A MINOR PROJECT REPORT

ON

INSTACHAT

SUBMITTED IN PARTIAL FULFILLMENT FOR THE AWARD OF DEGREE OF

BACHELOR OF TECHNOLOGY

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

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CERTIFICATE

This is to certify that the minor project report entitled, "**INSTACHAT**" submitted by **DHRUV SINGH WADHAWAN , SIDDHANT SINGH AND FARDEEN KHAN** in partial fulfillment of the requirements for the award of Bachelor of Technology Degree in **Electronics and Communication Engineering** of the Jaypee Institute of Information Technology, Noida is an authentic work carried out by them under my supervision and guidance. The matter embodied in this report is original and has not been submitted for the award of any other degree.

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DECLARATION

We hereby declare that this written submission represents our own ideas in our own words and where others' ideas or words have been included, have been adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission.

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ABSTRACT

The project titled InstaChat Messaging application presents the development of an instant messaging application based on the concept of a end-to-end developed client/server interface. It provides a client application which runs on the users' desktop and a server application which runs on any machine on the network.

To start chatting our client should get connected to a server where they can do group and private chatting. Our project is an example of a chat server. It is made up of two applications: the client application which runs on any Android Device and the second one is a server application which runs on the specific network.

To start texting or chatting clients should get connected to a server where they can go for private conversation or group conversation, it depends on user's choice. Therefore, the project is totally built at the administrative end and thus only the administrator is guaranteed access.

The purpose of the project is to build an application program to reduce the manual work for managing the Online Chat, Chat Application, Emoji chat, Chat History. It tracks all the details about the Chat History, Chat profile, Users.

ACKNOWLEDGEMENT
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If words are considered as a symbol of approval and token of appreciation then let the words play the heralding role expressing my gratitude.

The satisfaction that accompanies the successful completion of any task would be incomplete without the mention of people whose ceaseless cooperation made it possible, whose constant guidance and encouragement crown all efforts with success. We are grateful to our project mentor **Dr. Vimal Kumar Mishra** for the guidance, inspiration and constructive suggestions that helped us in the preparation of this project. New ideas and Direction from him made it possible for us to sail through various areas of our Project which further helped us to make it better. We would also thank our institution and faculty members without whom this project would have been a distant reality.

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INTRODUCTION

1.1 Web Programming

Web programming refers to the writing, markup and coding involved in Web development, which includes Web content, Web client and server scripting and network security. The most common languages used for Web programming are XML, HTML, JavaScript, CSS and PHP. Web programming is different from just programming, which requires interdisciplinary knowledge on the application area, client and server scripting, and database technology.

Web programming can be briefly categorized into client and server coding. The client side needs programming related to accessing data from users and providing information. It also needs to ensure there are enough plugins to enrich user experience in a graphic user interface, including security measures.

To improve user experience and related functionalities on the client side, JavaScript is usually used. It is an excellent client-side platform for designing and implementing Web applications.
HTML5 and CSS3 supports most of the client-side functionality provided by other application frameworks.

1.1.1 Overview

There are two broad divisions of web development – front-end development (also called Client-side development) and back-end development (also called server-side development). Front-end development refers to constructing what a user sees when they load a web application – the content, design and how you interact with it. This is done with three codes – HTML, CSS and JavaScript.

HTML, stands for HYPER TEXT MARKUP LANGUAGE, is a special code for 'marking up' text in order to turn it into a web page. Every web page on the net is written in HTML, and it is the backbone of every web application. CSS, short for Cascading Style Sheet, is a code for setting style rules for the appearance of web pages. CSS handles the cosmetic side of the web. Finally, JavaScript is a scripting language that's widely used to add

functionality and interactivity to web pages. Use Of Captcha has been used for security and encryption purposes.

Back-end development controls what goes on behind the scenes of a web application. A back-end often uses a database to generate the front-end.

1.1.2 Description

The objective of this project is to develop a **ReactJS** (ReactJS is JavaScript library used for building reusable UI components. React is a library for building composable user interfaces. It encourages the creation of reusable UI components, which present data that changes over time.)based chat application which runs on a backend **Firebase Server** (is a platform developed by Google for creating mobile and web applications, it acts as a Real time database with features like authentications)

Fid.1.1 Here we have provided a home screen snapshot of our InstaChat application. This is how the starting page of the Chat application looks like when you first open the application,
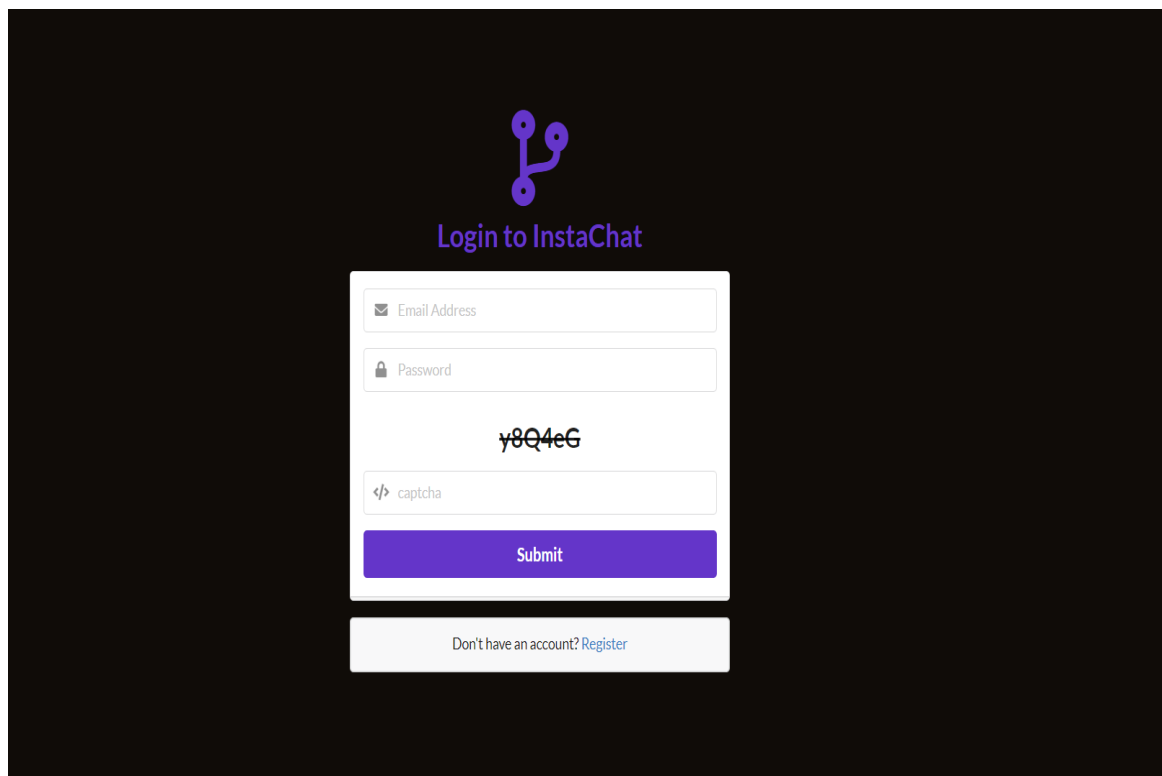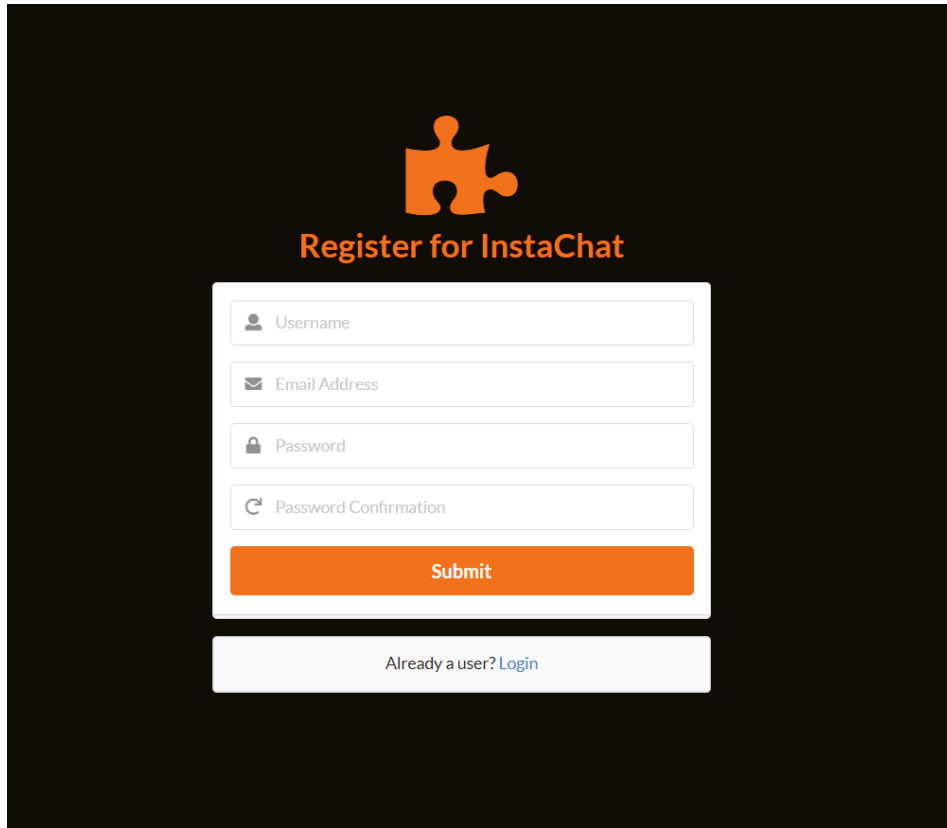

