

SOFTWARE REQUIREMENTS SPECIFICATION

For

**CHAT APPLICATION AND
WEBSITE**

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1. Introduction

1.1 Purpose

The main objective of this document is to illustrate the requirements of the project Chat application and website. The document gives the detailed description of the both functional and non-functional requirements of the proposed system. The purpose of this project is to implement a Chat application that will allow users with an internet connection to engage in private and public conversations. The main purpose of this project is to facilitate real-time communication and interaction between users over the internet. This project describes the hardware and software interface requirements using ER diagrams and UML diagrams.

1.2 Document Conventions

- Entire document should be justified.
- Convention for Main title
 - Font face: Times New Roman
 - Font style: Bold
 - Font Size: 14
- Convention for Sub title
 - Font face: Times New Roman
 - Font style: Bold
 - Font Size: 12
- Convention for body
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1.3 Scope of Development Project

The Chat Application and Website project emerges as an ambitious endeavor to create a dynamic and interactive platform for seamless real-time communication. The primary purpose of the project is to provide a comprehensive and feature-rich platform that enables users to connect, communicate, and collaborate effectively in the digital realm. This platform will facilitate a variety of communication modes, including text-based messaging, voice calls, and video calls, all within a secure and user-friendly environment.

This project is specifically designed to implement real-time messaging capabilities, including text-based chat, voice calls, and video calls, with a focus on delivering a smooth and latency-free user experience. Ensure robust security measures, including end-to-end encryption, to safeguard user data and privacy. Provide a feature-rich environment with options for media sharing, contact management, and customizable user profiles. Foster user engagement through the integration of multimedia elements, such as emojis, stickers, and reaction features. Create a scalable and maintainable system architecture that can accommodate future growth and evolving user needs. Establish clear monetization strategies to support the sustainability and growth of the platform.

The project can be easily implemented under various situations. We can add new features as and when we require, making reusability possible as there is flexibility in all the modules. The language used for developing the project is Java as it is quite advantageous than other languages in terms of performance, tools available, cross platform compatibility, libraries, cost (freely available), and development process.

1.4 Definitions, Acronyms and Abbreviations

JAVA -> Platform independence
SQL-> Structured query Language
ER-> Entity Relationship
UML -> Unified Modeling Language
IDE-> Integrated Development Environment
SRS-> Software Requirement Specification
IEEE ->Institute of Electrical and Electronics Engineers
API: Application Programming Interface
GUI: Graphical User Interface
HTML: Hypertext Markup Language
URL: Uniform Resource Locator
SEO: Search Engine Optimization
GDPR: General Data Protection Regulation.

