

# CENG 3545: Mobile Application Development

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<b>Project Topic</b>	A Multi-Purpose Platform for Group Communication and Collaboration
<b>Project Description</b>	This project involves the development of a real-time communication platform designed to connect communities and facilitate seamless collaboration. Inspired by a popular platform like Discord, the app enables users to create and join chat rooms, engage in group conversations, and communicate via text and voice.

**Scenario:** Sarah, a university student, is part of a study group working on a team project. Due to conflicting schedules, they need a way to communicate and collaborate virtually.

## 1. Organizing the Study Group

Sarah creates a *club* called "Project Group" and invites her teammates. They create *text channels* for different topics they also create a *voice channel* for discussing:

### Text Channels:

- Research and Resources
- Presentation Slides
- Final Report

### Voice Channel:

- Discussing

Each member joins the relevant channels and contributes without cluttering the conversation.

## **2. Real-Time Messaging and File Sharing**

- Sarah shares links to research articles in the "Research and Resources" channel.
- John uploads a draft of the PowerPoint in the "Presentation Slides" channel for feedback.
- The team discusses their progress in real-time through text chat.

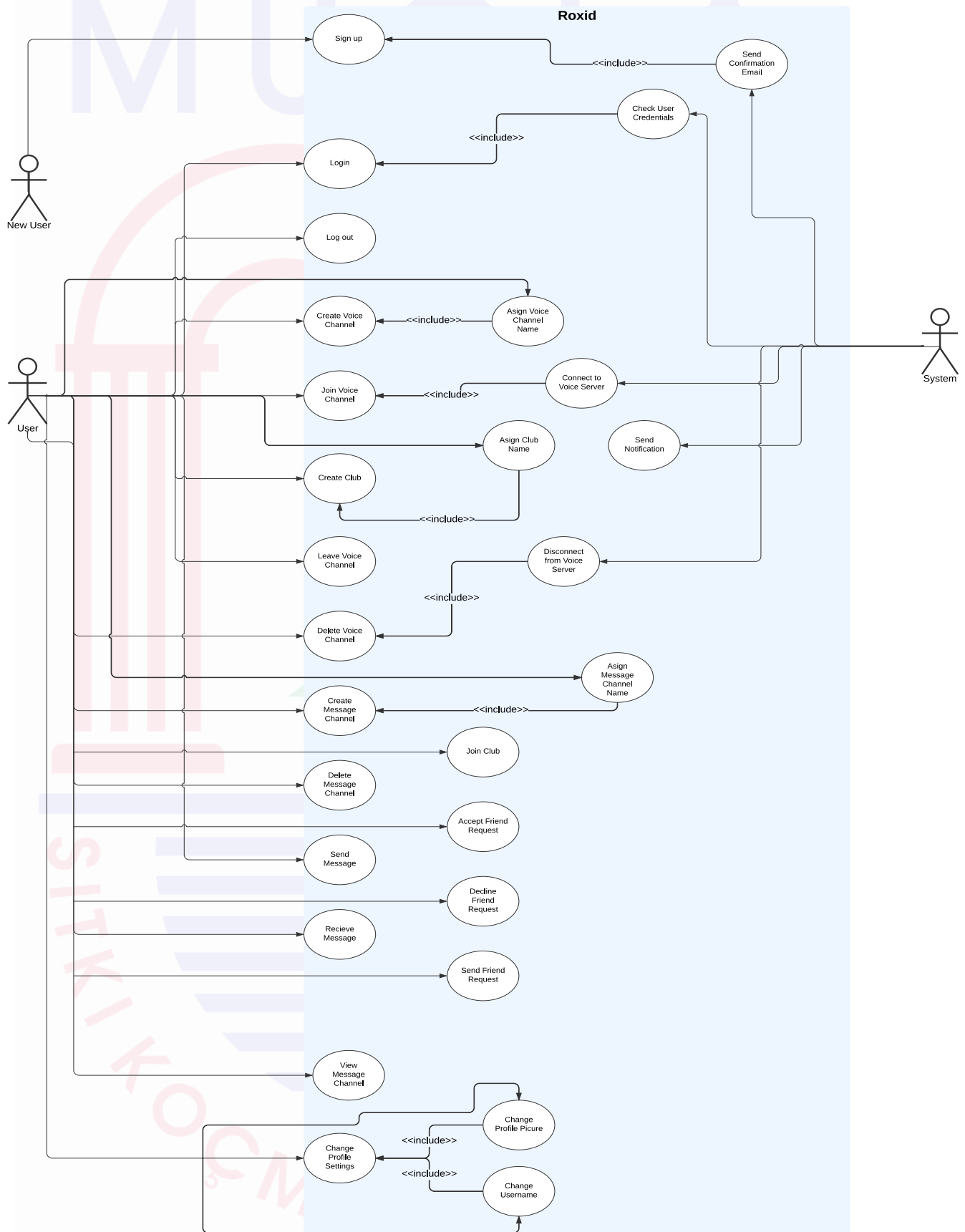
## **3. Voice Collaboration**

Needing quick feedback on the report, Sarah and group enter the discussing voice channel, and the group discusses their edits live.

## **4. Staying Updated**

The app sends push notifications when new messages or files are added, keeping everyone informed.

# Use Case Diagram



<b>Use Case Name</b>	Sign Up
<b>Participating Actors</b>	New User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• A user navigates to the registration page.</li> <li>• The user selects the “Register” option.</li> <li>• The system presents a registration form.</li> <li>• The user enters required information, such as name, email address and password.</li> <li>• The user submits the registration form.</li> <li>• The system validates the provided information.</li> <li>• The system creates a new user account.</li> <li>• The system sends a verification email to the user’s provided email address.</li> <li>• The user clicks the verification link in the email.</li> <li>• The system verifies the email and activates the user account.</li> <li>• The system notifies the user of successful registration.</li> <li>• The user is now able to log in with the new account.</li> </ul>

<b>Use Case Name</b>	Login
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• The user navigates to the login page.</li> <li>• The user enters their registered email address or username and password.</li> <li>• The system validates the input: <ul style="list-style-type: none"> <li>○ If the credentials are correct, proceed to next step.</li> <li>○ If the credentials are incorrect, display an error message and allow the user to re-enter the information.</li> </ul> </li> <li>• The system verifies the user’s identity and session: <ul style="list-style-type: none"> <li>○ If successful, create a secure session for the user.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ If unsuccessful (e.g., inactive account, incorrect password), display an appropriate error message.</li> <li>● The user gains access to the system and is redirected to the dashboard or a designated landing page.</li> </ul>
