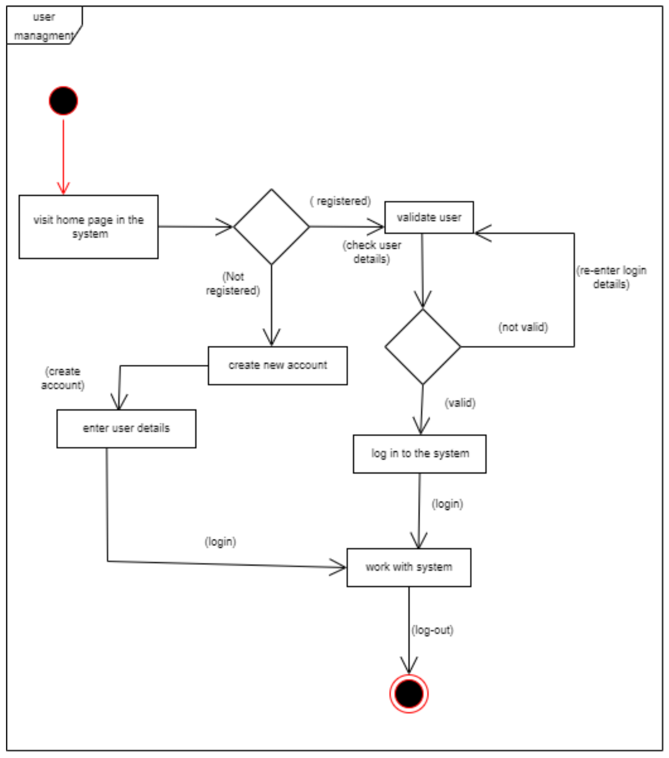


Internal logic (Class Diagram / Activity Diagram/Flow Chart)

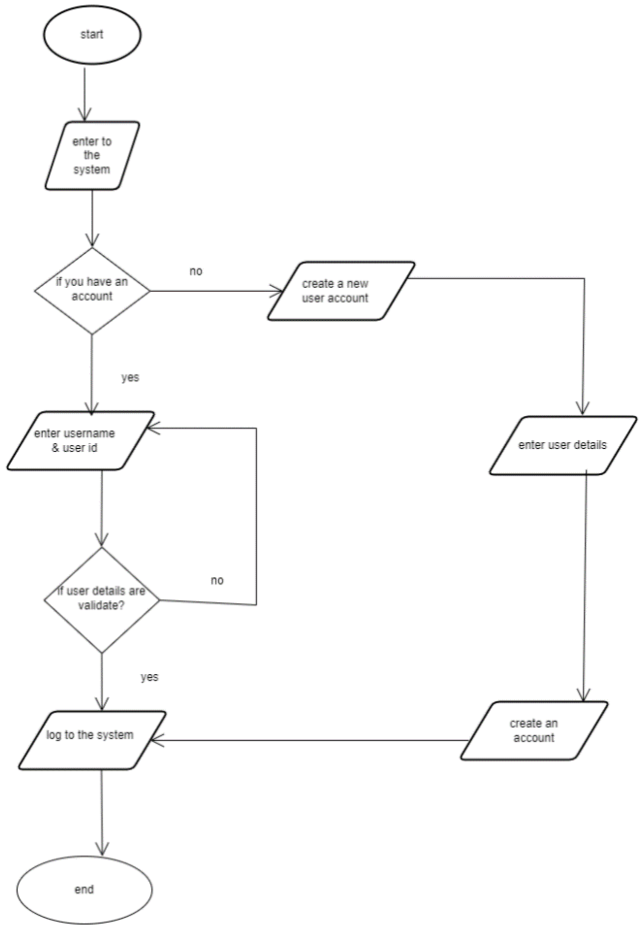
2.Class Diagram



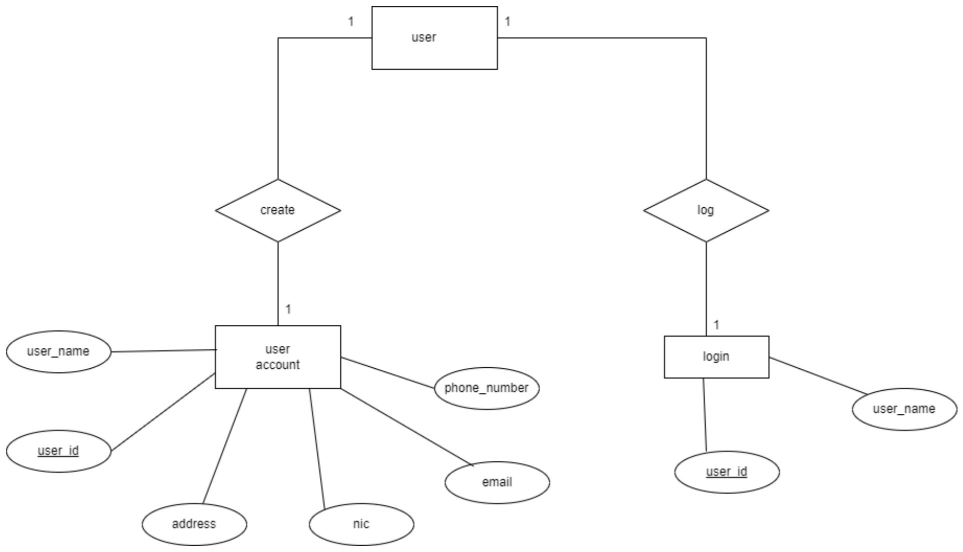
3.Activity Diagram



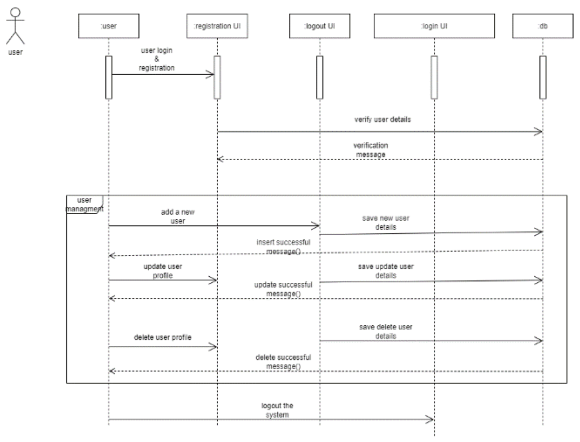
4.Flow Chart



5.Database of the Service (ER)



6.Sequence Diagram



7. Service development and testing.

	Tool Used	Reason for selection
Back end	JAX-RS, Jersey, Java	Easy configuration
Database	MySQL	Creation of database & connection is easy
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Build Tool	Maven	Information collected during laboratory times
IDE	Eclipse IDE	accustomed to previous use as well collected experiences. and to correct an error, integration, and integration with most git easy with Eclipse IDE
Testing Tool	Postman	postman can be a useful gizmo when you try to separate the relaxing API made for others test one do it yourself

No	Test Description	Test input	Exception output	Actual out
01	Insert user profile details	name – Yashi userID-1 nic-996354067V email-chamodya@gmail.com Phone- 0773396845	“Inserted successfully”	“Inserted successfully”
02	Update user details	url	“Updated successfully”	“Updated successfully”

03	Delete user details	url	"Deleted successfully"	"Deleted successfully"
04	View user profile	url	View User details Table	View User details Table

References - https://www.youtube.com/watch?v=-_VPzhKJPfE

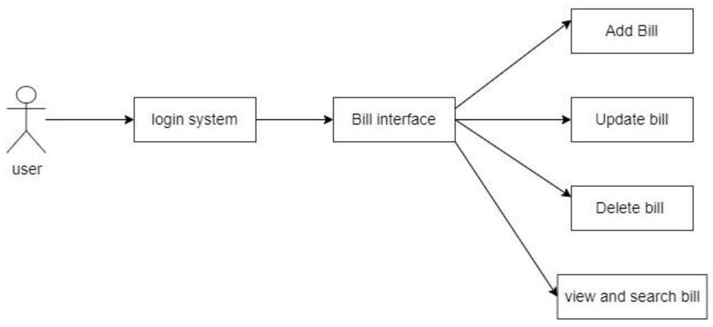
https://www.youtube.com/watch?v=dqJanLvjDqc