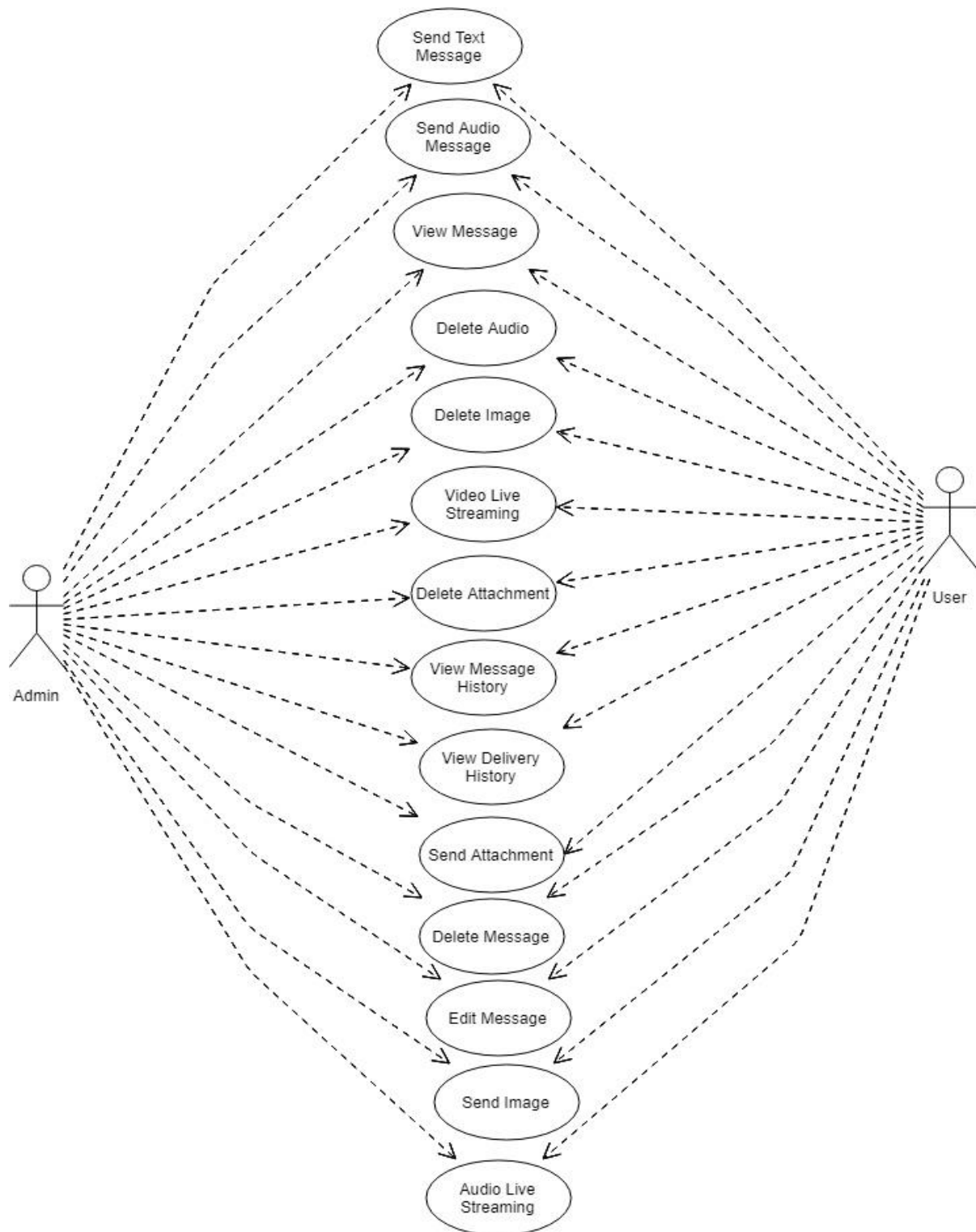
1.5 References

- ✓ Books
 - Software Requirements and Specifications: A Lexicon of Practice, Principles and Prejudices (ACM Press) by Michael Jackson
 - Software Requirements (Microsoft) Second Edition by Karl E. Wiegers
 - Software Engineering: A Practitioner's Approach Fifth Edition by Roger S. Pressman
- ✓ Websites
 - <https://web.whatsapp.com/%F0%9F%8C%90/en>
 - <http://www.uianduxdesign.com/ux-designs/whatsapp-user-interface-and-user-experience-design.html>
 - <https://en.wikipedia.org/wiki/WhatsApp>

