MINI PROJECT

(2021-22)

“Hangout Hub”

Project Report

Institute of Engineering & Technology

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Declaration

I/we hereby declare that the work which is being presented in the Bachelor of technology. Project **"Hangout Hub"**, in partial fulfillment of the requirements for the award of the ***Bachelor of Technology*** in Computer Science and Engineering and submitted to the Department of Computer Engineering and Applications of GLA University, Mathura, is an authentic record of my/our own work carried under the supervision of **Mr. Md. Farmanul Haque, Technical Trainer, Dept. of Training and Development, GLA University.**

The contents of this project report, in full or in parts, have not been submitted to any other Institute or University for the award of any degree.

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Certificate

This is to certify that the project entitled "Hangout Hub", carried out in Mini Project – II Lab, is a bonafide work by Rajat Pandey, Parth Sharma, Ashutosh Tripathi and is submitted in partial fulfillment of the requirements for the award of the degree Bachelor of Technology (Computer Science & Engineering).

Signature of Supervisor:

Name of Supervisor: Mr. Md. Farmanul Haque

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ACKNOWLEDGEMENT

Presenting the ascribed project paper report in this very simple and official form, we would like to place my deep gratitude to GLA University for providing us the instructor Mr. Md. Farmanul Haque, our technical trainer and supervisor.

He has been helping us since Day 1 in this project. He provided us with the roadmap, the basic guidelines explaining on how to work on the project. He has been conducting regular meeting to check the progress of the project and providing us with the resources related to the project. Without his help, we wouldn't have been able to complete this project.

And at last but not the least we would like to thank our dear parents for helping us to grab this opportunity to get trained and also my colleagues who helped me find resources during the training.

Thanking You

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ABSTRACT

In this project, we are creating a web application, basically a chat app which we have named Hangout Hub. This application will provide us a platform to interact with each other at the ease of our fingertips. All the users will be having their separate accounts on this platform which will be connected to their email id. This platform provides the searching facilities based on various factors, such as online chat, chat history, chat Profile. It tracks all the information of chat Application, chat Profile etc.

It also deals with monitoring the information and transaction of chat application. Editing, adding and updating of records is improved which results in proper resource management of student data.

In this modern world, we all are attracted to learning various technologies. So, in this paper, we work and find out such top technology which used in the corporate world. So, you will be familiar with the flow of these modern web technologies. Keywords: Back-End, Database, Digital Marketing, Domain and Hosting, Front-End, Full-Stack Development, Git and GitHub, Google Analytics, Heroku, Linux, MERN stack, Netlify, VPS, etc.

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CHAPTER-1
INTRODUCTION

1.1 CONTEXT

This Webapp “Hangout Hub” has been submitted in partial fulfilment of the requirements for the award of the degree of Bachelor of Technology in Computer Science and Engineering at GLA University, Mathura supervised by Mr. Md. Farmanul Haque. This project has been completed approximately two months and has been executed in modules, meetings have been organized to check the progress of the work and for instructions and guidelines.

1.2 MOTIVATION

The evolution of the internet technologies had benefit people to accessing to the web easily. More and more services provide by this internet All of this can be virtualize thank to the technologies. Communication between people using the internet becomes part of their daily life. People used to communicate with each other’s using the online chat system to transfer their messages. Traditionally, when people need to communicate with others, they will have a face-to-face conversation to deliver the message, same goes to the education field. It is strongly encouraged that student seeking for academic assistance from the lecturer when they face difficulties. Most often happening is when the exam is in the corner and or assignment due date. The traditional way to have a consultation is student make an email appointment with the lecturer and the lecturer accepted the appointment or lecturer is free and available at his room or lecturer consultation hour. However, this communication solution might be not convenient and not efficient due to some issue that happen before the consultation started. The consultation session can be realized in another similar way using an online solution.

1.3 OBJECTIVE

This project aims to build an online chat system that has the capability to have real-time communication using web browser. This application is used in variety of places the goal of this app is to provide account management, video sessions, privacy to the user, set SMS reminder

1.4 EXISTING SYSTEM

1)The existing system has some loopholes which is affecting the company and the client relationships.

2)We can also see that people are gradually losing their faith on the chat applications for leaking of personal data due to less security

3) We as a team developing this project has kept in mind to overcomes all the cons that the existing system of chat-based application world have.

4) We present a flawless GUI and also security policies to enhance the chatting experience and feedback of our customers.

5) Provides the searching facilities based on various factors. Such as Online Chat, Chat History, Chat profile, to Users...

CHAPTER -2

SOFTWARE REQUIREMENT ANALYSIS

2.1 IMPACT OF COMMUNICATION ON DAILY LIFE

Boost Knowledge sharing and innovation

Knowledge, if kept to oneself and never shared with the world, tends to lose its worth. It is only by sharing ideas, information, and knowledge that one can expand and improve on them, as well as figure out how to apply them to everyday life.

Effective and regular communication, between different departments as well as between the management and employees, is key for sharing & expanding knowledge as well as applying this knowledge for generating innovative ideas.

