Software Requirements Specification

for

Online Social Networking System

Version 1.0 approved

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CSE TMSL

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Contents

1. Introduction

1.1 Purpose/Objective

The OSNS Platform is a cutting-edge social networking solution designed to transform how users connect and interact online. By seamlessly integrating a range of social features, the system offers an intuitive interface for managing social connections, sharing content, and participating in communities. With advanced features for profile management, content sharing, real-time messaging, and personalized notifications, the platform ensures a seamless and engaging experience for all users. Embracing the latest technologies, the OSNS aims to enhance traditional social networking functionalities, providing secure and reliable solutions for social interaction and content management.

1.2 Document Conventions

1.2.1 Alignment: There entire document is in justified alignment**.**

1.2.2 Convention for the Main Title

1.2.2.1 Font Face: Times New Roman

1.2.2.2 Font Style: Bold

1.2.2.3 Font Size: 20

1.2.3 Convention for Sub-Title

1.2.3.1 Font Face: Times New Roman

1.2.3.2 Font Style: Bold

1.2.3.3 Font Size: 16

1.2.4 Convention for Sub-Subtitle

1.2.4.1 Font Face: Times New Roman

1.2.4.1 Font Style: Normal

1.2.4.2 Font Size: 14

1.2.5 Convention for the Body

1.2.5.1 Font Face: Times New Roman

1.2.5.2 Font Style: Normal

1.2.5.3 Font Size: 12

1.2.6 Abbreviations

1.2.6.1 OSNS: Online Social Networking System

1.2.6.2 UI: User Interface

1.2.6.3 API: Application Programming Interface

1.2.6.4 SQL: Structured Query Language

1.3 Scope

The project aims to develop an efficient, user-friendly, and robust Online Social Networking System (OSNS) that facilitates seamless online interactions and social engagements. The platform will provide users with a range of features, including profile management, content sharing, messaging, and community participation, while ensuring data security and scalable performance. Designed to enhance the social networking experience, the OSNS will offer secure and intuitive solutions for connecting with others, discovering content, and participating in discussions, all within a reliable and scalable framework.

1.4 References

1.4.1 https://www.investopedia.com/terms/s/social-networking/

1.4.2 Article by ResearchGate

1.4.3 Fundamentals of Software Engineering by Rajib Mall

2 History/Background Study

2.1 Technical Literature

This SRS outlines a comprehensive approach to designing a user-centric, scalable, and secure Online Social Networking System (OSNS). By integrating robust privacy controls, real-time data processing, and personalized social features based on advanced algorithms, the OSNS aims to enhance user engagement and interaction. With a focus on cross-platform compatibility, intuitive user interface design, and network analysis, the system is dedicated to creating a user-friendly and secure social networking experience. The incorporation of multi-platform integration, data analytics, secure communication protocols, and advanced business intelligence tools ensures that the OSNS can meet diverse social and content-sharing needs while developing an integrated, scalable, and intuitive platform.

