Project Report On

Laboratory Management System

Submitted by

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Group No: 10



Bachelor of Computer Application (Sem - VI)

Submitted To:

DNV INTERNATIONAL EDUCATION ACADEMY, PLOT NO.3, WARD 9/A, NEAR SUBHASH NAGAR, GANDHIADHAM, KUTCH

Year :- 2022-23

Acknowledgement

It was a highly eventful session at the DNV INTERNATIONAL EDUCATION ACADEMY & working with KSKV KACHCHH UNIVERSITY and highly devoted computer teacher's community and will probably remain the memorable experience of our life. Hence this acknowledgement is a humble attempt to earnestly thank all those who were directly or indirectly helping us.

We are lifelong indebted to our project guide **Prof. Shreedutt Sharma** for providing us with the environment that is best suited for outgrowth of the students' personality and boosting their morale.

Above all, how can we forget **Prof. Shreedutt Sharma**, our respected project coordinator who gave directions to our work and shaped our imagination. We are deeply indebted to him for providing immeasurable guidance and reposing faith is us when things went wrong.

And finally, there was and always will be love for all the professors who have taught us as everything that is written in this report has been the fruit of the knowledge that they gave us.

Thanking All Professors,

Nikhil Lathiya and Ayush Chauhan.



BACHELOR OF COMPUTER APPLICATION

Certificate

This is to certify that Nikhil Lathiya Exam Seat Number:
and Ayush Chauhan Exam Seat Number:
has satisfactorily completed his project work
entitled Laboratory Management System as a fulfillment of
the requirements, during the academic year $2022 - 2023$.
Date:
Place:

Preface

It is the trace that study cannot be complete without practical knowledge. It is a necessity of a technical student to gain practical knowledge. Technical knowledge is like a coin with two sides. One side represents theoretical knowledge, and the other side represents practical/technical knowledge.

This is Semester – 6 BCA during which students are trained in Web Application Development. Along with different computer languages & technologies, topics such as service-oriented architecture, smart device computing and wireless technologies are covered in this course.

Hence, I have taken up this project of LABORTAORY MANAGEMENT SYSTEM



OZA PATHOLOGY

DARSHAN OZA BSC, M.L.T (Chemistry) © +91 95742 29393

QUALITY TESTING WITH CARE

LETTER OF PERMISSION

To.

DNV INTERNATIONAL EDUCATION ACADEMY,

Plot No. 3, Ward No. 9-A,

Gandhidham (Kutch) Gujarat.

Respected Madam/Sir,

With the reference to your letter ref no. DNV/2022-23 dated

09/12/2022 received through your present 3rd year BCA student Mr. NIKHIL LATHIYA and Mr. AYUSH CHAUHAN of your college, we are pleased in permitting him for preparing Project Report on "Laboratory Management System" for our Firm from

12-12-2022 to 19-03-2023.

We wish him All the Best in his Project and pray for his Bright Career.

Thanking you,

Yours Sincerely,

For Oza Pathology Laboratory

DARSHAN R. OZA

DZA PATHOLOGY

Shop No. 2, Plot No. 262, Sector 1/A, Opp. GEB Office, Gandhidham - Kutch | No. 95581 51051



OZA PATHOLOGY

QUALITY TESTING WITH CARE

DARSHAN OZA 85C, M.L.T (Chemistry) 9+91 95742 29393

To,

Dt: 11/3/2023

DNV International Education Academy, PlotNo-3, Ward-9/A, Subhash Nagar, Gandhidham, Kutch

Subject: Project Completion Certificate for the Laboratory Management System.

We can confirm that the Laboratory Management System project has successfully fulfilled all of our requirements and is fully operational. After conducting comprehensive observations, inspections, and testing of all modules, we can affirm that the project is complete.

Project Name: LABORATORY MANAGEMENT SYSTEM

Project Prepared by: Mr. NIKHIL LATHIYA & Mr. AYUSH CHAUHAN

Project Completion Date: 12th March, 2023

For their hard work and dedication in completing this project, we wish them all the best of success in their future endeavors.

Thank you for your support and cooperation throughout this project.

Yours Sincerely,

Mr. Darshan Oza



OZA PATHOLOGY

Shop No. 2, Plot No. 262, Sector 1/A, Opp. GEB Office, Gandhidham - Kutch | Mo. 95581 51051

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Introduction





Laboratory Management System

1.1 Introduction

- The Laboratory Management System provides an efficient way to manage laboratory operations.
- The software simplifies the management process and handles various elements related to laboratory business.
- With the use of this software, paperless records can be maintained, and laboratory workflows can be streamlined.
- The software enables users to book appointments online and download their reports, making the process more convenient.
- The Laboratory Management System provides an integrated platform to manage laboratory workflows, including data management.





1.2 Project Summary

PURPOSE

The Laboratory Management System is specifically designed for "OZA PATHOLOGY LABORATORY" to reduce the reliance on physical documents. The system offers patients the convenience of online access to their reports, bills and appointment booking, as well as the ability to download and view them.

Through this system, patients can view their lab reports and bills anytime and anywhere, without the need for physical copies. They can also book appointments online, which saves time and effort for both the patients and the laboratory staff.

Additionally, the Laboratory Management System helps in organizing and managing lab reports, bills and appointments, thus reducing the risk of errors and delays. It also ensures secure storage of data and access to authorized personnel only. Overall, the Laboratory Management System streamlines the lab process and improves the patient experience, while ensuring efficient and accurate reporting.





Proposed System





2.1 Introduction to Laboratory Management System

The Laboratory Management System provides different levels of access for **Super Admin, Admin, and User**.

Super Admin and Admin:

- Super Admin and Admin can add, view, delete, and edit patient details with OTP verification, ensuring the accuracy and security of the data.
- Super Admin and Admin can generate, view, edit, and delete patient reports, making it easy to manage and retrieve patient data.
- Super Admin can add or remove Admin, ensuring that only authorized individuals have access to the system.
- Super Admin and Admin can view appointment requests submitted by patients and take action such as confirming or rejecting them.
- Super Admin and Admin can view test details, with Super Admin being the only one who can add and activate or deactivate tests.





User:

- Users can book appointments online for a specified date.
- Users can download their reports and bills online, making the process more convenient and saving time for both patients and staff.

♣ Overall, the Laboratory Management System provides an efficient and secure solution for managing laboratory operations, with different levels of access provided to ensure the system is used only by authorized individuals.





2.2 Advantages and limitations

Advantages	Limitations
 Paperwork can be eliminated. Managing data becomes easy. Large number of data can be accessed with ease. Patient Can book their appointment online. E-bills and E-Reports Can be generated. Patient can download their report by this website. Analysis the ratio of patients, Reports & tests. 	 E-mail is Mandatory. Test Measurement should be input in JSON format





2.3 Project Profiles

Project Title	Laboratory Management System
Project Definition	It allows to manage Laboratory and related services digitally.
Team Members	2
Team Member Name	Nikhil Lathiya & Ayush Chauhan
Time Duration	3 Months





2.4 User Profile

Super Admin	Manage patients, Manage Reports, Manage Tests, Manage Appointments (Confirm/Reject Appointments), Manage Admin, Generate Bills, Reports
Admin	Manage patients, Manage Reports, Manage Appointments (Confirm/Reject), View Tests, Generate Bills
User	Book their Appointments, View/Download the Reports