IT20234720 – Elpitiya S.N

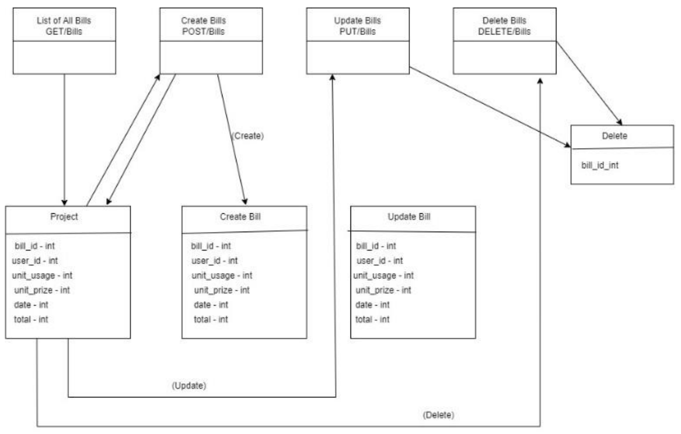
Bill Management

This system is meant to manage all the details of Electro grid. This bill management system is operated by the user. Customer can enter all details of the bill. Also, they will update and delete the added details as needed. And they can view their details.

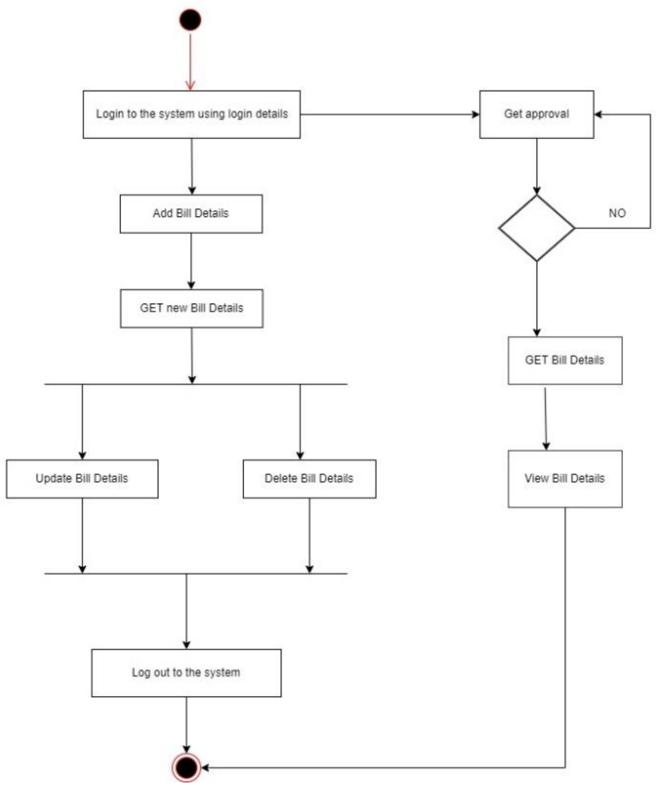
1. API of the service



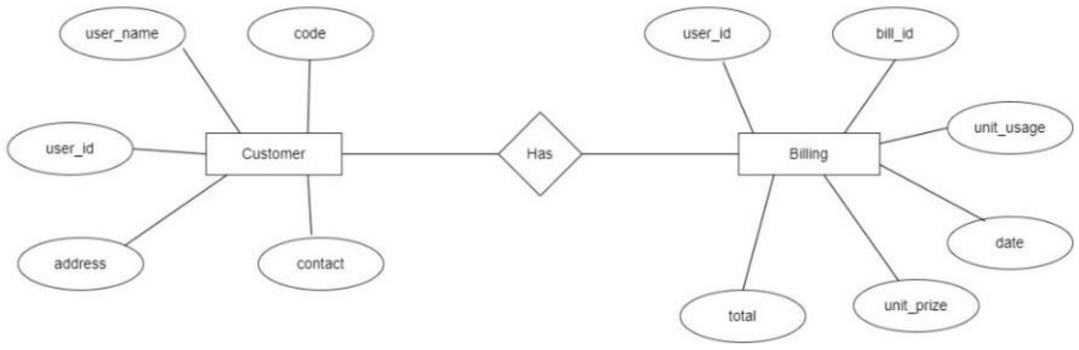
2. Class Diagram



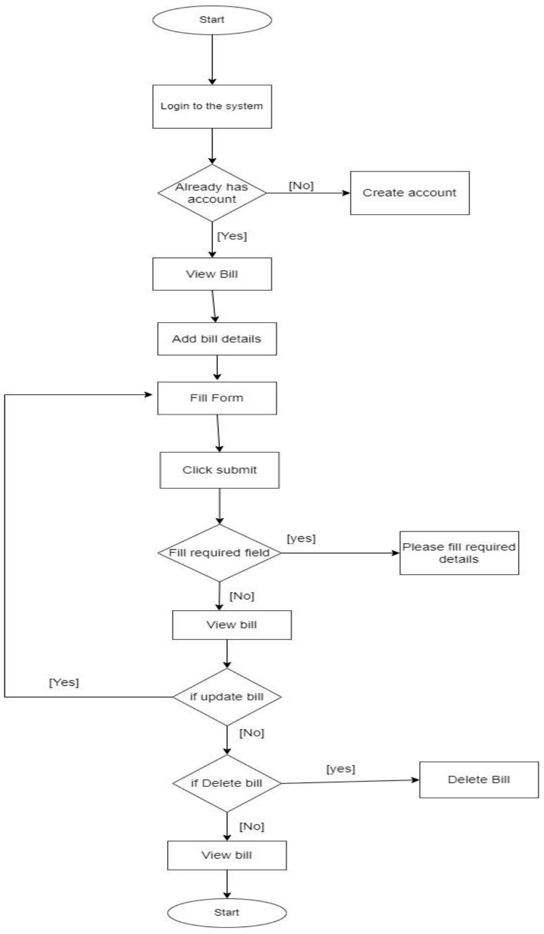
3.Activity Diagram



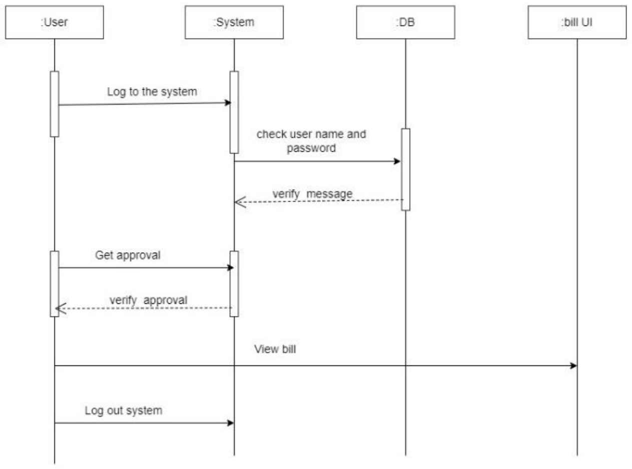
4.Database of the Service (ER)



5.Flowchart



6.Sequence Diagram



7. Service development and testing.

No	Test Description	Test input	Exception output	Actual out
1	Insert user bill details	Bill id User id Date Unit usage Unit prize total	“Inserted successfully”	“successfully”
2	Update bill	url	“Updated successfully”	“successfully”
3	Delete bill	url	“Deleted successfully”	“successfully”
4	Read	url	View User details Table	View User details Table