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<b>Use Case Name</b>	Logout
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>● The user selects the profile icon.</li> <li>● The user selects logout button.</li> <li>● System backs to login page.</li> </ul>

<b>Use Case Name</b>	Change Profile Settings
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>● The user selects the profile icon.</li> <li>● System shows profile details (e.g., profile picture, nickname, background picture)</li> <li>● The user enters a new nickname and save.</li> <li>● The user select new background picture and profile picture.</li> <li>● The system checks format file extension: <ul style="list-style-type: none"> <li>○ If the extension is valid profile picture is changed.</li> <li>○ If not valid, go back to previous step.</li> </ul> </li> </ul>

<b>Use Case Name</b>	Send Friend Request
<b>Participating Actors</b>	Users
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• The users selects friends icon.</li> <li>• The system shows friends and friend requests.</li> <li>• The user selects one of friends.</li> <li>• The system shows chat history.</li> <li>• The user selects add button and enter friend's username: <ul style="list-style-type: none"> <li>○ The system shows if user there is a matching username.</li> <li>○ If no matching, system show message.</li> </ul> </li> <li>• A notification appears to other user: <ul style="list-style-type: none"> <li>○ If user accepts friend request, they're being friends and they see can each other's icons.</li> <li>○ If user don't accept request, nothing will happen.</li> </ul> </li> </ul>

<b>Use Case Name</b>	Create Club
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User selects the "+" button on the main menu.</li> <li>• 2 options pop up for the user to choose.</li> <li>• User chooses the "create club" button.</li> <li>• System prompts the user to enter a club name. <ul style="list-style-type: none"> <li>○ If the club name is less than 50 characters the user creates the club.</li> <li>○ If the club name is more than 50 characters systems show an error message that the name should be less than or equal to 50 characters.</li> </ul> </li> </ul>

<b>Use Case Name</b>	Join Club
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User selects the “+” button on the main menu.</li> <li>• 2 options pop up for the user to choose.</li> <li>• User chooses the “join club” option.</li> <li>• System prompt user to enter a url of the club.</li> <li>• User enters the url of the club. <ul style="list-style-type: none"> <li>○ If the URL is valid, the user joins the club.</li> <li>○ If the URL is not valid, the system shows an error message.</li> </ul> </li> </ul>

