

# System Design Document

## Real-Time Chat Application (OMNAMO Chat)

**Deployed Link:** <https://omnamo-chat-rs.onrender.com/>

Since, it is free deploy service it takes some time open. Sorry for the inconvenience.

**Demo Video Link:**

<https://drive.google.com/file/d/1I7bM6gtn7HqRt3NMOHPmv0GQliNJlOSc/view?usp=sharing>

### Overview:

OMNAMO Chat is a real-time chat application designed to facilitate smooth and secure communication between users. It supports both one-on-one messaging and group chats with real-time updates. The application uses a **NoSQL database (MongoDB)** for data storage and real-time communication with **Socket.IO**.

### Key Features:

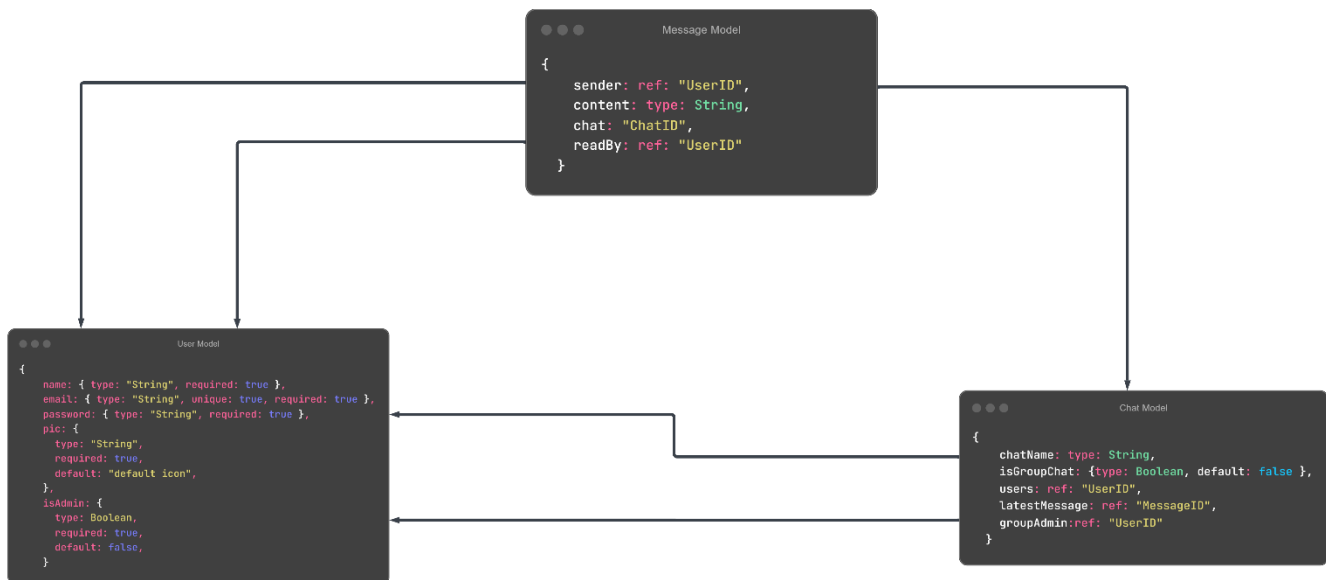
- **Real-Time Messaging:** Real-time, low-latency messaging using Socket.IO.
- **User Authentication:** Secure user authentication using JWT (JSON Web Tokens) and password hashing with bcrypts.
- **Group Chats:** Support for group chats with dynamic participant management.
- **Responsive UI:** Built with **Chakra UI** for responsive and accessible design.
- **Persistent Chat History:** Messages are stored in MongoDB for persistent chat history.

### System Architecture:

The system is built on a **Client-Server Architecture**:

1. **Frontend:** Developed using **ReactJS** for an interactive UI with Chakra UI components and real-time chat features.
2. **Backend:** Built on **Node.js** with **Express.js** for handling API routes and real-time features using **Socket.IO**.
3. **Database:** **MongoDB** is used as the database to store user profiles, chat messages, and chats.

## Data Model:



## Technologies Used:

### 1. Chakra UI

Provides a modern, accessible, and responsive design framework for React applications. Chakra UI's component library allows rapid UI development while ensuring responsiveness across devices.

### 2. Axios

A promise-based HTTP client used to handle API requests and responses between the frontend (React) and backend (Express).

### 3. Bcryptjs

A library used for hashing passwords before storing them in the database. Ensures that sensitive information like passwords are stored securely.

### 4. Socket.IO

Enables real-time bidirectional communication between the client and server. This is used for implementing live chat functionality, where messages are transmitted in real time.

5. **JWT (jsonwebtoken)**

Provides secure authentication using JSON Web Tokens. JWTs ensure that only authenticated users can access protected routes and resources.

6. **Mongoose**

A MongoDB object modeling tool used to define data schemas, manage relationships, and perform queries easily.

7. **React.js**

A popular JavaScript library for building dynamic and efficient user interfaces. React's component-based architecture allows modular and reusable code.

8. **React Router DOM**

Enables navigation within the React app by offering routing capabilities for single-page applications.