Fig.1.1 Login Page of InstaChat

Fig.1.2 Shows the registration page of the Chat application. The new users have to register first to continue with the rest of the process.

Fig.1.2 Register page of InstaChat

CHAPTER-2

LITERATURE SURVEY

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The analysis of literature review suggests filling a research gap to present formal models for estimating web-based applications considering specific characteristics of modern Technologies.

A lot of Research has been carried out on chatting because it is important to know how much research has been done in chatting. Their description is as follows: Anderson, K. M. Integrating Open Hypermedia Systems with the World Wide Web[1] in this research paper they showed the usage of www and the working of it. Also, we added a feature in chatting which is image sharing option, with the help of image sharing option, users can share images within the group chat as well as Personal chat also.

With the increasing use of instant messaging as a communication tool, psychological research on alerting and disruption have recently produced a lot of studies aimed at better understanding the impact of this communication interface on daily working tasks. Concerns have raised that instant messaging (InstaChat!) was disruptive enough to degrade one's performance on concurrent tasks. Finding ways to limit these interruptions' impact on ongoing tasks have also been studied, and several forms of InstaChat! infrastructures have been tested in the past few years.

The objective of our Project was to connect with more than one services at a time like Facebook, Google Talk, Jabber, MSN etc. with all the necessary features and real-time-chatting experience. This is a must have web based chat application.

Dealing with InstaChat and its effect on workload seems to require interruption management capabilities: considering the type, time of occurrence and frequency of disruption by InstaChat!, its impact on cognitive abilities might change, and be optimized. Therefore, it is very important to compare results of a newly created model produced with the newest information and not only with the state of the art methods. This chapter is a source of such information for researchers in order for them to be precisely correct on

result comparison before publishing new achievements in this field. In this literature survey three digital libraries are chosen due to limited resources and the huge number of articles under this topic. However, this can be clearly seen that these libraries cover a significant amount of the related literature sources for our study. Table 2.1 shows the reference of the article in the references with their features and the presented drawbacks with the application developed.

Table 2.1 shows about the literature survey of the project.

S.no	Article Name	Features	Drawbacks
1.	Android Based Instant Messaging Application Using Firebase[6].	It helps in implementing the backend technology of the application and storing the real-time database	Firebase doesn't provide any migration tools to transfer your data to another platform.
2.	Comprehensive Analysis of React-Redux Development Framework[4].	It is used in implementing framework to create a hybrid application capable of provisioning solutions	No encapsulation. Any component can access the data which can cause security issues.
3.	Multi-User Chat Application[5].	It also enables the feature of sharing resources like files, images, videos, etc.	File transfer is not available through url. Video Transfer is also not available.
4.	Developing an End-to-End Secure Chat Application[10].	The aim of the paper is to propose chat application that provides End-to-End security that let safely exchange private information with each other without worrying about data.	Due to encryption and security issues , the chat history is not saved and is not end-to-end encrypted.

CHAPTER-3

METHODOLOGY

- This project is developed using web programming and it's components like HTML , CSS , JAVASCRIPT, REACTJS and FIREBASE. The project is developed to overcome the barrier between the modern form of communication.

- methods used to developed the application:

1. HTML: It defines the content of the chat application.

2. CSS: It specifies the layout of the chat application. The styling of the chat application like you see in Login and Register page is done using CSS.

3. JavaScript: It is used to program the behavior of the Chat application. This is used for authentication purposes in the chat application.

4. React Js: It is used to build user interface and testing purposes of the chat application. The structure of the chat application is build on this component.

5. Firebase: It is used to store real-time database of the chat application. This is used for the backend purpose in the chat application.

CHAPTER-4

PROBLEM STATEMENT

4.1 PROBLEM STATEMENT

Chat rooms have become a popular way to support a forum for n-way conversation or discussion among a set of people with interest in a common topic. Chat applications range from simple, text-based ones to entire virtual worlds with exotic graphics. In this project we have implemented a simple text-based chat client/server (firebase server) application with several data transfer.

4.2 PROBLEM SOLUTION

Email, newsgroup and messaging applications provide means for communication among people but these are one-way mechanisms and they do not provide an easy way to carry on a real-time conversation or discussion with people involved. Chat room extends the one-way messaging concept to accommodate multi-way communication among a set of people. Fig.4.1 shows the architecture about the working of the chat application in the process going on between the frontend and backend development.
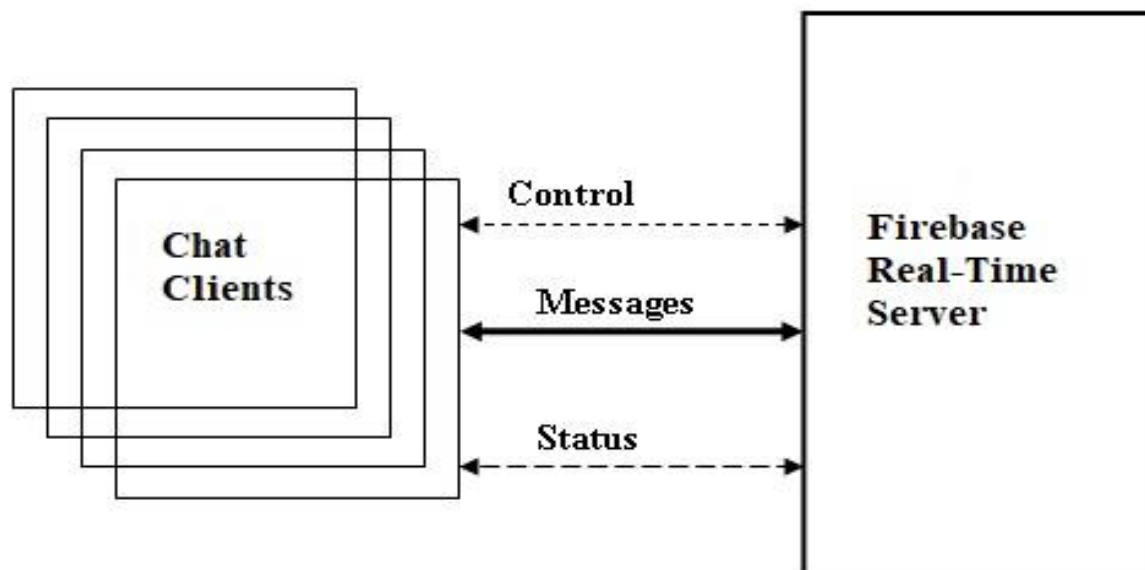

Fig 4.1 Project Skeleton

CHAPTER-5

FEATURES

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There are several features of our chat application.