Build Trust and Relationships

One of the primary reasons why communication is imperative is because it helps foster stronger relationships and build trust between people.
A key thing to note here is that communication is not a one-way process. That is, while speaking is an essential component of communication, listening is also an indispensable one.
So, if you wish to forge stronger relationships with people, don't just *talk* to them, but also listen to what they're saying

Develops your Personality

Another reason why communication is imperative in everyday life is that it helps build and enhance your personality and self.
This is because, through communication, you are better able to navigate the world and exploring new and challenging situations. You also meet new people, many of whom might have different opinions, views, and experiences.
This makes you grow as a person, and discover who you truly are.

2.2 HARDWARE AND SOFTWARE REQUIREMENTS

Software Specification:

Technology Used	MERN Stack
Language Used	JavaScript
Database	MongoDB
UI Design	React, Chakra UI
Web Browser	Google Chrome

Hardware Requirements:

Processor	Intel i3 or above
RAM	4 GB
Hard Disk	256 GB
Hardware Device	Laptop or Desktop

2.3 MODULES AND FUNCTIONALITIES

- **Login Page**: This page is for those users who have already registered themselves on the app and have a username and a password. There is also a way on this page for the new users to register themselves which will take them to the registration page.

- **Registration Page:** This page is solely designed for the new users of the app who are willing to register themselves. This page takes input of the various details of the user and stores it in the database, later helping the user to login into the account with credentials they have provided.

- **Search Drawer**: This is the most important part of the application that provides interactivity within the app as it connects users. A user can search another user and can start chatting.

- **Dashboard Page:** This is the page displayed for every user after entering the app successfully. It contains the search drawer, my-chats page, and a chat UI.

- **Group Chat Page:** This page helps user to create a Group Chat , which should contain a minimum of 3 members. Also the user who creates group has admin functionalities like change group name, add or remove users.

- **Profile**: This page will contain the user details that the user entered while creating the account on the webapp.

- **Logout page**: Then is this last panel for the users to sign out from the account. As soon as the users sign out, they are brought back to the login page.

CHAPTER -3

TECHNOLOGY USED

3.1 JavaScript

JavaScript is a lightweight, cross-platform, and interpreted scripting language. It is well-known for the development of web pages; many non-browser environments also use it. JavaScript can be used for Client-side developments as well as Server-side developments. JavaScript contains a standard library of objects, like Array, Date, and Math, and a core set of language elements like operators, control structures, and statements.

3.2 Database

It is a collection of information or data in an organized manner. Data is generally stored in a computer system. A database is typically controlled or managed by a database management system (DBMS). This stored data is easily accessed, managed, modified by the user.

There are some most widely used database softwares' which includes MySQL, MongoDB, Microsoft SQL Server, Oracle Database, etc. But in our case, we mainly focus on MongoDB. The main reason behind this is MongoDB is a NO-SQL Database so we can change Schema any time with affecting the stored data. There are two types of databases one is relational and another one is a non-relational database.

A. Relational Database

A relational database is a type of database that stores and provides access to data points that are related to one another. Relational databases are based on the relational model, an intuitive, straightforward way of representing data in tables. Most of the relational database systems used

SQL for managing the database. A relational database system is also called RDBMS because the data is stored in the row and columns format that is called the table. The most popular examples of relational databases include Oracle Database, Microsoft SQL Server, MySQL, etc.

B. Non-relational database

A non-relational database is a database that does not use the tabular schema of rows and columns found in most traditional database systems. Instead, non-relational databases use a storage model that is optimized for the specific requirements of the type of data being stored.

3.3 MERN Stack

Now we see in detail about MERN stack development, because we have used MERN stack in our Project. It is one of the collections of the several web stacks also used in the MEAN stack (MongoDB, Express Angular, Node), The main difference is we used Angular.js in the MEAN stack where as we use React.js in the MERN stack.

We generally used Angular.js as frontend framework it is replaced with React.js. In other variants, we also called MEVN (MongoDB, Express, Vue, Node) in which we include Vue.js. The entire above are used frontend JavaScript framework and it will work.

A. *What is the MERN Stack?*

MERN stands for MongoDB, Express, React, Node. With these technologies that make up the stack.