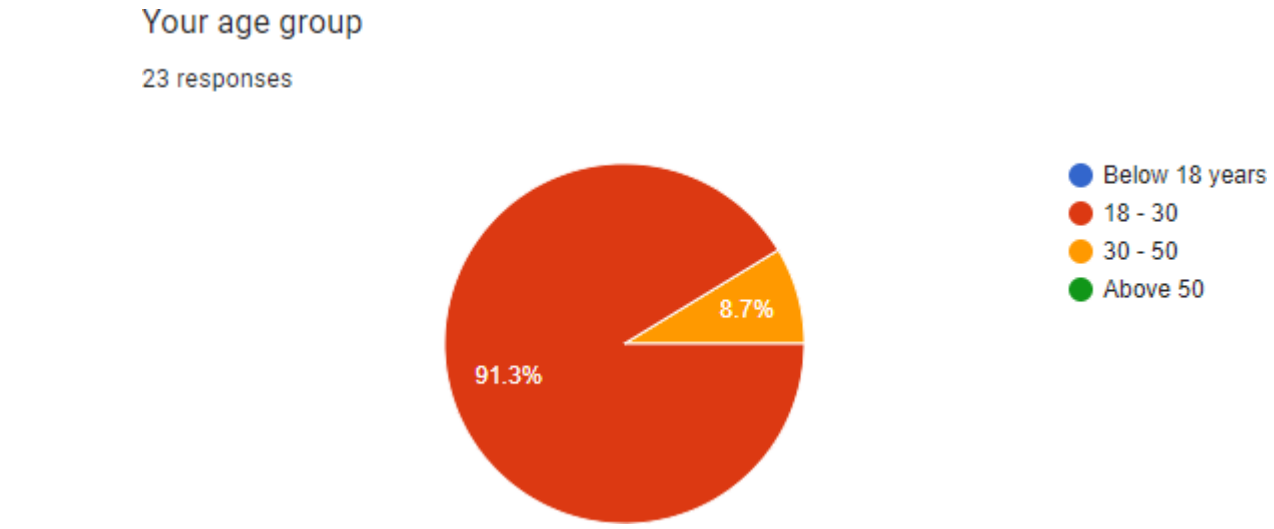
2.2 Existing Applications

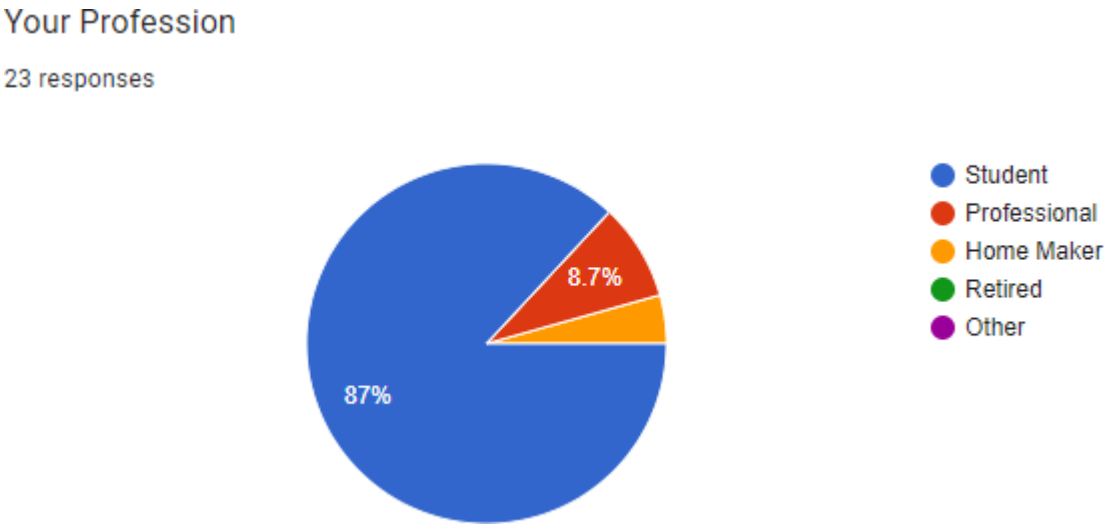
There are many existing social media applications in the market which we use on a day-to-day basis. Some of them are:

- Social media (WhatsApp, Instagram, etc.)
- Professional sites (LinkedIn, etc.)
- Content sharing /viewing (YouTube, TikTok, etc.)
- Forums (Reddit, Quora, etc.)

2.3 Customer Surveys

Survey form Form Responses

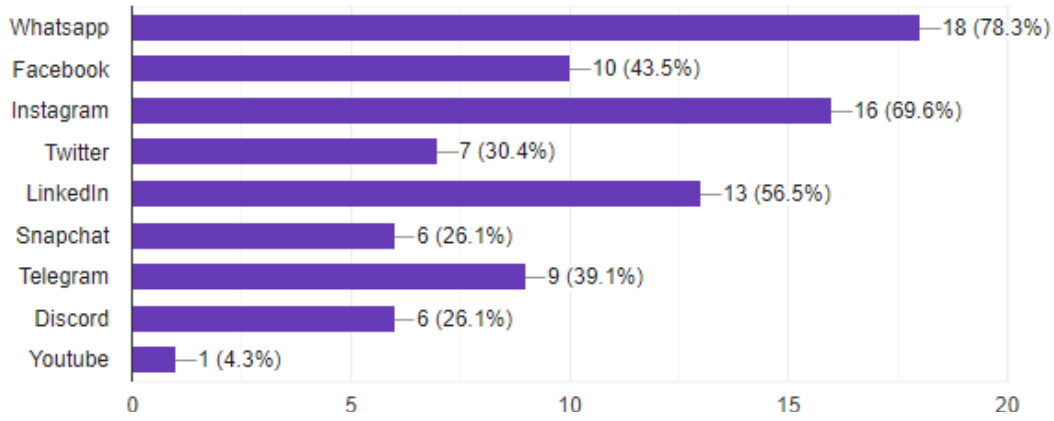




Which social media app do you use the most?