It tracks all the information of online conversation, chat profile and user's act. therefore it helps in reducing manual work for managing the chat, which further provides high quality of usability experience. Fig.5.1 shows the features when you first land in the messaging part of the chat application.
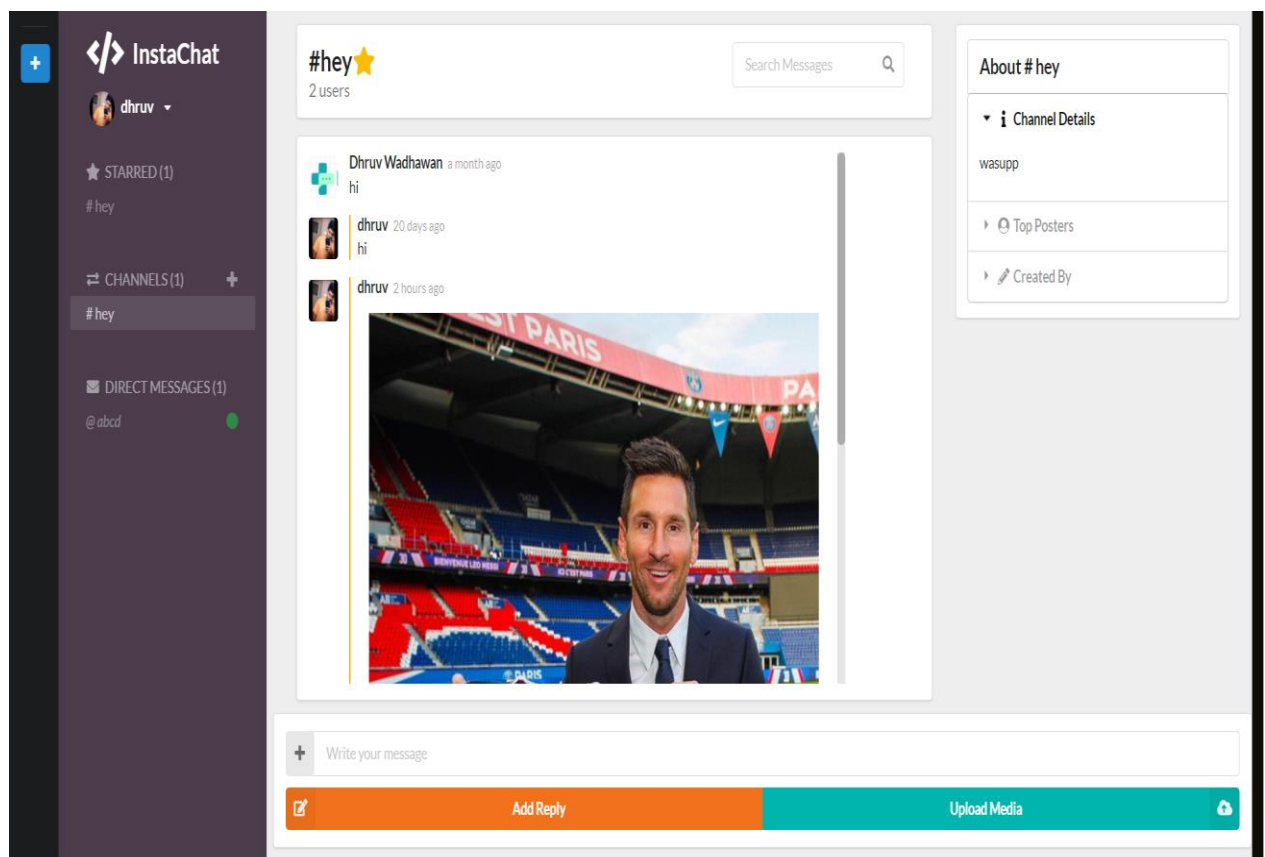

Fig.5.1 Landing Page for the Chat Option

Fig.5.2 Chat application provides us with a descriptive view of various groups and personal chat. Fig.5.3 Showing the personal chat view with the other users.
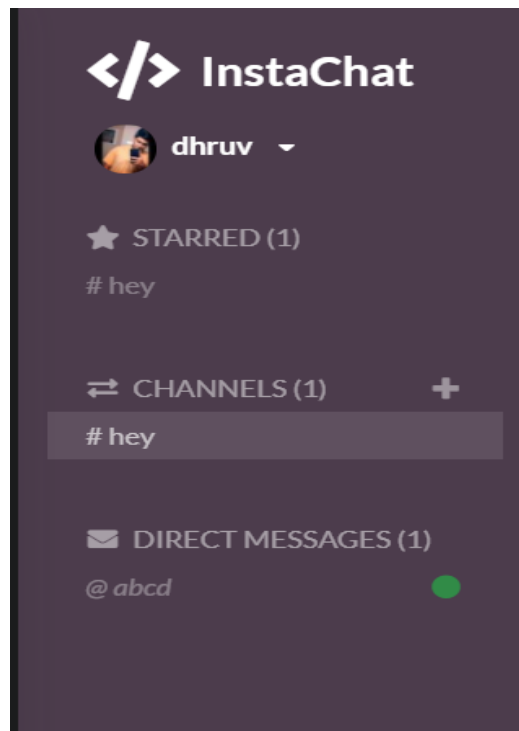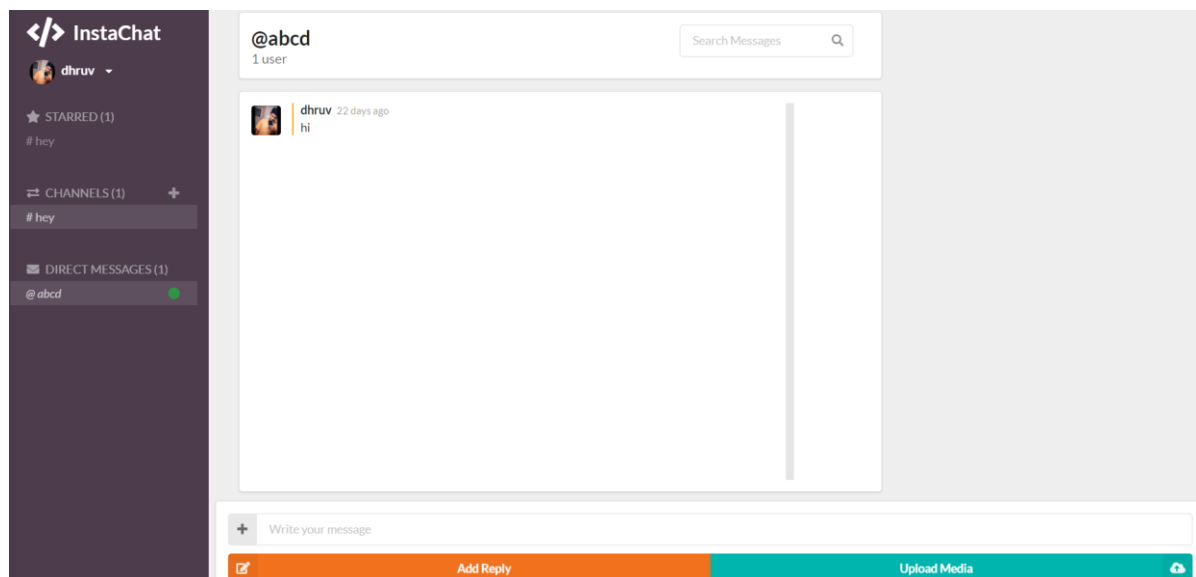