<b>Use Case Name</b>	Create Message Channel
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User chooses a club to enter at the main menu.</li> <li>• In the club screen the user chooses the “message channels” button.</li> <li>• On the message channels menu the user clicks the “+” button.</li> <li>• System prompts the user to enter the name of the message channel. <ul style="list-style-type: none"> <li>○ If the message channel name is less than 50 characters the user creates the message channel.</li> <li>○ If the message channel name is more than 50 characters systems show an error message that the name should be less than or equal to 50 characters.</li> </ul> </li> </ul>

<b>Use Case Name</b>	Delete Message Channel
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User chooses a club to enter at the main menu.</li> <li>• In the club screen the user chooses the “message channels” button.</li> <li>• The user selects the settings icon near the message channel the user wants to delete.</li> <li>• The user selects the delete button.</li> <li>• System asks to confirm. <ul style="list-style-type: none"> <li>○ If the user selects confirm, the message channel is deleted.</li> <li>○ If the user selects refuse the message channel is not deleted.</li> </ul> </li> </ul>

<b>Use Case Name</b>	Create Voice Channel
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User chooses a club to enter at the main menu.</li> <li>• In the club screen the user chooses the “voice channels” button.</li> <li>• On the message channels menu the user clicks the “+” button.</li> <li>• System prompts the user to enter the name of the voice channel. <ul style="list-style-type: none"> <li>○ If the voice channel name is less than 50 characters the user creates the voice channel.</li> <li>○ If the voice channel name is more than 50 characters systems show an error message that the name should be less than or equal to 50 characters.</li> </ul> </li> </ul>



<b>Use Case Name</b>	Delete Voice Channel
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User chooses a club to enter at the main menu.</li> <li>• In the club screen the user chooses the “voice channels” button.</li> <li>• The user selects the settings icon near the voice channel the user wants to delete.</li> <li>• The user selects the delete button.</li> <li>• System asks to confirm. <ul style="list-style-type: none"> <li>○ If the user selects confirm the voice channel is deleted.</li> <li>○ If the user selects refuse the voice channel is not deleted.</li> </ul> </li> </ul>

<b>Use Case Name</b>	Join Voice Channel
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User chooses a club to enter at the main menu.</li> <li>• In the club screen the user chooses the “voice channels” button.</li> <li>• The user selects the voice channel it wants to join.</li> <li>• The system connects the user to a voice server.</li> <li>• The user has joined a voice channel and can talk with any other person that also joined or joins the voice channel.</li> </ul>

<b>Use Case Name</b>	Leave Voice Channel
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User clicks the disconnect button.</li> <li>• The system severs the connection to the voice channel the user is in.</li> <li>• The user is redirected to the “voice channels” screen.</li> </ul>

<b>Use Case Name</b>	Send Message
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User chooses a club to enter at the main menu.</li> <li>• In the club screen the user clicks the “message channels” button.</li> <li>• The user selects the message channel it wants to join.</li> <li>• The user enters a message into a text bar.</li> <li>• The user clicks the send button.</li> </ul>

<b>Use Case Name</b>	Receive Message
<b>Participating Actors</b>	User 1, User 2
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User 1 sends a message to User 2.</li> <li>• System delivers the message to User 2.</li> <li>• User 2 gets a notification about the message.</li> <li>• User 2 clicks the friends button on the main menu.</li> <li>• User 2 clicks the User 1’s icon on the friends menu.</li> <li>• User 2 reads the message User 1 sent.</li> </ul>

<b>Use Case Name</b>	View Message History
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User chooses a club to enter at the main menu.</li> <li>• In the club screen the user clicks the “message channels” button.</li> <li>• User clicks the message channel they want to view the history of.</li> <li>• System loads all the messages that are sent in that channel.</li> </ul>

<b>Use Case Name</b>	Change Profile Picture
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User chooses a photo they want to change to.</li> <li>• System checks the file format of the photo. <ul style="list-style-type: none"> <li>○ if it is jpeg or png , the system sets the new profile photo.</li> <li>○ if it is a other file format than jpeg or png the system shows an error message.</li> </ul> </li> </ul>



