CS383 Group Project

Software Design Document

(SDD)

A Text Chat messaging application

(Echo) v1.0

Project for group 1 .

1 . Introduction

2 . System Overview

3 . System Architecture and components

4 . Data Design

5 . Design Details

6 . Human Interface Design

7 . Group Members Participation

1 Introduction :

This Software Design Document (SDD) outlines the design of Echo , a text-based chat application. Echo is designed to be a simple and user-friendly tool for people to communicate in real-time . The goal of Echo is to provide a fast and reliable messaging platform for users to connect with one another .

1.1 Purpose :

The purpose of this Software Design Document (SDD) is to provide a comprehensive and detailed description of the design of a specific software system , serving as a guide for implementation and testing .

1.2 Scope :

The scope of this Software Design Document (SDD) covers the design of a specific software system , including its architecture , component design , user interface design , interfaces, and data management design . This SDD serves as a comprehensive guide for implementation and testing, but does not include implementation details or low-level design decisions .

1.3 References :

SOFTWARE ENGINEERING by Ian Sommerville .

1.4 Document Structure :

The structure of this Software Design Document (SDD) includes the following sections :

1- Introduction : Overview of the software system and purpose of the SDD .

2- System Overview: Description of the system's architecture and 3-high-level design decisions.

3- System Architecture Component design: Description of the high-level structure of the software system design of individual components.

4- Data Design : refers to the design of the data elements and data structures used in the software system

5- Design Details : detailed design specifications for the software system using diagrams and other methods , it helps to find all the requirements of the system .

6- Human Interface Design : provide a clear and detailed description of the user interface, including its look-and-feel, navigation structure, and functional elements .

7- Group Members Participation : work participations done by the group members

2 System Overview :

When the user enters Echo app , they will be presented with a login page where they can either log in with an existing account , or create a new account The main page will display a list of current conversations , sorted by the time of the most recent message .

Users can start a new conversation , view and participate in existing conversations , and delete any unwanted conversations . The design of the Echo app will be analyzed and explained, including the system architecture and data design , using diagrams such as sequence diagrams , class diagrams , and activity diagrams .

3 System Architecture and components

3.1 Architecture Description :

Echo's architectural description is as follows :
1-User Interface : presenting the user with a clear and intuitive interface .