Fig.5.2 Channels View

Fig.5.3 Personal Chat with other users

Fig.5.4 This is one of the most decorative features in our application which asks user to select primary and secondary colors for changing the background.
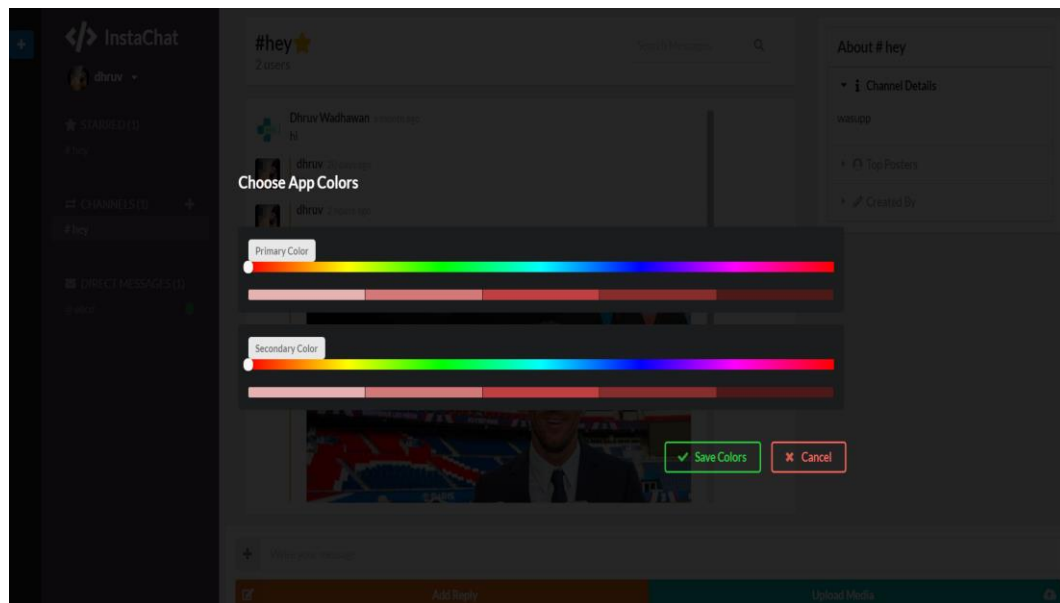

Fig.5.4 changing background color according to the user

Fig.5.5 Chat application has its own erratic feature of emoji's and the user can choose from more than 250 emojis.
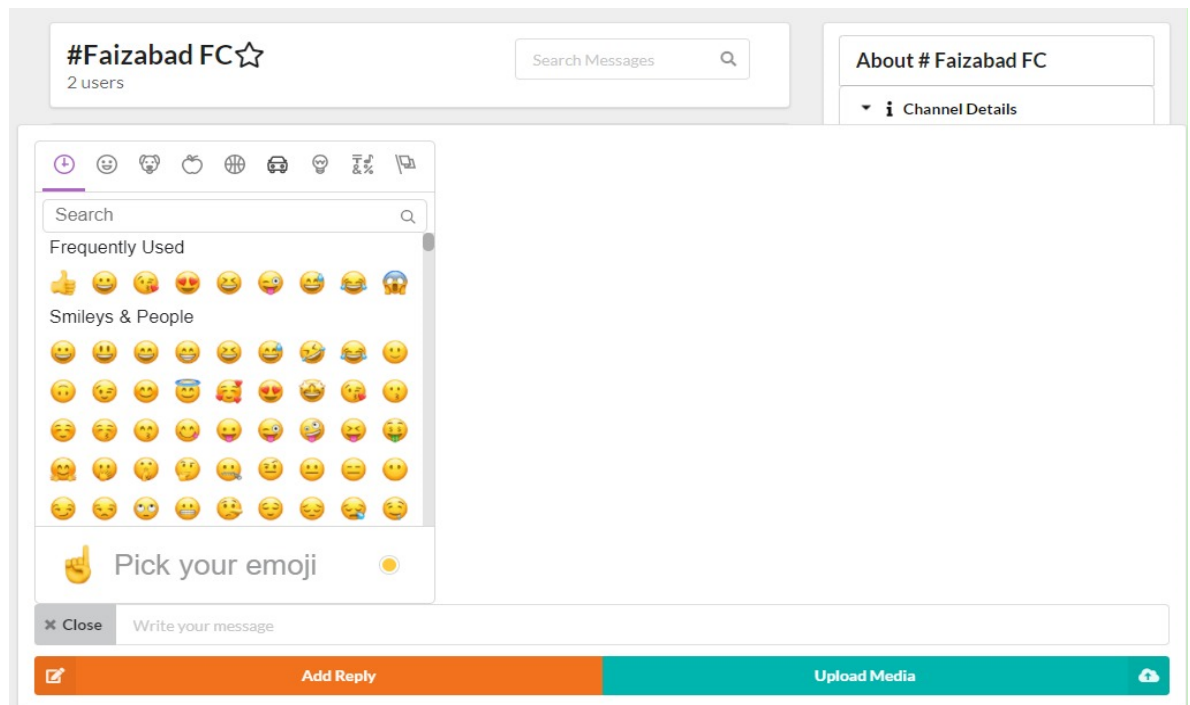

Fig.5.5 View of Landing Page for the emoji selection

Fig.5.6 Chat also shows that who is the top poster in the channel of the deployed chat application.
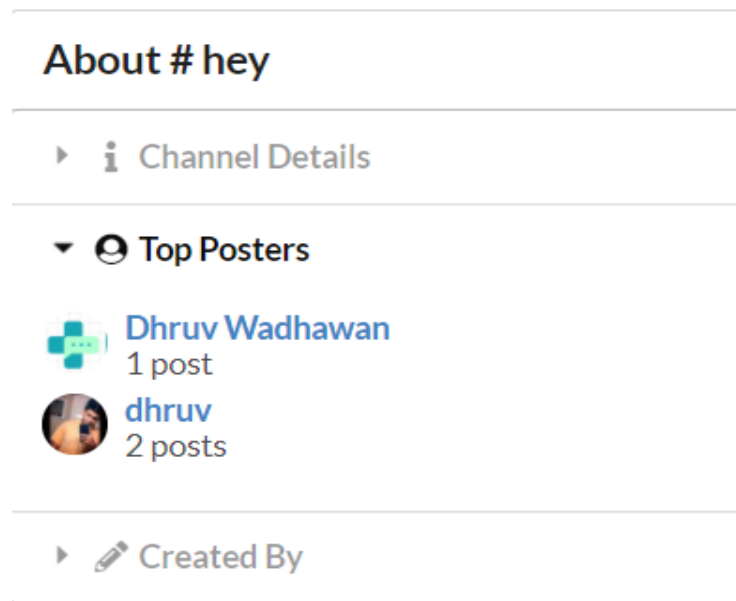