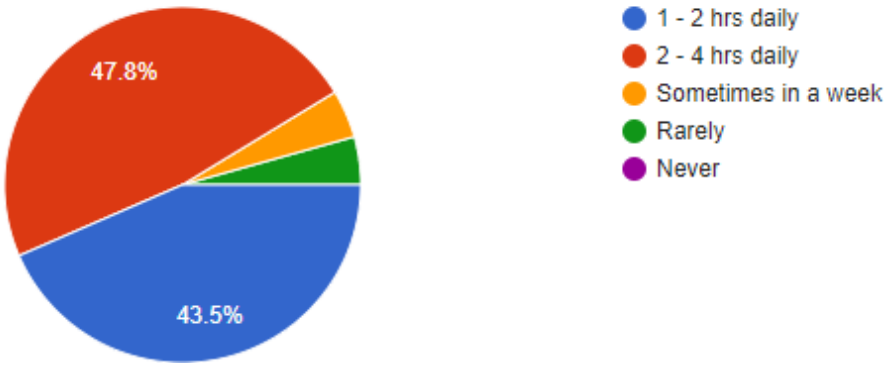
Copy

23 responses



How much time do you usually spend here?

23 responses



Which of these do you do usually?

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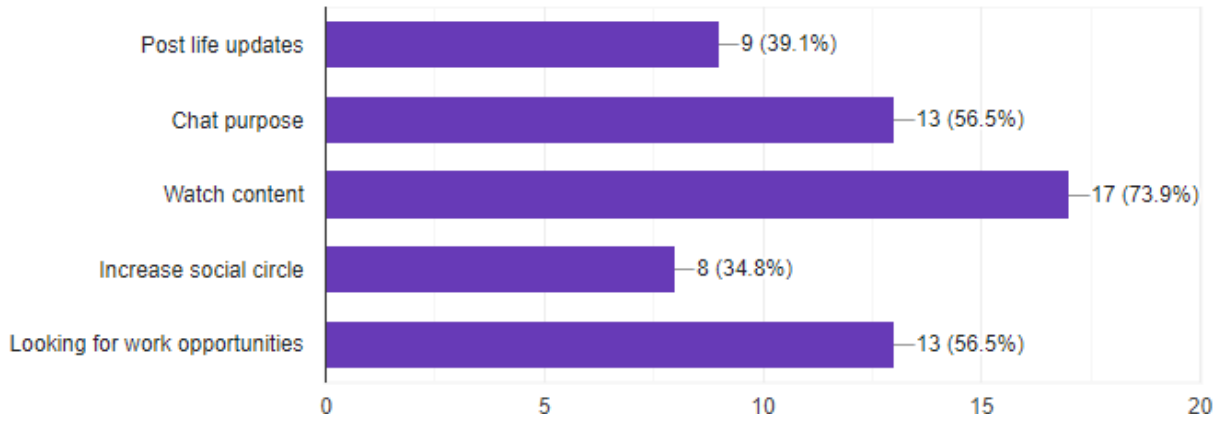
23 responses



Reasons behind the attraction of these sites?