	Tool Used	Reason for Selection
Back end	JAX-RS, Jersey, Java	Easy configuration
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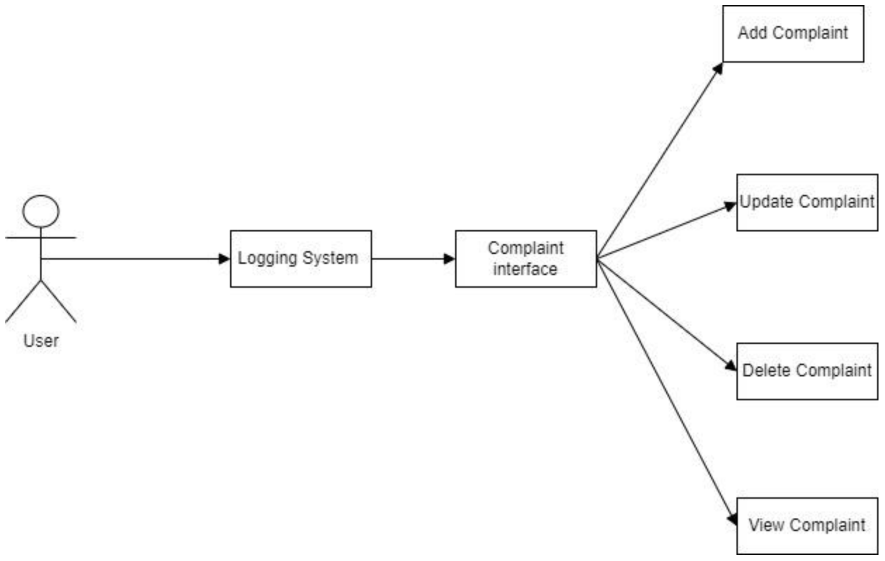
Testing Tool	Postman	postman may be a useful gizmo when trying to dissect restful API made by others for test one you've got made yourself

IT20249748-Thamaraka G.I

Complaint Management

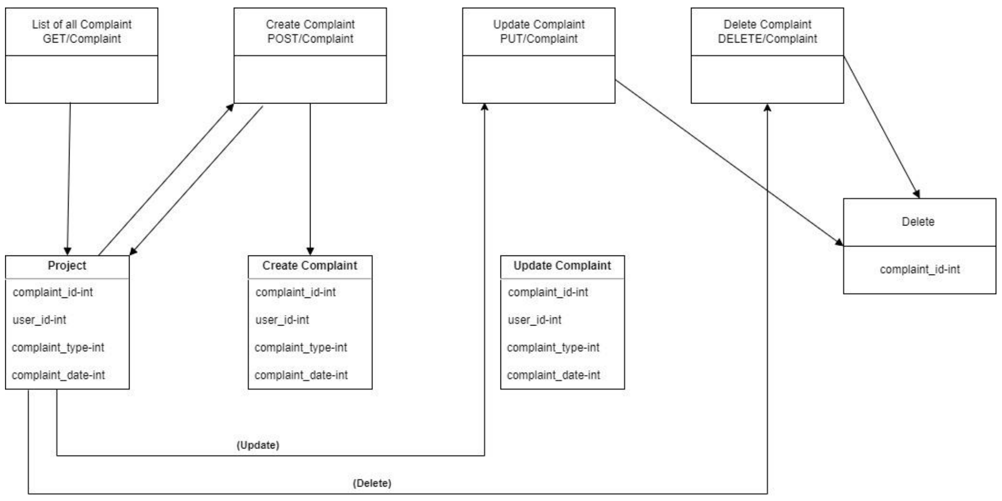
This system is meant to manage all the details of Admin. This Complaint management system is operated by the user. Customer can enter all details of the Complaint. Also, they will update and delete the added details as needed.

1. **API of the service**

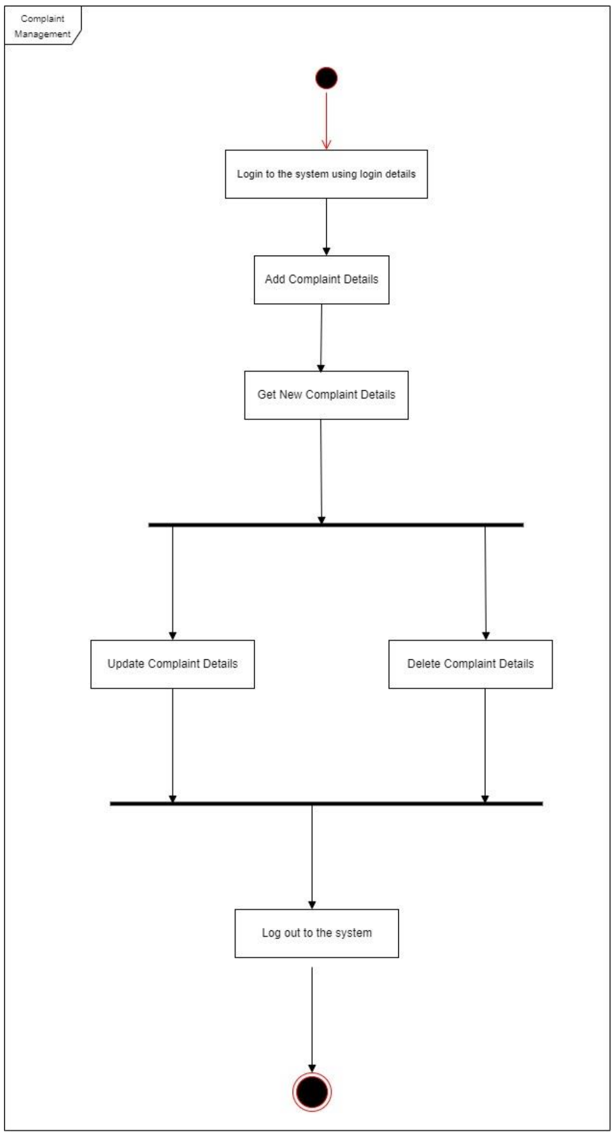


Internal logic (Class Diagram / Activity Diagram/Flow Chart)