2-Media Handling : handling multimedia content such as images and videos and ensuring that content is handled correctly .
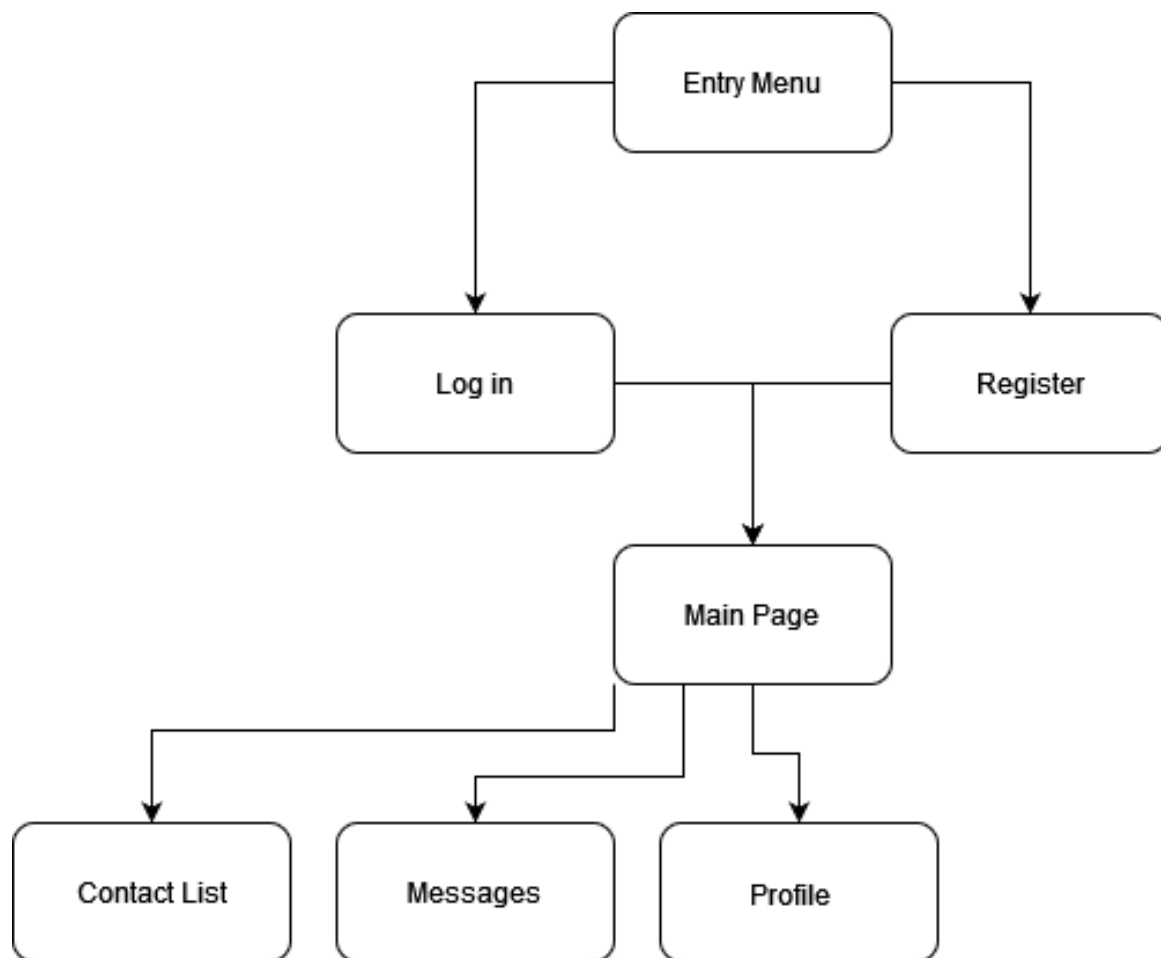
3-Data Storage : storing messages and user data .

4-Authentication and Authorization : authenticating users and controlling access to the system (e.g . user registration) .

5-Security: protecting the system and its users from potential security threats (e.g . spam messages) .

6-API : responsible for providing a programmatic interface for external applications .

3.2 Component Decomposition Description :

```
                        ┌─────────────┐
                        │ Entry Menu  │
                        └──────┬──────┘
            ┌──────────────────┴──────────────────┐
            ▼                                      ▼
      ┌─────────┐                           ┌─────────┐
      │ Log in  │                           │ Register│
      └────┬────┘                           └────┬────┘
           └───────────────┬───────────────┘
                           ▼
                    ┌─────────────┐
                    │  Main Page  │
                    └──────┬──────┘
        ┌──────────────────┼──────────────────┐
        ▼                  ▼                  ▼
  ┌────────────┐    ┌────────────┐    ┌────────────┐
  │Contact List│    │  Messages  │    │  Profile   │
  └────────────┘    └────────────┘    └────────────┘
```

3.3 Detail Component Description :

Upon launching the software the entry menu will be the first thing a user will see . This menu is the starting point for the user , providing them with access to Logging into an existing account or Registring a new account . Login option would allow users to log in to their account , allowing them to send and receive messages . The login page would require the user to enter their E-mail and password, and would validate their credentials against the authentication and authorization component . Register option would allow users to create a new account , providing them with access to the messaging features of the software. The registration page would require the user to enter their E-mail and and password . The main page is the central hub for the user's interactions with the software , providing them with access to all key features, after logging in the user will be transferred to the main page where they have access to

1- Contact list .
2- Messages .
3- Settings .
4- Personal profile .

Contact list : allows the user to manage their contacts, view their list of contacts and start conversations .

Messages : allows the user to send and receive messages with their contacts . the message view will display all of the user's conversation.

Settings : allows the user to configure the settings for the software , such as notifications , theme color and such .

Personal Porfile : allows the user to view and manage their personal profile such as their nickname , profile picture and such .

3.4 Design Rationale :

Echo was designed to address a specific problem , that problem is communicating things easily and quickly . by offering multi media messaging capabilities echo will provide users with a more versatile way to communicate with others . Echo is designed to be user-friendly and intuitive making it accessible to people accross all ages regardless of their technical abilities . the software is designed to work seamlessly accross multiple platforms and devices providing service to users accross all platforms and addressing the communication problem .