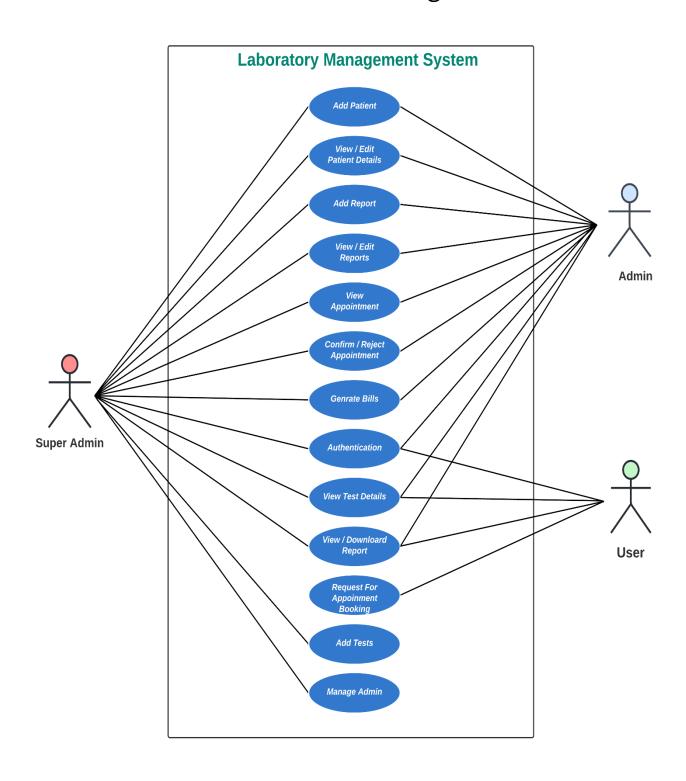
2.5 Technical Details

Front End	React-Js, JSX, Swagger, CSS, JavaScript, Bootstrap, Material-UI
Back End	Node-Js, Express-Js Postman, Prisma(ORM), PostgreSQL
os	Windows 11
Web Server	Node-Js, Express-Js(Nodemon)
Browsers	Chrome, Brave
API's	Node-Js , Express-Js
Tools	VS Code, Postman, Git & GitHub





2.6 Use Case Diagram







Platform/ Environment





3.1 SPECIFICATION OF H/W & S/W USED

3.1.1. SOFTWARE INTERFACE (FOR DEVELOPMENT)

Software	Chrome & Brave
Operating System	Windows -11
Server	Node-Js , Express-Js
Development tool	JavaScript (Node-Js , Express-Js)
Back End	DBeaver, pgAdmin4

FOR CLIENT SIDE:

• Software Required _> Any Web Browser





3.2 HARDWARE AND SOFTWARE DETAILS OF SYSTEM USED

Operating System	Windows -11
Front End	React-Js, JSX, CSS, JavaScript, Bootstrap
Back End	Node-Js, Express-Js, Postman, PostgreSQL
Ram	8 GB
Browser	Brave, Chrome