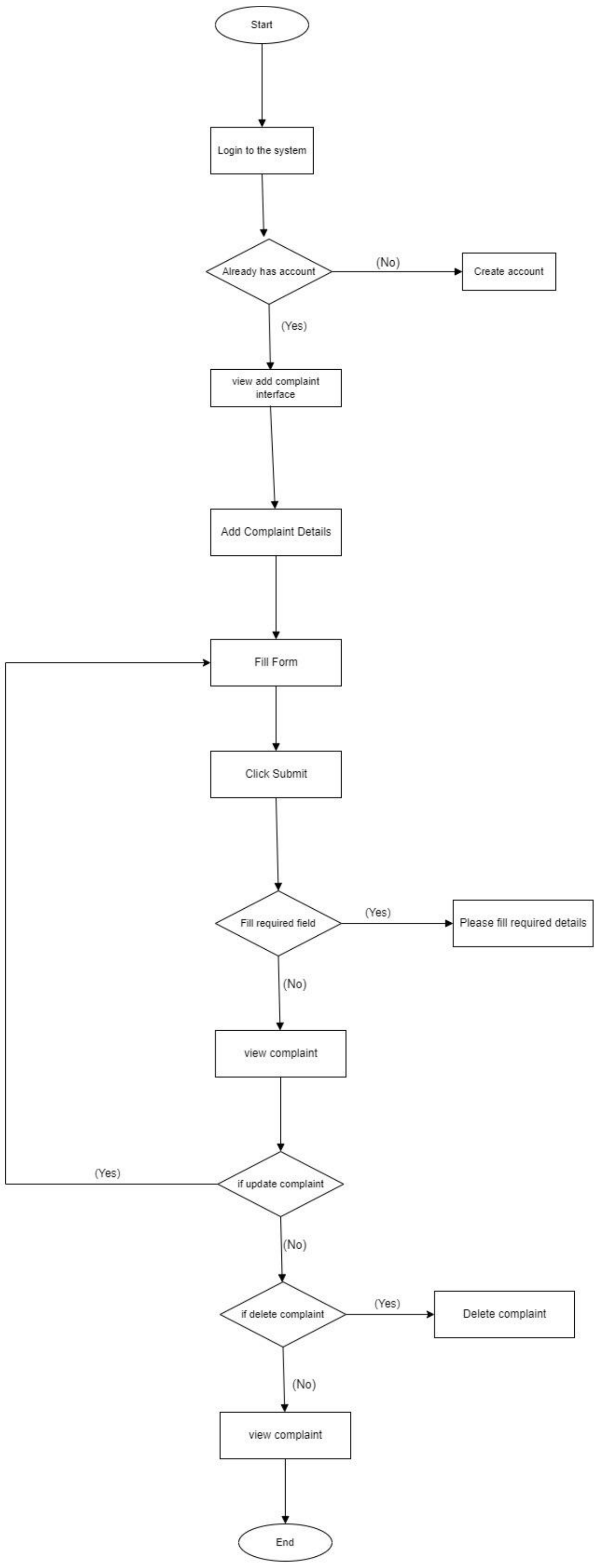
2.Class Diagram



3.Activity Diagram

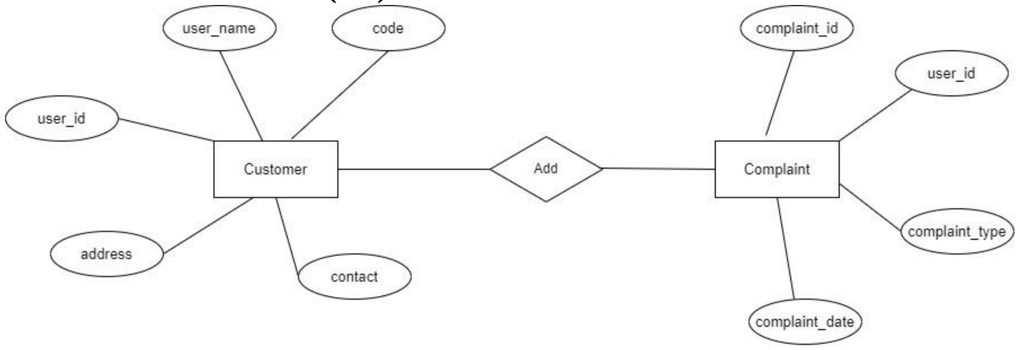

Complaint Management
Login to the system using login details
Add Complaint Details
Get New Complaint Details
Update Complaint Details
Delete Complaint Details
Log out to the system

4.Flow Chart

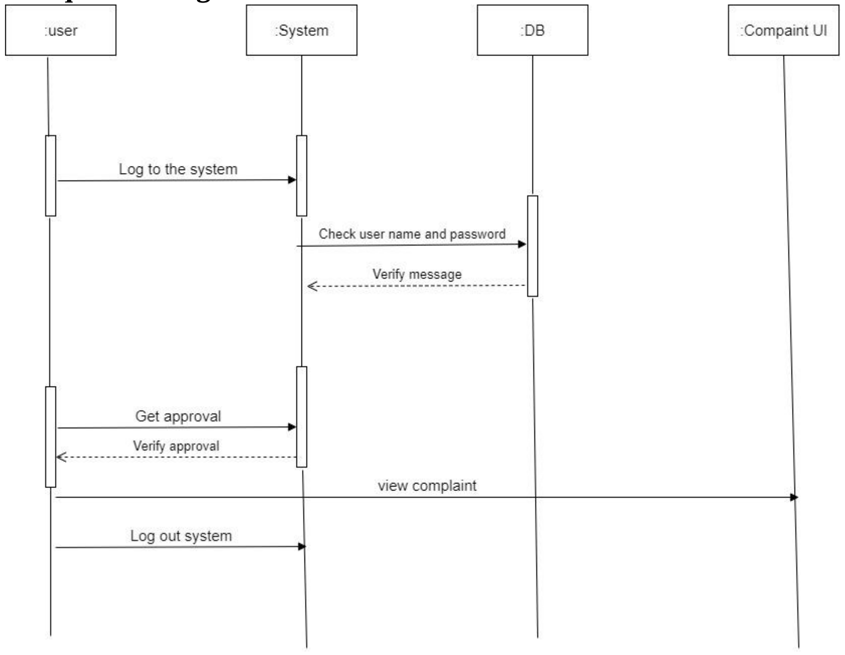


Start
Login to the system
Already has account
(No)
Create account
(Yes)
view add complaint interface
Add Complaint Details
Fill Form
Click Submit
Fill required field
(Yes)
Please fill required details
(No)
view complaint
(Yes)
if update complaint
(No)
if delete complaint
(Yes)
Delete complaint
(No)
view complaint
End

5.Database of the Service (ER)



6.Sequence Diagram



7.Service development and testing.

	Tool Used	Reason for selection
Back end	JAX-RS, Jersey, Java	Easy configuration
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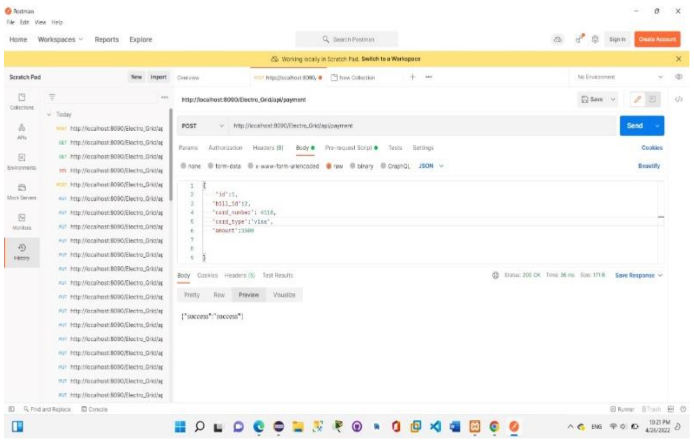
Testing Tool	Postman	postman can be a useful gizmo when you try to separate the relaxing API made for others test one do it yourself

No	**Test Description**	**Test input**	**Exception output**	**Actual out**
01	Insert complaint details	Complain_id user_id type complaint date	“Inserted successfully”	“Inserted successfully”
02	Update complaint details	url	“Updated successfully”	“Updated successfully”
03	Delete complaint details	url	“Deleted successfully”	“Deleted successfully”
04	View complaint	url	View User details Table	View User details Table

Screenshot in Testing

IT20275792(Kawmini P.W.U)

<u>Payment managment</u>

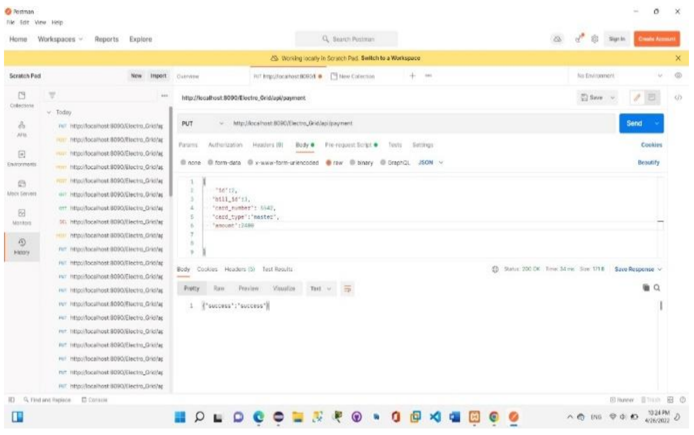

POST http://localhost:8090/Electro_Grid/api/payment

```
{
  "id":1,
 "bill_id":2,
 "card_number": 4118,
 "card_type":"visa",
 "amount":1500


}
```

