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# I. Abstract

In Today's fast world, Instant communication is essential. This project introduces a real-time chat application that enables instant messaging between users. "Talkiie : A Real Time Chat Application (web-based)".

This web-based application offers real time exchange of message in groups and one-on-one messaging.

This app "Talkiie" is built using HTML,CSS for frontend, PHP for backend and JavaScript and AJAX for asynchronous communication. This system autoloads new messages without refreshing the actual page and leading to fast response of web-page. We have used MySQL database to manage users information and messages.

This application supports group messaging and individual chats.

Asynchronous communication enhances speed of message delivery. This is a user friendly interface making it understandable for people of any age group.

Future versions of application could include voice and video calling, message encryption and mobile version.

## **II. Acknowledgement**

We as a group of three Aditi, Mamta and Ankisha are grateful of our Professor Mr. Suyash Patankar Sir for his guidance throughout the project.

From guiding for selecting project topic to taking project presentation after every fifteen days he has helped a lot. Project presentation was one thing that kept track of our project and made our personal growth allowing us to speak confidently among a group of people which has encouraged us.



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# Report

## 1. Introduction

### I. Existing System

There are many real-time chat applications that exist already such as WhatsApp, Facebook Messenger, Snapchat and many more. These systems provide real-time communication for both one-to-one and group messaging, message delivery status and multi-media sharing over the internet. Some of the system provide end-to-end encryption for messages.

Some may not provide real-time updates they may require page refresh or page reload. Existing systems do not provide customized user interface and a good GUI for chat application.

## II. Need For New System

We wanted to create the new system to offer customized user interface to users allowing them to design their app look as they wish and one more feature that when we would enable video calling and voice calling no data can be recorded without the other user permission to maintain data private and preventing from misuse of pictures taken on a video call.

Existing systems don't allow to take screenshot but allows to screen record which again leads to data loss or data breach.

In future development of this web-application with the video call feature we will try to add setting that will ask user on other side before screen-recording.

## 2. Problem Definition

In many web-based systems there is lack of real time message updates causing communication delays, reducing efficiency. Privacy concerns due to third-party server Dependency.

Limitation to customization of design of web-page as per user need.

To overcome these limitations, this app “Talkiie” introduces real-time chat application that offers instant messaging over the internet using PHP, AJAX, JavaScript and MySQL database. And HTML, CSS for customized user interface by using SVG images from canva .

# 3. Proposed System

## I. Explanation

The new system for real-time chat application "Talkiie".

A web-based chat-app for instant messaging over the internet with auto page reload using AJAX increases the speed of communication making it more efficient. It provides one-to-one and group chatting, real-time messages delivery.

Registration using E-mail and password with name and profile image registers user and login with email and password allows only registered users to use application and communicate with other logged in users.

Responsive UI might attract users to use the application according to their needs. With modern designs, elegant backgrounds and clean designs.

Database stores all data of users and message are stored with timestamps.

..

## II. Methodology Used

- Frontend:-- HTML, CSS, BOOTSTRAP, JavaScript
- Backend:-- PHP, MySQL
- Asynchronous Communication:--- AJAX
- Database:-- MySQL

## 4. Scope Of The System

The proposed system is designed for small to medium scale organizations and personal use.

Its designed very simple that it can be used by people of any age group with ease.

It can be accessed from any device with a web browser.

Supports multiple users communicating simultaneously.

Current System only supports text-based messaging is one of the limitations to this. Future versions will include video calls, voice calls, message encryption and file sharing of any type.

# 5. System Requirements

## I. Hardware Requirement

- CPU :- Intel(R)Core(TM) i5-8350u CPU @ 1.70GHz, 1896...
- RAM :- 8 GB
- Storage :- 256GB
- Network Requirements :- Wi-Fi, Internet connection with speed 60mbps

## II. Software Requirements

- Operating System :- Windows or Linux
- Web Server :- Apache 2.4
- Database :- MySQL
- Programming Languages :- HTML,CSS,PHP,JS,AJAX
- Libraries Framework :- mysqli, bootstrap, json

## **6. Fact Finding Techniques**

To create this real-time chat application we mostly had a group discussion and a hackathon competition held in our college where we students represented their presentation and we discussed what extra we can add. And rest is based on our personal experience.

# 7. Feasibility Study

## I. Operational Feasibility :-

- The chat application is simple and has a friendly user interface
- Users can easily send messages in group or to an individual user.
- Use of AJAX for instant messaging without refreshing the page.
- The application is web-based that can be accessed from desktops, laptops, and mobile devices.