4 Data Design

Echo database will have five tables that contain information about user credentials , their conversation and contacts .

The user and conversation table share a unique ID which gives each user their own conversations , users can have multiple conversations , conversations can have one member (private message) or multiple members (group message) .

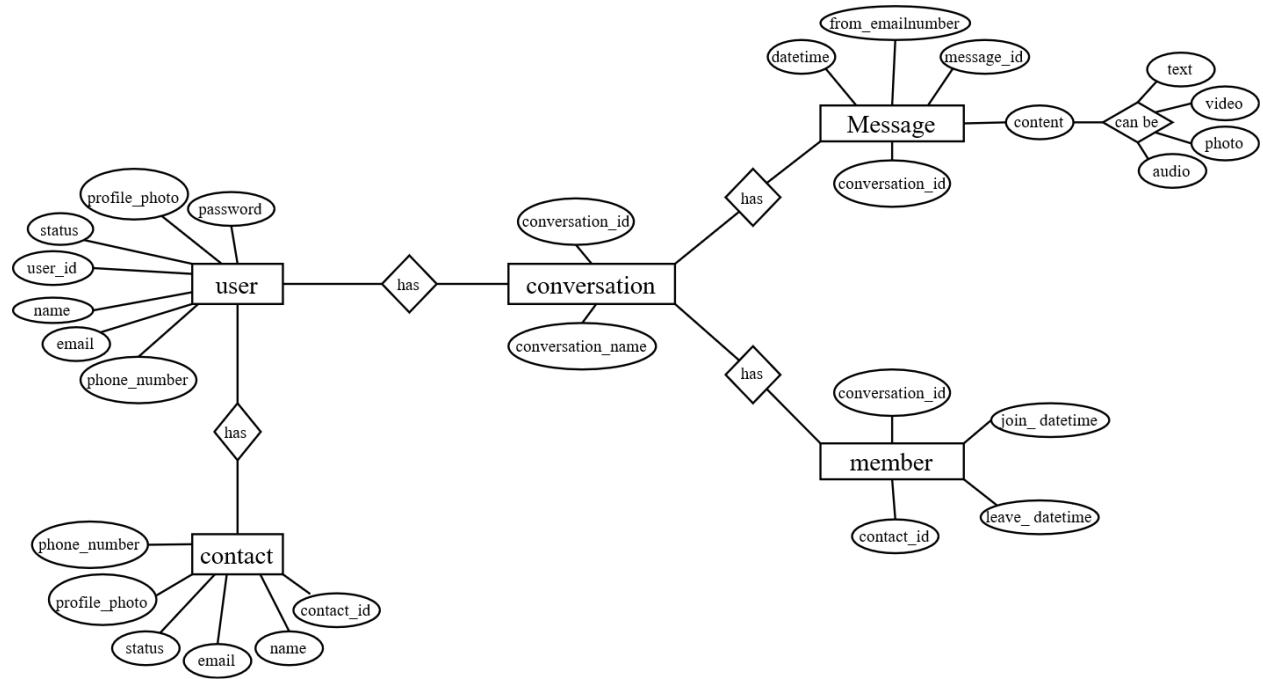User table contains : user_id , name , password , email , phone number , profile_photo, status .

Conversation table contains : conversation_id, conversation_name.

Contact table contains : contact_id, name, email, phone number, profile_photo, status .