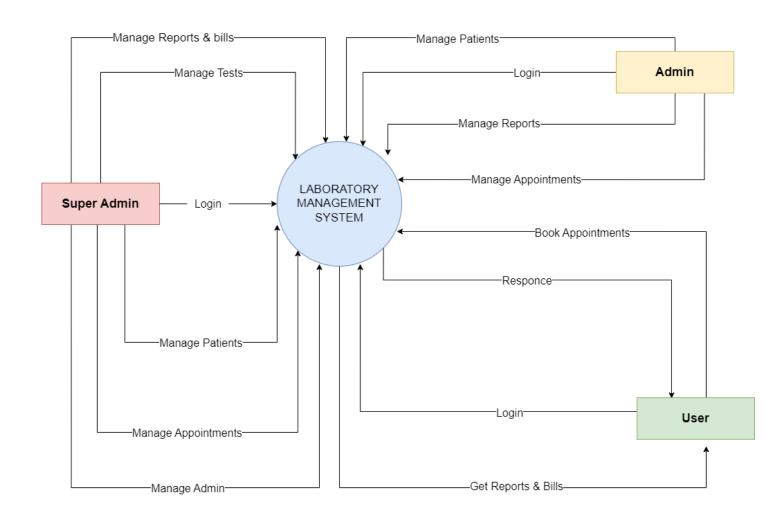


Structural Analysis





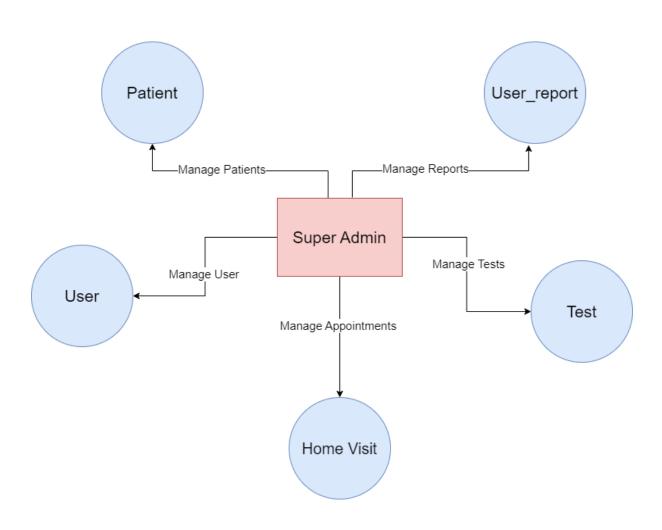
$Level \ 0 - Data \ Flow \ Diagram$







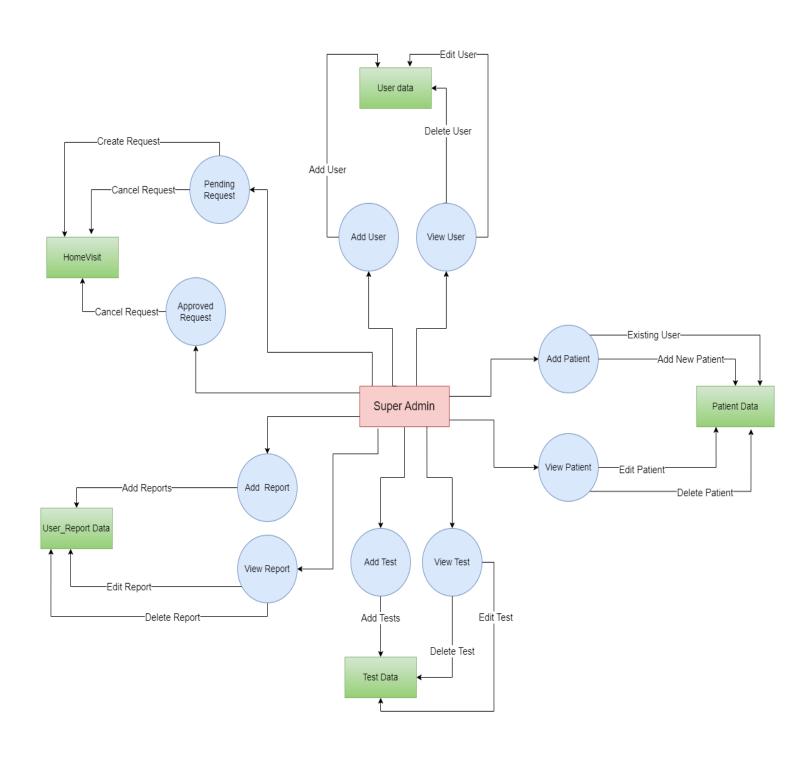
Super Admin Level 1 – Data Flow Diagram







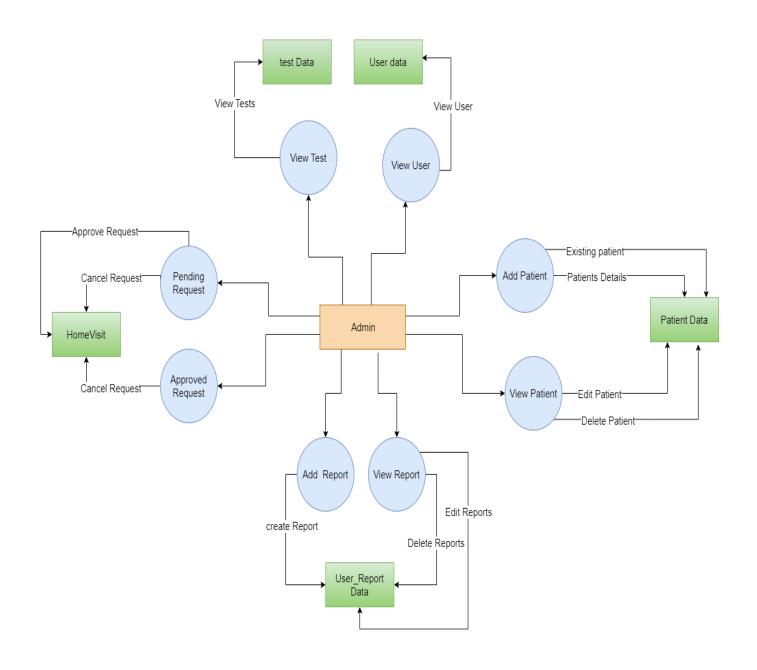
Super Admin Level 2 – Data Flow Diagram







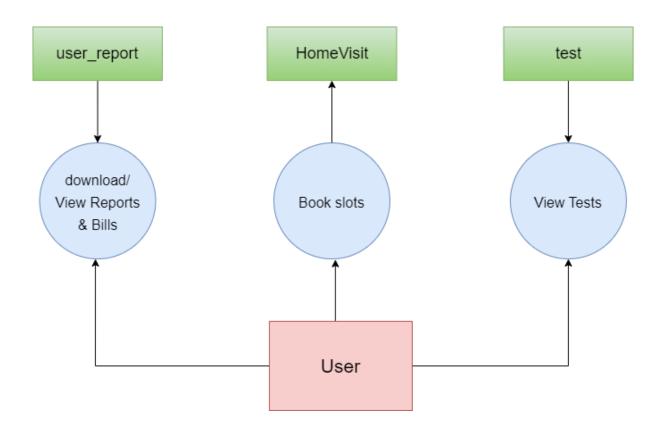
Admin Level 1 – Data Flow Diagram







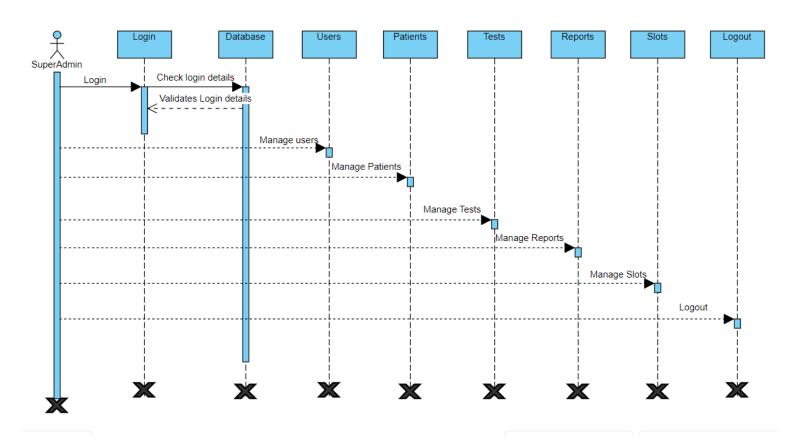
User Level 1 – Data Flow Diagram







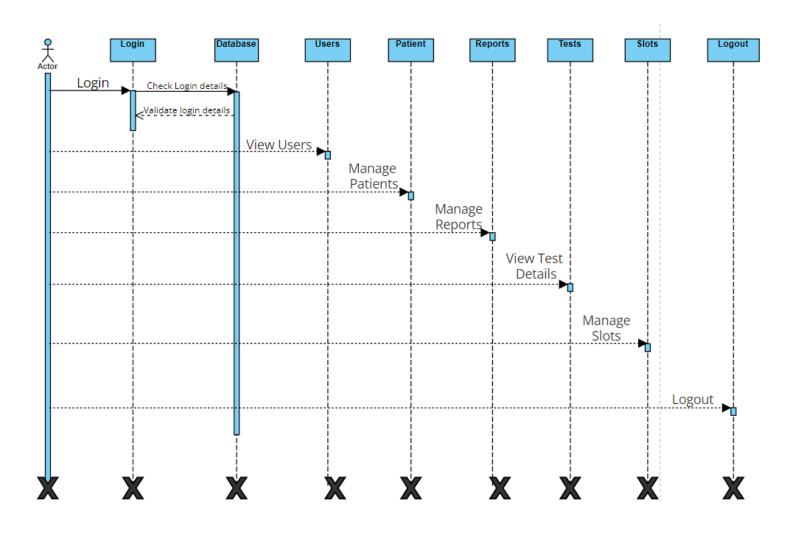
Sequence Diagram of Super Admin







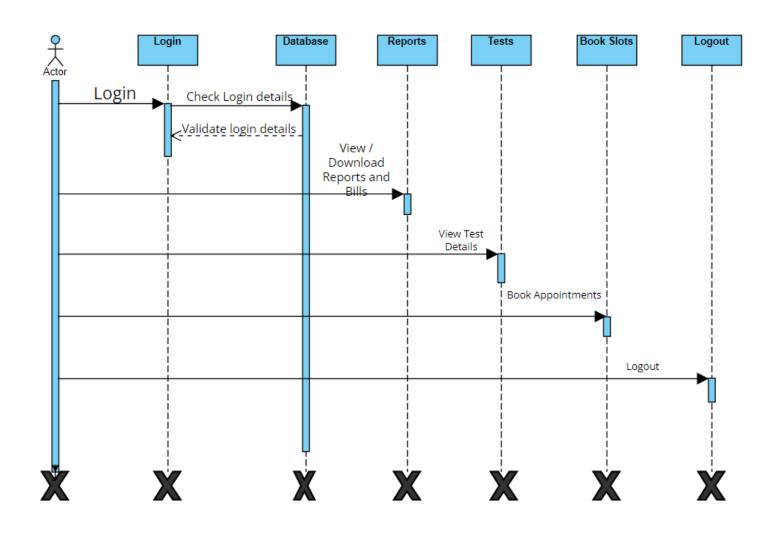
Sequence Diagram of Admin