## II. Technical Feasibility :-

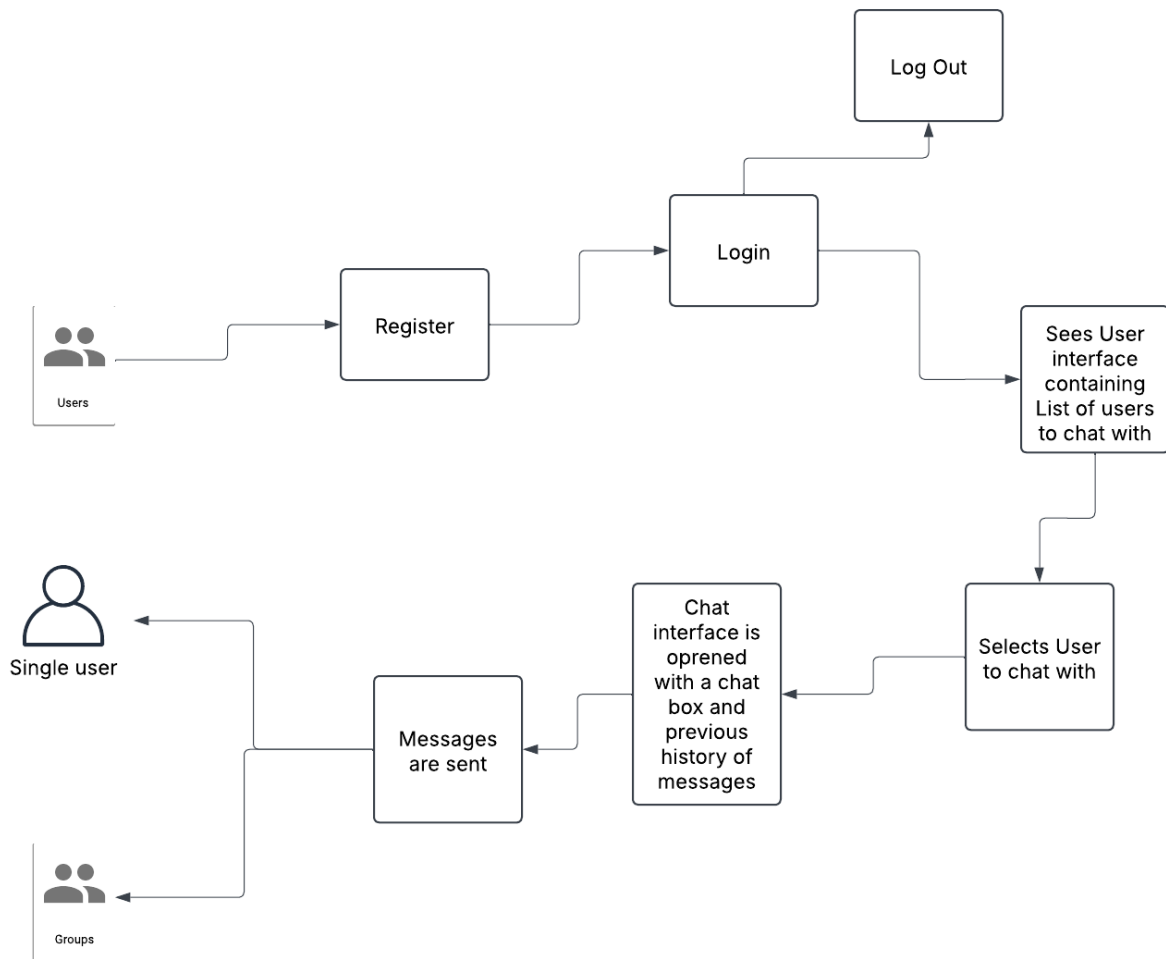
- The system uses PHP, MySQL, HTML, CSS and JavaScript which are widely supported and easily accessible
- MySQL database can handle large volumes of messages efficiently.
- System is compatible with common web servers like Apache
- AJAX enables asynchronous message delivery without reloading page.
- This can be enhanced with WebSockets in future for better scalability

### III. Economic Feasibility:-

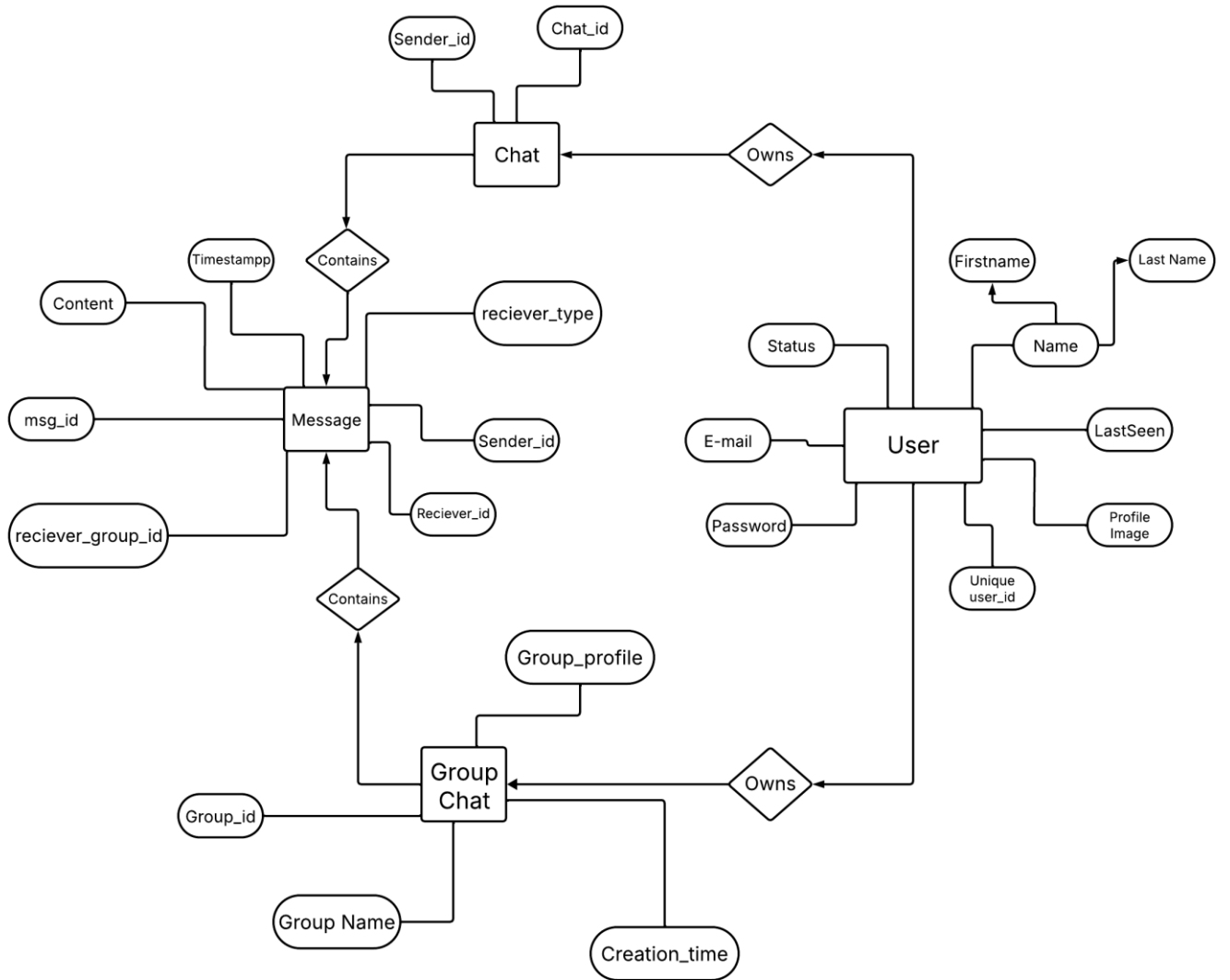
- Standard server with basic storage and 4GB+ RAM is sufficient.
- No need for advanced hardware, reduces cost.
- This app uses open-source technologies (PHP,MySQL,JavaScript) making it free to develop.
- No external APIs or third-party services required.
- Self-hosting reduces cloud expenses.
- Minimal maintenance cost as system uses familiar technologies.