Status: 200 OK Time: 36 ms Size: 171 B

```
{"success":"success"}
```

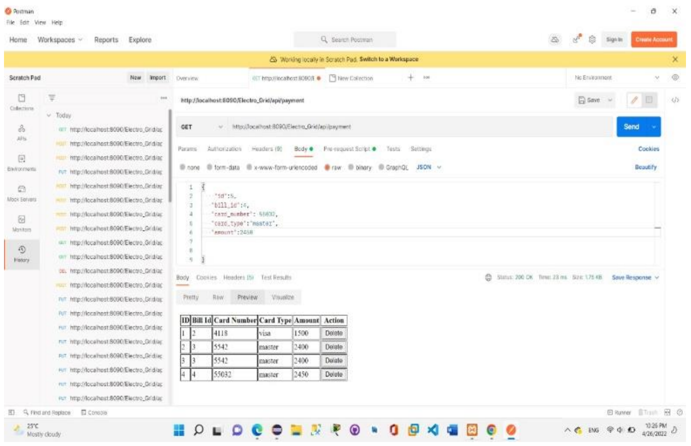

PUT http://localhost:8090/Electro_Grid/api/payment

```
{
  "id":2,
 "bill_id":3,
 "card_number": 5542,
 "card_type":"master",
 "amount":2400


}
```

Status: 200 OK Time: 34 ms Size: 171 B

```
{"success":"success"}
```

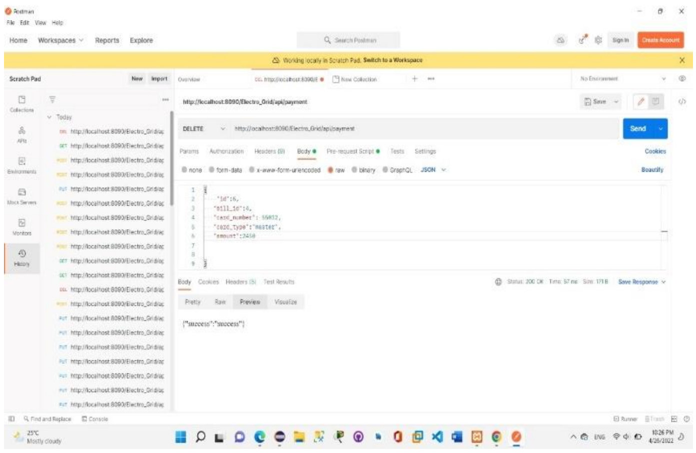

GET http://localhost:8090/Electro_Grid/api/payment

```
{
  "id":5,
 "bill_id":4,
 "card_number": 55032,
 "card_type":"master",
 "amount":2450


}
```

Status: 200 OK Time: 23 ms Size: 1.75 KB

ID	Bill Id	Card Number	Card Type	Amount	Action
1	2	4118	visa	1500	Delete
2	3	5542	master	2400	Delete
3	3	5542	master	2400	Delete
4	4	55032	master	2450	Delete

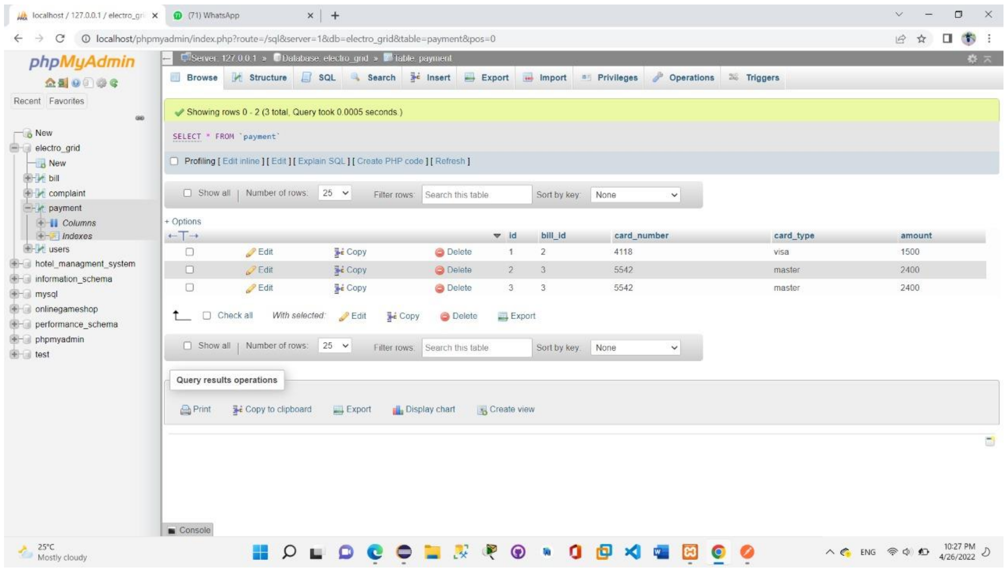

DELETE http://localhost:8090/Electro_Grid/api/payment

```
{
  "id":6,
 "bill_id":4,
 "card_number": 55032,
 "card_type":"master",
 "amount":2450


}
```

Status: 200 OK Time: 57 ms Size: 171 B

```
{"success":"success"}
```


localhost/phpmyadmin/index.php?route=/sql&server=1&db=electro_grid&table=payment&pos=0

Server: 127.0.0.1 » Database: electro_grid » Table: payment

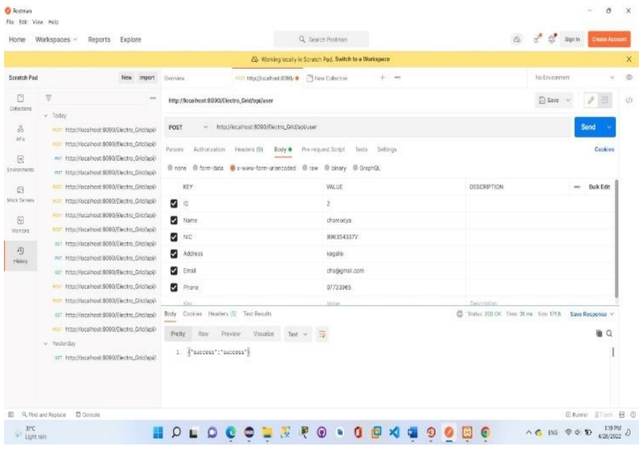
Showing rows 0 - 2 (3 total, Query took 0.0005 seconds.)

```
SELECT * FROM `payment`
```

	id	bill_id	card_number	card_type	amount
Edit Copy Delete	1	2	4118	visa	1500
Edit Copy Delete	2	3	5542	master	2400
Edit Copy Delete	3	3	5542	master	2400

IT20244002(Madhushani E.A.Y.C)

<u>User management</u>



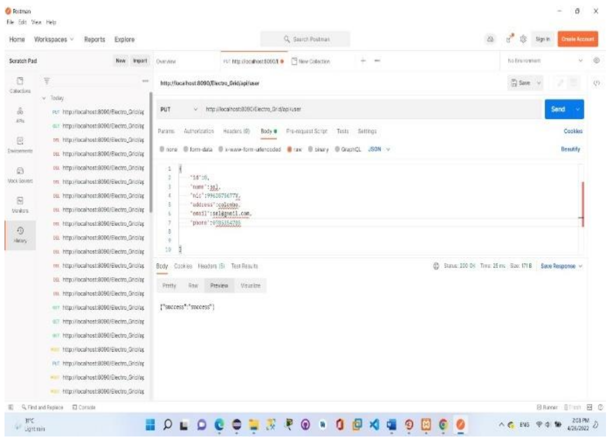
POST http://localhost:8090/Electro_Grid/api/user