Message table contains : message_id, from_emailnumber, content, datetime, conversation_id .
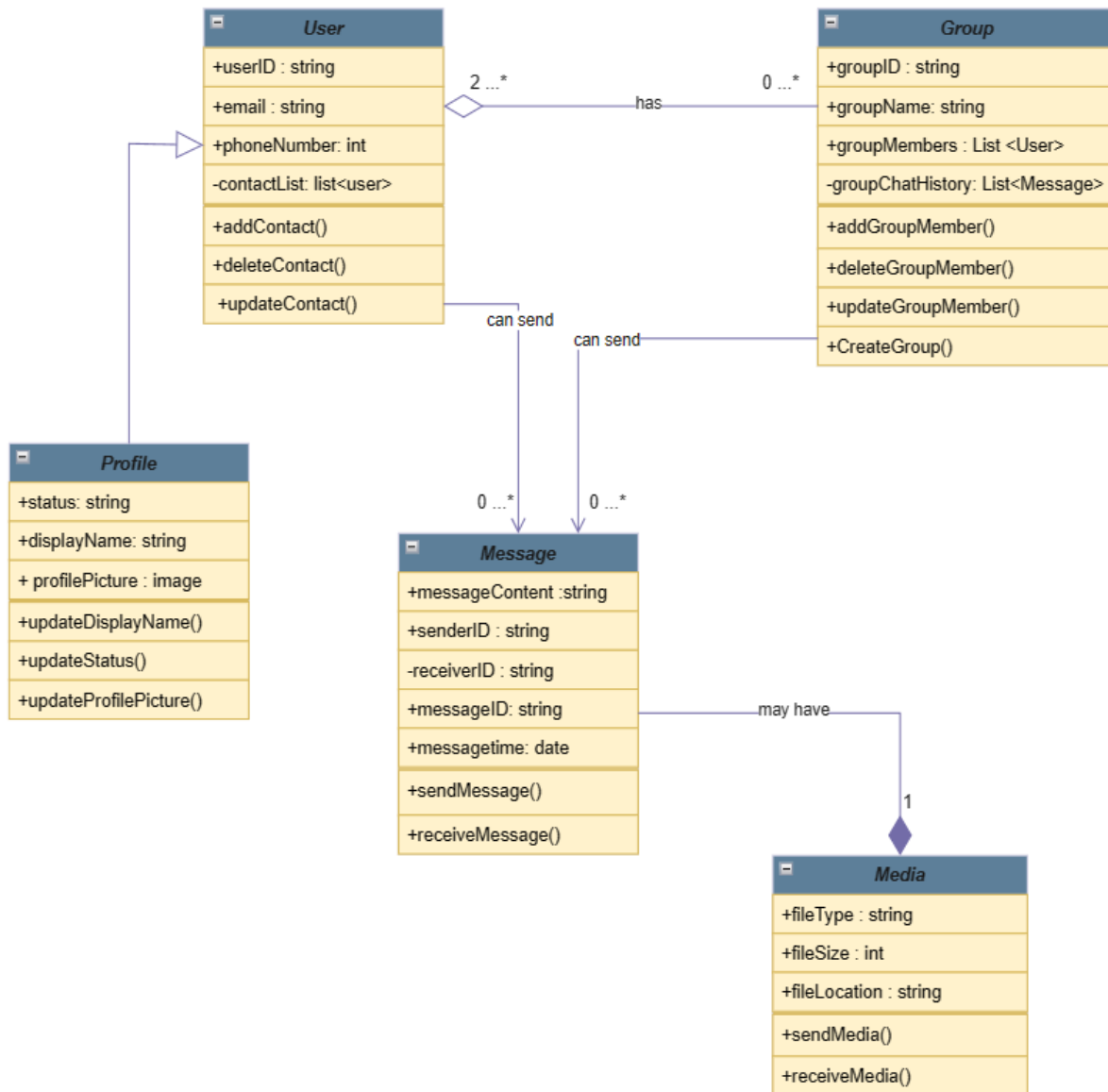
Member table contains : contact_id, conversation_id, join_ datetime, leave_ datetime .