2.Overall Descriptions

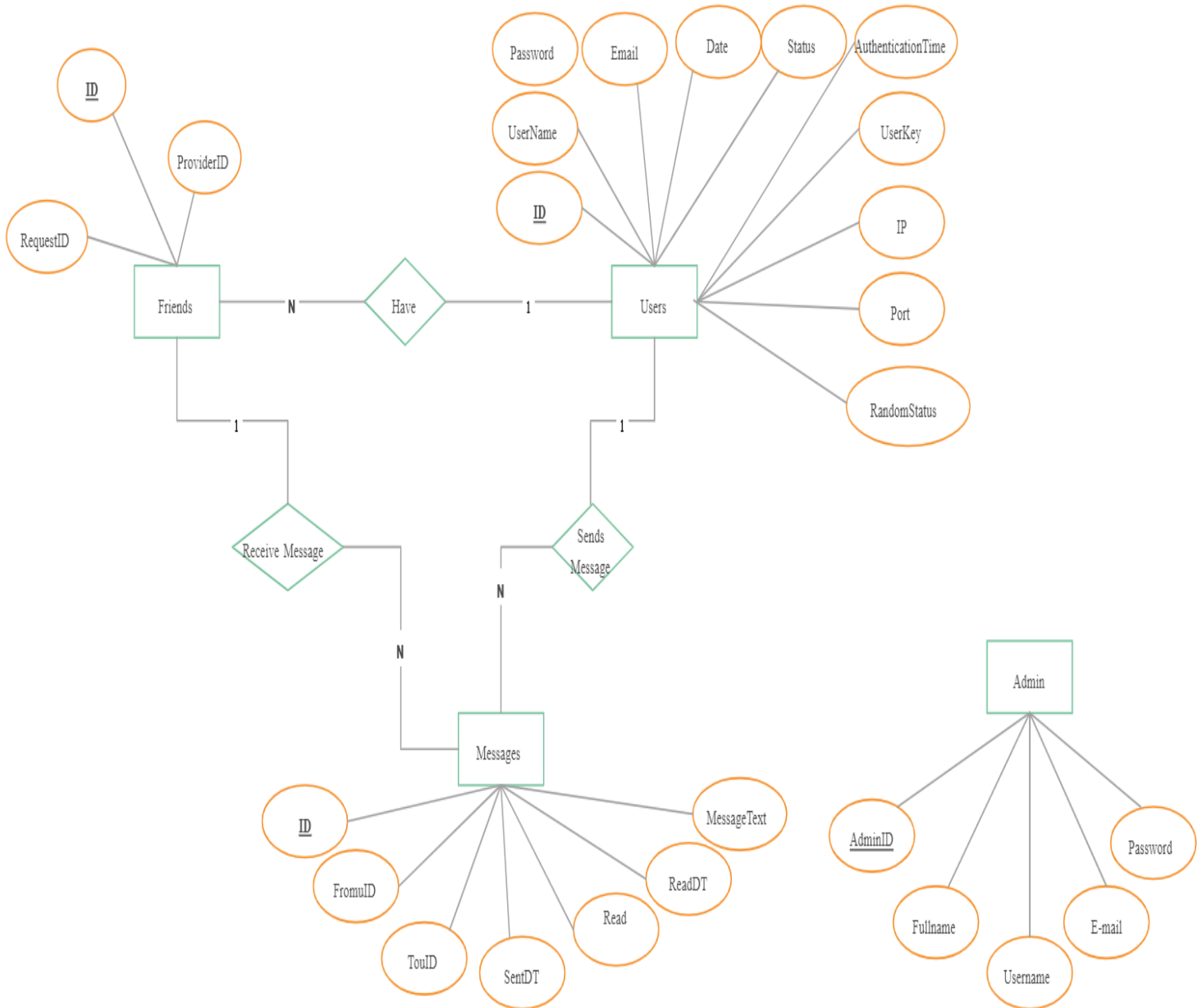
2.1 Product Perspective

A use case diagram for a chat application and website serves several purposes, providing a visual representation of the system's functionality from a user's perspective.



2.2 Product Function

Entity Relationship Diagram of Chat application and website. This ER (Entity Relationship) Diagram represents the model of Chat Application Entity. The entity-relationship diagram of Chat Application shows all the visual instrument of database tables and the relations between user, Group chat, chat, smiles chat etc. It used structured data and to define the chat Application are chat, user, chat history, group chat, notification, and smiles chat.



2.3 User Classes and Characteristics

User classes and characteristics for a chat application can help in defining user persons and making the application to meet the diverse needs of the users. Here are some user classes and their characteristics:

- 1) Individual Users:
 - Personal use.
 - May chat with friends and family.
 - May use the application for social networking and sharing personal updates.
 - Seek a user-friendly and intuitive interface.
 - Value privacy and security of their messages.
- 2) Business Users:
 - Use the chat application for work-related communication.
 - May collaborate with colleagues, clients, or partners.
 - Require features like file sharing, group chats, and integrations with productivity tools.
 - Need efficient communication for remote work.
 - May need administrative controls for managing team members.
- 3) Teenagers and Students:
 - Use the application for socializing with peers.
 - High usage of emojis, stickers, and multimedia content.
 - May require parental controls and safety features.
 - May prefer customizable profiles and themes.
- 4) Elderly Users:
 - May use the application to connect with family and friends.
 - Prefer simplicity and larger text/icons for readability.
 - May need assistance with app setup and troubleshooting.
 - Value clear and accessible user guides.
- 5) Power Users:
 - Frequently use the chat application for various purposes.
 - Explore advanced features like message formatting, bots, and automation.
 - May need customization options and keyboard shortcuts.
 - Seek integration capabilities with other apps and services.
- 6) Casual Users:
 - Use the chat application infrequently.
 - May not explore all features and settings.
 - Prefer a straightforward and uncomplicated user experience.
 - May need occasional reminders or tips.
- 7) International Users:
 - Speak different languages and may require multilingual support.
 - Use the application to connect with friends and contacts from various countries.
 - May need translation features for better communication.
- 8) Privacy-Conscious Users:
 - Highly value privacy and data security.
 - May prefer end-to-end encryption and anonymous registration options.
 - May use the application for sensitive or confidential conversations.