Fig.5.6 Top Posters in the channel

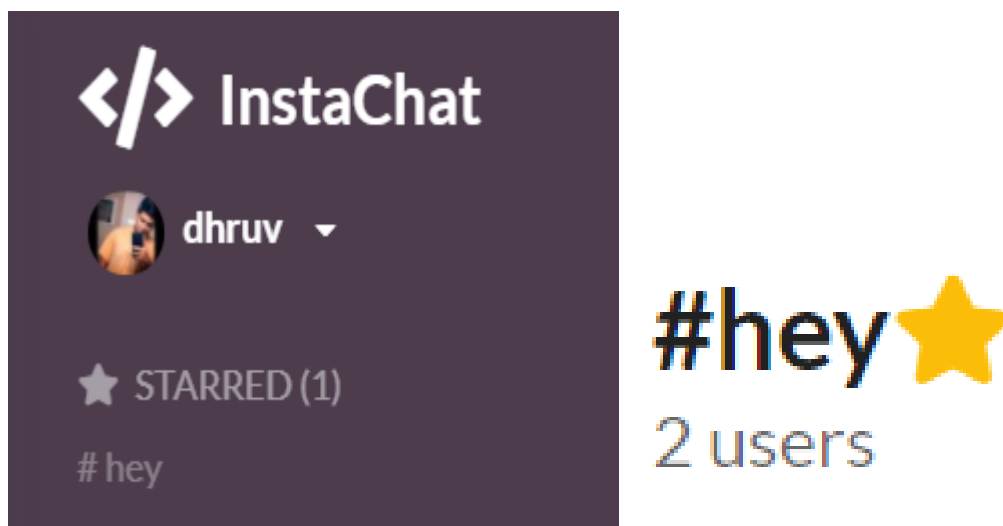Fig.5.7 Chat also shows the starred channels in the side panel of the Application.
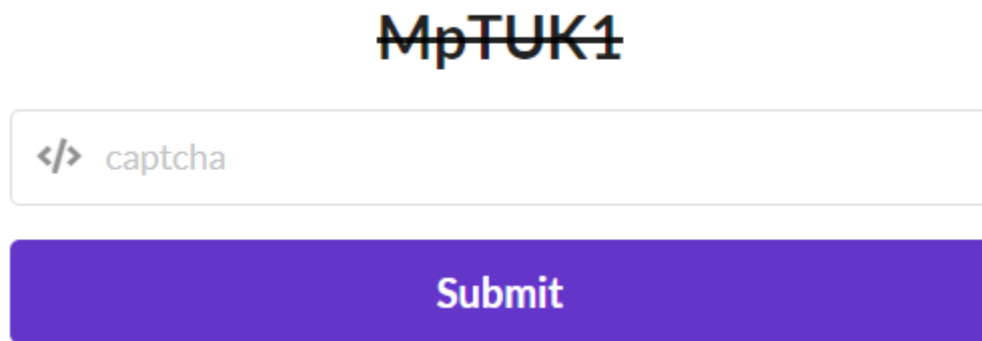

Fig.5.7 Showing of starred channels

Fig.5.8 A CAPTCHA is a type of challenge–response test used in computing to determine whether or not the user is human.

Fig.5.8 Captcha required to login

CHAPTER-6

BLOCK DIAGRAMS

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Fig.6.1 Authentication is the process of verifying the identity of an individual. A user can interact with a web application using multiple actions. Access to certain actions or pages can be restricted using user levels.
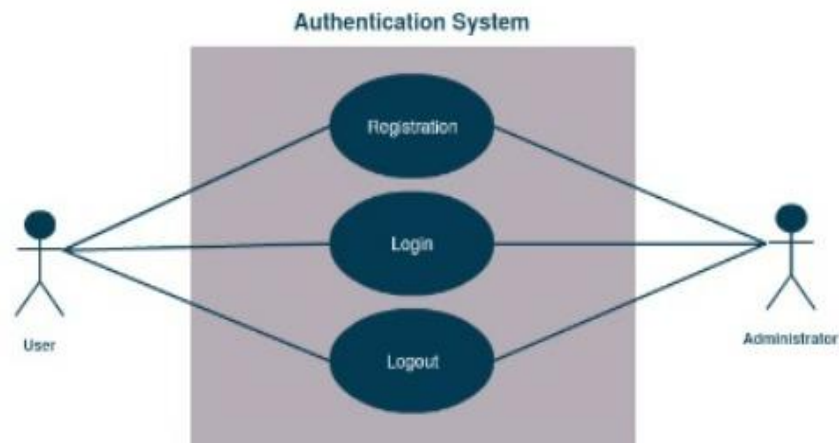
Fig 6.1. Detailed Flowchart of working of our Authentication System

Fig.6.2 As we all know that one to one conversation is also possible through email and various other mail based tools, keeping this scenario in mind, we developed various types of chat rooms in our application which includes sending one on one messages, to have a conversation in a group and we can also tag our close ones to have a talkfest.

Fig.6.2 Flowchart for the user experience
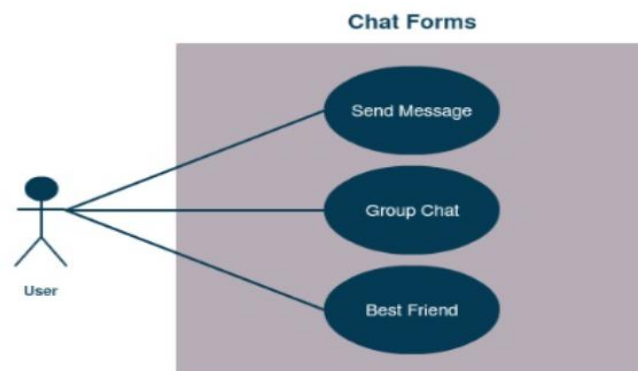
Fig.6.3 Monitoring conversation is one of the most significant feature of our application, since we have a database to hold various types of information which executes during a conversation and which makes our user to be convinced by our application.Fig.5.4 shows what the database contains.

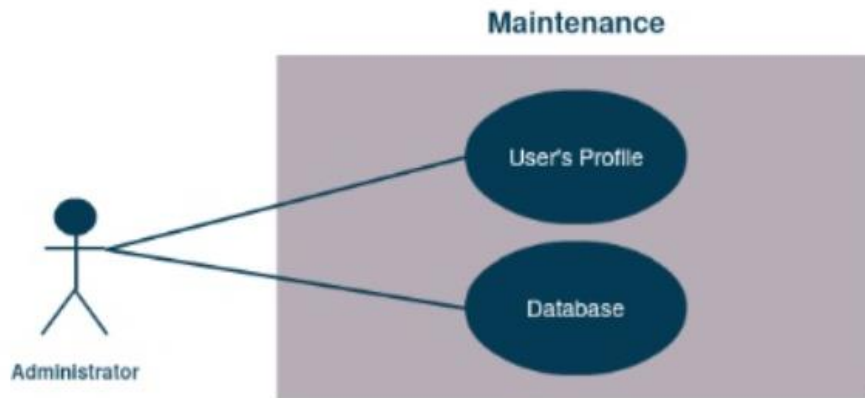**Fig.6.3** Flow diagram defining the chat history

Fig.6.4 Flow diagram for Database System

CHAPTER-7

DISCUSSION

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7.1 Supported Platforms

Visual Studio Code is a source-code editor that can be used with a variety of programming languages, including Java, JavaScript, Go, Node.js, Python and C++. It is based on the Electron framework, which is used to develop Node.js Web Applications that run on the Blink layout Engine. Visual Studio Code employs the same editor component (code named "Monaco") used in Azure DevOps (formerly called Visual Studio Online and Visual Studio Team Services).

Instead of a project system, it allows users to open one or more directories, which can then be saved in workspaces for future reuse. This allows it to operate as a language-agnostic code editor for any language. It supports a number of programming languages and a set of features that differs per language. Unwanted files and folders can be excluded from the project tree via the settings. Many Visual Studio Code features are not exposed through menus or the user interface but can be accessed via the command palette.

Visual Studio Code can be extended via extensions, available through a central repository. This includes additions to the editor and language support. A notable feature is the ability to create extensions that add support for new languages, themes, and debuggers, perform static code analysis, and add code linters using the Language Server Protocol.

