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Sarvajanik College of Engineering and Technology, Surat.

Department of Computer Engineering

Report on

Chat Application(Chatify)

For the subject

Web Technology (BTCO13502)

Submitted to

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Chat Application (CHATIFY)

INTRODUCTION

Chatify is a real-time messaging platform designed to facilitate seamless communication between users. Whether for personal conversations, team collaboration, or customer support, Chatify offers a robust and user-friendly environment for exchanging messages, media files, and engaging in group discussions.With more knowledge of network the application can be integrated to intuitive design with advanced features like end-to-end encryption, file sharing, and group chat capabilities, ensuring secure and efficient communication.

The primary objective of Chatify is to provide a platform that is easy to navigate, highly responsive, and adaptable to various use cases, from casual chatting to professional team management. It supports both one-on-one messaging making it ideal for users seeking flexibility in how they connect. With a focus on delivering a smooth user experience, Chatify is built to handle large volumes of messages in real time, ensuring minimal delays and high reliability.

In this report, we will discuss the system architecture, key functionalities, user interface, and performance aspects of Chatify, along with a detailed look at its scalability for future enhancements.

SYSTEM ARCHITECTURE

The system architecture of **Chatify** is designed to support efficient one-to-one communication with minimal complexity. It follows a client-server model to handle real-time messaging between users. Below is an outline of the key components of Chatify's architecture:

1. Client-Server Model

- **Client Side**:
  The client-side application, typically running in a web browser or mobile app, provides the user interface for sending and receiving messages. It handles tasks such as displaying conversations, sending user inputs to the server, and rendering the messages from the server.

- **Server Side**:
  The server is responsible for routing messages between users. When one user sends a message, the server stores it and forwards it to the intended recipient in real-time. The server also manages user authentication and session management.

2. Communication Protocol

- **RESTful API**:
  Chatify uses a RESTful API for communication between the client and the server. HTTP requests (POST/GET) are used to send messages, retrieve chat history, and manage user sessions. This keeps the system simple and easy to scale.
- **Polling for Real-Time Messaging**:
  Since Chatify doesn't implement WebSockets, it uses polling to simulate real-time messaging. The client sends periodic requests to the server to check for new messages, providing the appearance of instant messaging while keeping the architecture straightforward.

3. Database Design

- **Users Table**:
  Stores user information such as username, password (hashed for security), and user settings.
- **Messages Table**:
  This table stores messages exchanged between users. Each message includes details such as sender ID, recipient ID, message content, timestamp, and message status (read/unread).
- **Session Management**:
  Session tokens are generated for users upon login to manage active sessions, ensuring that users can communicate without re-authenticating every time.

4. Message Flow

- **Sending a Message**:
  When a user sends a message, the client makes an API request to the server, which then stores the message in the database and forwards it to the recipient.
- **Retrieving Messages**:
  The recipient periodically polls the server for new messages. If there are new messages, they are retrieved from the database and displayed in the chat window.

- **Message Status**:
  Messages can be marked as "delivered" or "read" based on the recipient's interaction. This information is updated in the database and reflected in the user interface.

5. Authentication and Session Management

- **Simple Authentication**:
  Chatify uses basic username-password authentication. Users must log in to access the chat features. Passwords are stored securely using hashing algorithms.
- **Session Tokens**:
  Upon successful login, session tokens are generated and stored in the client's browser or app to maintain the user's session. This allows users to stay logged in for a period without needing to re-authenticate.

6. Scalability

- **Basic Load Handling**:
  Chatify's architecture, while simple, can handle a moderate number of users due to its lightweight polling mechanism and efficient database queries. As the user base grows, the system can be scaled by horizontally adding more servers to handle traffic.
- **Message Queue**:
  For future scalability, Chatify could integrate a message queue system (such as RabbitMQ or Kafka) to manage high message traffic efficiently and ensure messages are delivered in order.

This architecture provides a foundation for Chatify to handle one-to-one communication efficiently, with room for future expansion and optimization as user demand increases.

USER INTERFACE

The **Chatify** user interface is designed to be simple, intuitive, and visually appealing. The focus is on providing a seamless experience for users to navigate, find contacts, and start conversations. Below is a breakdown of key elements of the UI and UX, based on the provided screenshot and development in HTML and CSS:

1. Clear and Consistent Design

- **Dark Theme**:
  Chatify uses a dark theme with contrasting neon green accents for key actions like the logout button and the search icon. This design choice makes the interface modern, visually striking, and easier on the eyes during long usage.
- **User Profile Section**:
  At the top, users can see their profile picture and status (e.g., "Active now"), giving them a quick snapshot of their current status in the chat app. This reinforces a sense of identity for the user within the app.
- **Logout Button**:
  The bright green "Logout" button is highly visible, making it easy for users to find and log out when needed.