9) Accessibility Users:

- Have disabilities or impairments and require accessible features.
- Rely on screen readers, voice commands, or other assistive technologies.
- Seek applications with good contrast, keyboard navigation, and text-to-speech options.

10) Community or Group Organizers:

- Use the chat application to manage and engage with a community or group.
- Need features like moderation, event scheduling, and announcements.
- May require tools for member recruitment and engagement tracking.

Understanding these user classes and their characteristics can help in designing and prioritizing features, user interface elements, and support options to scatter a diverse user base effectively. Additionally, conducting user research and gathering feedback can further refine the application's usability and user experience.

2.4 Operating Environment

The product will be operating in windows environment. The Chat application and website is a website and shall operate in all famous browsers, for a model we are taking Microsoft Internet Explorer, Google Chrome, and Mozilla Firefox. Also, it will be compatible with the IE 6.0. Most of the features will be compatible with the Mozilla Firefox & Opera 7.0 or higher version. The only requirement to use this online product would be the internet connection.

The hardware configuration includes Hard Disk: 40 GB, Monitor: 15” Color monitor, Keyboard: 122 keys. The basic input devices required are keyboard, mouse and output devices are monitor, printer etc.

2.5 Assumptions and Dependencies

The assumptions are: -

- The coding should be error free
- The system should be user-friendly so that it is easy to use for the users
- The information of all chat, notifications and files must be stored in a database that is accessible by the website.
- The system should have more storage capacity and provide fast access to the database
- The system should provide search facility and support quick transactions
- The system should provide search facility to identify users and support quick delivery of messages.
- Users may access from any computer that has Internet browsing capabilities and an Internet connection.
- Users must have their correct usernames and passwords to enter their online accounts and do actions

The dependencies are: -

- The specific hardware and software due to which the product will be run
- Based on listing requirements and specification the project will be developed and run
- The end users (admin) should have proper understanding of the product
- The system should have the general report stored.

2.6 Requirement

Software Configuration: -

- Operating System: Windows 11 Home Single Language Version 23H2
- Front End Tool: Visual Studio Code
- Database: MongoDB

Hardware Configuration: -

- Processor: 11th Gen Intel(R) Core(TM) i5-1135G7 @ 2.40GHz 1.38 GHz
- Hard Disk: 40GB
- RAM: 256 MB or more

2.7 Data Requirement

Designing a chat application and website involves collecting and managing various types of data to provide a seamless and engaging user experience. Below is a list of data requirements for the system of chat application and a website:

1. User Profile Data
2. User Authentication Data
3. Chat Data
4. Notification Data
5. Activity and usage Data.

3.External Interface Requirement

3.1 GUI

External Interface Requirements for the graphical user interface (GUI) of a chat application and website typically include elements related to user interaction, navigation, and overall user experience. Here are some key aspects to consider:

- Users should be able to enter their credentials (username and password) in a secure and user-friendly manner.
- Upon login, users should be directed to a dashboard or homepage displaying relevant information such as recent messages, contacts, or group chats.
- Users should be able to manage their contacts, add new contacts, and see the online/offline status of their connections.
- Users should have the ability to update their profile information, including profile picture, status, and other relevant details.
- Implement a search feature that allows users to find and connect with other users or groups.
- Provide a settings menu where users can customize preferences, such as notification preferences, privacy settings, and account settings.

4. System Features

The users of the system should be provided the surety that their account is secure. This is possible by providing: -

- Ability for users to create, customize, and manage their profiles.
- Group chat functionality with multiple participants.
- Notifications for new messages, friend requests, and other important events.
- Secure file sharing within chat conversations.