# 8. Diagrams

## 1. System Flow Diagram

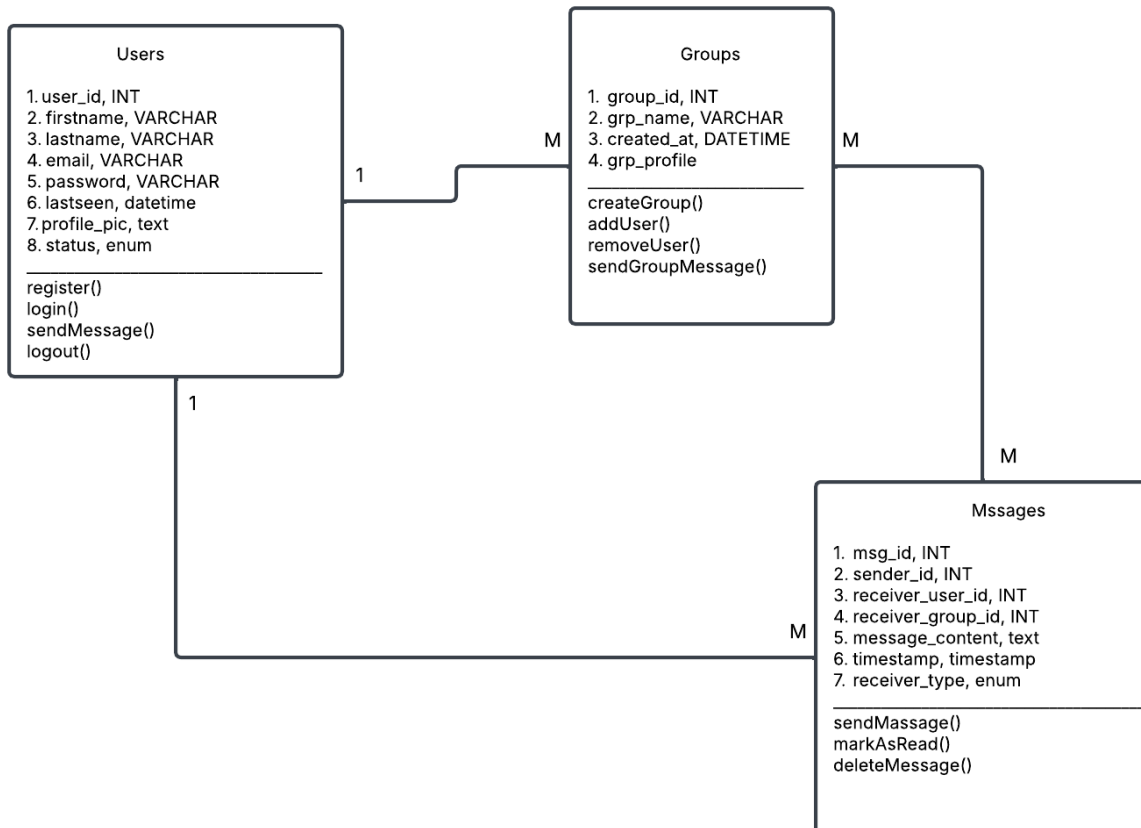


## 2. E-R Diagram

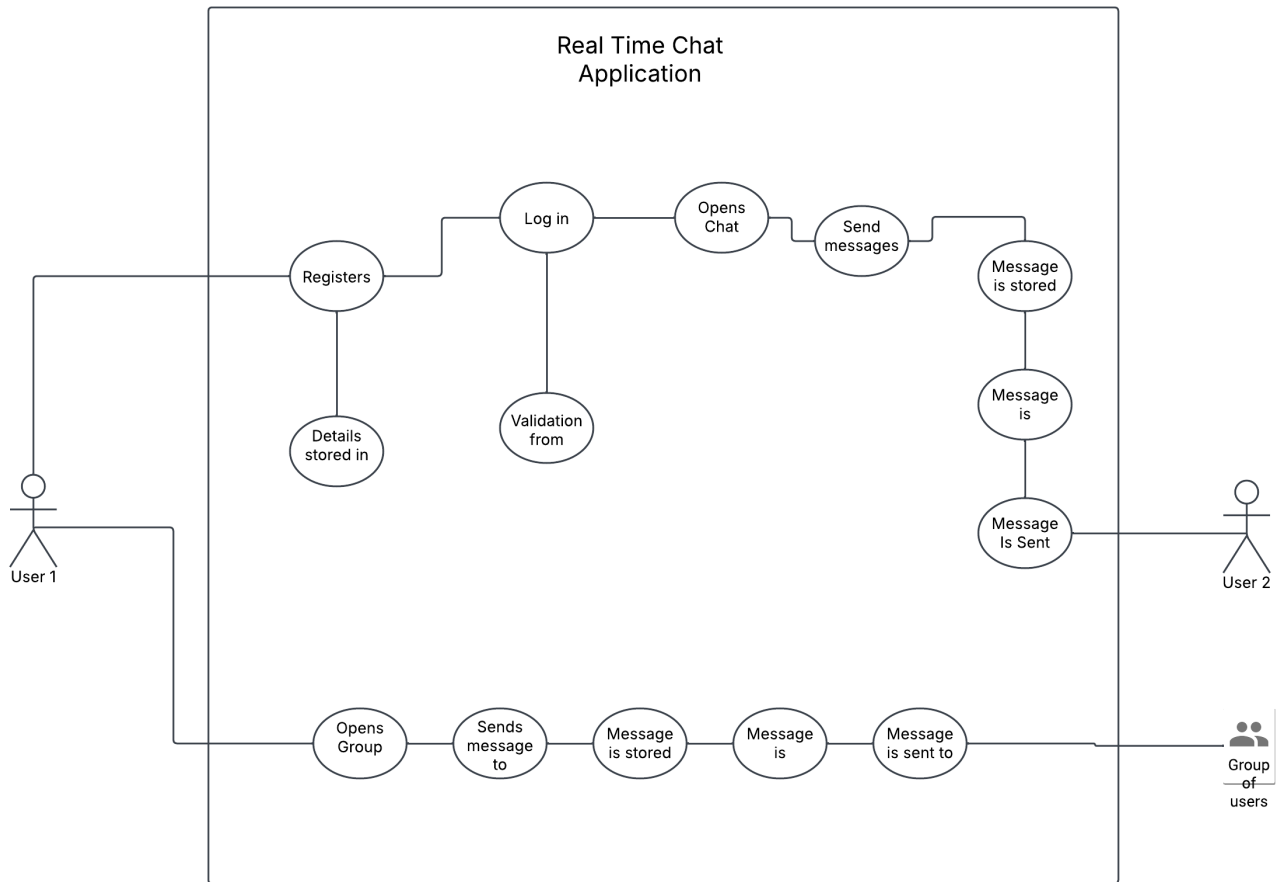


### 3. UML Diagram

#### 1. Class Diagram



## 2. USE CASE Diagram



# 9. Data Dictionary

## 1) user table

user_id	Unique id for each user
firstname	First name of user
lastname	Last name of user
email	Email to login
password	Password to login
profile_pic	Profile image
lastseen	Time when user has last seen
status	Online or offline

## 2) groups table

grp_id	Unique id for each group
grp_name	Name group
created_at	Time when group was created
grp_profile	Profile image of group

## 3) group\_members table

grp_memb_id	Unique id for each member of groups
grp_id	Refers to the grp_id in table groups
user_id	Refers to the user_id in table users

#### 4) messages table

msg_id	Unique id for each message
sender_id	Refers to the user_id from user table
receiver_user_id	Refers to the user_id from users table
receiver_group_id	Refers to the grp_id from groups table
message_content	Message to be sent is stored
timestamp	Time when message is stored
is_read	Checks if message is read or not

..

receiver_type	It define type of receiver user or group
---------------	--

# 10. Database Designing

## 1) 'users' table

Server: 127.0.0.1 » Database: chat\_app\_db » Table: users

Table structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/>	1	user_id	int(11)	UNSIGNED	No	None		AUTO_INCREMENT	<a href="#">Change</a>
<input type="checkbox"/>	2	firstname	varchar(255)	utf8mb4_general_ci	No	None			<a href="#">Change</a>
<input type="checkbox"/>	3	lastname	varchar(255)	utf8mb4_general_ci	No	None			<a href="#">Change</a>