<b>Use Case Name</b>	Change Username
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User writes the username they want to change to.</li> <li>• User clicks the confirm button.</li> <li>• System checks the length of the name: <ul style="list-style-type: none"> <li>○ if it is longer than 50 characters the system shows an error message.</li> <li>○ if it is less than 50 characters the username is changed.</li> </ul> </li> </ul>

<b>Use Case Name</b>	Send Confirmation
<b>Participating Actors</b>	System
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• System generates a confirmation token.</li> <li>• System constructs a confirmation email.</li> <li>• System sends a confirmation email to the email address the new user has entered.</li> </ul>

<b>Use Case Name</b>	Check User Credentials
<b>Participating Actors</b>	System
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User enters their username and password.</li> <li>• System receives the credentials.</li> <li>• System checks if the username exists. <ul style="list-style-type: none"> <li>◦ If the username is not found, the system shows an error message.</li> </ul> </li> <li>• System retrieves the stored password for the corresponding username.</li> <li>• System compares the entered password with the stored password. <ul style="list-style-type: none"> <li>◦ If the password does not match, the system shows an error message.</li> </ul> </li> <li>• System checks the credentials that are entered by the user: <ul style="list-style-type: none"> <li>◦ if the credentials are true the user is granted access to the system.</li> <li>◦ if the credentials are false the user is not granted access to the system</li> </ul> </li> </ul>

<b>Use Case Name</b>	Assign Voice Channel Name
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User enters a voice channel name.</li> <li>• User clicks the confirm button: <ul style="list-style-type: none"> <li>◦ if it is longer than 50 characters the system shows an error message.</li> <li>◦ if it is less than 50 characters the voice channel name is assigned.</li> </ul> </li> <li>• User is redirected to the voice channels screen.</li> </ul>

<b>Use Case Name</b>	Connect to Voice Server
<b>Participating Actors</b>	System
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User clicks a voice channel they want to join.</li> <li>• System retrieves connection details for the selected voice server.</li> <li>• System attempts to establish a connection to the voice server.</li> <li>• System checks network availability and connection stability. <ul style="list-style-type: none"> <li>◦ If the network is unavailable, the system returns an error.</li> </ul> </li> <li>• System verifies the connection with the voice server. <ul style="list-style-type: none"> <li>◦ If the connection fails, the system shows an error.</li> </ul> </li> <li>• System establishes the voice communication session and sets up audio streams.</li> </ul>

<b>Use Case Name</b>	Send Notification
<b>Participating Actors</b>	System
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• System detects a notification trigger.</li> <li>• System checks who triggered it.</li> <li>• System generates a notification.</li> <li>• System sends the notification to the user.</li> <li>• User receives the notification.</li> </ul>

<b>Use Case Name</b>	Assign Club Name
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User enters a club name.</li> <li>• User clicks the confirm button: <ul style="list-style-type: none"> <li>○ if it is longer than 50 characters the system shows an error message.</li> <li>○ if it is less than 50 characters the club name is assigned.</li> </ul> </li> </ul>

<b>Use Case Name</b>	Disconnect From Voice Server
<b>Participating Actors</b>	System
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User clicks the disconnect button.</li> <li>• System gets the voice channel the user is in.</li> <li>• System severs the connection to that voice server.</li> </ul>

<b>Use Case Name</b>	Assign Message Channel Name
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User enters a message channel name.</li> <li>• User clicks the confirm button. <ul style="list-style-type: none"> <li>○ if it is longer than 50 characters the system shows an error message.</li> <li>○ if it is less than 50 characters the message channel name is assigned.</li> </ul> </li> </ul>

<b>Use Case Name</b>	Accept Friend Request
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User clicks the friends button on the main menu.</li> <li>• In the friends menu the user clicks the friend requests button.</li> <li>• On the friend requests menu the user clicks the accept button near the name of the user who sent the friend request.</li> <li>• Person who sent the friend request is added to the friends list.</li> </ul>

<b>Use Case Name</b>	Decline Friend Request
<b>Participating Actors</b>	User
<b>Flow of Events</b>	<ul style="list-style-type: none"> <li>• User clicks the friends button on the main menu.</li> <li>• In the friends menu the user clicks the friend requests button.</li> <li>• On the friend requests menu the user clicks the decline button near the name of the user who sent the friend request.</li> <li>• Person who sent the friend request is notified.</li> </ul>