

# **Communications Project Phase: I**

## *Software Requirements Specification*

## Revision History

Date	Revision	Description	Author
02/22/24	1.0	Scope, definitions, identify use cases	Herminia
02/23/24	1.1	Use cases	Herminia
02/24/24	1.2	Section 2	Herminia
02/25/24	1.3	Updated use cases and requirements	Lyca Mangarin

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# 1. Purpose

This document outlines the requirements for a company's communication system.

## 1.1. Scope

This document will catalog the user, system, and hardware requirements for a company's communication system.

## 1.2. Definitions, Acronyms, Abbreviations

- **Synchronously:** Communication that occurs in real-time, allowing users to send and receive messages while they are connected.
- **Asynchronously:** Communication that occurs when users are not connected to the system. This means users can receive messages even when they are offline, and the messages are stored until the user connects to the system..
- **Chat privately:** Conversation within the system that is exchanged exclusively between two users.
- **Chat in groups:** Conversation that enables multiple users to engage in a conversation simultaneously within a single chat.
- **IT users:** Individuals responsible for managing and maintaining the technical aspects of the system.
- **Ticket:** A ticket serves as a help desk feature within the software. Its purpose is to track and manage users' requests to reset or change passwords associated with their accounts.

## 1.3. References

Use Case Specification

- Use case ID: CS01
- Use case name: Assigning Credentials
- Relevant requirements: Actively participating in company operations.
- Primary actor: IT users
- Pre-conditions: IT users must be active participants in the company's operations and have the necessary permissions and access to the system administration interface.
- Post-conditions: Standar users and new IT users have successfully assigned login credentials.
- Basic flow or main scenario:
  - The IT user logs in with their credentials into the system administration interface.
  - The IT user selects the option to assign login credentials.
  - The system verifies the IT user's ability, using their credentials, to assign login credentials to new users.
  - Once verified, the IT user enters the username and password for the new user in the company.
  - The IT user saves the login credentials.
  - The system confirms the successful assignment of the credentials.
- Extensions or alternate flows:
  - If the entered username is already in use, IT user receives a notification and must choose a different username.
- Exceptions:

- If IT user lacks the necessary permissions, the credential assignment process cannot proceed.
  - Related use cases:
    - Managing user permissions
    - Accessing credentials and chat logs
- 

- Use case ID: CS02
  - Use case name: Login
  - Relevant requirements: Being provided with authorized credentials.
  - Primary actor: All individuals actively participating in company operations.
  - Pre-conditions: IT user must have provided authorized credentials to the user.
  - Post-conditions: Successfully login into the system.
  - Basic flow or main scenario:
    - Users enter their username and password.
    - The system verifies the entered credentials.
    - Upon successful authentication, the user gains access to the system.
    - Users can start using the system features and functionalities.
  - Extensions or alternate flows:
    - If the user forgets their password, they can request a password reset link via email.
    - If the entered username or password is incorrect, the system displays an error message prompting the user to re-enter the credentials.
    - After a certain number of unsuccessful login attempts, the system might lock the user's account for security reasons.
  - Exceptions:
    - If there is an unexpected system error during the login process, such as server downtime, the system should display an error message informing the user that login is temporarily unavailable and advise them to try again later.
    - If the user's account has been deactivated due any suspicious activity or a violation of terms, the system should inform the user that their account has been disabled and provide instructions for reactivation or contacting support with IT users.
  - Related use cases:
    - Resetting credentials.
- 

- Use case ID: CS03
- Use case name: Messaging
- Relevant requirements:
  - Have successfully logged into the system.
  - Communication must be Synchronously and asynchronously.
  - Private and group chats are allowed between users.
  - Messages within the system should only consist of text.
- Primary actor: All individuals actively participating in company operations.
- Pre-conditions: Have logged in on one device at a time.
- Post-conditions: Successfully starting messaging through the system.
- Basic flow or main scenario:

- Upon accessing the messaging system, users can view and respond to messages received while they were offline.
- User selects the option to start a new chat.
- User chooses between initiating a private chat or creating a group chat.
- If initiating a private chat, user selects the recipient from the list of available users and sends a message.
- If creating a group chat, user selects multiple recipients and sends a message.
- Recipients receive the message in real-time for synchronous communication or when they next access the system for asynchronous communication.
- Extensions or alternate flows:
  - If a user attempts to send any file, image, or video in the chat, they will receive an error message indicating that the content is invalid and cannot be sent.
- Exceptions:
  - If there are technical issues or system errors, users may experience delays or interruptions in messaging functionality.
  - If users encounter any privacy breaches or security issues, they should promptly report them to IT administrators.
- Related use cases:
  - Reporting Inappropriate Content

- Use case ID: CS04
- Use case name: Monitoring conversations
- Relevant requirements: Privacy should be minimized
- Primary actor: IT users
- Pre-conditions: Have successfully logged into the system.
- Post-conditions: All conversations are logged and viewable by IT users.
- Basic flow or main scenario:
  - IT users access the monitoring section of the system.
  - IT users navigate to the conversation logs or monitoring dashboard.
  - IT users view a list of ongoing conversations and recent messages.
  - IT users select a conversation to monitor in detail.
  - IT users review the messages exchanged within the conversation.
  - IT users may flag or take action on any messages that violate company policies or pose security risks.
- Extensions or alternate flows:
  - ...
- Exceptions:
  - In cases where the conversation logs are unusually large or the system experiences high traffic, accessing and loading conversation data may be delayed.
  - If the system encounters a critical error while attempting to retrieve conversation logs, IT users should be notified promptly and the issue should be resolved as soon as possible to ensure continuity of monitoring activities.
- Related use cases:
  - ...