<input type="checkbox"/>	4	email	varchar(100)	utf8mb4_general_ci	No	None			<a href="#">Change</a>
<input type="checkbox"/>	5	password	varchar(255)	utf8mb4_general_ci	No	None			<a href="#">Change</a>
<input type="checkbox"/>	6	lastseen	datetime		Yes	current_timestamp()			<a href="#">Change</a>
<input type="checkbox"/>	7	profile_pic	text	utf8mb4_general_ci	Yes	"https://cdn.pixabay.com/photo/2015/10/05/22/37/blank-profile-picture-973460_1280.png"			<a href="#">Change</a>
<input type="checkbox"/>	8	status	enum('online', 'offline')	utf8mb4_general_ci	No	offline			<a href="#">Change</a>

Check all With selected: [Browse](#) [Change](#) [Drop](#) [Primary](#) [Unique](#) [Index](#) [Spatial](#) [Fulltext](#)

Print [Propose table structure](#) [Move columns](#) [Normalize](#)

Add 1 column(s) after status [Go](#)

Indexes

Console

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
---------	------	--------	--------	--------	-------------	-----------	------	---------

## 2)'groups' table

localhost / 127.0.0.1 / chat\_app x +

http://localhost/phpmyadmin/index.php?route=/table/structure&db=chat\_app\_db&table=groups

Server: 127.0.0.1 » Database: chat\_app\_db » Table: groups

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/>	1	grp_id	int(10)	UNSIGNED	No	None		AUTO_INCREMENT	<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
<input type="checkbox"/>	2	grp_name	varchar(255)	utf8mb4_general_ci	No	None			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
<input type="checkbox"/>	3	created_at	datetime		No	current_timestamp()			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
<input type="checkbox"/>	4	grp_profile	text	utf8mb4_general_ci	No	None			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>