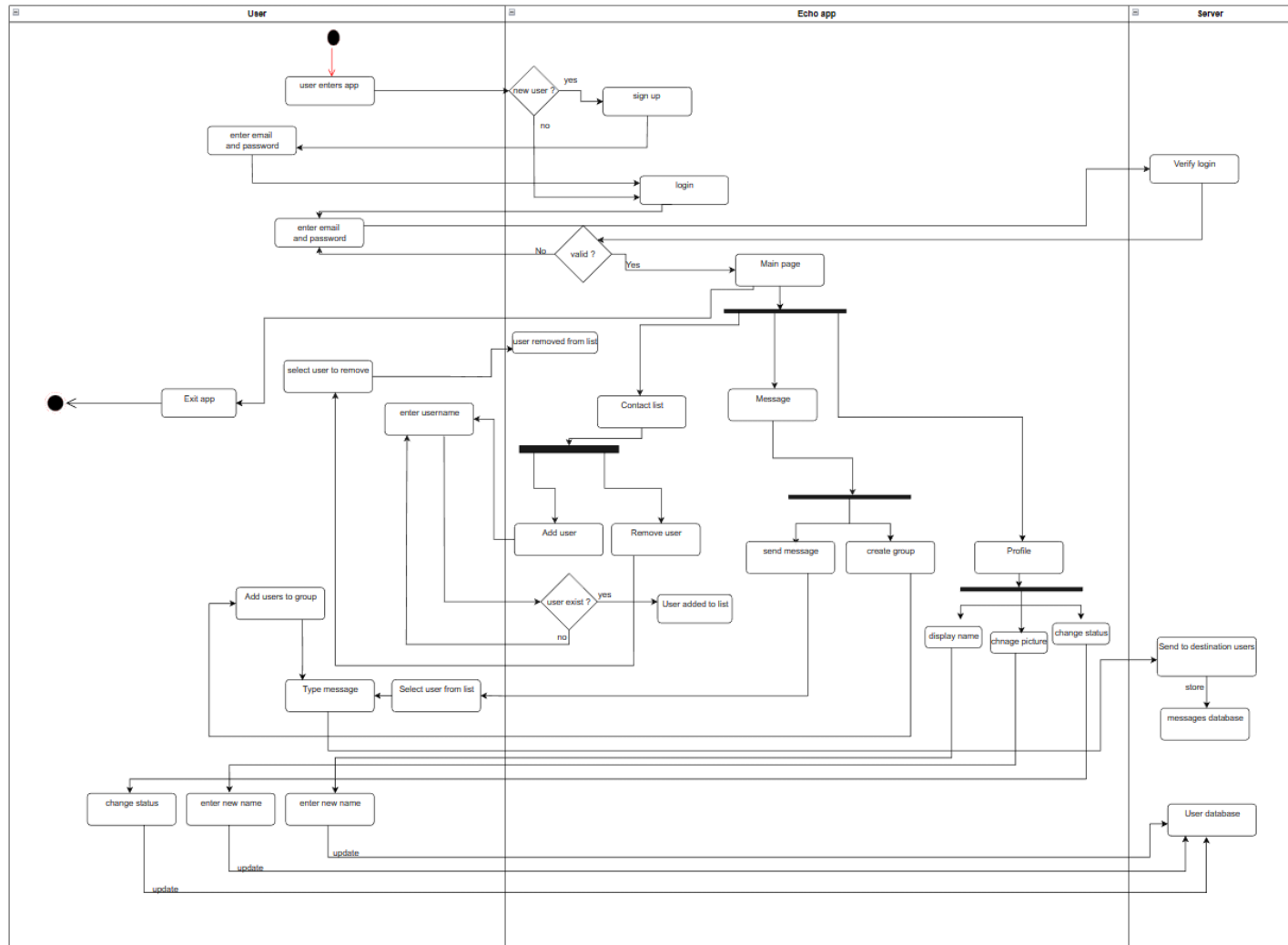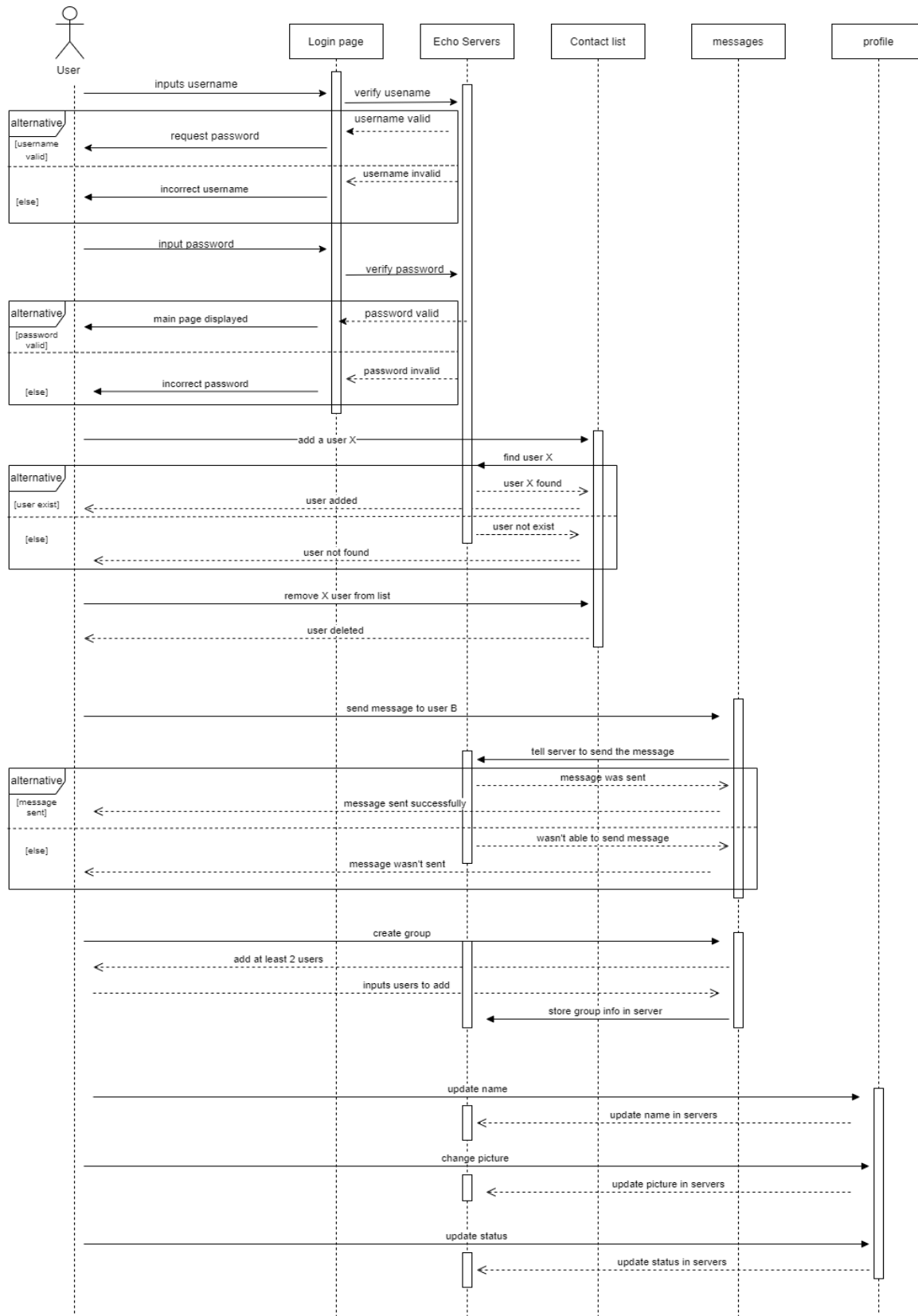
4.2. Data Structure