Body: x-www-form-urlencoded

KEY	VALUE	DESCRIPTION
ID	2	
Name	chamodya	
NIC	996354337V	
Address	kegalle	
Email	cha@gmail.com	
Phone	07733965	

Status: 200 OK Time: 26 ms Size: 171 B

```
{"success":"success"}
```



PUT http://localhost:8090/Electro_Grid/api/user

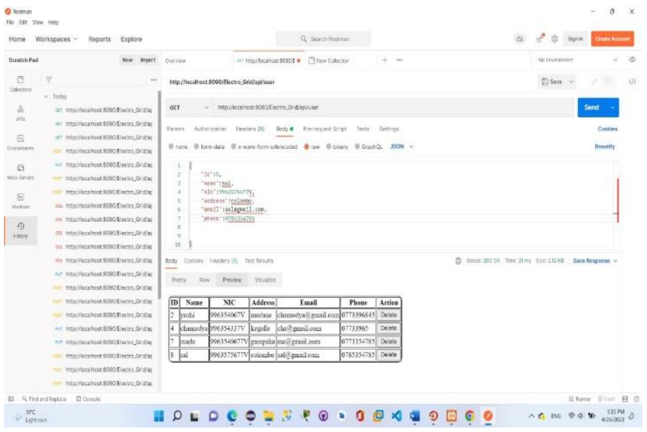
Body: raw JSON

```
{
    "id":8,
    "name":sal,
    "nic":996357567?V,
    "address":colombo,
    "email":sal@gmail.com,
    "phone":0785354785


}
```

Status: 200 OK Time: 25 ms Size: 171 B

```
{"success":"success"}
```



GET http://localhost:8090/Electro_Grid/api/user

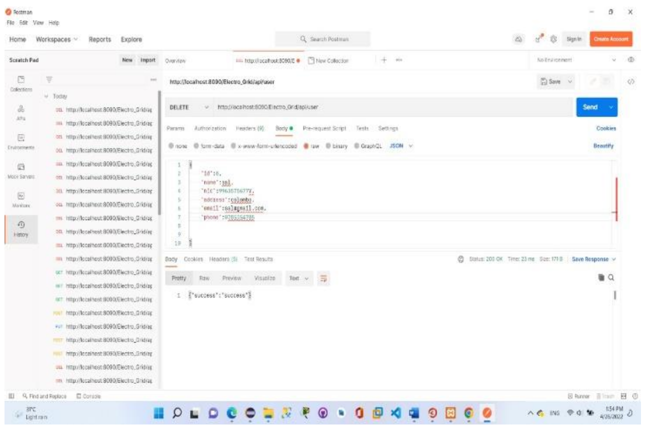
Body: raw JSON

```
{
    "id":8,
    "name":sal,
    "nic":996357567?V,
    "address":colombo,
    "email":sal@gmail.com,
    "phone":0785354785


}
```

Status: 200 OK Time: 21 ms Size: 2.12 KB

ID	Name	NIC	Address	Email	Phone	Action
2	yashi	996354067V	madana	chamodya@gmail.com	0773396845	Delete
4	chamodya	996354337V	kegalle	cha@gmail.com	07733965	Delete
7	madu	9963540677V	gampaha	ma@gmail.com	0773354785	Delete
8	sal	9963575677V	colombo	sal@gmail.com	0785354785	Delete



DELETE http://localhost:8090/Electro_Grid/api/user

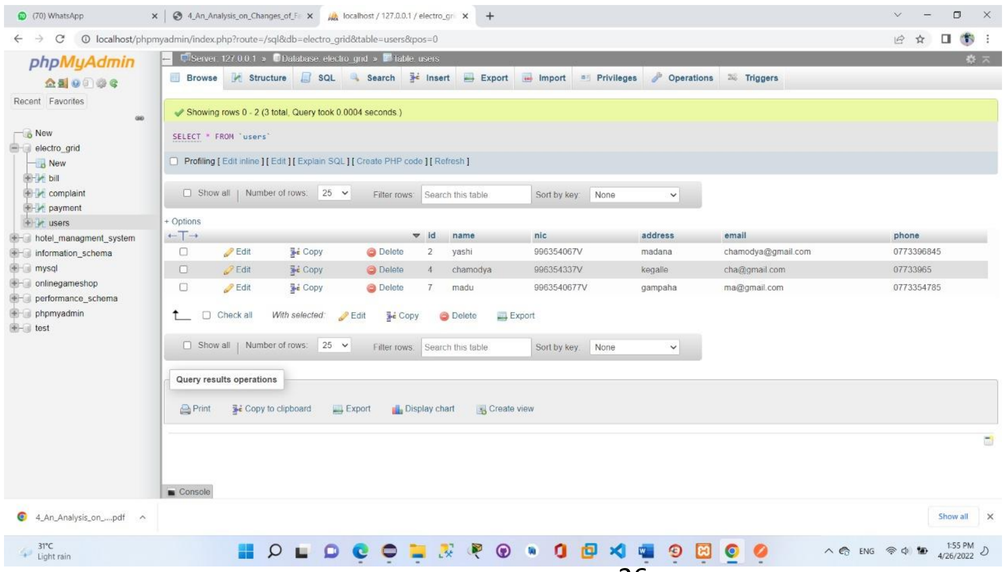
Body: raw JSON

```
{
    "id":8,
    "name":sal,
    "nic":996357567?V,
    "address":colombo,
    "email":sal@gmail.com,
    "phone":0785354785


}
```

Status: 200 OK Time: 23 ms Size: 171 B

```
{"success":"success"}
```



localhost/phpmyadmin/index.php?route=/sql&db=electro_grid&table=users&pos=0

Server: 127.0.0.1 » Database: electro_grid » Table: users

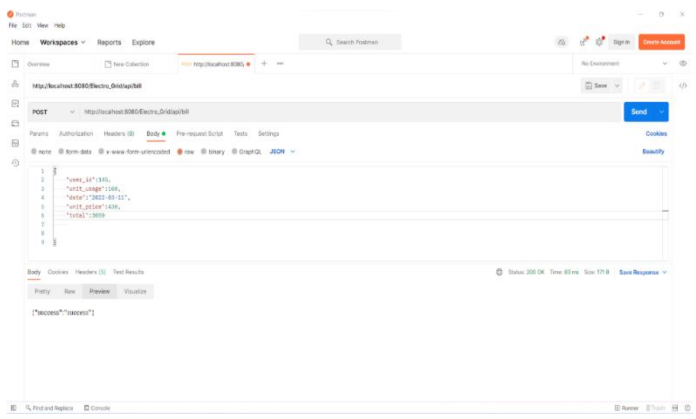
Showing rows 0 - 2 (3 total, Query took 0.0004 seconds.)

```
SELECT * FROM `users`
```

id	name	nic	address	email	phone
2	yashi	996354067V	madana	chamodya@gmail.com	0773396845
4	chamodya	996354337V	kegalle	cha@gmail.com	07733965
7	madu	9963540677V	gampaha	ma@gmail.com	0773354785

IT20234720 (Elpitiya S.N)

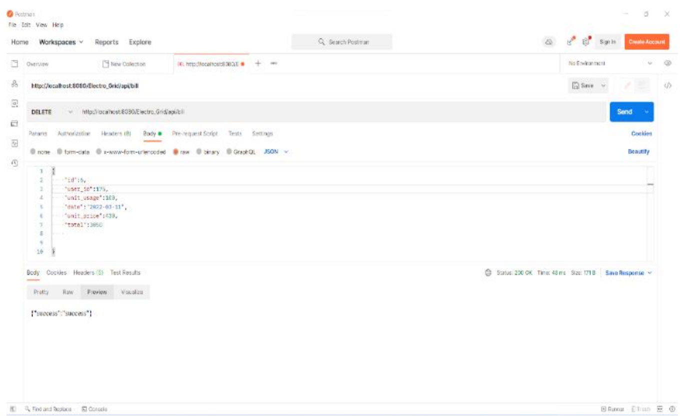
<u>Bill Managment</u>


POST http://localhost:8080/Electro_Grid/api/bill

```
{
    "user_id":145,
    "unit_usage":100,
    "date":"2022-03-11",
    "unit_price":430,
    "total":3050
    
    
}
```