Check all With selected: [Browse](#) [Change](#) [Drop](#) [Primary](#) [Unique](#) [Index](#) [Spatial](#) [Fulltext](#)

[Print](#) [Propose table structure](#) [Move columns](#) [Normalize](#)

Add 1 column(s) after grp\_profile [Go](#)

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
<a href="#">Edit</a> <a href="#">Rename</a> <a href="#">Drop</a>	PRIMARY	BTREE	Yes	No	grp_id	0	A	No	

Create an index on 1 columns [Go](#)

Console

### 3) 'groupmembers' table

The screenshot shows the phpMyAdmin interface for the 'group\_members' table. The table structure is as follows:

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	grp_memb_id	int(11)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	grp_id	int(11)		UNSIGNED	No	None			Change Drop More
3	user_id	int(11)		UNSIGNED	No	None			Change Drop More

Below the table structure, there are options to check all columns, browse, change, drop, primary, unique, index, spatial, and fulltext. There are also options to print, propose table structure, move columns, and normalize. A form to add a new column is visible, with '1' in the input field, 'column(s)' in the dropdown, and 'after user\_id' in the dropdown. The 'Indexes' section shows three indexes:

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Rename Drop	PRIMARY	BTREE	Yes	No	grp_memb_id	0	A	No	
Edit Rename Drop	grp_id	BTREE	No	No	grp_id	0	A	No	
Edit Rename Drop	user_id	BTREE	No	No	user_id	0	A	No	

At the bottom, there is a form to create a new index on 1 column(s) with a 'Go' button.

## 4) 'message' table

localhost / 127.0.0.1 / chat\_app x +

http://localhost/phpmyadmin/index.php?route=/table/structure&db=chat\_app\_db&table=message

Server: 127.0.0.1 » Database: chat\_app\_db » Table: message

[Browse](#)
[Structure](#)
[SQL](#)
[Search](#)
[Insert](#)
[Export](#)
[Import](#)
[Privileges](#)
[Operations](#)
[Triggers](#)

[Table structure](#)
[Relation view](#)

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/>	1 msg_id	int(11)		UNSIGNED	No	None		AUTO_INCREMENT	<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
<input type="checkbox"/>	2 sender_id	int(11)		UNSIGNED	No	None			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
<input type="checkbox"/>	3 receiver_user_id	int(10)		UNSIGNED	No	None			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
<input type="checkbox"/>	4 receiver_group_id	int(10)		UNSIGNED	No	None			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
<input type="checkbox"/>	5 message_content	text	utf8mb4_general_ci		Yes	NULL			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
<input type="checkbox"/>	6 timestamp	timestamp			No	current_timestamp()			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
<input type="checkbox"/>	7 is_read	tinyint(1)			No	0			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
<input type="checkbox"/>	8 receiver_type	enum('user', 'group')	utf8mb4_general_ci		Yes	NULL			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>

Check all
 With selected:
 [Browse](#)
[Change](#)
[Drop](#)
[Primary](#)
[Unique](#)
[Index](#)
[Spatial](#)
[Fulltext](#)

[Print](#)
[Propose table structure](#)
[Move columns](#)
[Normalize](#)

[Add](#)

column(s)
 after receiver\_type
 [Go](#)

[Indexes](#)

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
			No		msg_id	0	A	No	

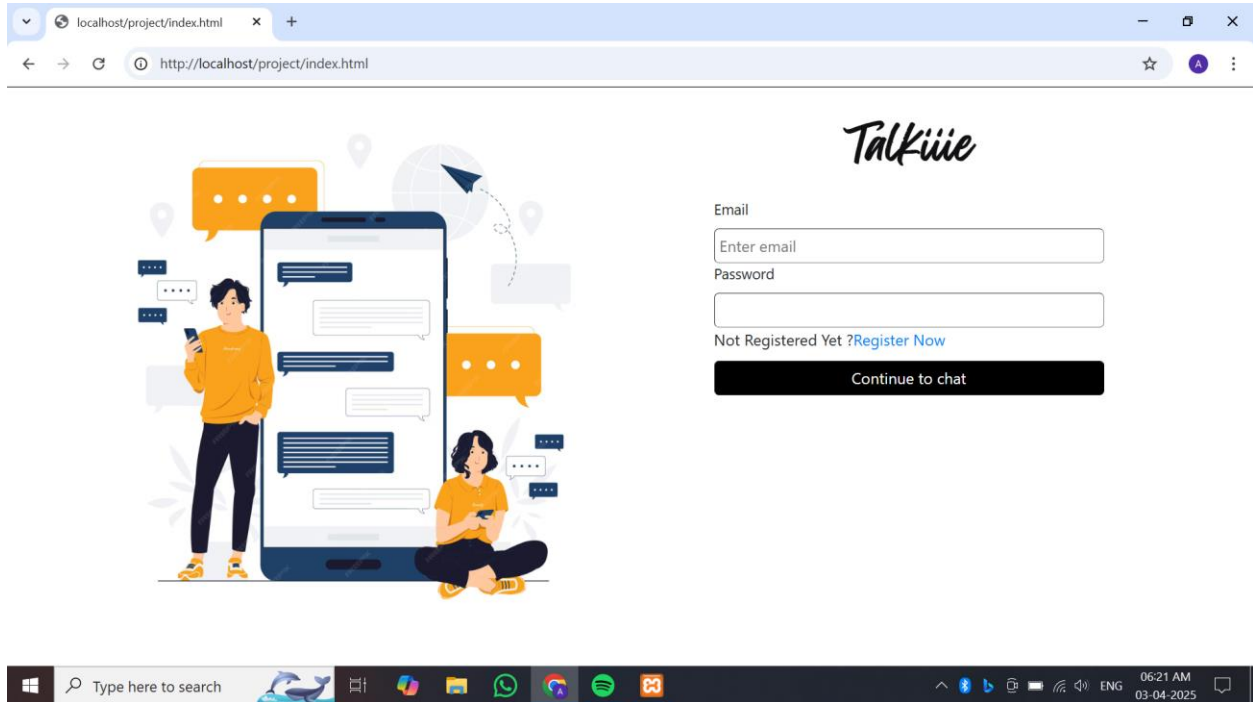
localhost/phpmyadmin/index.php?route=/database/structure&db=chat\_app...