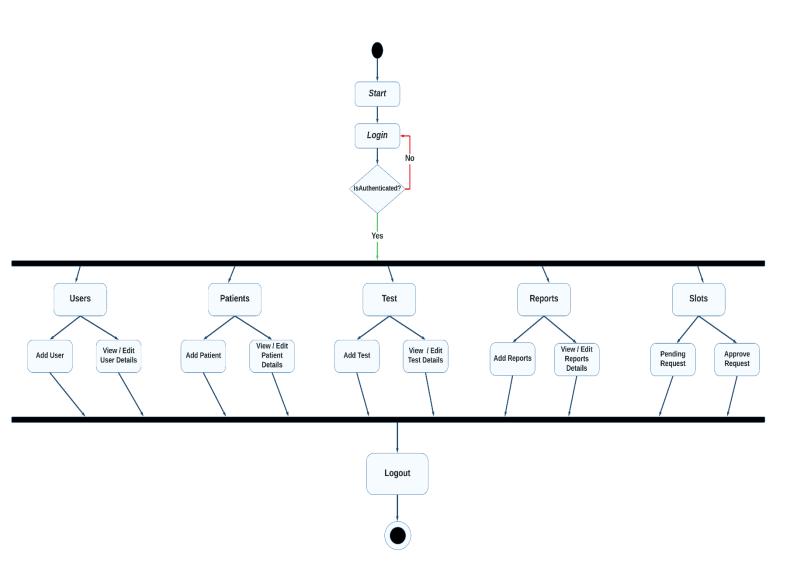
Sequence Diagram of User







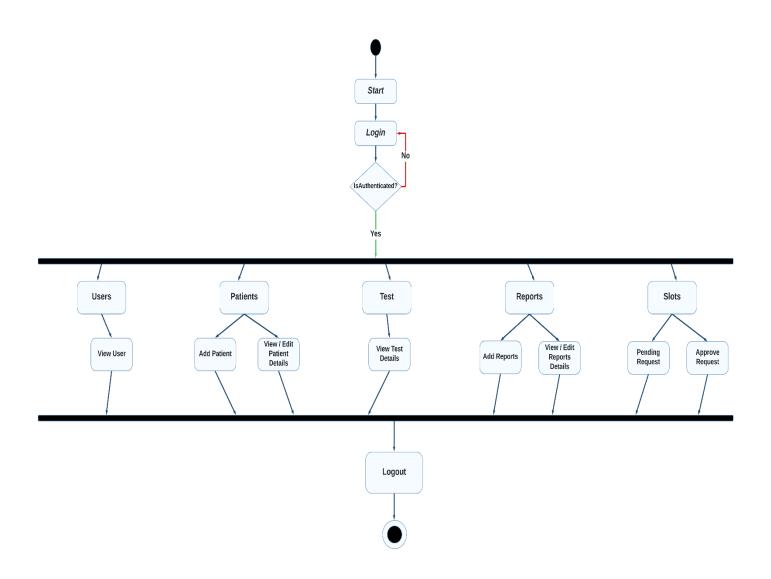
Activity Diagram of Super Admin







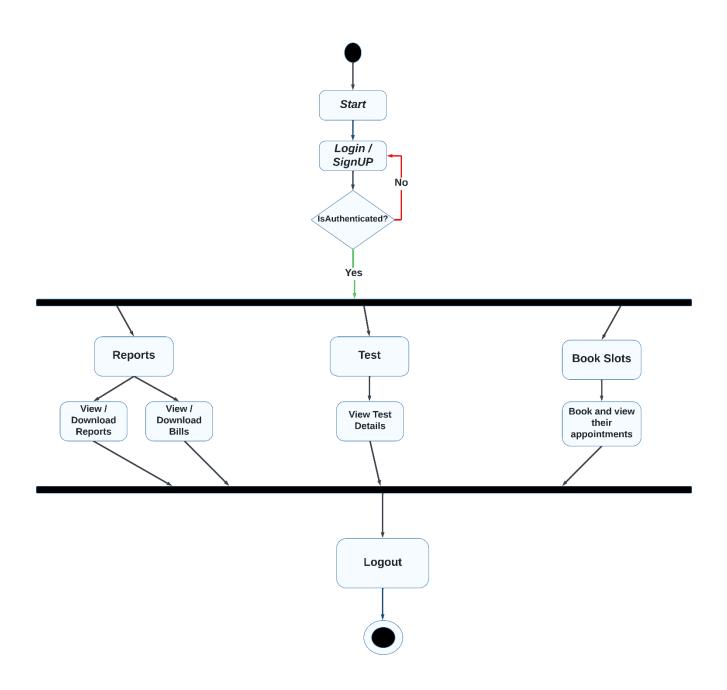
Activity Diagram of Admin







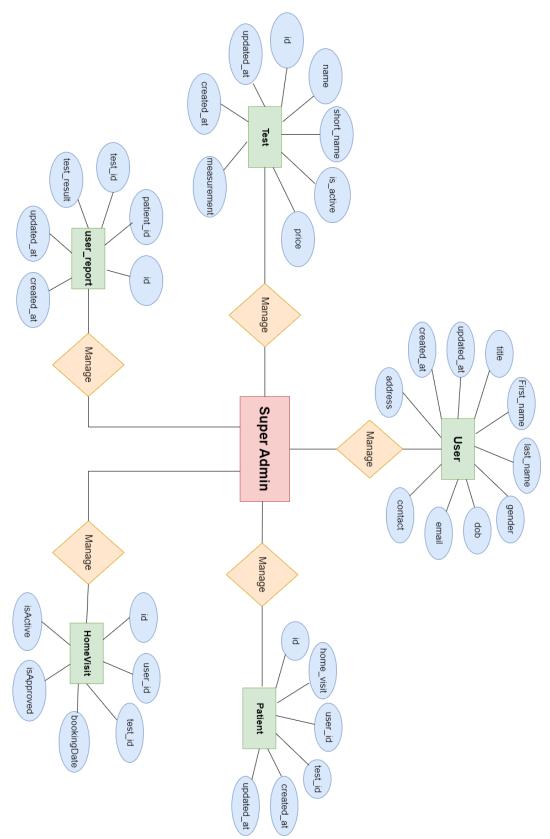
Activity Diagram of User







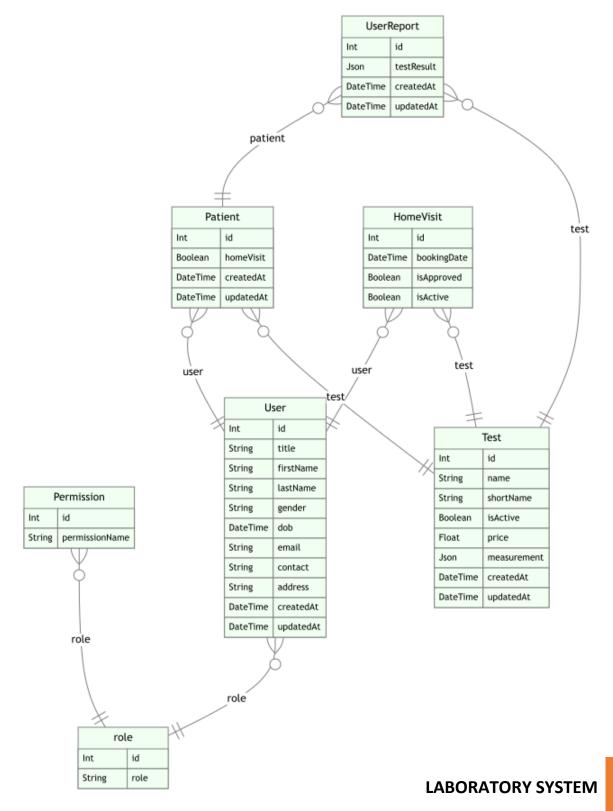
Er Diagram







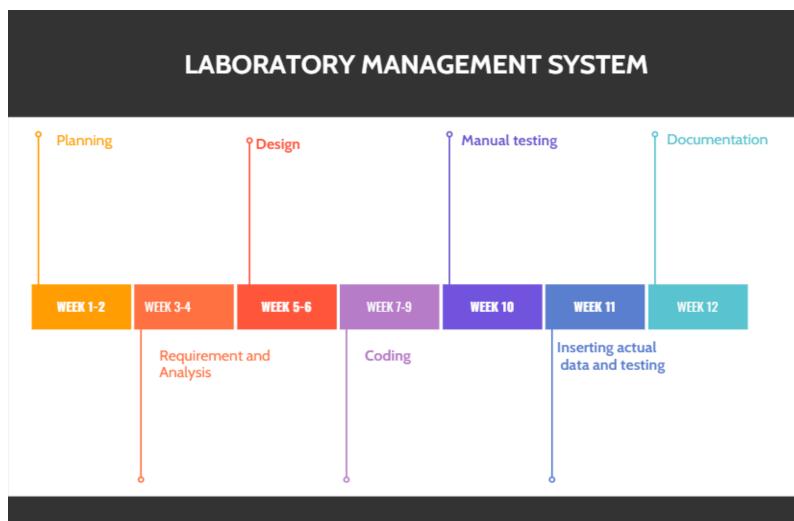
Relationship Between Tables







TimeLine Chart







Database Design





Role:

Sr No	Column Name	Datatype	Constraint	Description
1	\nearrow id	Int	Auto Inc/ Not null	PK of the role table.
2	role	String	_	Role of the user (E.g. Super Admin / Admin / User)