5 Design Details

5.1 Class Diagram

User
+userID : string
+email : string
+phoneNumber: int
-contactList: list<user>

+addContact()
+deleteContact()
+updateContact()

Group
+groupID : string
+groupName: string
+groupMembers : List <User>
-groupChatHistory: List<Message>

+addGroupMember()
+deleteGroupMember()
+updateGroupMember()
+CreateGroup()

2 ...*   has   0 ...*

can send   can send

Profile
+status: string
+displayName: string
+ profilePicture : image

+updateDisplayName()
+updateStatus()
+updateProfilePicture()

0 ...*   0 ...*

Message
+messageContent :string
+senderID : string
-receiverID : string
+messageID: string
+messagetime: date

+sendMessage()
+receiveMessage()

may have   1

Media
+fileType : string
+fileSize : int
+fileLocation : string

+sendMedia()
+receiveMedia()

5.2 Activity Diagram

5.3 Sequence Diagram

6 Human Interface Design

6.1 . Overview of the User Interface
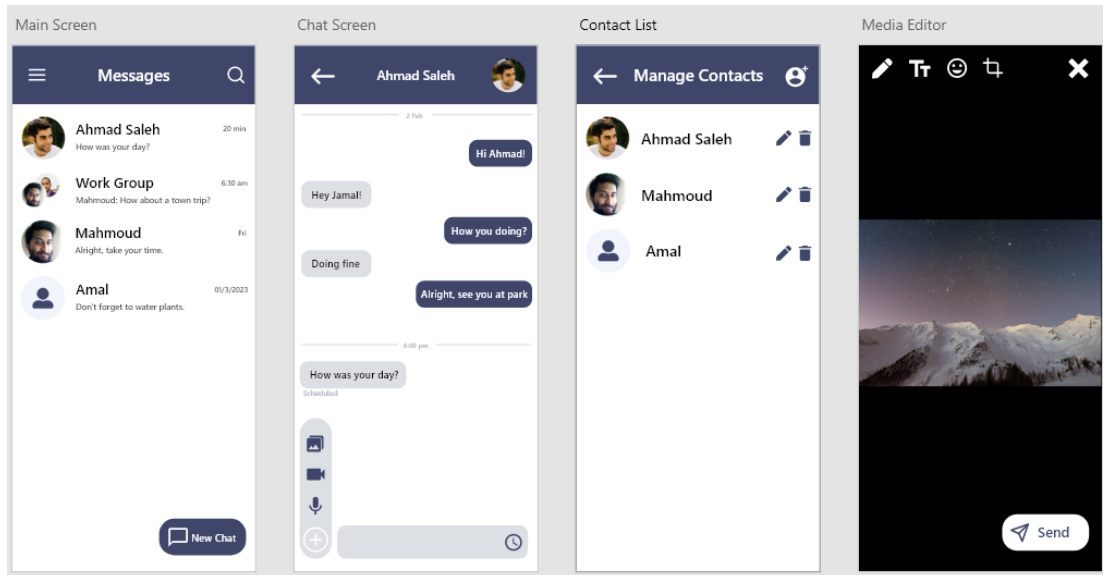
In Echo , we provided 3 main functions :

One is to sign up for a new account and log in with an existing account . Login will provide a special verification code that the user should know it . The other is to send/receive messages from users/groups . Message type is either regular text or picture or video or audio . The last property is user profile . Echo user can customize its profile by Adding a nickname and a profile picture and a custom status .

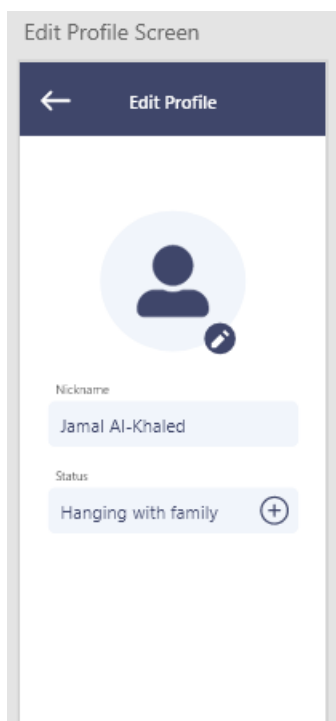## 6.2 . Detail design of the user interface

6.2.1 . Login Screens

6.2.2 . Chat Screens

Main Screen | Chat Screen | Contact List | Media Editor

6.2.3 . Profile Screen

Edit Profile Screen

6.2.4 . Screens Description

In 6.2.1 , we see that we have login and sign-up screens . Users can either login or sign up . On Login Screen , the user must provide both Email Address , password , and verification code .

In 6.2.2 , we see that we have Main Screen , direct and group chats will be listed there . On Chat Screen , you can send a text or either image , video , or audio , also there is an option that you can schedule the message at any time . On Contact List Screen , you can manage your contacts (or users) by adding new contacts or editing current contacts or deleting any contact . On Media Editor Screen , you can edit any type of media and send it directly to the receiver .

In 6.2.3 , we see that we have Profile Screen , there you can change the nickname and set a profile picture and a custom status .

7 . Group Members Participation

Student Name	Work on document
ناصر العواجي	Introduction
ناصر العواجي	System Overview
حمد المعارك	System Architecture and components
عمار الزين	Data Design
محمد الرشود	Design Details
عبدالعزيز السحيباني	Human Interface Design