Visual Studio Code includes multiple extensions for FTP, allowing the software to be used as a free alternative for web development. Code can be synced between the editor and the server, without downloading any extra software. Fig.7.1 shows the editor of VS code and what it looks like when you first open the code source editor.
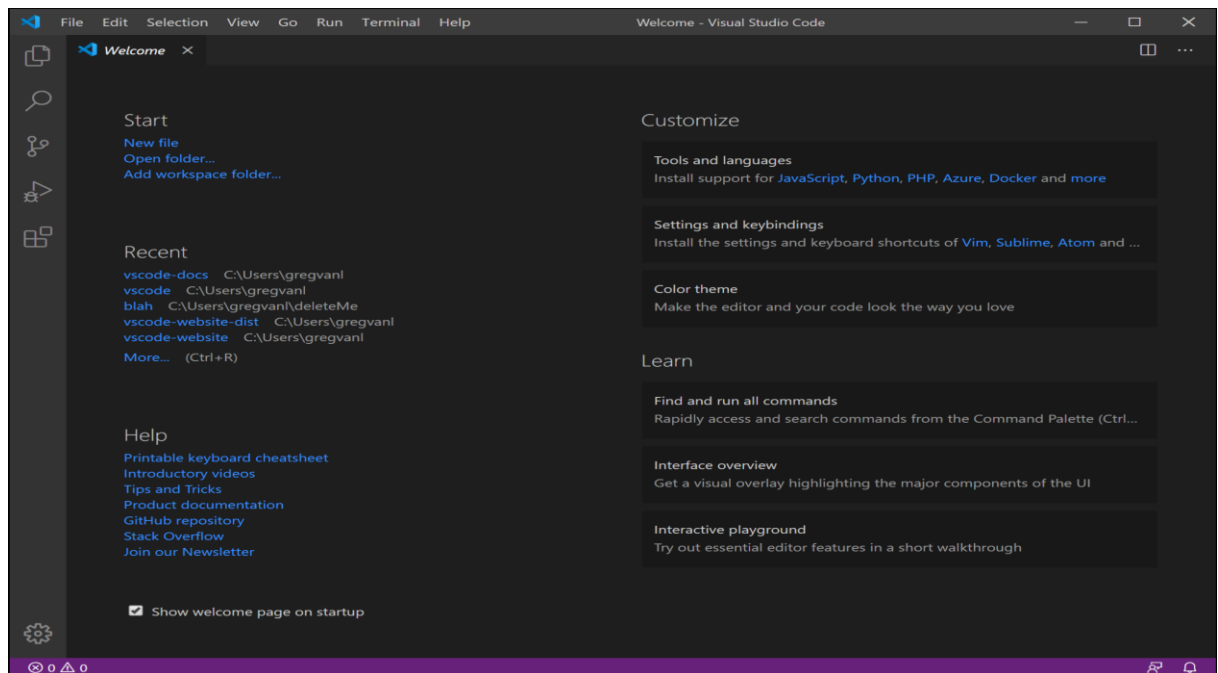
Fig. 7.1 View of VS Code

7.2 VS Code Interface

7.2.1 VS Code UI (User Interface)

At its heart, Visual Studio Code is a code editor. Like many other code editors, VS Code adopts a common user interface and layout of an explorer on the left, showing all of the files and folders you have access to, and an editor on the right, showing the content of the files you have opened.

VS Code comes with a simple and intuitive layout that maximizes the space provided for the editor while leaving ample room to browse and access the full context of your folder or project. The UI is divided into five areas that is **Editors, Side bar, Status bar, activity bar** and **Panels.** Fig.7.2 shows the features that are included in the VS code editor.

VS Code uses editor groups whether or not you have enabled Tabs. Without Tabs, editor groups are a stack of your open items with the most recently selected item visible in the editor pane.
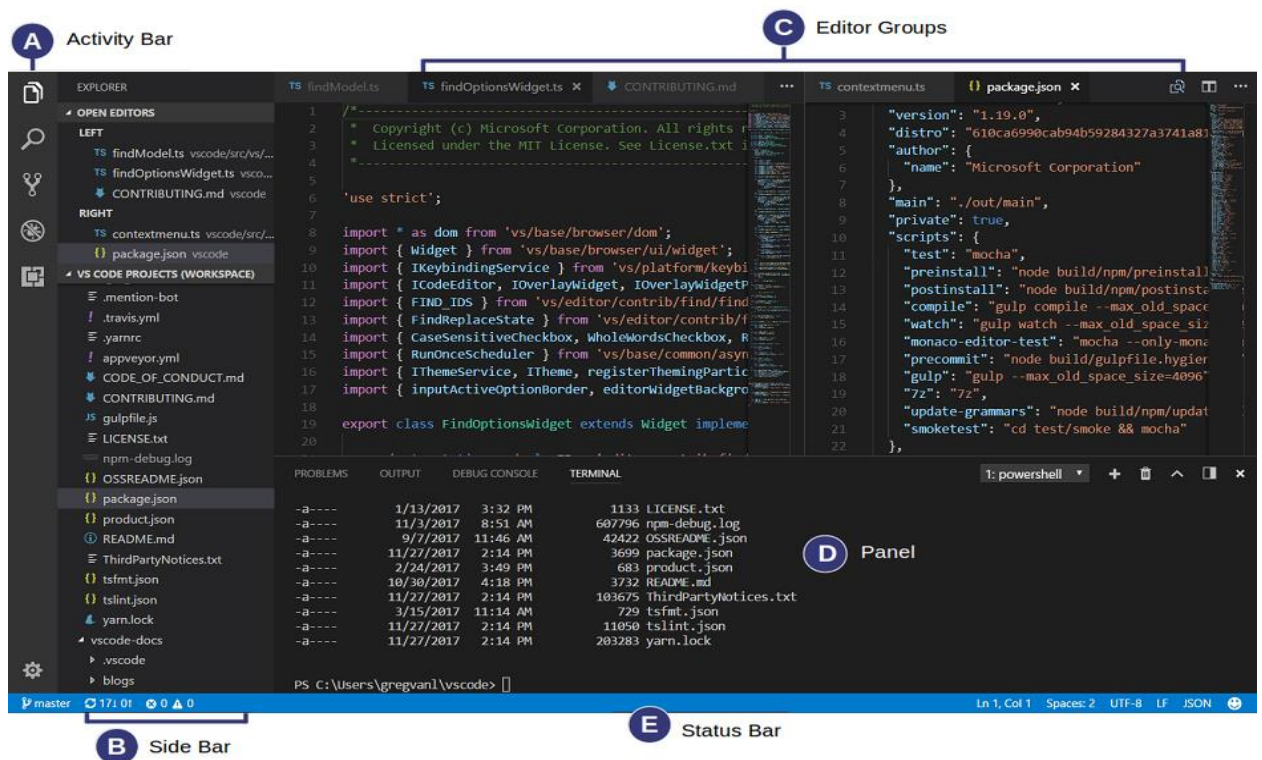
Fig. 7.2 View of Code in VS Code

7.2.2 Editors Group in VS Code

When you split an editor (using the Split Editor or Open to the Side commands), a new editor region is created which can hold a group of items. You can open as many editor regions as you like side by side vertically and horizontally. You can see these clearly in the OPEN EDITORS section at the top of the Explorer view: You can Drag and Drop editor groups on the workbench, move individual Tabs between groups and quickly close entire groups (Close All).

VS Code uses editor groups whether or not you have enabled Tabs. Without Tabs, editor groups are a stack of your open items with the most recently selected item visible in the editor pane.