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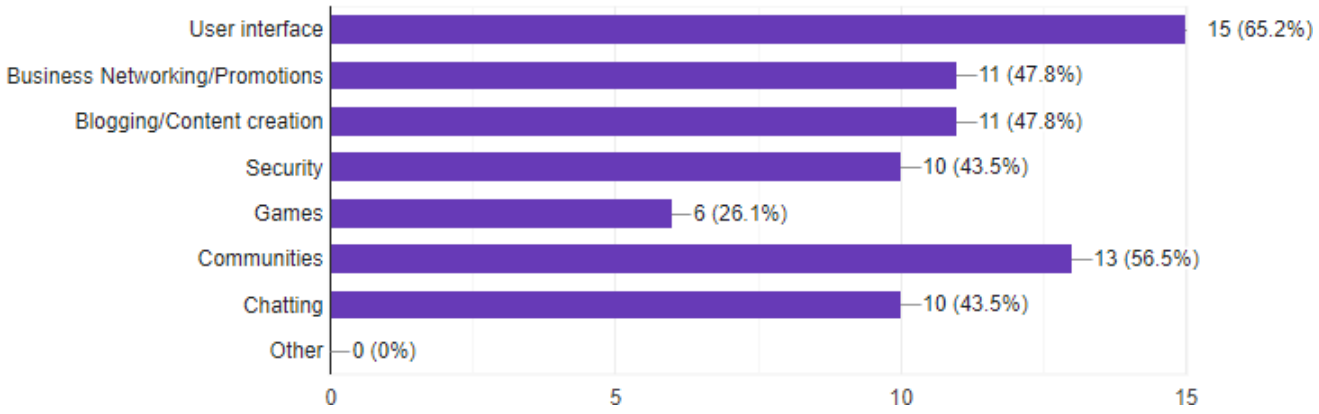
23 responses



What type of content do you mostly enjoy?

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23 responses

How would you rate your overall satisfaction with the platform?

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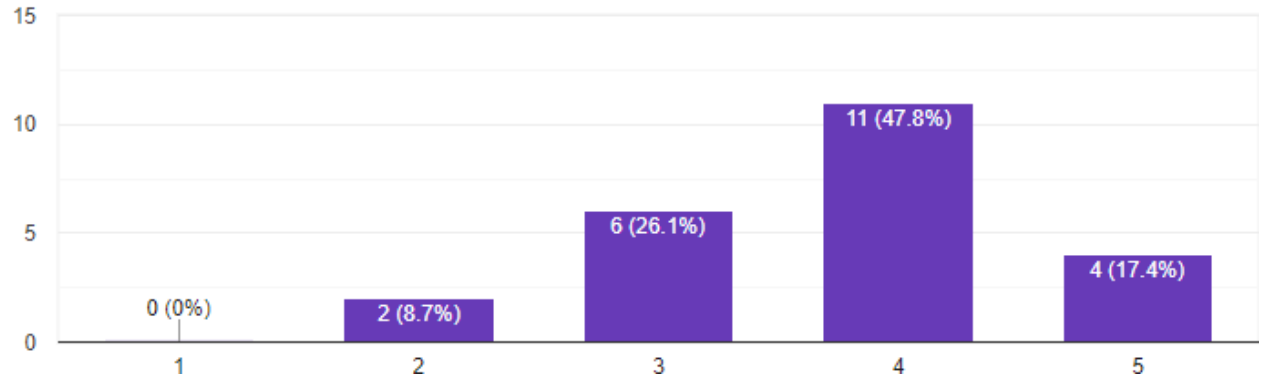
23 responses



Which new features would you like to see in the future?

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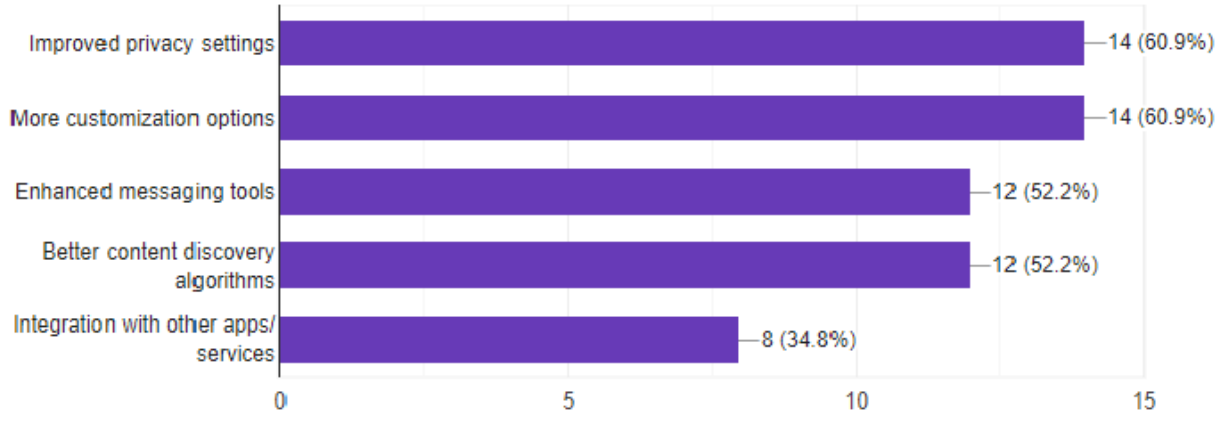
23 responses