Test:

Sr No	Column name	Datatype	Constraint	Description
1	$ ot\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	int	Auto inc / Not null	PK of the table
2	name	varchar	-	Full Name of the test
3	short_name	varchar	_	Short name of test
4	is_active	boolean	_	Test is active or not
5	price float		_	Price of the test
6	measurement	Json	_	Measurements
7	created_at	Datetime	By default	Creation date with current time stamp
8	updated_at	Datetime	By default	date when updated





Permission:

Sr No	Column Name	Datatype	Constraint	Description
1	\nearrow Id Int		Auto Inc/ Not null	PK of the Permission Table.
2	permissionName String		_	Name of the Permission
3	role_id	Int	_	FK of role table

User_report:

Sr No	Column name	Data type	Constraint	Description
1	<i>P</i> id	Int	Auto inc / Not null	PK
2	patient_id	Int	_	FK from patient
3	$\operatorname{test_id}$	Int	_	FK from tests
4	${ m testResult}$	JSON	_	Result data
5	created_at	Datetime	By default	Creation date with current time stamp
6	updated_at	Datetime	By default	Date when updated





User:

Sr No	Column Name	Datatype	Constraint	Description
1	<i>p</i> id	Int	Auto Inc/ Not null	PK of the user table
2	role_id	Int	ŀ	Fk of role table
3	title	String	Т	Title of the user (E.g. mr , ms , mrs)
4	first_name	String	-	FirstName of the user
5	lastName	String	-	LastName of the user
6	gender	String	-	Gender of the user
7	dob	DateTime	_	Date of birth
8	email	String	-	Email of the user
9	contact	String	_	Contact number of the user
10	address	String	-	Address of user
11	created_at	Datetime	By default	Creation date with current time stamp
12	updated_at	Datetime	By default	Date & time when updated





Patient:

Sr No	Column Name	Datatype	Constraint	Description
1	\mathcal{S} id	Int	Auto inc/ Not null	PK of the table
2	user_id	user_id Int		Fk from user id
3	home_visit	Boolean	-	Home visit [yes / no]
4	test_id	Int	-	Fk from test id
5	created_at	Datetime	By default	Creation date with current time stamp
6	updated_at	Datetime	By default	date when updated

Home_visit:

Sr No	Column Data type Name		constraint	Description
1	\mathcal{S} id	Int	Auto inc / Not null	PK
2	user_id	Int	ı	FK from patient
3	test_id	Int	I	FK from tests
4	bookingDate	JSON	I	Result data
5	isApproved	Datetime	By default	Creation date with current time stamp
6	isActive	Datetime	By default	Date when updated



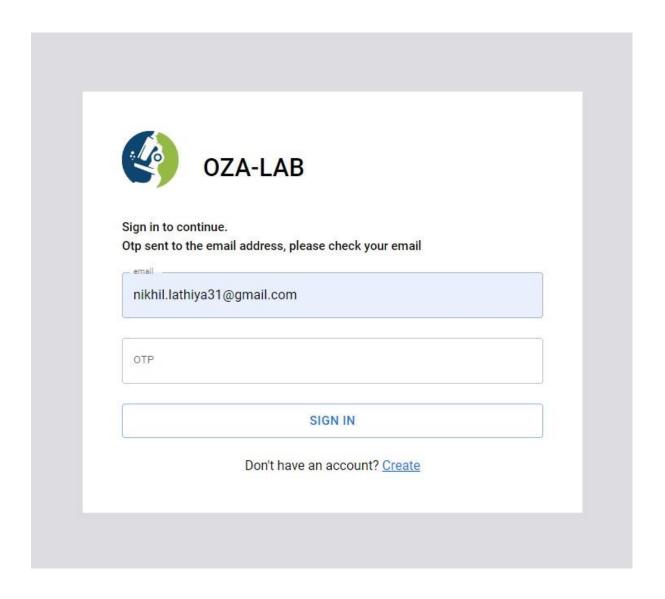


Interface Design





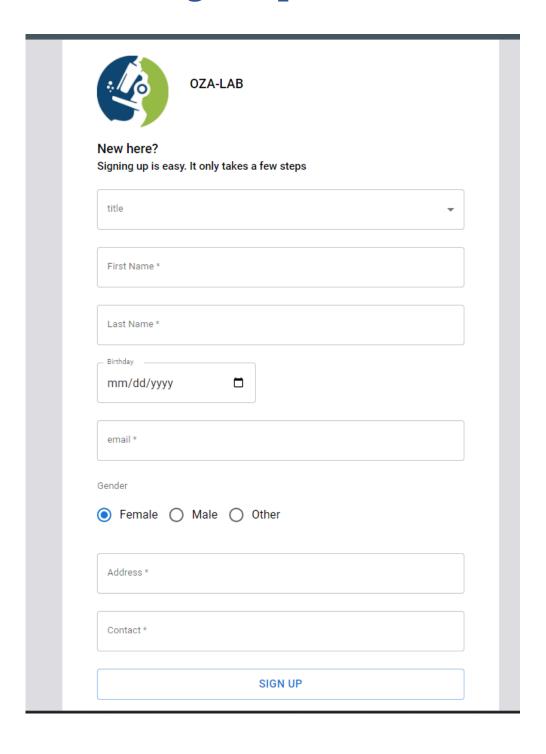
Login Page







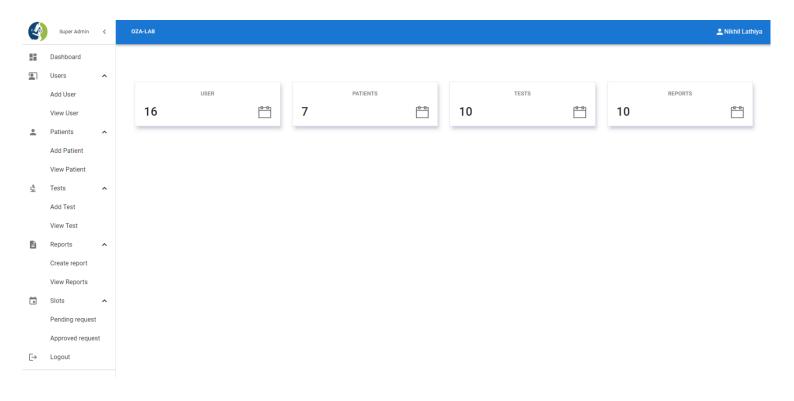
Sign_Up Form







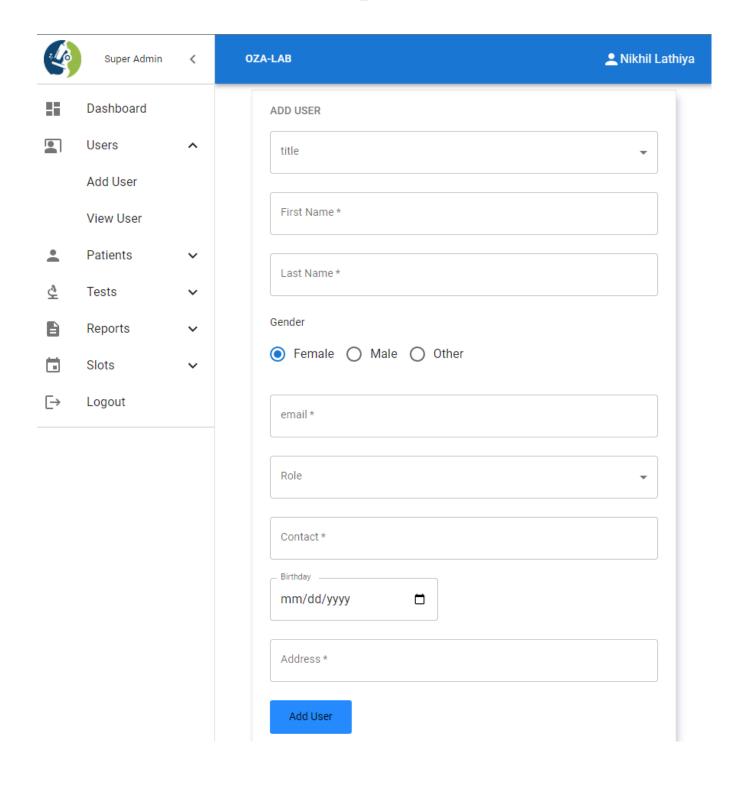
Dashboard [Super Admin]