# 11. Screen Designing

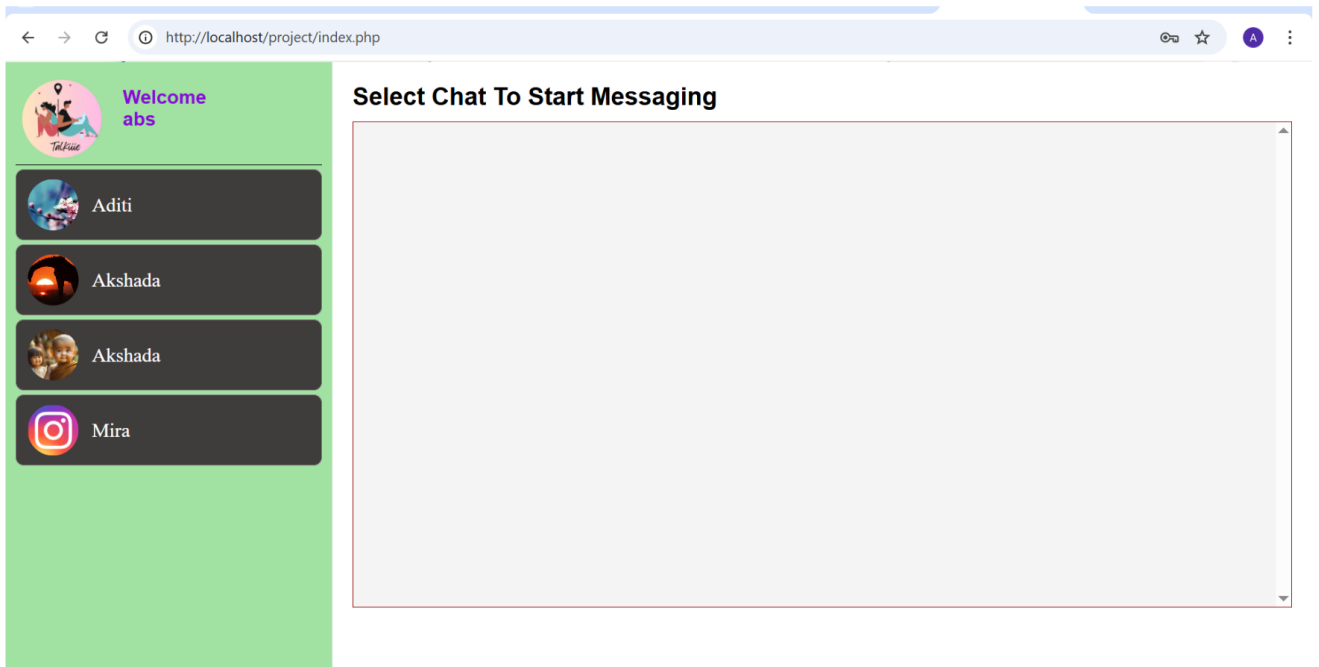
## 1. Registration page



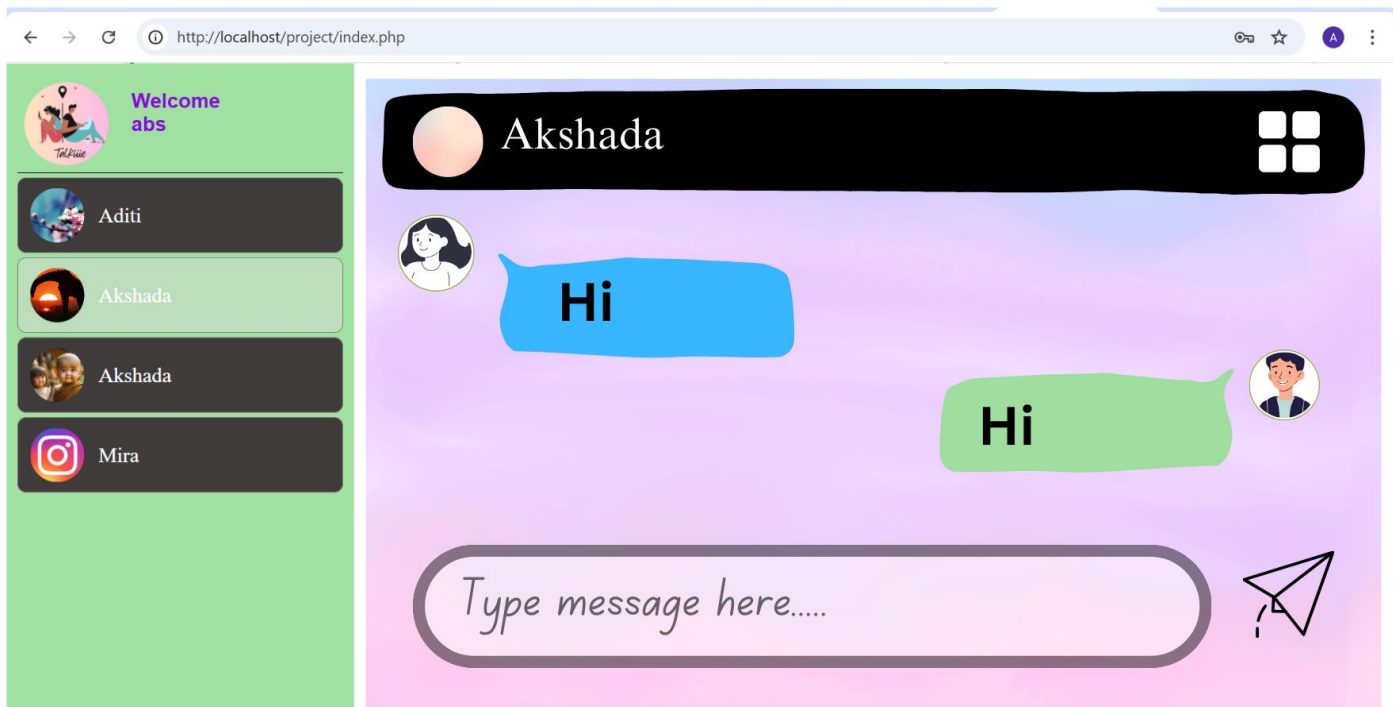
## 2. Login Page



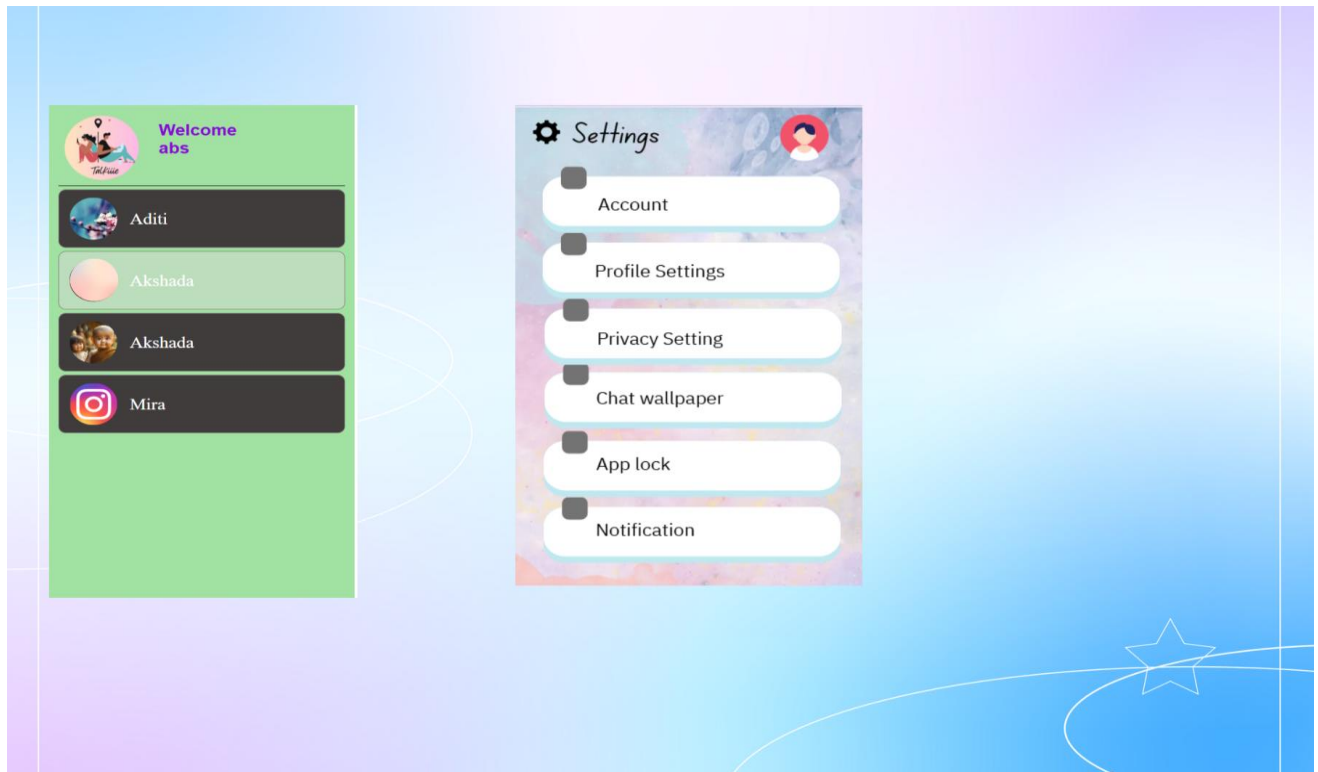
### 3. User list



## 4. Chat Interface



## 5. Settings Page



## **12. Test Cases (Login page and Registration page )**

Test ID	Testcase Name	Test Description	Pre-Conditions	Steps	Test Data	Expected Result	Actual Result
CA-01	Registration Functionality of Chat Application	To Verify the Registration Functionality of Chat Application <b>(With Valid Email and Valid Password)</b>	To check The internet connection.	To Start the internet connection		Internet connection should be available	Internet connection should be available
			to vistl URL	To visit the URL	<a href="https://www.Talkiite.com/login/">https://www.Talkiite.com/login/</a>	URL should be opened and Launched the chat application	URL is open and Launch the chat application login page
			User have valid Account	Enter Valid Email	<a href="mailto:admisha01@gmail.com">admisha01@gmail.com</a>	Enter valid Email should be Accepted	valid Email should be Accepted
				Enter Valid Password	Admisha123*	Enter valid Password should be Accepted	valid Password should be Accepted
	Click on Continue to Chat		login should be successful and navigate to chat home page	Login is successful			
CA-02	Registration Functionality of Chat Application	To Verify the Registration Functionality of Chat Application <b>(With Invalid Email and Valid Password)</b>		Enter InValid Email	<a href="mailto:admisha13@gmail.com">admisha13@gmail.com</a>	Enter invalid Email should be Accepted	Invalid Email is rejected
				Enter valid password	Admisha123*	Enter valid Password should be Accepted	valid Password is rejected
				Click on Continue to Chat		login should not be successful it should show error message	login is failed and showing error message
CA-03	Registration Functionality of Chat Application	To Verify the Registration Functionality of Chat Application <b>(With Invalid Email and Invalid Password)</b>		Enter Valid Email	<a href="mailto:admisha01@gmail.com">admisha01@gmail.com</a>	Enter valid Email should be Accepted	valid Email is accepted
				Enter invalid password	Admisha1234*	Enter invalid Password should be Accepted	invalid Password is rejected
				Click on Continue to Chat		login should not be successful it should show error message	login is failed and showing error message