MongoDB - No SQL Database

Express.js - Node.js web framework

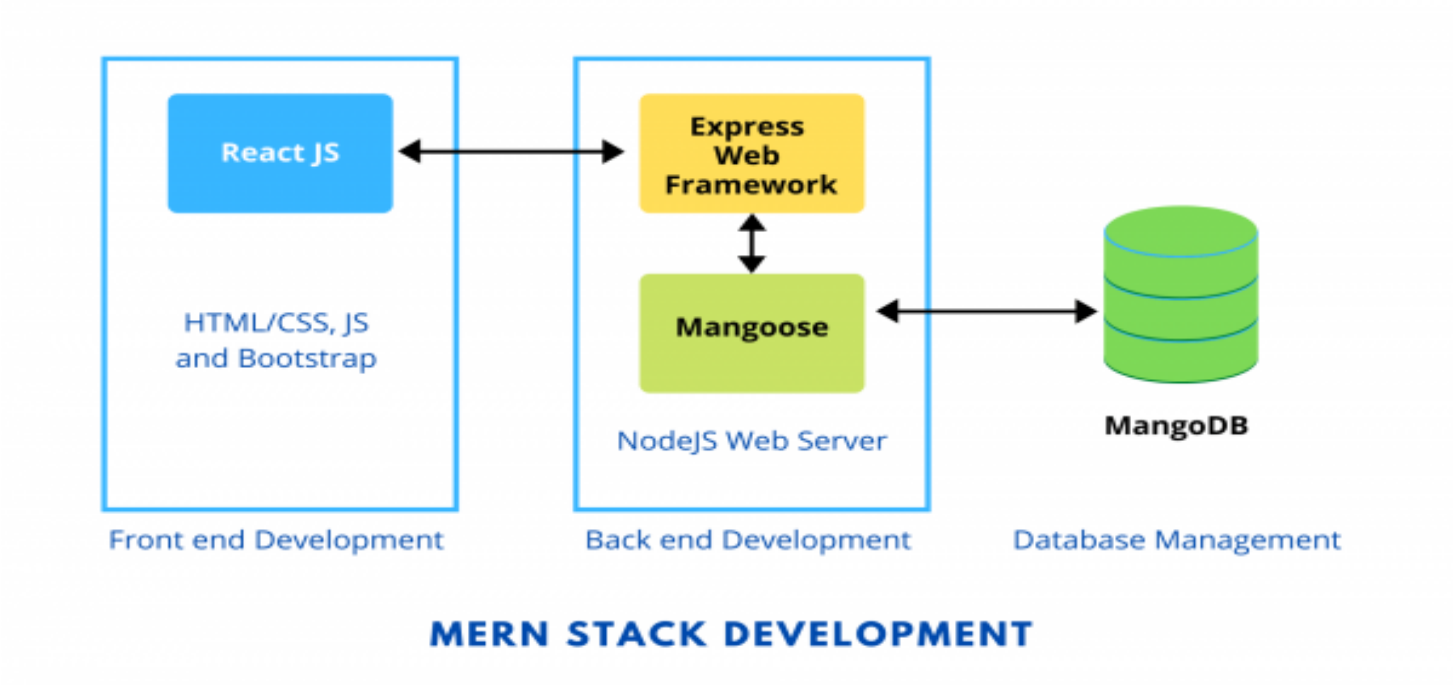
React.js - a client-side JavaScript framework

Node.js - NODE.js is a JavaScript based web server

In the MERN stack, Express and Node are used in the middle (application) order of architecture. Express.js is a server-side web framework. Where Node.js is the popular JavaScript based server platform. And React is a JavaScript Library to build User Interfaces.

B. *How Does the MERN Stack Work?*

MERN stack work based on the other Stack. In which the MERN architecture permits you to easily construct a 3-tier architecture (frontend, backend, database). We entirely used JavaScript and JSON.



C. React.js

React (also known as React.js or ReactJS) is a free and open-source front-end JavaScript library for building user interfaces based on UI components. It is maintained by Meta (formerly Facebook) and a community of individual developers and companies. Main component in the MERN stack is React.js. It is used for creating dynamic client-side applications. It helps developer builds a complex application with a complex interface. React.js is easy to connect with servers. It is based on simple Components. Also, render them as HTML. React is the best choice for handling stateful, data-driven interfaces with minimal code and minimal pain.

Features of React.js :-

a. It is easy to learn and explore. It is mostly combined with basic HTML and JavaScript concepts and also has some extra and additional concepts. But we remember one thing while

using this sometimes it is required to get extra knowledge of the JavaScript.

b. The basic concept of the React framework is COMPONENTS. These components can be created once and then we can use them in multiple places in Codebase which helps in keeping code DRY.

c. We can use it for both web and mobile app development.

D. Express.js and Node.js Server Tier

Express is a minimal and flexible Node.js web application framework that provides a robust set of features to develop web and mobile applications. It facilitates the rapid development of Node based Web applications. Following are some of the features of Express framework –

a. Allows to set up middleware to respond to HTTP Requests.

b. Defines a routing table which is used to perform different actions based on HTTP Method and URL.

c. Allows to dynamically render HTML Pages based on passing arguments to templates.

d. It makes Node.js web application development fast.

E. MongoDB Database

MongoDB is an open-source document database and leading NoSQL database. MongoDB is written in C++. The term 'NoSQL' means 'non-relational'. It means that MongoDB isn't based on the table-like relational database structure but provides an altogether different mechanism for storage and retrieval of data. This format of storage is called BSON (similar to JSON format).

Features of MongoDB

a. Has Document-Oriented storage.

b. Has a single master with built-in replication support.

c. It has very wide driver support, although databases ship with limited support, MongoDB has drivers for every language.

d. Provide horizontal scalability to balance the increasing load of modern applications.
e. Robust, flexible, and scale-able.

F. Why choose the MERN stack?

The MERN stack's main advantage in web development is that each line of code is written in JavaScript, which is a nearly universal programming language since it is vital for both server-side and client-side code. By using a single programming language, the MERN stack eliminates the need for context switching and greatly simplifies the entire development process, giving web developers the tools to create efficient web applications with far less effort.