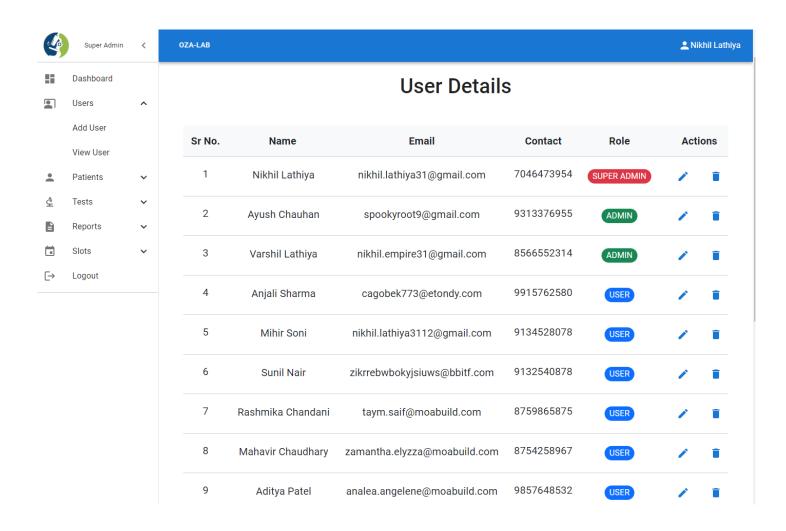
Add User [Super Admin]







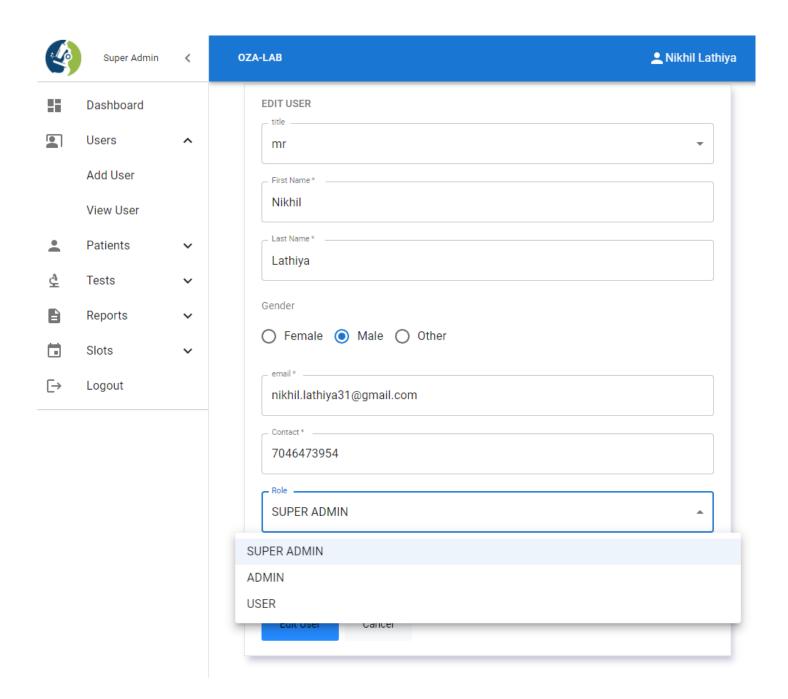
View User [Super Admin]







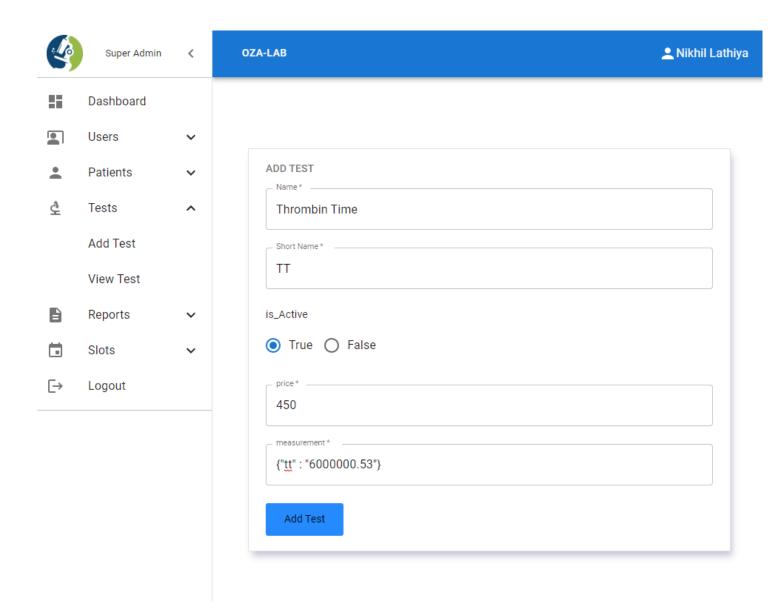
Edit User







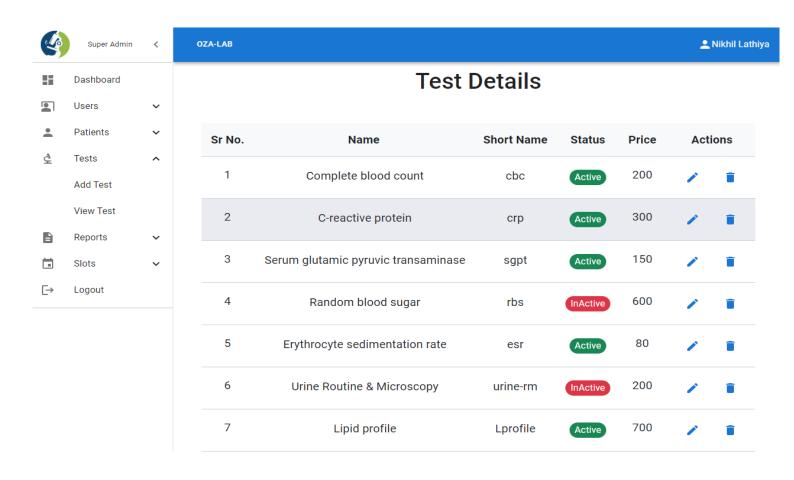
Add Test







View Test







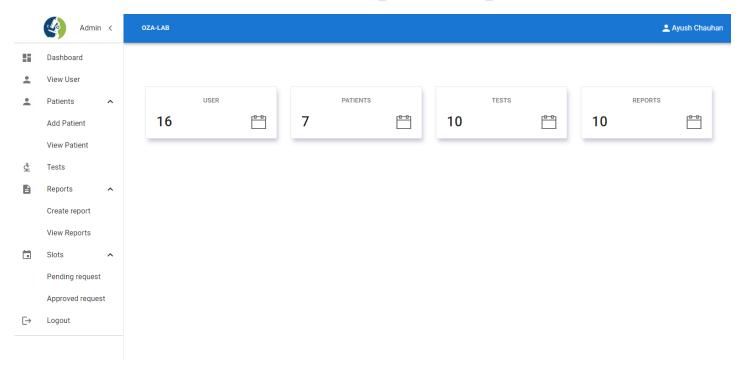
Edit Test

	Super Admin	<	OZA-LAB Nikhil Lathiy
#	Dashboard		
	Users	~	
•	Patients	~	EDIT TEST Name *
<u>\$</u>	Tests	^	Complete blood count
	Add Test		Short Name *
	View Test		cbc
	Reports	~	is_Active
	Slots	~	● True False
→	Logout		200
			measurement * {"cbc":"50"} Edit Test

