

Project Name - UniChat

Software Requirements Specification

INT219

Front End Development

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1. Introduction

UniChat is a secure real-time web-based chat platform that allows users to communicate through private one-on-one messaging. It is built using HTML, CSS (TailwindCSS), JavaScript, PHP, and MySQL. UniChat also includes recent modifications like real-time updates using AJAX, typing indicators, user presence status, and message timestamps. It supports profile customization and enhanced session handling.

1.1 Purpose

This SRS document provides a comprehensive view of the requirements for the UniChat application. It defines both functional and non-functional specifications, design constraints, and system goals.

1.2 Scope

UniChat offers:

- *Secure user registration and login*
- *Live chat with typing indicators*
- *Profile editing with image upload*
- *AJAX-based real-time updates*
- *Presence status (Online/Offline)*
- *Responsive design and cross-browser compatibility*

1.3 Definitions, Acronyms, and Abbreviations

- **AJAX:** Asynchronous JavaScript and XML
- **UI:** User Interface
- **SRS:** Software Requirements Specification
- **PHP:** Hypertext Preprocessor
- **MySQL:** Relational Database Management System
- **DOM:** Document Object Model

1.4 References

- *PHP Docs:* <https://www.php.net/docs.php>
- *MySQL Docs:* <https://dev.mysql.com/doc/>
- *TailwindCSS:* <https://tailwindcss.com/docs>
- *MDN Web Docs:* <https://developer.mozilla.org>

1.5 Overview

This document covers a complete description of the system, including the architecture, functional modules, and design specifications for the UniChat platform.

2. General Description

This section of the SRS should describe the general factors that affect 'the product and its requirements. It should be made clear that this section does not state specific requirements; it only makes those requirements easier to understand.

2.1 Product Perspective

UniChat is a standalone full-stack web application. It follows a client-server architecture. The frontend is responsive and styled using TailwindCSS. The backend uses PHP for server logic and MySQL for persistent data storage.

2.2 Product Functions

- *User Registration and Authentication*
- *One-on-One Chat Functionality*
- *Profile Image Upload and Update*
- *Typing Indicator Feature*
- *Real-Time Message Updates via AJAX*
- *Online/Offline Presence Status*
- *Message Timestamp*
- *Session Management*

2.3 User Characteristics

- *Users must register before accessing the chat features.*
- *Users should have basic familiarity with web applications.*

2.4 General Constraints

- *Deployed on server with PHP and MySQL support*
- *Optimized for major modern browsers*
- *Requires a stable internet connection*

2.5 Assumptions and Dependencies

- *Server must support PHP 7.4+*
- *MySQL should be properly configured*
- *Browser must support JavaScript*

3. Specific Requirements

This section outlines the detailed software requirements that guide the design, development, and testing of the UniChat system.

3.1 External Interface Requirements

3.1.1 User Interfaces

- TailwindCSS for styling
- JavaScript for interactivity
- Forms for login, registration, and chat

3.1.2 Hardware Interfaces

- PC/Laptop/Mobile with internet

3.1.3 Software Interfaces

- PHP (Backend)
- MySQL (Database)
- JavaScript (Frontend)

3.1.4 Communications Interfaces

- HTTP/HTTPS protocols

3.2 Functional Requirements

This section describes specific features of the software project.

3.2.1 User Authentication (Signup/Login)

3.2.1.1 Introduction

Allows users to create accounts and securely log into the UniChat application.

3.2.1.2 Inputs

Username, Password

3.2.1.3 Processing

Credentials are verified against the MySQL database using PHP scripts. Passwords are hashed and matched securely.

3.2.1.4 Outputs

User is logged in and redirected to the chat dashboard or shown error messages on failure.

3.2.1.5 Error Handling

Displays validation messages for invalid input or login failure. Catches database errors.

3.2.2 Real-Time Messaging

3.2.2.1 Introduction

Enables users to send and receive messages instantly.

3.2.2.2 Inputs

Message text, sender ID, receiver ID

3.2.2.3 Processing

Messages are sent via AJAX and stored in the database. Periodic polling retrieves new messages.

3.2.2.4 Outputs

Displays new messages in the chat window dynamically.

3.2.2.5 Error Handling

If message fails to send, shows notification to user and retries on next polling.

3.2.3 Profile Management

3.2.3.1 Introduction

Lets users update profile picture and basic details.

3.2.3.2 Inputs

Image file, name, contact info, Socials

3.2.3.3 Processing

Uploaded files are validated and stored, data is updated in the database.

3.2.3.4 Outputs

Updated profile displayed on user dashboard.

3.2.3.5 Error Handling

Invalid file types or large files prompt error messages.

3.2.4 Logout Functionality

3.2.4.1 Introduction

Allows users to end session securely.

3.2.4.2 Inputs

Logout button click

3.2.4.3 Processing

Session variables are destroyed, and user is redirected to login page.

3.2.4.4 Outputs

User is logged out and returned to login screen.

3.2.4.5 Error Handling

Force logout on session timeout or server error.

3.5 Non-Functional Requirements

3.5.1 Performance

95% of message transmissions should appear within 1 second. AJAX polling should not exceed 2 seconds per interval.

3.5.2 Reliability

System should support at least 100 concurrent users without failure. Message loss rate must be < 0.01%.