5.Other Non-functional Requirements

5.1 Performance Requirement

The Performance requirements for a chat application and website are crucial to ensure a smooth and responsive user experience. Here are some key performance requirements:

- Messages should be delivered within milliseconds, and the website should load within a few seconds.
- The system should be able to handle an increasing number of users and messages without a significant degradation in performance.
- The application should support concurrent users engaging in multiple conversations without performance bottlenecks.
- Optimize data transmission to minimize bandwidth usage, especially for multimedia content.
- The performance of the system should be fast and accurate

5.2 Safety Requirement:

The database may get crashed at any certain time due to virus or operating system failure. Therefore, it is required to take the database backup so that the database is not lost. Proper UPS/inverter facility should be there in case of power supply failure.

5.3 Security Requirement

The security requirements are:

- Implement secure session management to prevent session hijacking and unauthorized access.
- Ensure the integrity of user data by implementing mechanisms to detect and prevent unauthorized modifications.
- Normal users can just read information but they cannot edit or modify anything except their personal and some other information.
- System will have different types of users and every user has access constraints

5.4 Requirement attributes

The requirement attributes are:

- There may be multiple admins creating the project, all of them will have the right to create changes to the system. But the members or other users cannot do changes
- The project should be open source
- The Quality of the database is maintained in such a way so that it can be very user friendly to all the users of the database
- The user be able to easily download and install the system

5.5 Business Rules

A business rule is anything that captures and implements business policies and practices. A rule can enforce business policy, decide, or infer new data from existing data. This includes the rules and regulations that the System users should abide by. This includes the cost of the project and the discount offers provided. The users should avoid illegal rules and protocols.

5.6 User Requirements

User requirements for a chat application and website are essential for ensuring that the system meets the needs and expectations of its users. Here are some user requirements for a chat application and website:

- Backup and Recovery
- Data replication i.e., if the data is lost in one branch, it is still stored with the server
- Auto Recovery i.e., frequently auto saving the information
- Maintaining files i.e., File Organization
- The server must be maintained regularly and it must be updated from time to time.

6. Other Requirements

6.1 Data and Category Requirement

Data and category requirements for a chat application and website involve specifying the types of data that the system will handle and the categories into which this data can be organized.

6.2 Appendix

A: Admin, Abbreviation, Acronym, Assumptions; B: Books, Business rules; C: Class, Client, Conventions; D: Data requirement, Dependencies; G: GUI; K: Key; N: Non-functional Requirement; O: Operating environment; P: Performance, Perspective, Purpose; R: Requirement, Requirement attributes; S: Safety, Scope, Security, System features; U: User, User class and characteristics, User requirement.

6.3 Glossary

The following are the list of key terms related to the chat application and website:

- Chat Application: Software or platform that enables users to engage in real-time text or multimedia-based conversations with one another.
- User: An individual who registers and interacts with the chat application or website.
- Authentication: The process of verifying and confirming the identity of a user attempting to log into the chat application.
- Authorization: Granting or denying access to specific features or resources within the chat application based on the user's permissions.
- End-to-End Encryption: A security measure that ensures that messages and data are encrypted and can only be decrypted by the intended recipient.
- Group Chat: A feature that allows multiple users to participate in a single chat conversation.
- Multimedia Messaging: Sending and receiving various types of media, such as images, videos, and documents, within chat conversations.
- Contact List: A list of users or contacts with whom a user can communicate within the chat application.
- Profile: Information and details associated with a user, including profile picture, status, and other personal preferences.
- Notification: Alerts or messages that inform users about new messages, friend requests, or other relevant activities.

6.4 Class Diagram

A class is an abstract, user-defined description of a type of data. It identifies the attributes of the data and the operations that can be performed on instances (i.e. objects) of the data. A class of data has a name, a set of attributes that describes its characteristics, and a set of operations that can be performed on the objects of that class. The classes' structure and their relationships to each other frozen in time represent the static model. In this project there are certain main classes which are related to other classes required for their working. There are different kinds of relationships between the classes as shown in the diagram like normal association, aggregation, and generalization. The relationships are depicted using a role name and multiplicities.