2. Intuitive Navigation

- **Contact List**:
  The interface provides a list of users (e.g., "Z M", "S P", "A J", "H K"), with their status indicated by green or gray dots. The color-coded status markers make it easy for users to identify who is online (green) or offline (gray). Each contact is accompanied by a short status such as "No message available," making it clear that no recent conversations exist.
- **Search Functionality**:
  A search bar with a prominent green button allows users to quickly find a contact. This enhances user experience by providing fast access to specific conversations without scrolling through the contact list.

3. Messaging Flow

- **Simple Interaction**:
  The UI is designed for one-to-one conversations, with clear sections dedicated to contact selection and chat initiation. The simplicity of the messaging process reduces user confusion and ensures that starting a chat is straightforward.

4. Customization and Personalization

- **Profile Picture and Status**:
  Users can see their own profile picture and online status at the top of the chat list, providing a personalized touch. The ability to display a custom profile picture gives users a sense of individuality within the app.

5. Visual Feedback and Accessibility

- **Status Dots**:
  The green and gray dots indicating user availability provide clear, immediate feedback on whether a contact is online or offline. This makes it easier for users to know who is available to chat.
- **Color Contrast**:
  The contrast between the dark background and the neon accents ensures that important elements like buttons and status indicators stand out, improving accessibility for users with visual impairments.

6. Responsiveness

- **Mobile-Friendly Layout**:
  The design seems optimized for both desktop and mobile, with large, tappable areas for each contact, ensuring that the app is easy to use on smaller touchscreens.

The UI and UX of Chatify reflect a focus on simplicity, ease of use, and minimal distractions. The use of HTML and CSS ensures that the design remains lightweight, fast, and easily modifiable. While currently limited to one-on-one conversations, the interface leaves room for future expansions, such as adding group chats or more dynamic status messages.

KEY FUNCTIONALITIES

Chatify is a simple one-to-one conversation platform, built with ease of use in mind. The key functionalities focus on providing a smooth, minimalistic experience for users to connect with each other directly. Below are the primary features offered by Chatify:

1. One-to-One Messaging

- **Direct Messaging**:
  Chatify allows users to engage in real-time one-to-one conversations. The simplicity of this feature ensures a quick and focused user experience without the distractions of group chats or other complex features.

- **Message Notifications**:
  Users are notified of new messages as soon as they log in or refresh the chat, making sure that no conversation is missed. Real-time updates keep users informed about new incoming messages from their contacts.

2. User Status Indicators

- **Online/Offline Status**:
  Each user is marked with a status dot next to their name in the contact list. Green indicates that the user is online, while gray shows that they are offline. This provides users with an immediate overview of which of their contacts are currently available for chatting.

3. Search Functionality

- **Contact Search**:
  The search feature allows users to quickly find specific contacts by entering part of the name in the search bar. This reduces the effort of scrolling through a long contact list, making it easier to start a conversation.

4. Login and Logout

- **User Authentication**:
  Chatify includes a simple login system that requires users to authenticate before accessing the messaging features. Once authenticated, users can start or continue conversations with others.
- **Logout Functionality**:
  Users can log out of the application securely via a clearly visible logout button. This ensures that their session ends when they no longer wish to use the app.