- Use case ID: CS05
- Use case name: Ticket Request
- Relevant requirements:
  - Users should be able to request and submit a ticket to IT Users
  - There should be a button that allows IT users to open and close tickets.
- Primary actor: Standard User
- Pre-conditions: Standard user exists in the system.
- Post-conditions: A ticket is sent to IT to resolve user feedback.
- Basic flow or main scenario:
  - User opens a support ticket that states the concern (reset password, report user, bug report)
  - The system sends the support ticket to any or all IT users
  - An IT user acknowledges the ticket, performs the necessary actions to resolve the issue, and closes the ticket.
- Extensions or alternate flows:
- Exceptions:
  -
- Related use cases:
  - Login
  - Reporting Inappropriate Content

Use case ID: CS06

Use case name: Logout

Relevant requirements: Refer to 3.1.1.6. and 3.1.4.5.

Primary actor: Standard and IT user

Pre-conditions: User is logged in

Post-conditions: User's account is logged off.

Basic flow or main scenario:

1. User is logged into their respective profile.
2. User have a logout button in their UI.
3. User chooses the logout button.
4. User's account is successfully logged out of the system.

Extensions or alternate flows: User closes the application.

Exceptions:

1. User does not have a logout button
2. User chooses to logout but the system does not respond.

Related use cases: Login

#### Potential Use Cases

- Reset password
- Add User to Chat
  - Basic flow: user is added if preexisting chat doesn't exist | Alter flow: chat already exists between the involved users
  - could be scrapped since the Messaging use case already exists
- Search for Chat
  - Basic flow: existing chat is displayed and able to be selected for viewing | Alter flow: chat does not exist
-

### use case template

Use case ID:

Use case name: Ticket Request

Relevant requirements:

Primary actor:

Pre-conditions:

Post-conditions:

Basic flow or main scenario:

Extensions or alternate flows:

Exceptions:

Related use cases:



## 2. Overall Description

### 2.1. Product Perspective

The communication system strives to be user-friendly and reliable. It is designed to work seamlessly with different devices and systems, ensuring ease of use for everyone. Security is a top priority, guaranteeing that messages are kept safe and private. The system is also closely monitored to quickly address any issues, maintaining smooth operation for all users.

### 2.2. Product Architecture

- 2.2.1. **Server module:** Responsible for managing client-server communication, user authentication, message routing, and logging.
- 2.2.2. **Client GUI module:** provides the graphical user interface (GUI) for users to interact with the system. This module ensures a user-friendly experience for clients interacting with the system.
- 2.2.3. **Communication module:** Manages the core functionality of the chat system, including synchronous and asynchronous messaging, private and group chat functionalities, and real-time message delivery.

### 2.3. Product Functionality/Features

- 2.3.1. **Chat functionality**
  - **Synchronous chat:** Enable real-time messaging between all users for instant communication.
  - **Asynchronous chat:** Allow users to send and receive messages even when the recipient is offline, with messages delivered once the recipient reconnects.
  - **Private Chat:** Facilitates one-on-one conversations between users.
  - **Group Chat:** Allows multiple users to participate in a single conversation.
- **Message formatting:** Supports only text in user communication.
- **User Management**
  - **User Registration and Authentication:** Provide a registration process for new users and secure authentication mechanisms to verify user identities.
  - **User Profiles:** Allow users to create and customize their profiles with profile pictures, status messages, and contact information.
- **Administration and Monitoring**
  - **User Activity Monitoring:** Allow IT users to monitor user activity, track login/logout times, and view user session information.
  - **Content Moderation:** Give IT users tools to manage user content, like flagging inappropriate messages and handling user bans or suspensions.
  - **System Health Monitoring:** Monitor system performance, resource utilization, and network traffic to identify and address potential issues proactively.

## 2.4. Constraints

- 2.4.1. The system needs to be permanently connected to an internet connection.
- 2.4.2. The system only accepts text format for communication among all users.
- 2.4.3. The system only accepts text characters that fall under the ASCII table.
- 2.4.4. **Scalability:** The system should be scalable to accommodate future growth in the number of users and messages without needing major changes.
- 2.4.5. **Performance Limitations:** The system must handle a large volume of messages and users without sacrificing performance or responsiveness.
- 2.4.6. **Platform Compatibility:** Ensuring compatibility across different operating systems (Windows, macOS, Linux) and devices (desktops, laptops, mobile devices) may pose challenges.