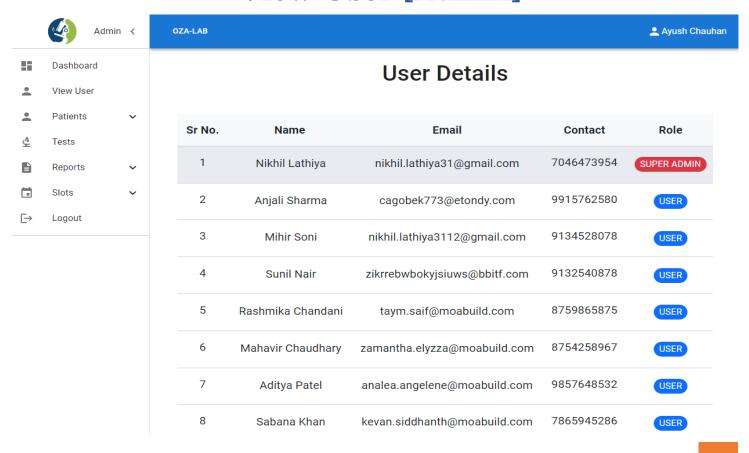




Dashboard [Admin]



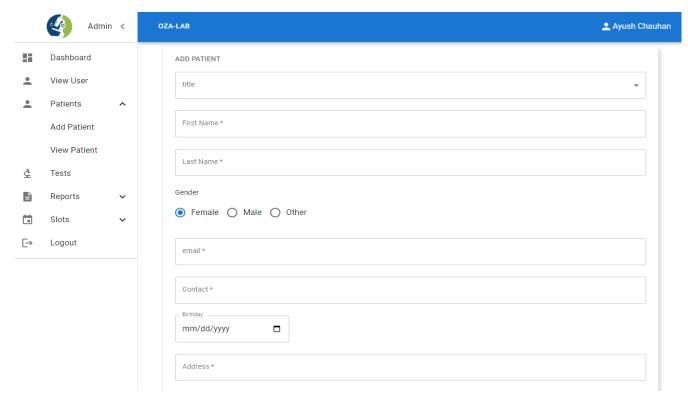
View User [Admin]



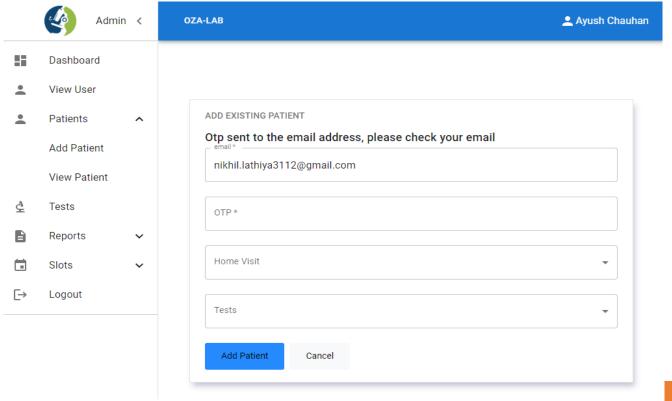




Add Patient [Admin]



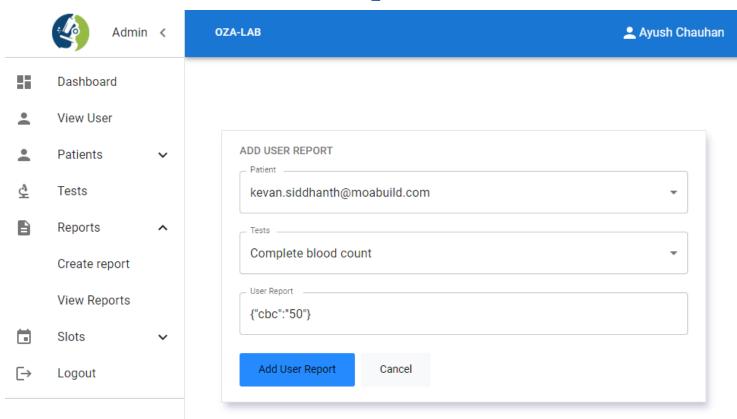
Add Existing patient [Admin]