3.4 Tools and Languages

- **Visual Studio**: Visual Studio Code is a source-code editor made by Microsoft for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, etc.
- **HTML:** HTML stands for Hyper Text Markup Language. It is used to design web pages using markup language. HTML is the combination of Hypertext and Markup language. Hypertext defines the link between the web pages. Markup language is used to define the text document within tag which defines the structure of web pages. HTML5 is the fifth and current version of HTML. It has improved the markup available for documents and has introduced application programming interfaces (API) and Document Object Model (DOM).
- **CSS:** Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a sdocument written in a markup language such as HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript. CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts.

- **JAVASCRIPT:** JavaScript is a high-level programming language that follows the ECMAScript standard. It was originally designed as a scripting language for webapps but became widely adopted as a general-purpose programming language, and is currently the most popular programming language in use.

  JavaScript is usually found running in a web browser as interactive or automated content, ranging from popup messages and live clocks to large web applications. JavaScript is also commonly used in server-side programming through platforms like Node.js, or "embedded" in non- JavaScript applications where the base programming language lacks the high-level functionality that JavaScript offers.

CHAPTER -4

IMPLEMENTATION AND USER INTERFACE

Creating a web concept design with screen sketches and functional flow diagrams is the best way to communicate your vision to the web developer. Making the concept clear to the developer is probably the most important factor in successful web development. Yet it is one of the most common problems or obstacles in a web development outsourcing project.

No matter what the marketing and profit goals are or if you are outsourcing a webapp for your personal use, you need to fully design and document the app concept if you expect a programmer to make your vision a reality. Developers are not mind readers and even descriptions given during conversations can be very fleeting or interpreted differently. Fully documenting your concept, therefore, leaves little to chance. The two most important things to do are: A) make a comprehensive description of how this webapp works and what it does (functionality) and B) create a comprehensive description of what the user sees and does (look and feel).

4.1 Implementation of the Hangout Hub:

Implementation of Hangout Hub is taken place in various phases. Firstly, we build the login interface then Navigation drawer i.e., make fragment for each of the list item using the Navigation view and the make various layout for the supporting features and connect the webapp with the Backend for Server functionalities. And finally, we parse the JSON object to get the data in the required format and then display the result.

4.1.1 Step to be followed to develop the web application:

1. Firstly, we create the home page with animated text using HTML and CSS and linked it with the main activity through JAVASCRIPT.

2. After that we create login phase which comprises of various phases that are mentioned below:

- Login Page: allows user to login into the webapp if the user is existing one.
- Register Page: If the user is new to our webapp, then firstly, he/she have to register themselves on the webapp.

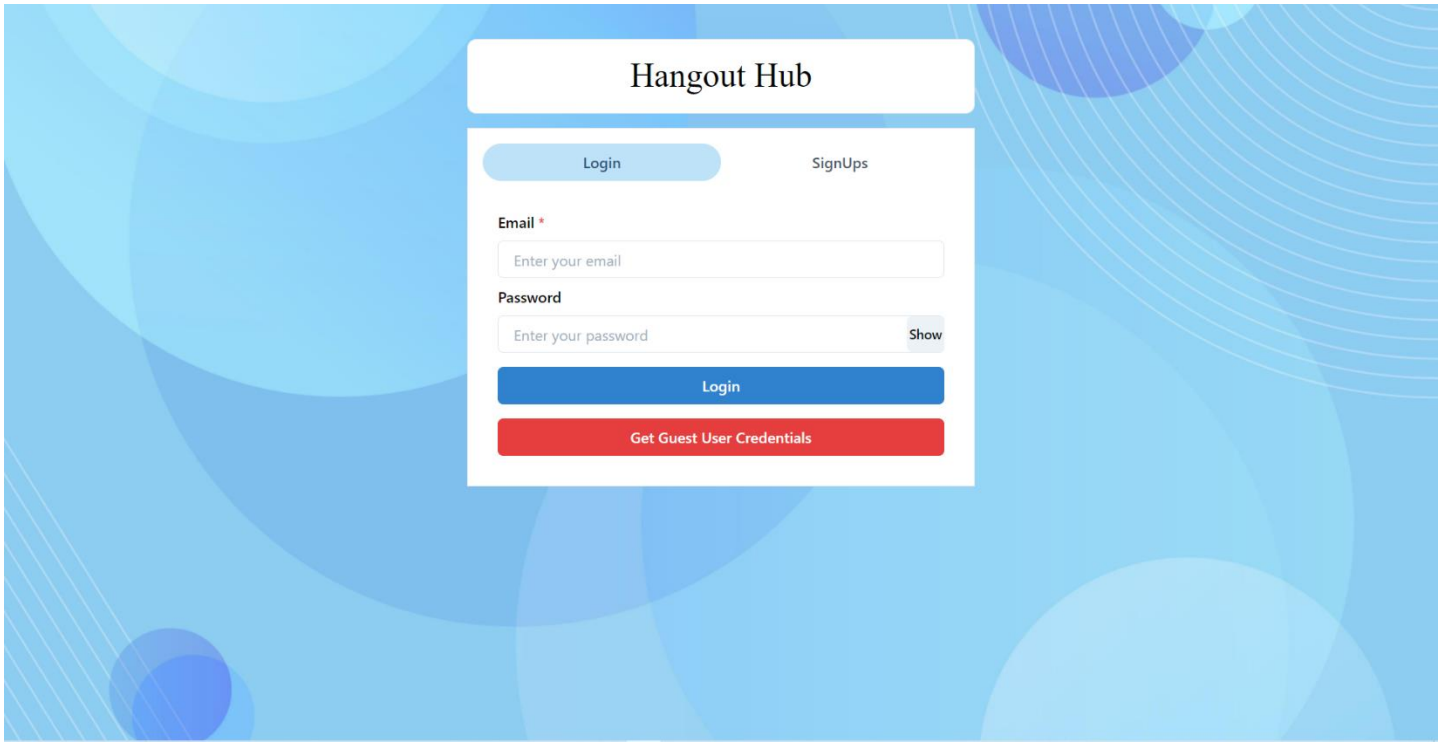
3. Now, we are going to create Home page which will contain different components