VS Code helps you be instantly productive with syntax highlighting, bracket-matching, auto-indentation, box-selection, snippets, and more. Intuitive keyboard shortcuts, easy customization and community-contributed keyboard shortcut mappings let you navigate your code with ease. Fig.7.3 shows the editor groups available in VS code.
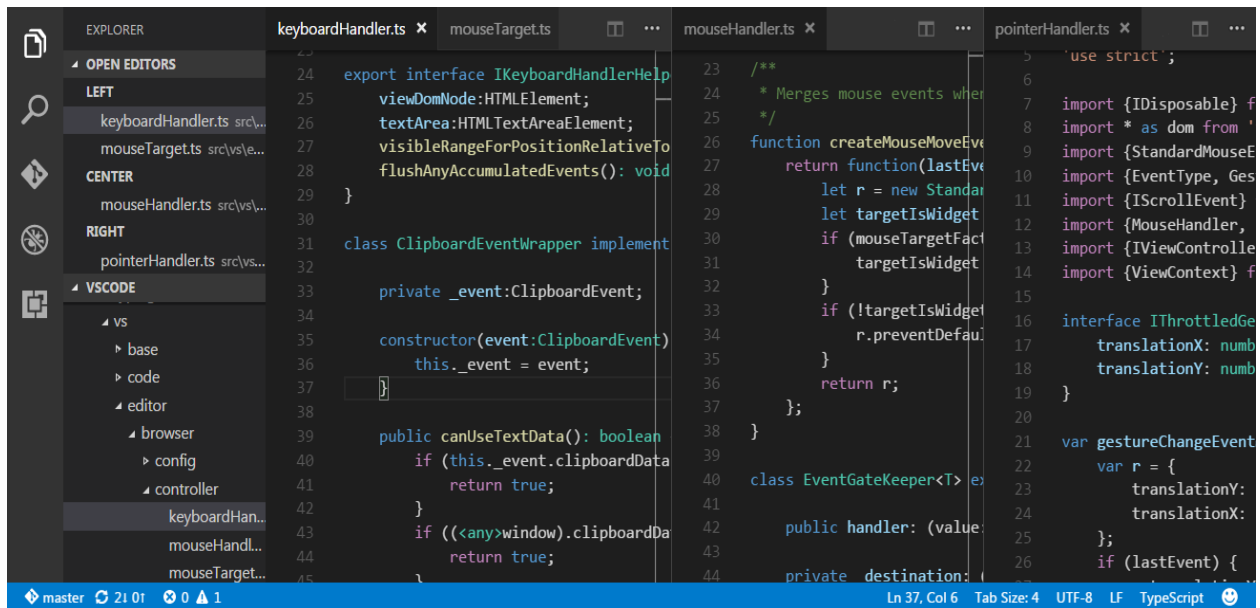
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Fig. 7.3 View of Editor group in VS Code

7.3 LIBRARY USED

7.3.1 REACT JS

React (also known as **React.js** or **ReactJS**) is an open-source, front end, JavaScript Library[1] for building User Interfaces or UI components. It is maintained by Facebook and a community of individual developers and companies. React can be used as a base in the development of single-page or mobile applications. However, React is only concerned with state management and rendering that state to the DOM, so creating React applications usually requires the use of additional libraries for routing, as well as certain client-side functionality. Fig.7.4 shows how the page looks like when the ReactJs code page has been deployed.
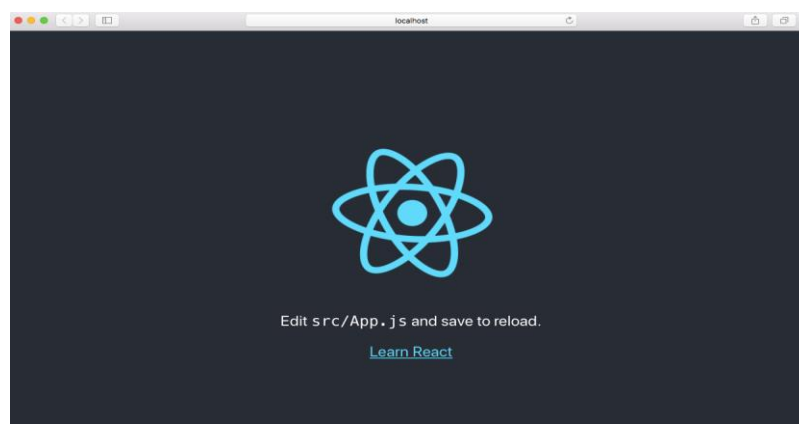

Fig 7.4 React.JS Starting Deployed Page

7.4 FIREBASE

7.4.1 INTRODUCTION TO FIREBASE

Firebase is a platform developed by Google for creating Mobile and WEB applications, this powerful and massive platform is possessed with many salient features such as:

- The real-time data management system is one of the most important features that allow easy and quick change of data to and from the database.
- The possibility to sync data without refreshing the screen is another feature that is heavily used in today's market.
- Unlimited Reporting and Audience Segmentation. Firebase has integrated services like Firebase Crash Reporting, Big Query, Firebase Notifications, Firebase Remote Config and Google Tag Manager to improve their services. Fig.7.5 shows the console of the Firebase and the features shows in the side panel of it. Fig,7.6 shows the real-time database stored side by side in the firebase.
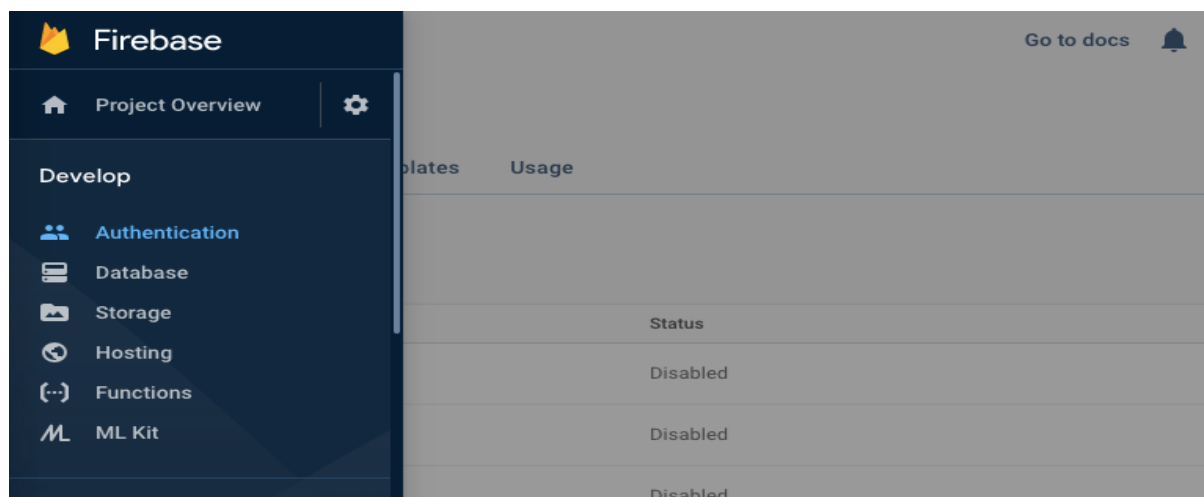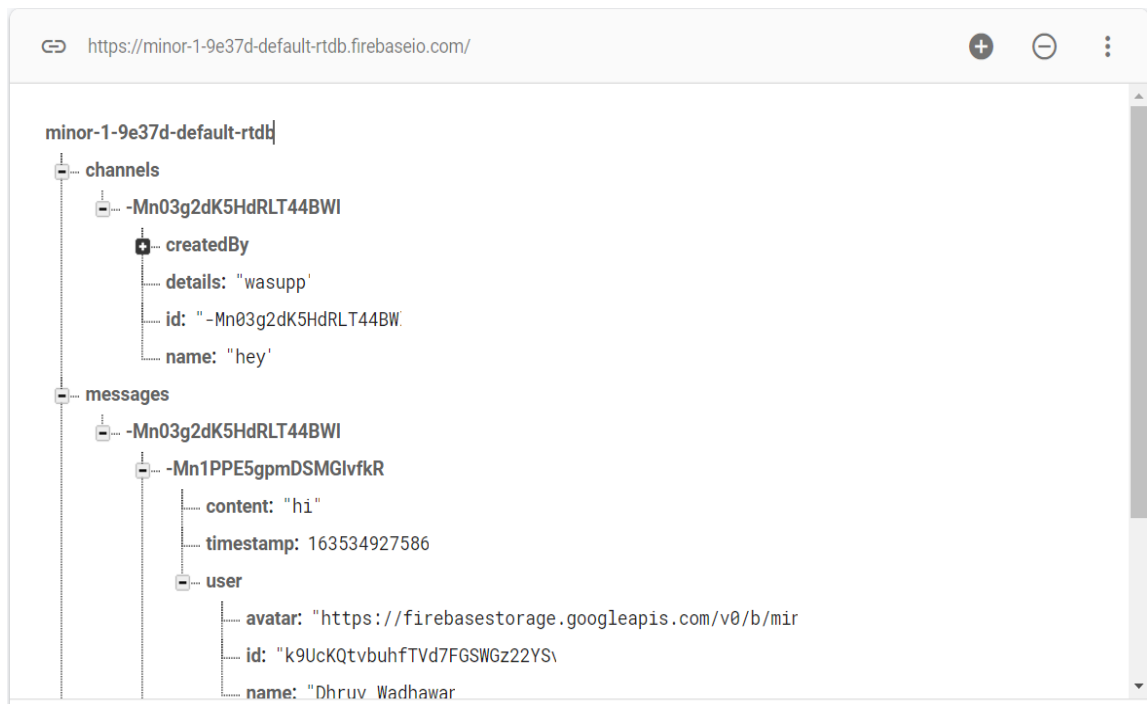