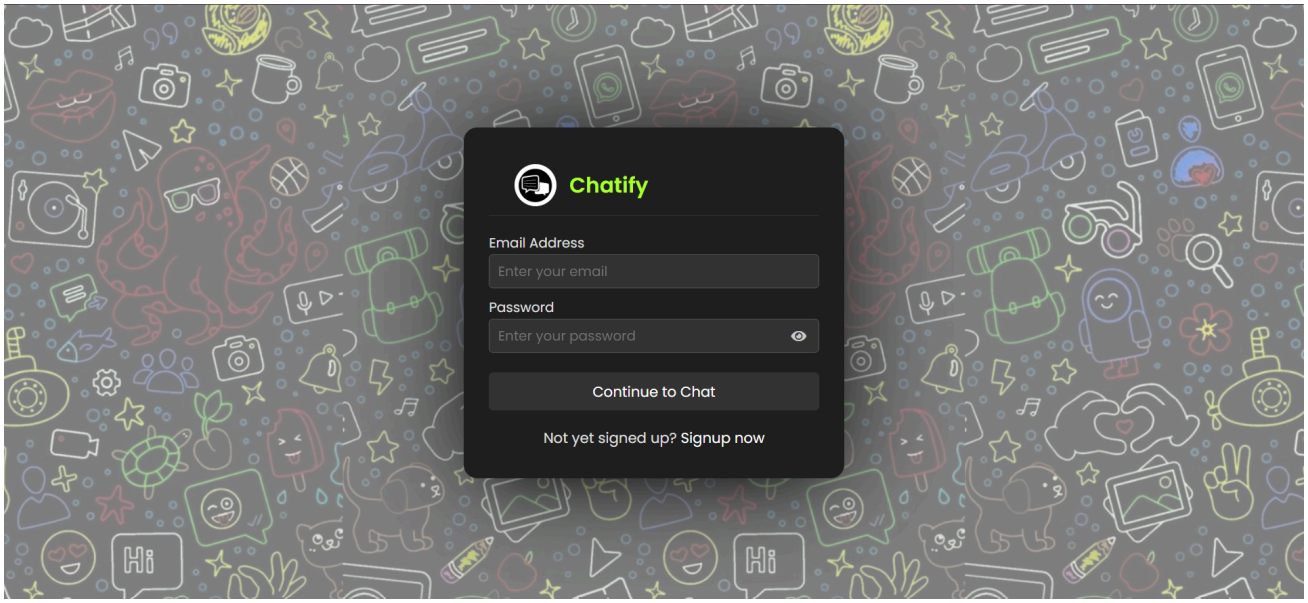
5. Profile and Active Status Display

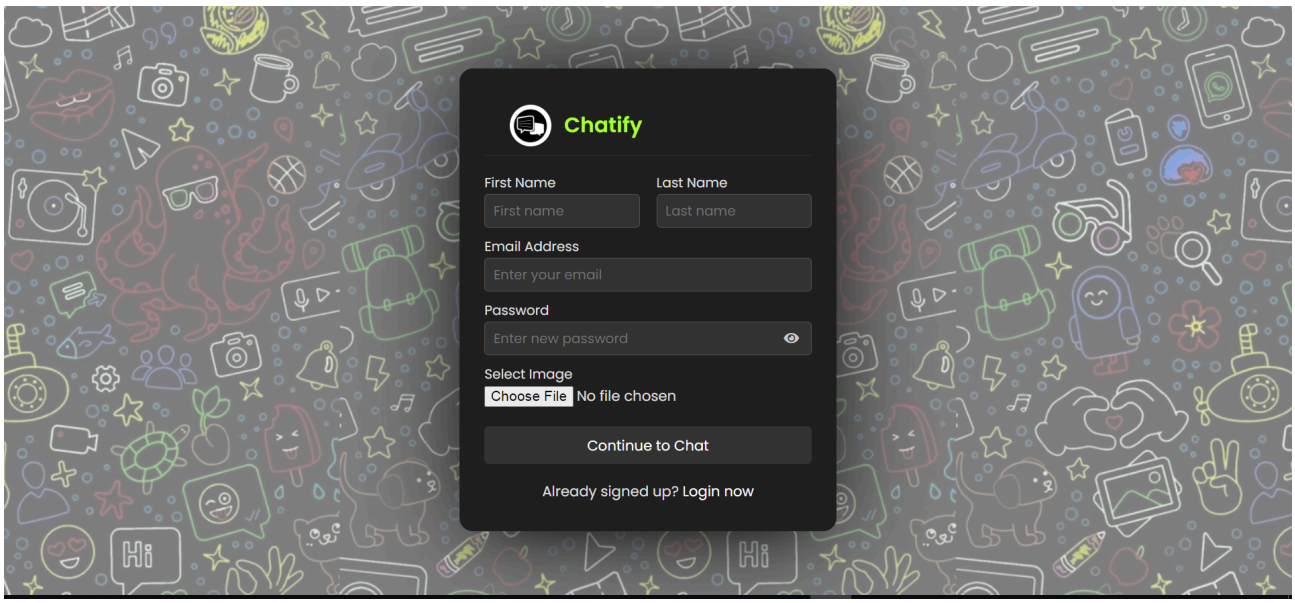
- **Profile Overview**:
  At the top of the chat interface, users can view their own profile picture and active status (e.g., "Active now"). This feature allows users to personalize their profile and gives them a sense of ownership within the application.
- **Self-Status Indication**:
  The app clearly displays the user's online status, helping them know when they are available to others.