Status: 200 OK Time: 83 ms Size: 171 B

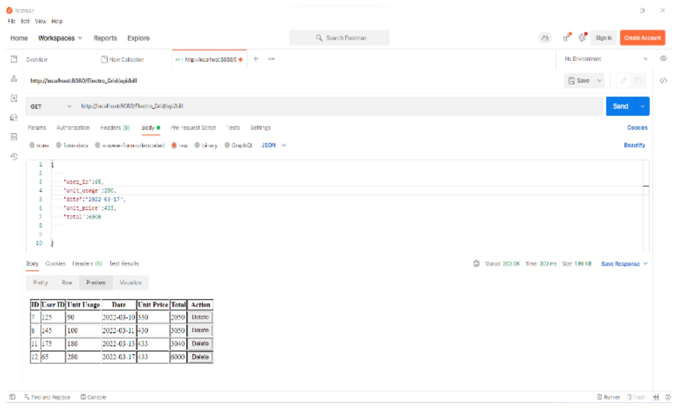
```
{"success":"success"}
```


DELETE http://localhost:8080/Electro_Grid/api/bill

```
{
    "id":6,
    "user_id":175,
    "unit_usage":180,
    "date":"2022-03-11",
    "unit_price":430,
    "total":3050
    
    
}
```

Status: 200 OK Time: 40 ms Size: 171 B

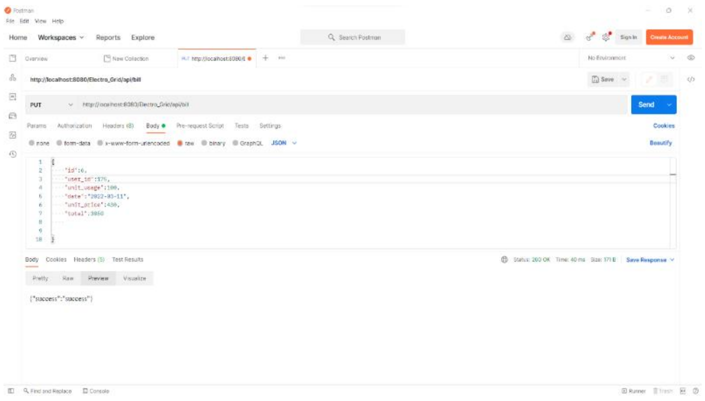
```
{"success":"success"}
```


GET http://localhost:8080/Electro_Grid/api/bill

```
{
    
    "user_id":65,
    "unit_usage":280,
    "date":"2022-03-17",
    "unit_price":433,
    "total":6000
    
    
}
```

Status: 200 OK Time: 303 ms Size: 1.89 KB

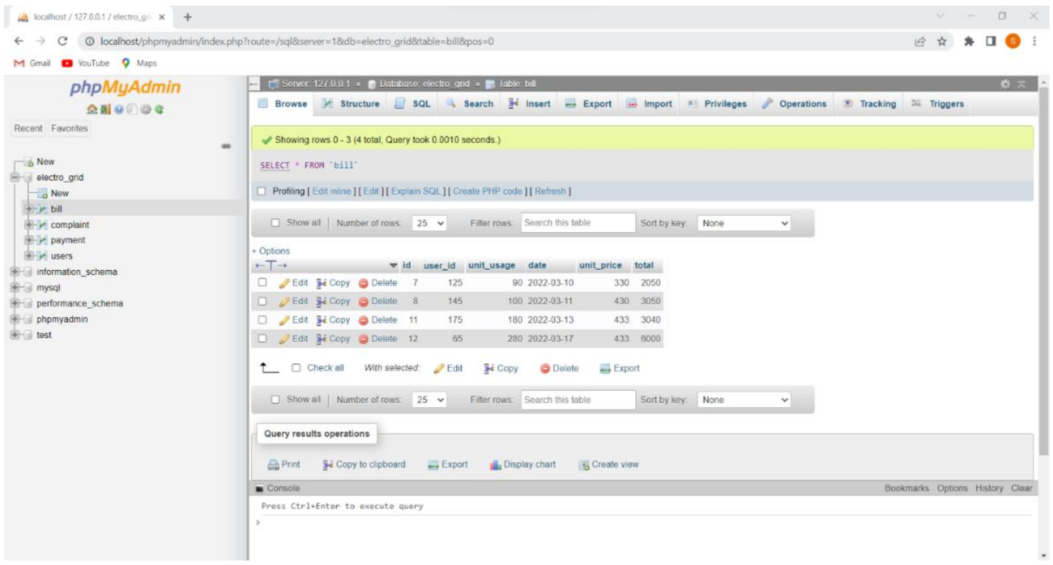
ID	User ID	Unit Usage	Date	Unit Price	Total	Action
7	125	90	2022-03-10	330	2050	Delete
8	145	100	2022-03-11	430	3050	Delete
11	175	180	2022-03-13	433	3040	Delete
12	65	280	2022-03-17	433	6000	Delete


PUT http://localhost:8080/Electro_Grid/api/bill

```
{
    "id":6,
    "user_id":175,
    "unit_usage":180,
    "date":"2022-03-11",
    "unit_price":430,
    "total":3050
    
    
}
```

Status: 200 OK Time: 40 ms Size: 171 B

```
{"success":"success"}
```


localhost/phpmyadmin/index.php?route=/sql&server=1&db=electro_grid&table=bill&pos=0

Server: 127.0.0.1 » Database: electro_grid » Table: bill

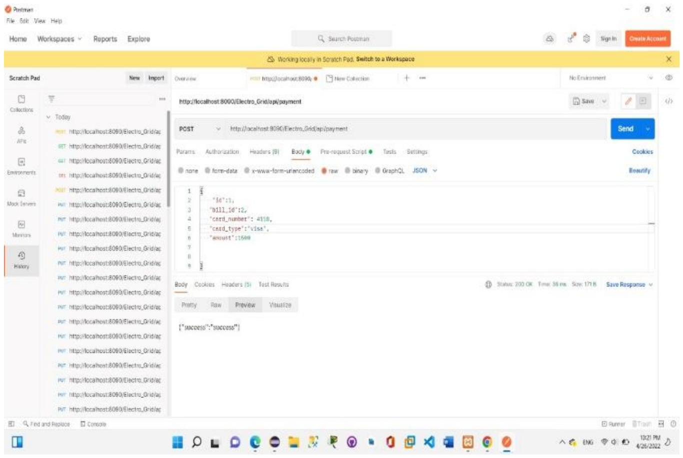
Showing rows 0 - 3 (4 total, Query took 0.0010 seconds.)

```
SELECT * FROM `bill`
```

	id	user_id	unit_usage	date	unit_price	total
Edit Copy Delete	7	125	90	2022-03-10	330	2050
Edit Copy Delete	8	145	100	2022-03-11	430	3050
Edit Copy Delete	11	175	180	2022-03-13	433	3040
Edit Copy Delete	12	65	280	2022-03-17	433	6000

IT20249748(Thamaraka G.I)