3.5.3 Availability

System uptime must be > 99.5%. Downtime may not exceed 7 minutes.

3.5.4 Security

All inputs sanitized. Passwords hashed with bcrypt. Session hijack prevention in place.

3.5.5 Maintainability

Code modularity should allow any feature update to be implemented in under 1 day.

3.5.6 Portability

App must run consistently across Chrome, Firefox, Safari, and mobile browsers with responsive design.

3.7 Design Constraints

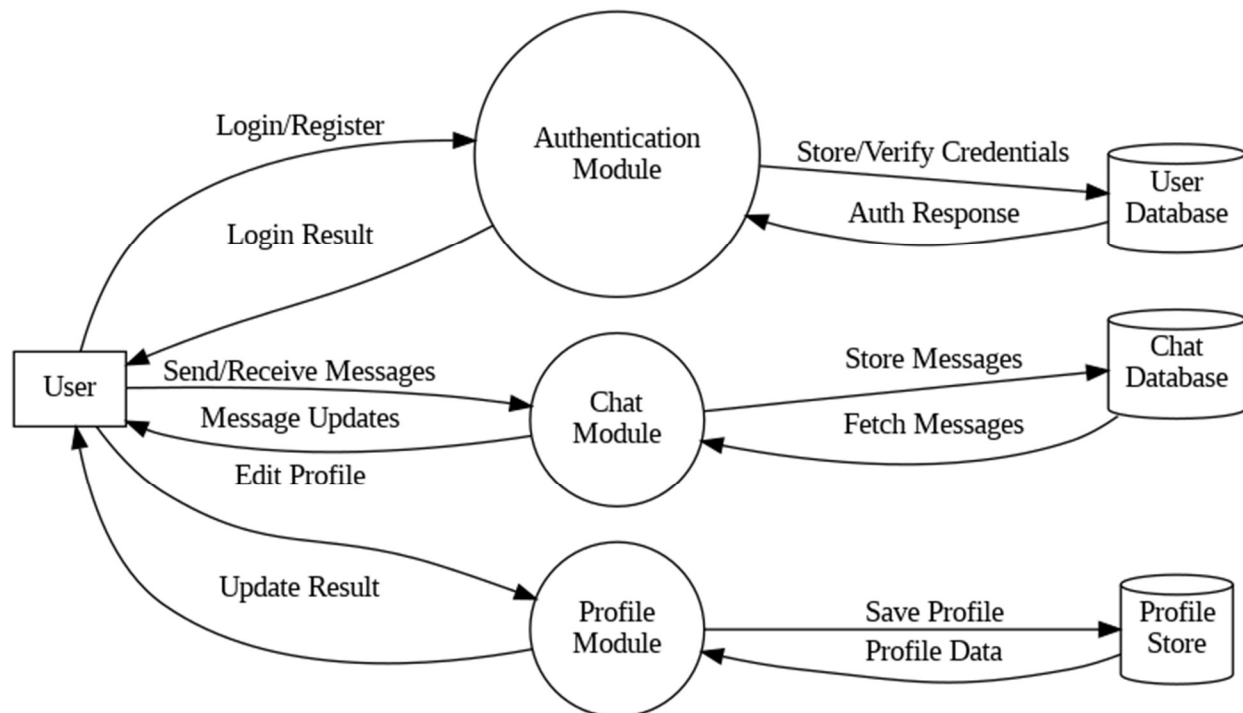
- *No WebSocket implementation; AJAX used for updates*
- *Message storage limited to 100 per user pair (customizable)*

3.9 Other Requirements

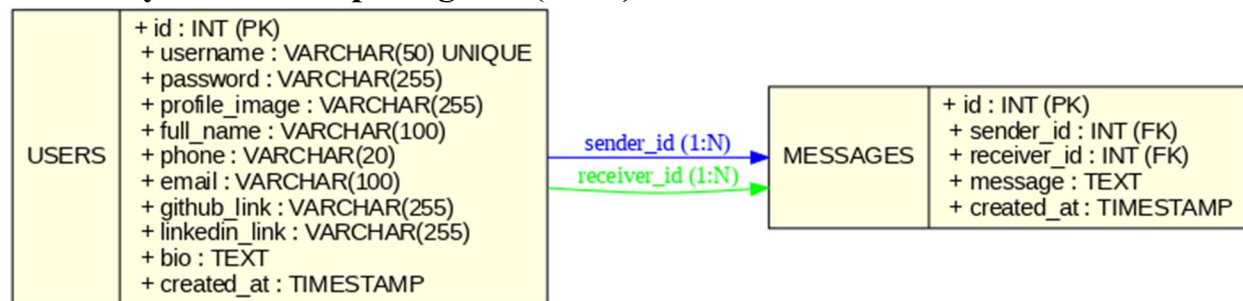
- *README and Deployment Guide included*
- *Modular file structure*

4. Analysis Models

4.1 Data Flow Diagrams (DFD)



4.2 Entity Relationship Diagram (ERD)



5. GitHub Link

<https://github.com/manpreetsidhhu/uniChat>

A. Appendices

A.1 Glossary

- **Session:** Maintains user state across pages
- **Typing Indicator:** Visual cue for typing
- **AJAX:** For dynamic frontend interaction

A.2 Known Issues

- No group chat or multimedia support
- Typing indicator refreshes every 3 seconds
- Logout delay if server is slow