CA-04	Registration Functionality of Chat Application	To Verify the Registration Functionality of Chat Application <b>(With Invalid Email and Invalid Password)</b>		Enter InValid Email	<a href="mailto:admisha13@gmail.com">admisha13@gmail.com</a>	Enter invalid Email should be Accepted	Invalid Email is rejected
				Enter Invalid password	Admisha1234*	Enter invalid Password should be Accepted	invalid Password is rejected
				Click on Continue to Chat		login should not be successful it should show error message	login is failed and showing error message
CA-05	Registration Functionality of Chat Application	To Verify the Registration Functionality of Chat Application <b>(With valid image)</b>	Choose Profile Image	Upload a valid JPEG image.		The image should upload successfully. A success message "Profile image updated successfully!" should be displayed.	Image upload Successfully
				Upload a valid PNG image.		The image should upload successfully. A success message "Profile image updated successfully!" should be displayed.	Image upload Successfully
CA-06	Registration Functionality of Chat Application	To Verify the Registration Functionality of Chat Application <b>(With Invalid image)</b>	Choose Profile Image	Upload a Invalid JPEG image.		An error message "Invalid file format. Please upload a JPEG file	Invalid File Format
				Upload a Invalid PNG image.		An error message "Invalid file format. Please upload a PNG file	Invalid File Format

X40							
A	B	C	D	E	F	G	H
Test ID	Testcase Name	Test Description	Pre-Conditions	Steps	Test Data	Expected Result	Actual Result
CA-01	Login Functionality of Chat Application	To Verify the Login Functionality of Chat Application ( <b>With Valid Email and Valid Password</b> )	To check The internet connection.	To Start the internet connection		Intenet connection should be available	Intenet connection should be available
			to visti URL	To visit the URL	<a href="https://www.Talkiie.com/login/">https://www.Talkiie.com/login/</a>	URL should be opened and Launched the chat application	URL is open and Launch the chat application login page
			User have valid Account	Enter Valid Email	<a href="mailto:admisha01@gmail.com">admisha01@gmail.com</a>	Enter valid Email should be Accepted	valid Email should be Accepted
				Enter Valid Password	Admisha123*	Enter valid Password should be Accepted	valid Password should be Accepted
			Click on Continue to Chat		login should be successful and navigate to chat home page	Login is successful	
CA-02	Login Functionality of Chat Application	To Verify the Login Functionality of Chat Application ( <b>With InValid Email and Valid Password</b> )		Enter InValid Email	<a href="mailto:admisha13@gmail.com">admisha13@gmail.com</a>	Enter invalid Email should be Accepted	Invalid Email is accepted
				Enter valid password	Admisha123*	Enter valid Password should be Accepted	valid Password is Accepted
				Click on Continue to Chat		login should not be successful it should show error message	login is failed and showing error message
CA-03	Login Functionality of Chat Application	To Verify the Login Functionality of Chat Application ( <b>With Valid Email and InValid Password</b> )		Enter Valid Email	<a href="mailto:admisha01@gmail.com">admisha01@gmail.com</a>	Enter valid Email should be Accepted	valid Email is accepted
				Enter invalid password	Admisha1234*	Enter invalid Password should be Accepted	invalid Password is Accepted
				Click on Continue to Chat		login should not be successful it should show error message	login is failed and showing error message
CA-04	Login Functionality of Chat Application	To Verify the Login Functionality of Chat Application ( <b>With InValid Email and InValid Password</b> )		Enter InValid Email	<a href="mailto:admisha13@gmail.com">admisha13@gmail.com</a>	Enter invalid Email should be Accepted	Invalid Email is accepted
				Enter InValid password	Admisha1234*	Enter invalid Password should be Accepted	invalid Password is Accepted
				Click on Continue to Chat		login should not be successful it should show error message	login is failed and showing error message

# 13. Conclusions

The development of this Talkiie is successfully demonstrates the integration of instant messaging, user management.

By using Ajax for real-time updates the application ensures smooth and low latency communication without requiring page loads.

Features:-

1. Instant messaging
2. User authentication and management
3. Database optimization

Challenges and Solution

1. Scalability issues:-Optimized database queries and indexing were implemented to handle large scale user activity.

2. Data Consistency :-Constraints and foreign keys maintain relational integrity between messages and users.

3. Security Concerns- passwords are hashed.

4. Responsive GUI using media query

Future Enhancements:-

- 1) Enabling Video calling and Voice calling
- 2) Multimedia Support
- 3) End-to-End encryption
- 4) AI-powered Chat Features
- 5) Story sharing
- 6) Video call integrity

# 14. Bibliography References

- W3Schools. (n.d.). AJAX Tutorial. Retrieved from <https://www.w3schools.com/ajax/>
- GeeksforGeeks. (n.d.). PHP and MySQL for Real-Time Chat Applications. Retrieved from <https://www.geeksforgeeks.org/>
- Styling svg are taken from <https://www.canva.com/>
- <https://chatgpt.com/>
- <https://youtu.be/UdamtabIRtk?si=W7jkN0m38KBkbqOv>