9. **Nodemon**

A tool that automatically restarts the Node.js server whenever changes are detected, aiding in efficient development.

10. **Dotenv**

Manages environment variables like API keys and database URIs, which are stored in a .env file for security.

11. **Framer Motion**

A React animation library used to provide smooth, declarative animations, enhancing the user experience.

12. **MongoDB**

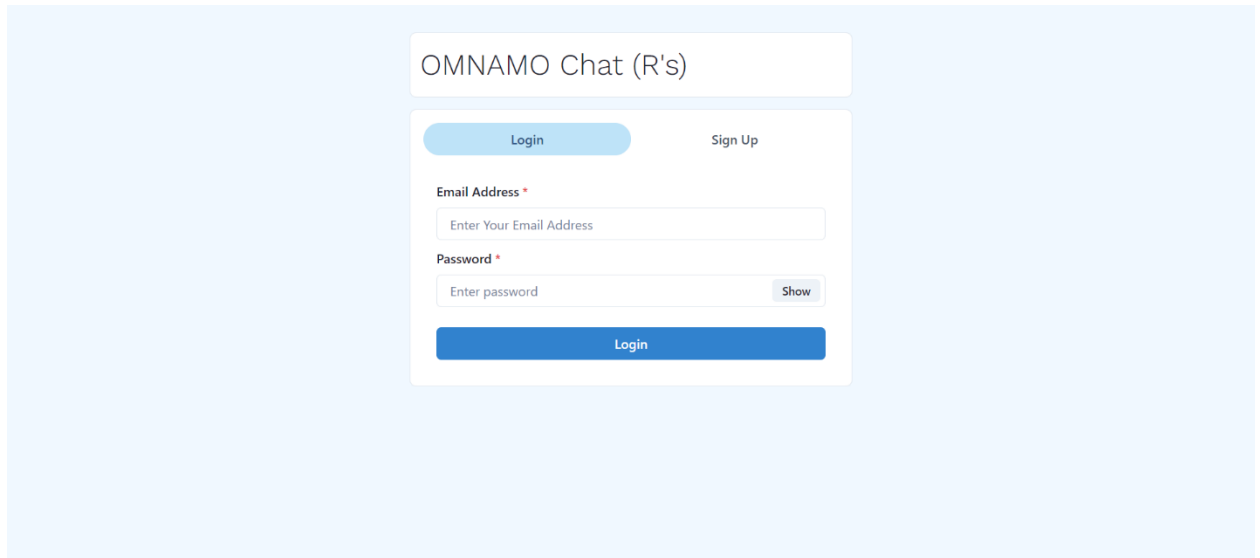
A NoSQL database suited for storing JSON-like data. MongoDB is ideal for this project due to its scalability and flexibility in handling dynamic chat data structures.

13. **Express**

A lightweight web application framework for Node.js. It simplifies the creation of API endpoints and server-side logic.

## Application Images:

- Login



The login form is titled "OMNAMO Chat (R's)". It features two tabs: "Login" (active) and "Sign Up". The form includes fields for "Email Address \*" and "Password \*". The "Email Address" field has a placeholder "Enter Your Email Address". The "Password" field has a placeholder "Enter password" and a "Show" button. A "Login" button is at the bottom.

OMNAMO Chat (R's)