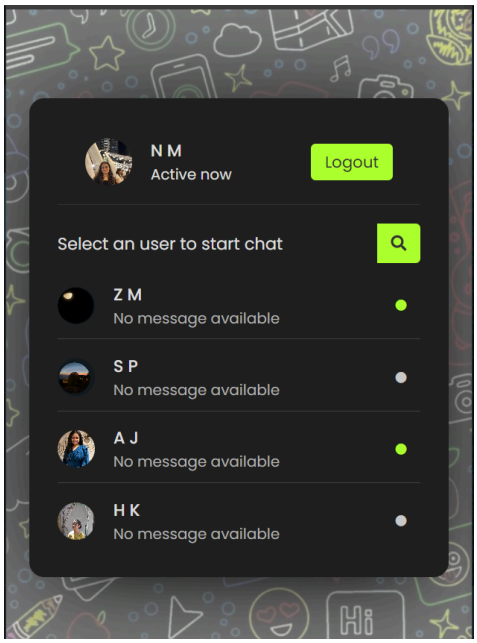
These key functionalities provide users with a straightforward communication experience, making **Chatify** ideal for quick, one-on-one interactions without unnecessary complexity.

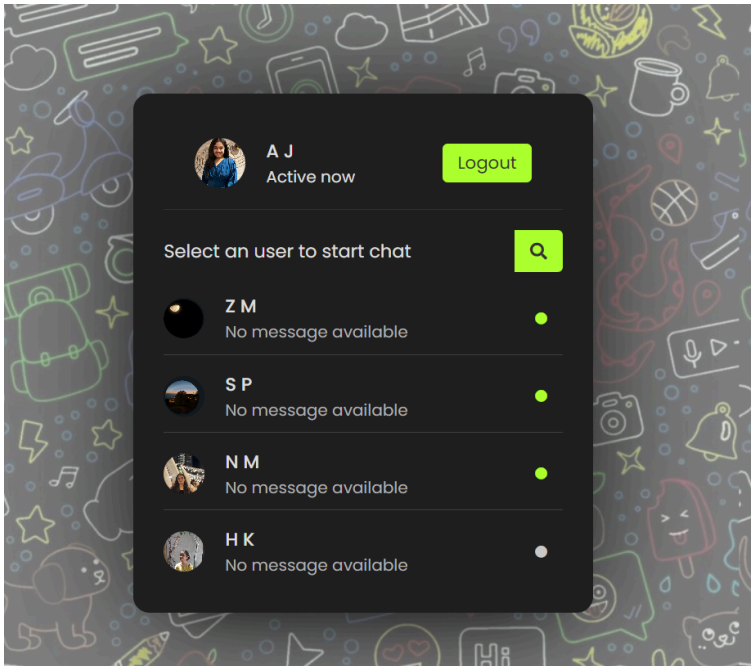
SCREENSHOTS

User interface:






N M
Active now
Logout
Select an user to start chat
Z M
No message available
S P
No message available
A J
No message available
H K
No message available