How would you rate the following aspects of customer support? (Rate each from 1 = Poor to 3 = Good)

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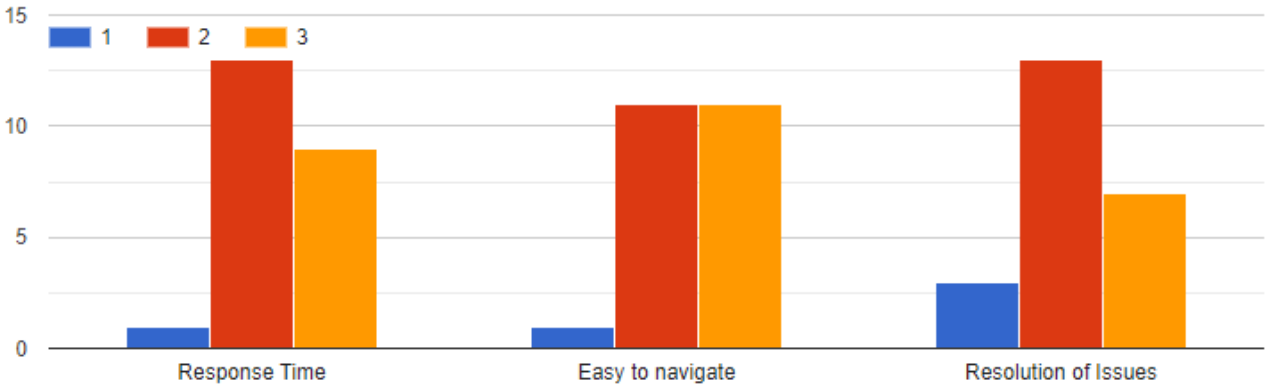

2.4 Expert Advice

In crafting the SRS for the Online Social Networking System (OSNS), it is crucial to prioritize a user-centric design, scalability, and robust security measures. By thoroughly understanding users' needs through research and usability testing, the OSNS can deliver a seamless and engaging social experience. Anticipating future growth and technological advancements, the system should be flexible and adaptable, allowing for easy integration with external services and platforms. Ensuring compliance with legal regulations, such as data protection laws, and fostering inclusivity through accessibility features are paramount. Continuous testing, comprehensive documentation, and effective communication among stakeholders will promote a collaborative and efficient development process. Emphasizing data analytics for informed decision-making and user engagement further enhances the OSNS's potential to evolve into a successful, secure, and user-friendly social networking platform.

2.5 Current/Future Requirements

1. Advanced Privacy Controls: Customizable privacy settings, encryption, and management of third-party access.
2. Decentralization and Fintech Integration: Integration of decentralized technologies and fin-tech solutions for digital payments and financial services.
3. AI-Powered Personalization: Personalized content recommendations, friend suggestions, and targeted advertising based on user behavior.
4. Virtual Reality (VR) and Augmented Reality (AR) Integration: Support for immersive VR experiences and AR features like filters and interactive environments.
5. Enhanced Accessibility Features: Compliance with accessibility standards , including text-to-speech, speech-to-text, and customizable UI options.
6. Real-Time Language Translation: Instant translation of chat messages, posts, and user interfaces to facilitate multilingual communication.
8. Secure User Verification**:** Multi-factor authentication, biometric verification, and secure identity verification processes.
9. Cross-Platform Collaboration: Seamless interaction and data consistency across web, mobile (iOS and Android), and desktop applications.
10. Integrations with Emerging Technologies: Support for blockchain, IoT, and advanced data analytics tools.
11. AI-Driven Support and Customer Service: AI-powered chatbots and virtual assistants for immediate support and issue resolution.

3. Overall Description

3.1 Product Functions

3.1.1 Hardware Requirement

- **Servers:**
  - Web Servers: For hosting the OSNS platform.
  - Application Servers: For running application logic.
  - Database Servers: For storing user data.
- **User Devices**:
  - Computers: For accessing the web platform.
  - Mobile Devices: Smartphones and tablets for mobile access.

- **Networking Equipment:**
  - Routers and Switches: For data management and routing.
  - Firewalls: For security and protection.