- My Chats – displays all existing chats.
- Search header
- Chat UI section

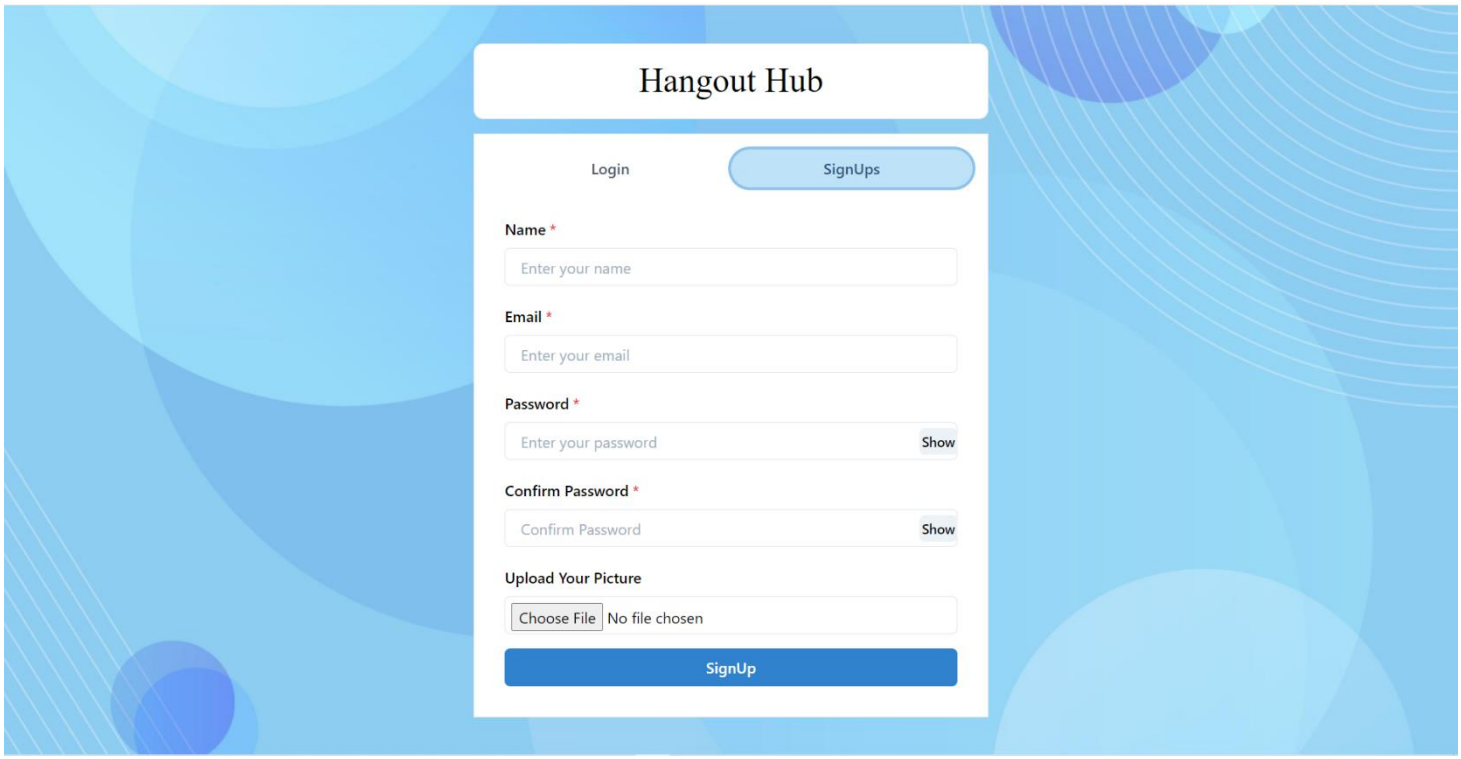
4. Now we focus on creating Back-end of our webapp. Firstly, we will create a server which will accept to different Routes from our frontend.
5. Now we use Cloudinary Platform for storing Profile Photo of our users.