A J
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N M
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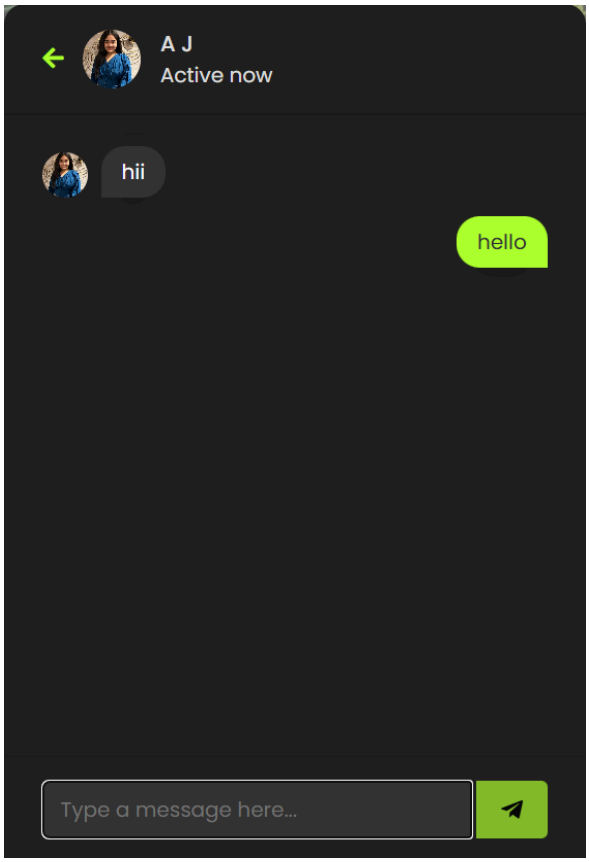
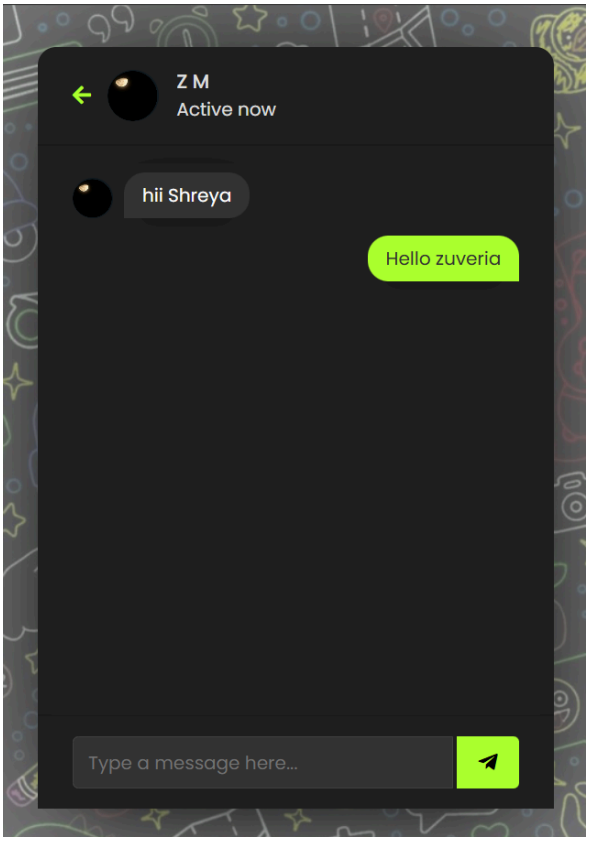
H K
No message available


A J
Active now
hii
hello
Type a message here...


Z M
Active now
hii Shreya
Hello zuveria
Type a message here...

Database:

	user_id	unique_id	fname	lname	email	password	img	status
Edit Copy Delete	6	1005291530	H	K	hk@gmail.com	4297f44b13955235245b2497399d7a93	172966257620240304_193914.jpg	Offline now
Edit Copy Delete	9	1145030606	A	J	aj@gmail.com	4297f44b13955235245b2497399d7a93	1729666605Anjali_Jariwala1.jpg	Active now
Edit Copy Delete	10	1251931745	N	M	nm@gmail.com	4297f44b13955235245b2497399d7a93	1729666714WhatsApp Image 2024-10-04 at 11.02.29_18...	Active now
Edit Copy Delete	11	1267160251	S	P	sp@gmail.com	4297f44b13955235245b2497399d7a93	1729666878sp.png	Offline now
Edit Copy Delete	12	222396713	Z	M	zm@gmail.com	4297f44b13955235245b2497399d7a93	1729666942zm.png	Active now

	msg_id	incoming_msg_id	outgoing_msg_id	msg
Edit Copy Delete	9	481008334	1005291530	Hii
Edit Copy Delete	10	1005291530	481008334	hello
Edit Copy Delete	11	1180674670	1005291530	hii
Edit Copy Delete	12	481008334	1180674670	hii
Edit Copy Delete	13	481008334	1180674670	Kal clg jana he??
Edit Copy Delete	14	1180674670	481008334	Haa
Edit Copy Delete	15	222396713	1145030606	hii
Edit Copy Delete	16	1145030606	222396713	hello
Edit Copy Delete	17	1267160251	222396713	hii Shreya
Edit Copy Delete	18	222396713	1267160251	Hello zuveria

CONCLUSION

Chatify serves as a simple and efficient platform for one-to-one communication, focusing on ease of use and a clean user interface. By offering core features such as direct messaging, online/offline status indicators, and a contact search function, Chatify meets the essential needs of users seeking a streamlined chat experience.

While the application lacks advanced features like group chats or end-to-end encryption, its lightweight design and focus on real-time communication make it ideal for quick, casual conversations. The user interface, developed using HTML and CSS, enhances usability with intuitive navigation and a visually appealing layout.

Moving forward, Chatify offers potential for growth. Features such as message history storage, improved real-time functionality using WebSockets, or even security enhancements could elevate the app for a broader audience. However, in its current form, Chatify effectively delivers a reliable, easy-to-use one-on-one chat application that fulfills its intended purpose with minimal complexity.