Complaint Management



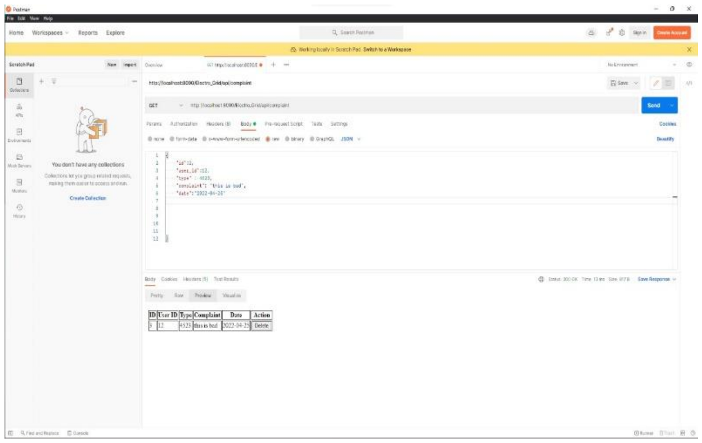
POST http://localhost:8090/Electro_Grid/api/payment

```
{
    "id":1,
    "bill_id":2,
    "card_number": 4358,
    "card_type":"visa",
    "amount":1600

}
```

Status: 200 OK Time: 36 ms Size: 171 B

```
{"success":"success"}
```

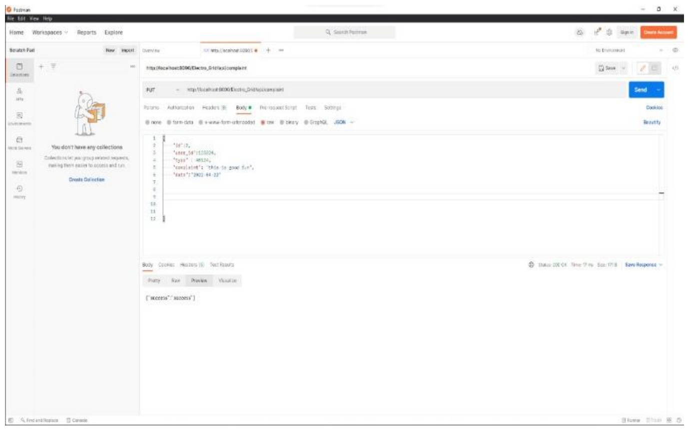


GET http://localhost:8090/Electro_Grid/api/complaint

```
{
    "id":12,
    "user_id":12,
    "type" : 4523,
    "complaint": "this is bad",
    "date":"2022-04-25"
}
```

Status: 200 OK Time: 13 ms Size: 877 B

ID	User ID	Type	Complaint	Date	Action
5	12	4523	this is bad	2022-04-25	Delete

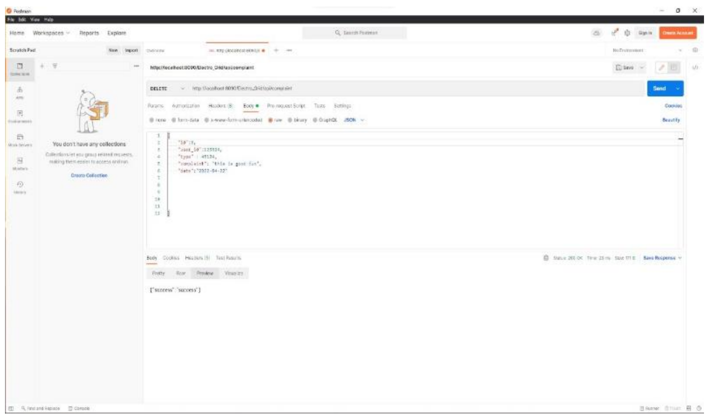


PUT http://localhost:8090/Electro_Grid/api/complaint

```
{
    "id":7,
    "user_id":123324,
    "type" : 48124,
    "complaint": "this is good fun",
    "date":"2022-04-22"
}
```

Status: 200 OK Time: 17 ms Size: 171 B

```
{"success":"success"}
```

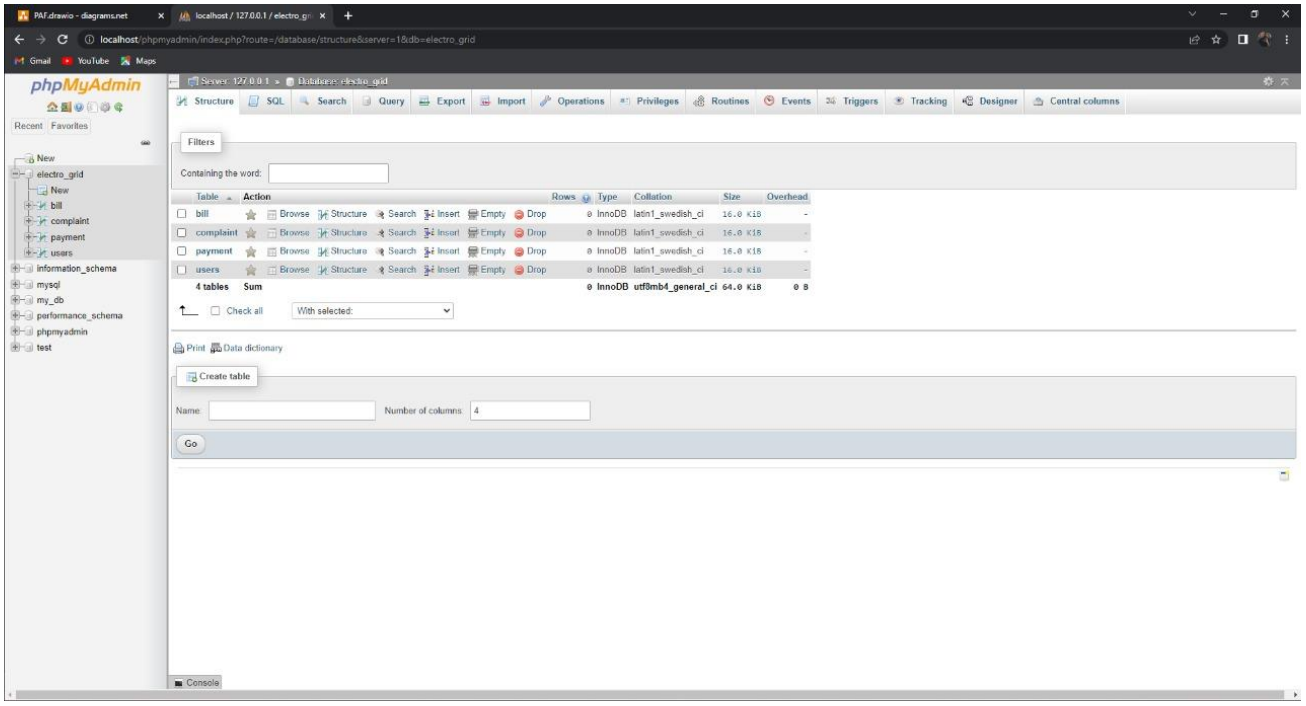


DELETE http://localhost:8090/Electro_Grid/api/complaint

```
{
    "id":8,
    "user_id":123524,
    "type" : 48124,
    "complaint": "this is good fun",
    "date":"2022-04-22"
}
```

Status: 200 OK Time: 23 ms Size: 171 B

```
{"success":"success"}
```



localhost/phpmyadmin/index.php?route=/database/structure&server=1&db=electro_grid

Server: 127.0.0.1 » Database: electro_grid

Table	Action						Rows	Type	Collation	Size	Overhead
bill	Browse	Structure	Search	Insert	Empty	Drop	0	InnoDB	latin1_swedish_ci	16.0 KiB	-
complaint	Browse	Structure	Search	Insert	Empty	Drop	0	InnoDB	latin1_swedish_ci	16.0 KiB	-
payment	Browse	Structure	Search	Insert	Empty	Drop	0	InnoDB	latin1_swedish_ci	16.0 KiB	-
users	Browse	Structure	Search	Insert	Empty	Drop	0	InnoDB	latin1_swedish_ci	16.0 KiB	-
4 tables	Sum						0	InnoDB	utf8mb4_general_ci	64.0 KiB	0 B