4.2 User Interface

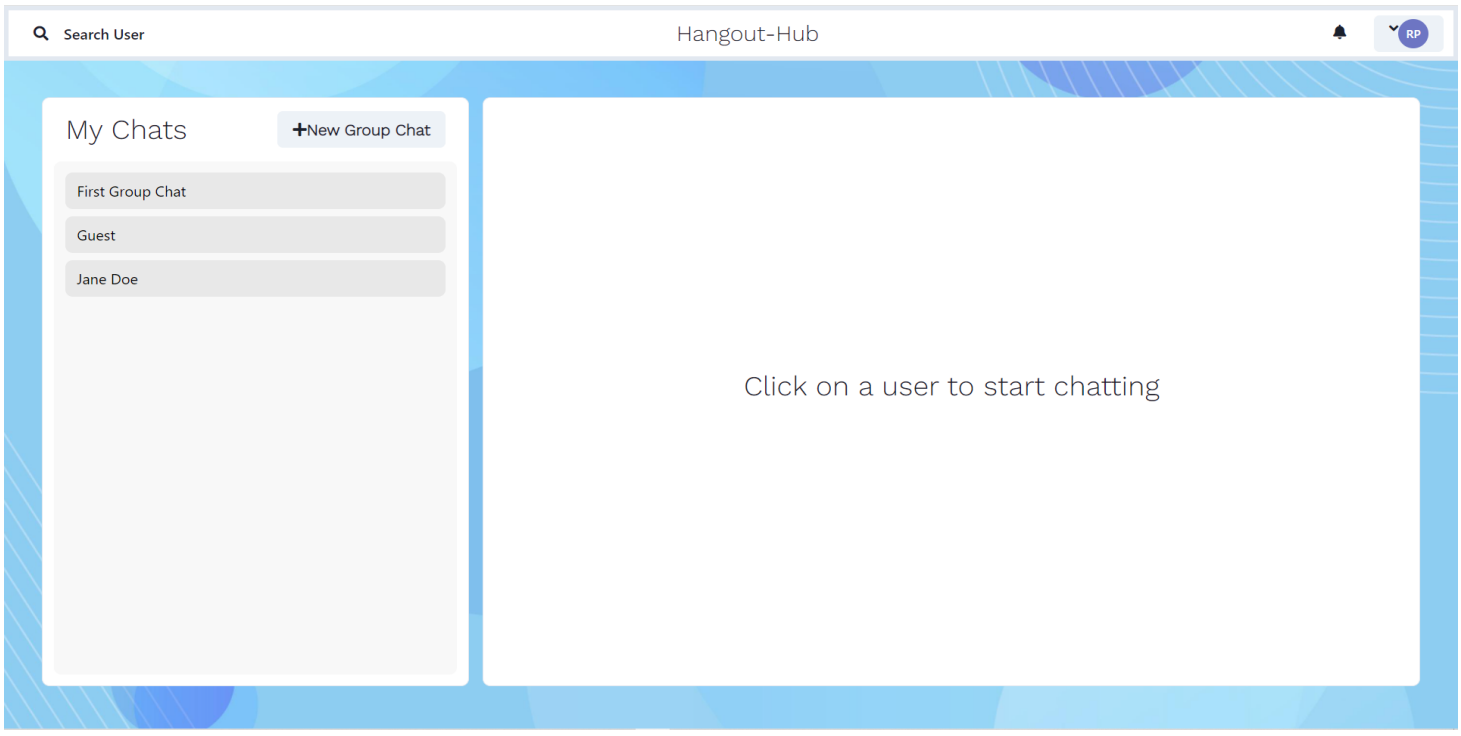
- **Login Page**



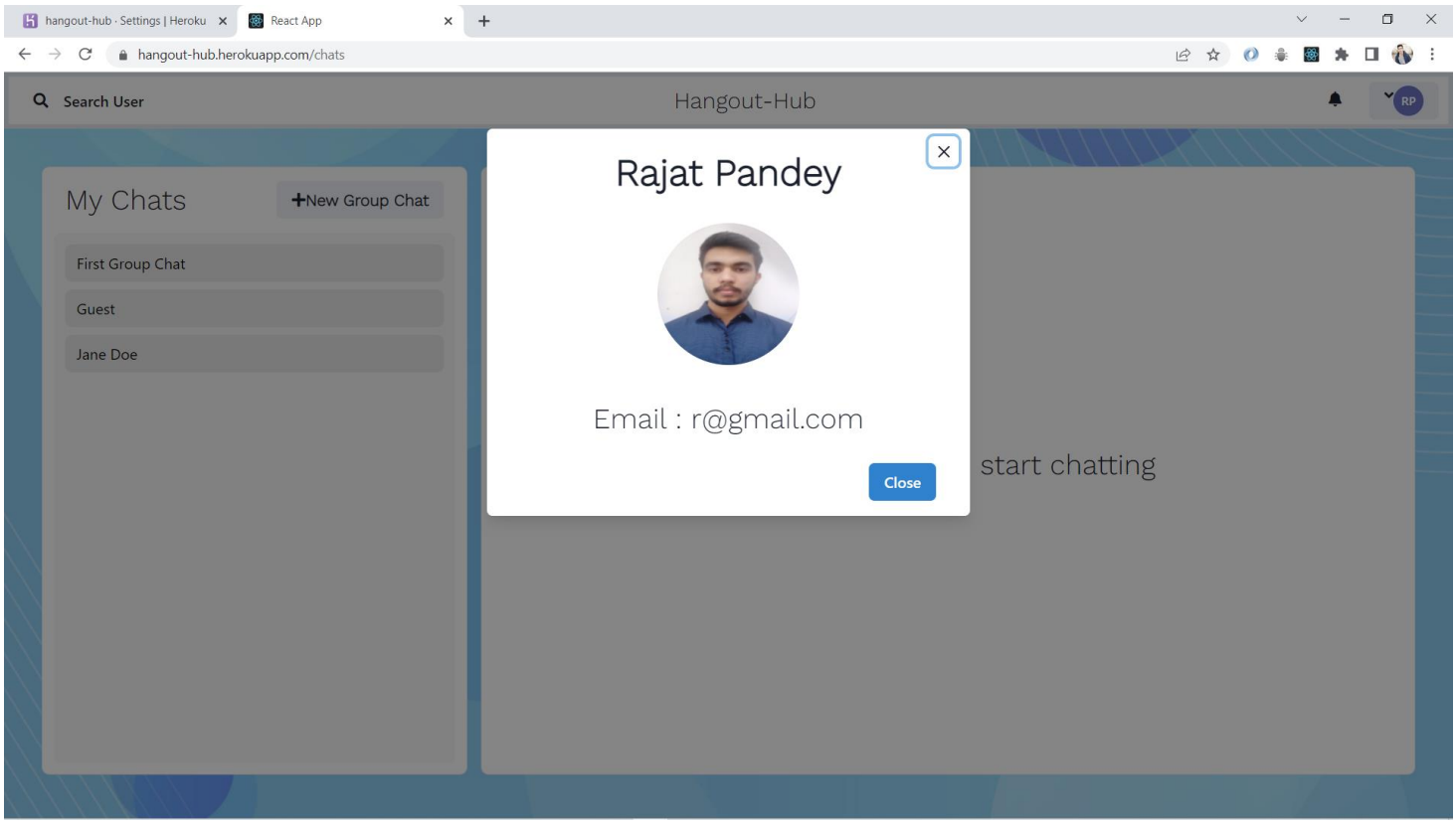
- **Signup Page**



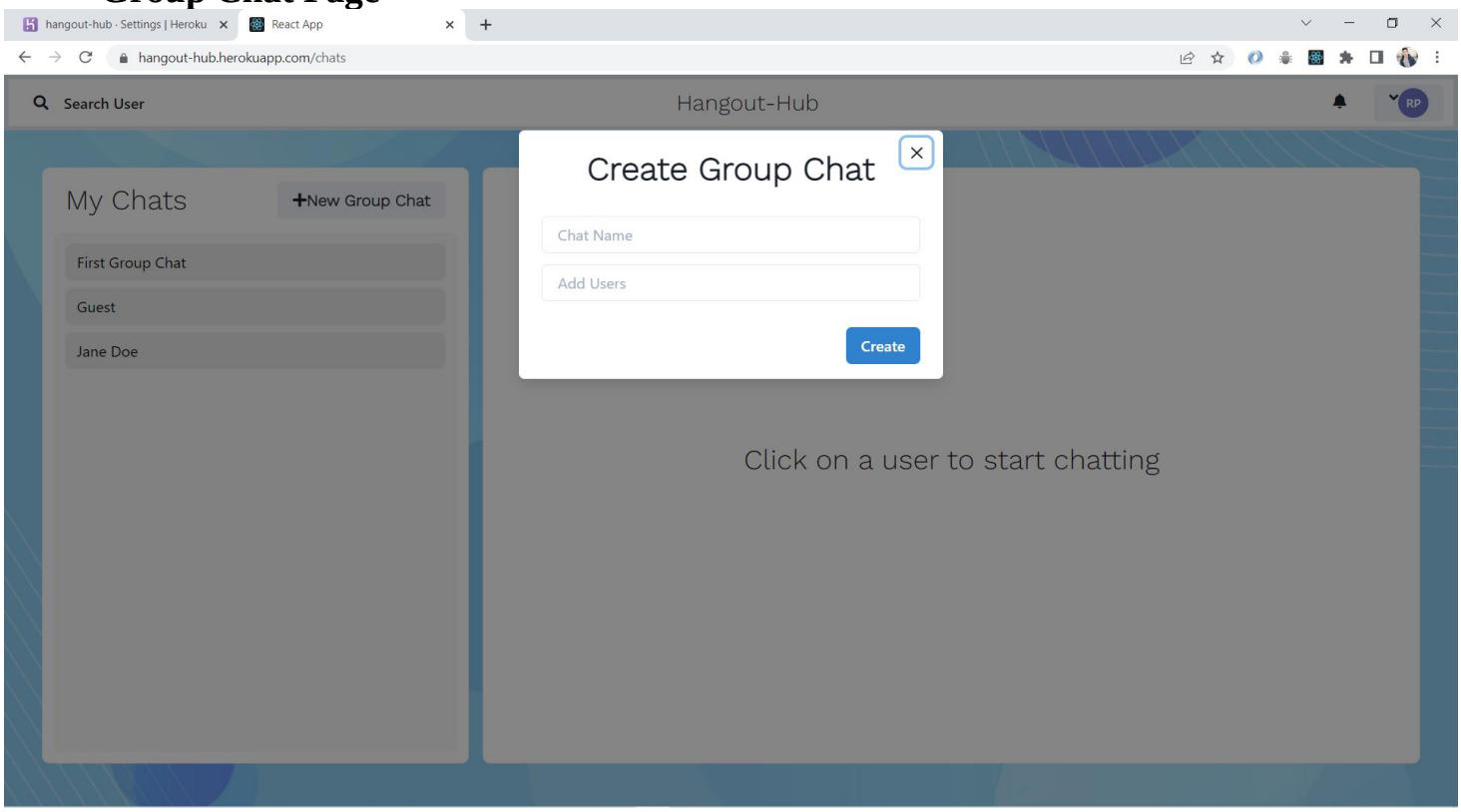
- **Home Page**



- **User Info**



- **Group Chat Page**



CHAPTER - 5

TESTING

Once source code has been generated, software must be tested to uncover as many errors as possible before delivery. It is very important to work the system successfully and achieve high quality of software. Testing includes designing a series of test cases that have a high likelihood of finding errors by applying software-testing techniques.

System testing makes logical assumptions that if all the parts of the system are correct, the goal will be successfully achieved. The system should be checked logically. Validations and cross checks should be there. Avoid duplications of record that cause redundancy of data.

In other Words, Testing is the process of evaluating a system or its component(s) with the intent to find whether it satisfies the specified requirements or not. It is executing a system in order to identify any gaps, errors, or missing requirements in contrary to the actual requirements.

There are different types of testing some of them are listed below:

5.1 Installation Testing:

There are two types of apps on an Android device i.e., pre-installed applications and the applications which are installed later by the user.

For both of the above, installation testing is carried out by our teammates. It is ensuring smooth installation of the application without ending up in errors, partial installation etc.

5.2 Unit Testing