## 2.5. Assumptions and Dependencies

### Assumptions:

1. The project assumes that the organization's network infrastructure is reliable and can support the demands of the communication system without significant interruptions.
2. The project assumes that users will readily adopt the new communication system and integrate it into their daily workflows.
3. The project assumes that users will receive adequate training and support to effectively utilize the features and functionalities of the communication system.
4. Assumes that the communication system is compatible with various devices and operating systems commonly used by employees within the organization.
5. Assumes that the data transmitted and stored within the communication system will remain accurate, consistent, and free from corruption or loss.

### Dependencies:

1. The project may depend on user feedback and testing to identify areas for improvement and refine the features and usability of the communication system over time.
2. The project may depend on compliance with regulatory requirements, such as data protection laws and industry standards, which may impact the design and implementation of the communication system.
3. The project may depend on the network infrastructure since the organization's network needs to provide sufficient bandwidth, reliability, and security for the transmission of messages and data within the communication system.

## **3. Specific Requirements**

### **3.1. Functional Requirements**

#### **3.1.1. Common Requirements:**

- 3.1.1.1. All users on the system should be able to request a password reset.
- 3.1.1.2. All messages should show the username, date, and time that a message was sent.
- 3.1.1.3. All users should be able to receive notifications regarding unread messages upon logging in.
- 3.1.1.4. All user logins should be limited to one device at a time.
- 3.1.1.5. All users can be added to an existing chat.
- 3.1.1.6. All users should be able to login and logout anytime.

#### **3.1.2. Standard User Module Requirements:**

- 3.1.2.1. Users should be able to send messages.
- 3.1.2.2. Files, such as pictures, audios, and videos, etc. will not be allowed to be sent.
- 3.1.2.3. Users should be able to view their chats on a home page or lobby.
- 3.1.2.4. All users should receive message notifications for any missed messages while they were not signed in.
- 3.1.2.5. Users should be able to create a new private or group chat.
- 3.1.2.6. Users should be able to request and submit a ticket to the IT department.
- 3.1.2.7. When a user is added to a group chat, they should be able to see all previous messages in the chat.
- 3.1.2.8. A user cannot have more than one private chat with another user. Similarly, there can only be one instance of a group with the same participants.

#### **3.1.3. IT User Module Requirements:**

- 3.1.3.1. IT users should share all functionality of a standard user.
- 3.1.3.2. IT users must assign login credentials for a standard user and new IT users.
- 3.1.3.3. IT users should be able to look up all credentials and view all chat logs between users.
- 3.1.3.4. IT users should be able to change the account permissions of a standard user to an IT user.
- 3.1.3.5. IT users should not be able to modify existing conversations in the system.

#### **3.1.4. Users GUI Module Requirements:**

- 3.1.4.1. When inside a specific chat, there should be a “Send” button that allows the users to send their message.
- 3.1.4.2. When inside a specific chat, there should be a text box where the user types in the desired message.
- 3.1.4.3. When the client program is loaded, there should be a box for the users to type their login credentials such as username and password.
- 3.1.4.4. A “Login” button that allows the user to log in should be present.
- 3.1.4.5. A “Logout” button that signs a user out of the system should be present.
- 3.1.4.6. There should be a button that allows the user to create an IT ticket.
- 3.1.4.7. When the user logs into the system they should see a list of the chats they are a part of.

- 3.1.4.8. There should be a button that allows the user to search for a particular chat.
- 3.1.4.9. When a user clicks on a specific chat, the GUI should display the chat in the same window.
- 3.1.4.10. There should be a button to create a new chat dialogue with another user.

### **3.1.5. IT GUI Module Requirements:**

- 3.1.5.1. The IT GUI should show all of the same UI elements as referenced in section 3.1.4.\*
- 3.1.5.2. There should be a button that allows IT users to open and close tickets on the system.
- 3.1.5.3. There should be a button that allows the IT users to query the log file for a specific chat.
- 3.1.5.4. There should be a button that allows the IT users to modify user information such as usernames, passwords, and account permissions(standard or IT).
- 3.1.5.5. There should be a button that allows the IT users to create a new user on the system.

### **3.1.6. Server Module Requirements:**

- 3.1.6.1. No databases
- 3.1.6.2. Must be able to handle multiple client requests
- 3.1.6.3. Must save messages for a recipient who is offline.
- 3.1.6.4. Must store logged chats from all private/group chats in .txt format.
- 3.1.6.5. Must have a list of user's credentials

## **3.2. External Interface Requirements**

- 3.2.1.

## **3.3. Internal Interface Requirements**

- 3.3.1.

## **4. Non-Functional Requirements**

### **4.1. Security and Privacy Requirements**

- 4.1.1. System should require users to login to access their profiles.
- 4.1.2. The system should check for matching credentials.

### **4.2. Environmental Requirements**

- 4.2.1. Must be Java based
- 4.2.2. The server must always be accessible for all users.
- 4.2.3. The system must require only the installation of the program itself

### **4.3. Performance Requirements**

- 4.3.1. The system should be able to handle a large volume of users and simultaneous messages.