Fig 7.5 Firebase Console

Fig 7.6 Database

The mobile and cloud are buzzwords nowadays. Every week there's some new innovation related to these technologies. Fig.7.7 shows what all is stored in the backend database of the chat application.
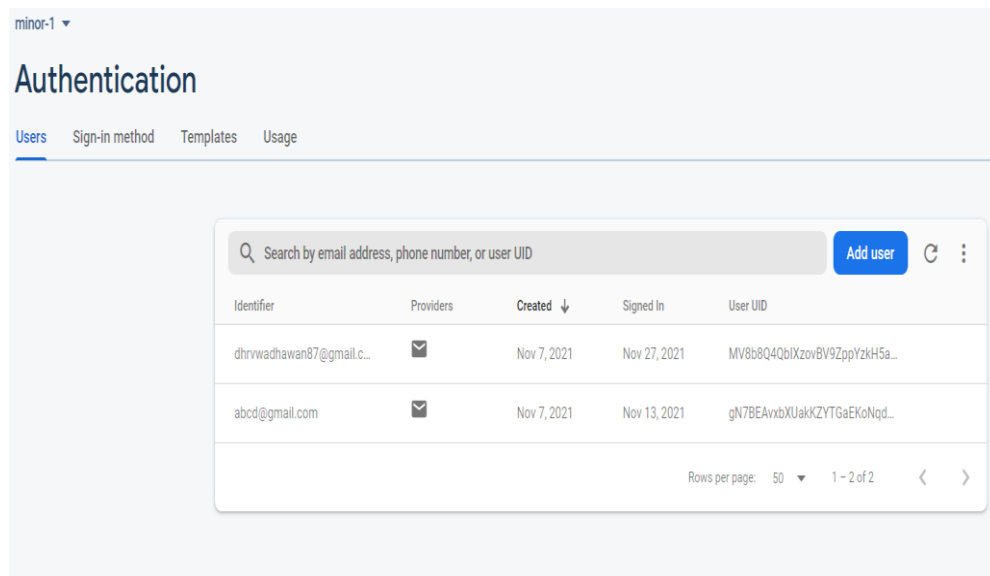

Fig 7.7 Storage section of Firebase

The mobile and cloud are buzzwords nowadays. Every week there's some new innovation related to these technologies.

There are many backed service provider like AWS, Kumulos, Meteor, Kinvey, Mongodb, Stack Mob, Applicasa, Appcelerator Cloud among them Firebase is on the top with their main features like free and unlimited analytics solution, Unlimited Reporting and Audience Segmentation. Firebase has integrated services like Firebase Crash Reporting, Big Query, Firebase Notifications, Firebase Remote Config and Google Tag Manager to improve their services.

Why use firebase?

As everyone knows Parse was a very popular BAAS especially for iPhone and Android based applications but as they announced to close their service in 2017. So parse based applications will no longer be available. If you don't want to use your own backend server then Firebase is a good option to create your application without backend services. Firebase Crash Reporting, Big Query, Firebase Notifications, Firebase Remote Config and Google Tag Manager to improve their services. Fig.7.8 denoted the firebase flowchart and the components present for backend use for the web application.
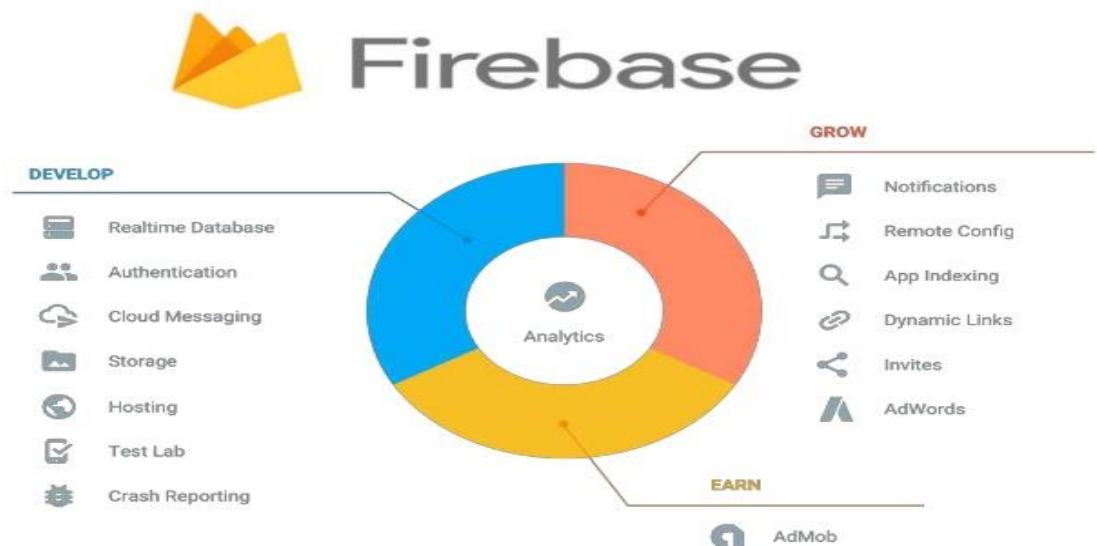

Fig.7.8 Firebase flowchart

7.4.2 BENEFITS OF FIREBASE

- Create Application without backend server
- No need extra money spent for backend server
- Sync real time data in the application
- Quick display data in the application
- No SQL database so it is more faster
- It has a feature of Crash Report
- Push Notification
- Dynamic Linking
- Cloud Storage with Auto Backup
- Firebase provides app analytics without any charge on it.
- It also provides us option of login with any social media networking sites like Email login, facebook , Twitter, Github , Gmail and many more.

CHAPTER 7

CONCLUSION AND FUTURE SCOPE

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CONCLUSION

There is always room for improvements in any apps. Right now we are just dealing with text communication. There are several web based chat applications which serve similar purposes as this project, but these apps were rather difficult to use and provide confusing interfaces. A positive first impression is essential in human relationship as well as in human computer interaction.

FUTURE SCOPE

With the knowledge we have gained by developing this application, we are confident that in the future we can make the application more effective by adding these services:

- Extending this application by providing covid 19 service.
- Increasing the effectiveness of the application by providing Voice Chat.
- Extending it to Web Support.
- It can also be used by businessman for the transfer of large amount of information as no user will get disturbed by any kind of pop-ups.

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