Login Sign Up

Email Address \*

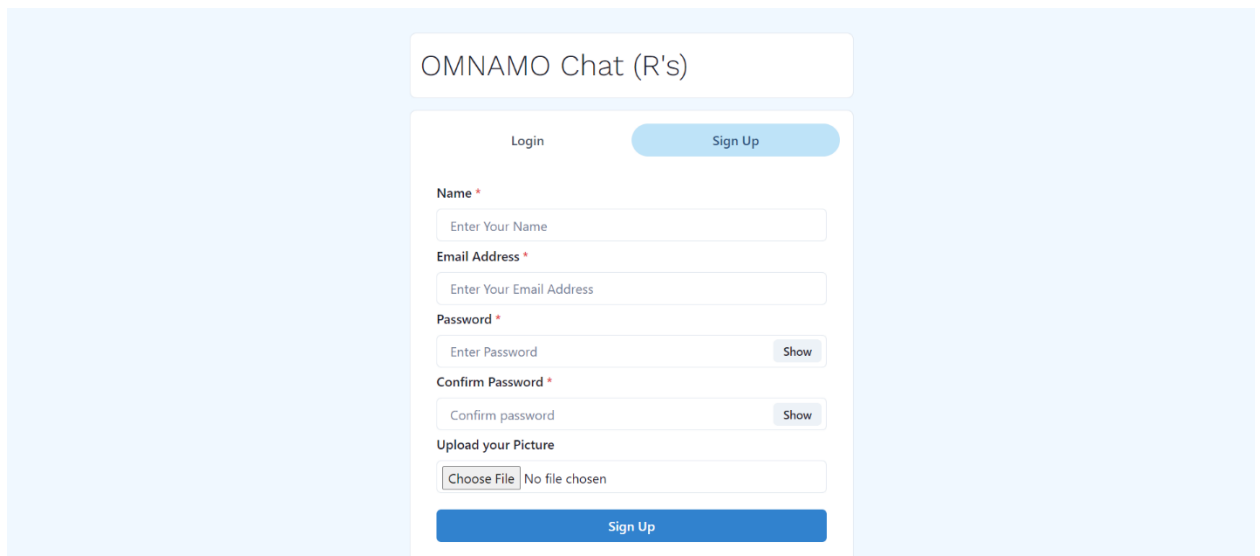
Enter Your Email Address

Password \*

Enter password Show

Login

- Sign Up



The sign up form is titled "OMNAMO Chat (R's)". It features two tabs: "Login" and "Sign Up" (active). The form includes fields for "Name \*", "Email Address \*", "Password \*", "Confirm Password \*", and "Upload your Picture". The "Name" field has a placeholder "Enter Your Name". The "Email Address" field has a placeholder "Enter Your Email Address". The "Password" field has a placeholder "Enter Password" and a "Show" button. The "Confirm Password" field has a placeholder "Confirm password" and a "Show" button. The "Upload your Picture" section has a "Choose File" button and a placeholder "No file chosen". A "Sign Up" button is at the bottom.

OMNAMO Chat (R's)

Login Sign Up

Name \*

Enter Your Name

Email Address \*

Enter Your Email Address

Password \*

Enter Password Show

Confirm Password \*

Confirm password Show

Upload your Picture

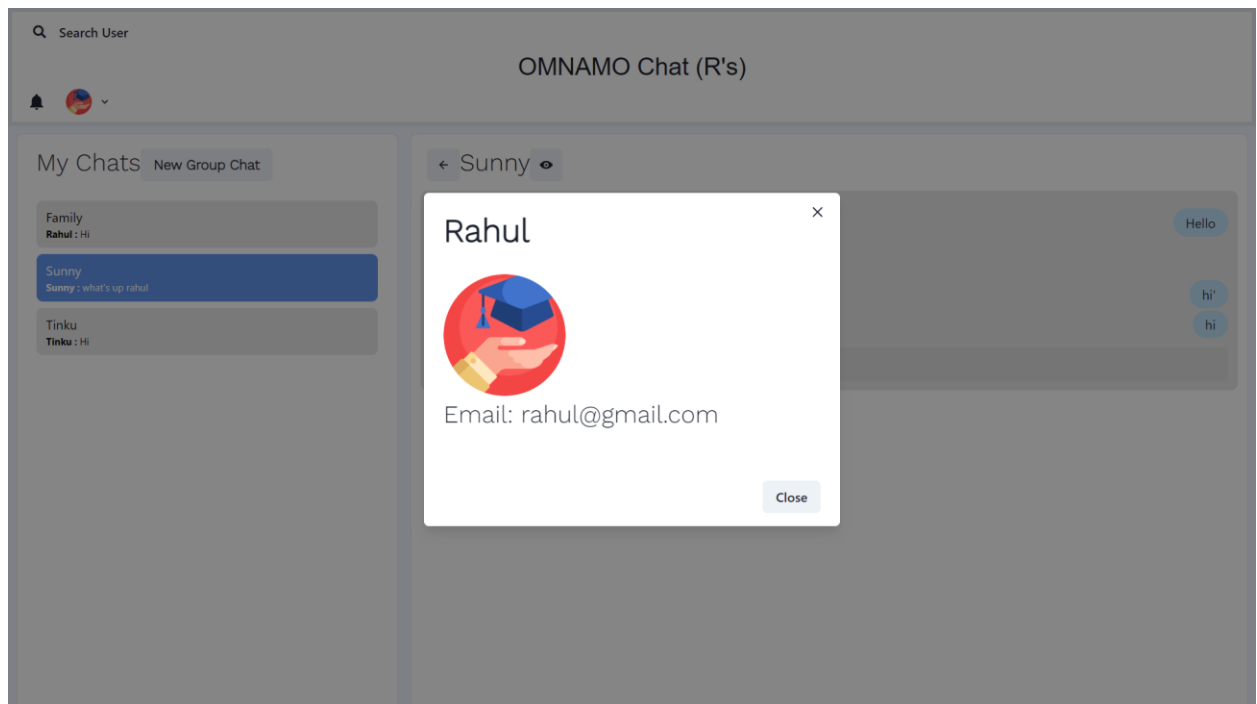
Choose File No file chosen

Sign Up

- Chat Page



- Profile



# Setup/Installation

## Prerequisites:

- **Node.js** (version >= 14)
- **MongoDB** (installed locally or using a cloud service like MongoDB Atlas)
- **NPM**

## Steps for Cloning Repository and Running Application

- **Step-1:** Run the following command in bash for cloning Repo

```
git clone https://github.com/Rahulsree1/OMNAMO-chat-.git
```

- **Step-2:** Navigate to the directory

```
cd OMNAMO-chat--main
```

- **Step-3:** Install dependencies by running following commands

```
npm install
```

- **Step-4:** Setup Environment Variables, by changing the .env file **or** you can run directly no need to change it will run on my database.

```
MONGO_URI=your_mongo_db_uri  
JWT_SECRET=your_secret_key
```

- **Step-5:** Run the Application by typing following command.

```
npm start
```

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