It focuses on smallest unit of software design. In this we test an individual unit or groups of inter related units. It is often done by programmer by using sample input and observing its corresponding outputs. In this testing technique we are primarily focuses on

5.2.1 Loop methods and function is working fine or not.

5.2.2 Misunderstood or incorrect Arithmetic precedence

5.2.3 Incorrect Initializations

Unit Testing of the app:

Test cases	Description	Expected Outcome	Result
1	Login Page	Should display the name in Database	Pass

2	Register Screen	Should display register activity where you need to fill the required details	Pass
3	Chat Sent	Should send message and it should be displayed on user's screen.	Pass
4	Logout	Should logout the user id and redirect back to login page.	Pass

Table 1: Unit Testing of Hangout Hub

5.3 User Testing

User testing is the process through which the interface and functions of a webapp, app, product, or service are tested by real users who perform specific tasks in realistic conditions. The purpose of this process is to evaluate the usability of that webapp or app and to decide whether the product is ready to be launched for real users.

This webapp was tested by our team mates and friends who are using different devices (and having different windows and processor) also tested on different emulator to check its performance and it seems to be working fine and users of this app are satisfied with the facilities and performance of the webapp and like the way how the webapp is worked.

5.4 Performance Testing

In this type of testing, we have checked the performances of our application under some peculiar conditions are checked. Those conditions include:

5.4.1 Low memory in the device.

5.4.2 The battery in extremely at a low level.

5.4.3 Poor/Bad network reception.

Performance is basically tested from 2 ends, application end, and the application server end. Our app is also performing well in this phase of testing as well. And we are getting positive feedback from user of our app.

5.5 Compatibility Testing

This webapp was tested and used on different devices like HP, ASUS, MAC BOOK. The webapp worked fine and is stable.

On all types of testing (that we have performed above) our performing well on our webapp i.e., Hangout Hub

CHAPTER -6

CONCLUSION

The chat application (Hangout Hub) provides a better and flexible system for chatting. It is developed with recent advanced technologies in a way to provide a reliable system. Main advantages of the system is instant messaging, real-world connectivity, adding security, group chat, etc. This application can find better need in the market for most of the organizations aim at having private applications for them. Additional features will also be included in the system based on the public need which includes conference call, video chat, location share, etc. based on the needs.

FUTURE SCOPE

Further scope would be involved in the area of security, video call, large size file transfer and some additional features that are required in the competing world. Other work is involving in implementation of the system in private networks.

Project Repository :-

https://github.com/rajatpandey95/MERN-hangout-hub

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