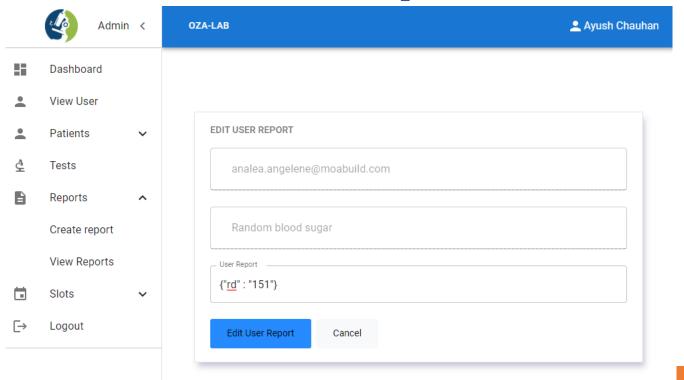




Add User Report



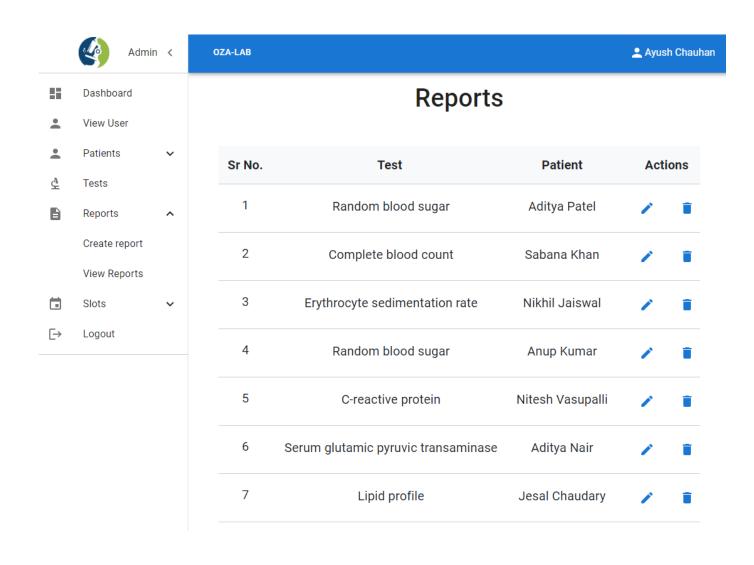
Edit User Report







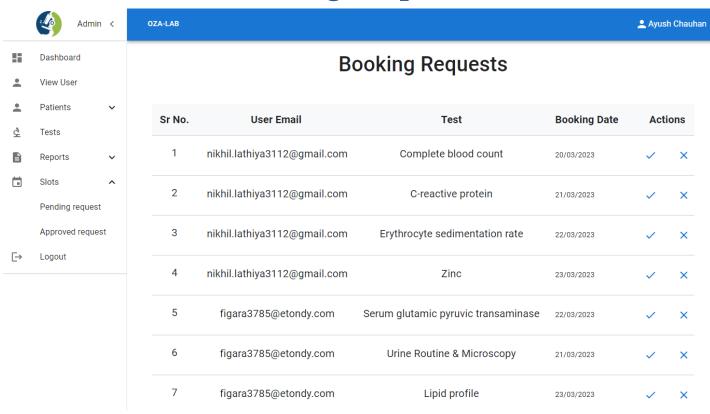
View Reports



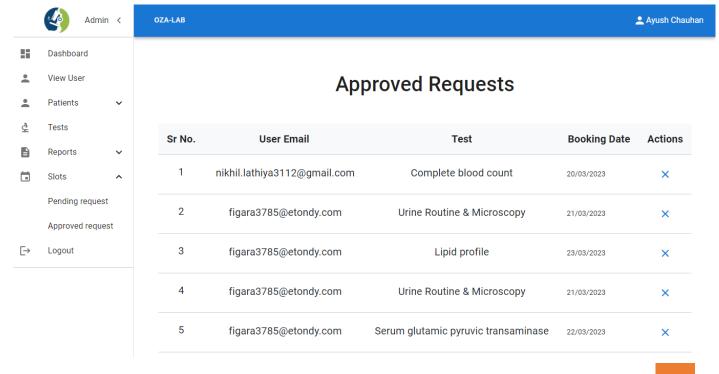




Pending Request



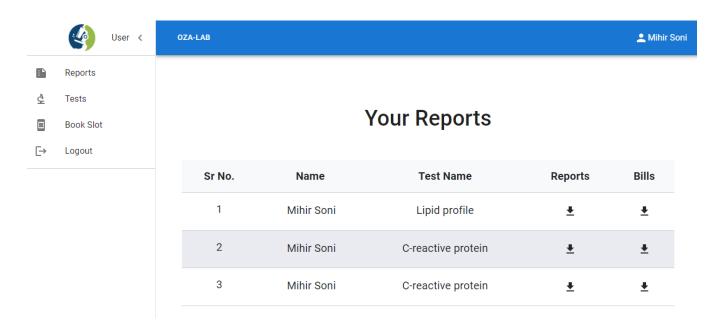
Approved Request



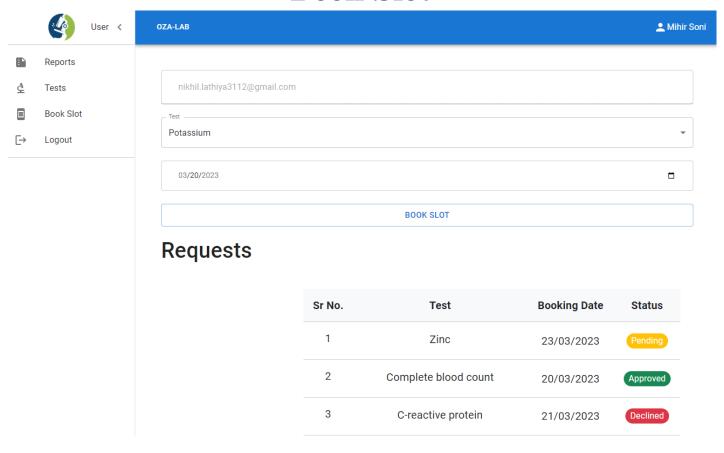




Dashboard [User]



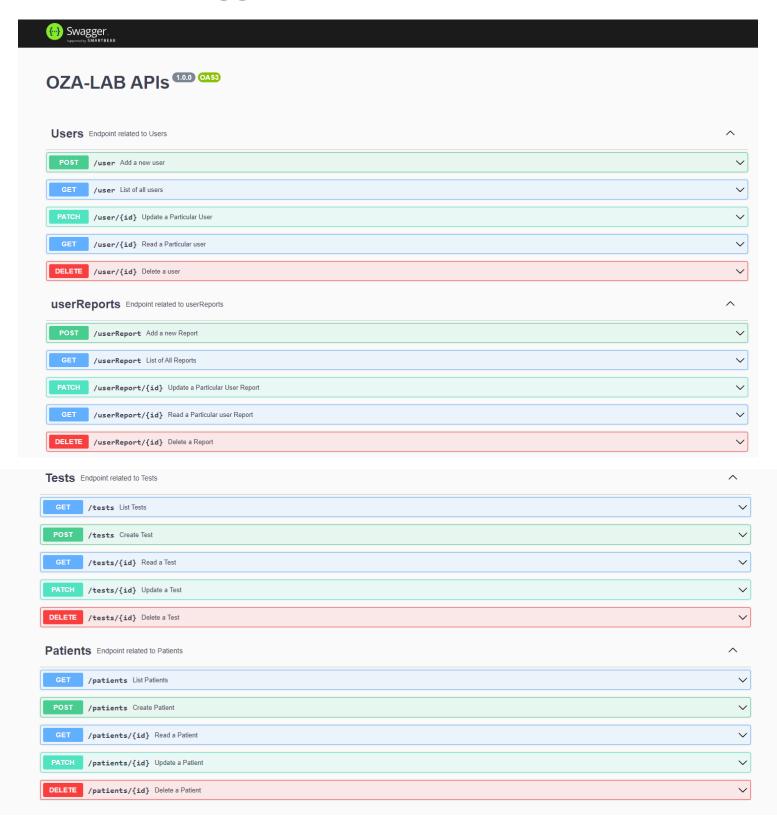
Book Slot





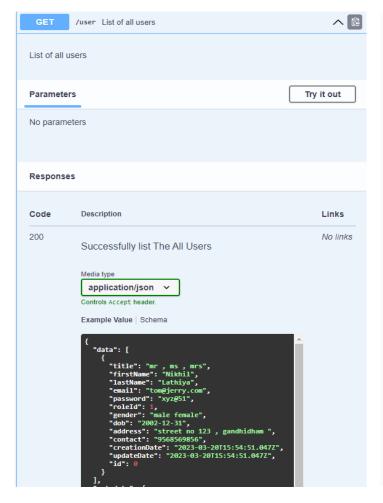


Swagger (For API Testing)



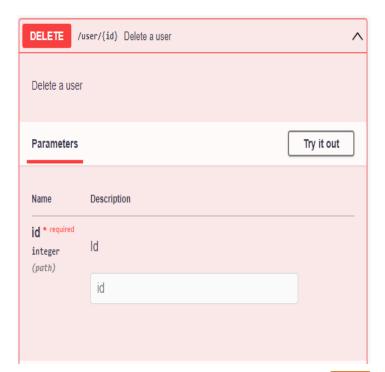






PATCH /u	ser/{id} Update a Particular User	^			
Update a particular visitor					
Parameters		Try it out			
Name	Description				
id * required integer (path)	Id				
(puch)	id				
Request body	, required	application/json ∨			
Update a visito					
<pre>Example Value Schema { "title": "mr , ms , mrs", "firstName": "Nikhil", "lastName": "tathiya", "email": "tom@jerry.com", "password": "xyz@51", "roletd": 1, "gender": "male female", "dob": "2002-12-31", "address": "street no 123 , gandhidham ", "contact": "9568569856" }</pre>					

POST /user Add a new user	^
Add a new user	
Parameters	Try it out
No parameters	
Request body required	application/json 🗸
<pre>User Creation Payload Example Value Schema { "title": "mr , ms , mrs", "firstName": "Nikhil", "lastName": "Nikhil", "email": "tom@jerry.com", "password": "xyz@51", "roleId": 1, "gender": "male female", "dob": "2002-12-31", "address": "street no 123 , gandhidham ", "contact": "9568569856" }</pre>	







Testing





Unit Testing:

Unit testing is a type of software testing where individual units or components of the software area tested. All modules are tested properly. The purpose is to validate that each unit of the software code is performing as it is meant to be.

Interface Testing:

Interface Testing is defined as a software testing type which verifies whether the communication between two different software system is done correctly. Interface testing is done on a connection that integrates two components called interface.

Testing Documents:

Testing documentation is the documentation of artifacts that are created during or before the testing of a software application. Documentation reflects the importance of processes for the customer, individual, and organization. Projects which contain all documents have a high level of maturity.

Final Testing:

The Final Test of the project gave some bugs and errors, but I solved it





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