- **Data Storage**: Cloud Storage: For scalable data storage and backups.
- **Security Systems**:
  - Encryption Modules: For securing data transmission.
  - Intrusion Detection Systems (IDS): For monitoring security threats.

3.1.2 Software Requirements

- Operating System
  - Web Servers: Common platforms like Linux or Windows Server.
  - Mobile Platforms: iOS and Android for mobile apps.

- Application Software: Software that facilitates:
  - User Interface: For interacting with users and displaying content.
  - Backend Processing: To handle user data, content management, and server communication.
  - Security Protocols: For user authentication and secure transactions.
  - Error Handling: To manage and log system errors and exceptions.
- Security Software: Includes:
  - Encryption: To secure data in transit and storage.
  - Authentication: For secure user access and identity verification.
  - Anti-Fraud Measures: To detect and prevent fraudulent activities.
- Monitoring and Management Software:
  - System Monitoring: For tracking system performance and uptime.
  - Update Management: For applying software updates and patches.
  - Remote Diagnostics: For troubleshooting and maintenance.

3.2 Functional Requirements

3.2.1 User Greeting

- **Description**: When a user logs in, the app home or feed page is displayed.
- **Input**: User logs in using their credentials (username and password).
- **Output**: If credentials are correct, the message "Welcome [User's Name]" is displayed; otherwise, "Incorrect username or password" is shown.

3.2.2 Language Selection

- **Description**: The user will be asked to select their preferred language from the list of available languages
- **Input**: User will enter their preferred language.
- **Output**: All interface elements and instructions are displayed in the chosen language

3.2.3 User Activity Selection

- **Description**: Users choose their desired activity from a list of available options.
- **Input**: User selects an activity (e.g., post a status, send a message, view notifications).
- **Output**: The system navigates to the chosen activity interface.

3.2.3.1 Post a Status

- **Description** Users can post updates to their profile**.**
- **Input**: User writes a status update and optionally adds media (images, videos).
- **Output**: The status update is posted to the user's profile and visible to their connections.

3.2.3.2 Send a Message

- **Description**: Users can send private messages to other users.
- **Input**: User selects a contact, types a message, and sends it.
- **Output**: The message is delivered to the recipient's inbox and a confirmation "Message sent" is displayed.

3.2.3.3 View Notifications

- **Description**: Users can view notifications for interactions such as likes, comments, or friend requests.
- **Input** User clicks on the notification's icon.
- **Output**: A list of recent notifications is displayed, with options to view details.

3.2.3.4 View Profile

- **Description**: Users can view their own or others' profiles.
- **Input**: User navigates to a profile (themselves or another user).
- **Output**: The profile page is displayed with information such as bio, posts, and friend list.

3.2.3.5 Update Profile Information

- **Description**: Users can update their profile details.
- **Input**: User edits profile information (e.g., bio, profile picture).
- **Output**: Updated profile information is saved and displayed on their profile page.

3.2.3.6 Manage Friend Requests

- **Description**: Users can accept or decline friend requests.
- **Input**: User views incoming friend requests and chooses to accept or decline.
- **Output**: The friend request status is updated, and the user's friend list is modified accordingly.

3.2.3.7 Change Password

- **Description**: Users can change their account password.
- **Input**: User enters current password, new password, and confirms the new password.
- **Output**: If passwords match and are valid, a message "Password changed successfully" is displayed; otherwise, "Incorrect current password" or "Passwords do not match" is shown.

3.2.3.8 Report a Problem

- **Description**: Users can report issues or problems encountered on the platform.
- **Input**: User provides details of the problem and submits a report.
- **Output**: A confirmation message "Your report has been submitted" is displayed, and the issue is logged for review.

3.3 Non-Functional Requirements

3.3.1 Correctness Requirement:

All requirements specified in the document must be correctly implemented to ensure that the OSNS functions as intended. This includes accurate execution of all specified features and use cases.

3.3.2 Installation Requirement:

The OSNS must be compatible with various operating systems and web browsers. It should be designed for straightforward installation and configuration to ensure that end users and administrators can deploy and maintain the system effectively.

3.3.2 Efficiency Requirement: The software is highly efficient and various tasks in its various modules can be performed efficiently. Even if the system fails, the system will be recovered back up within a short span of time.

3.3.3 Usability Requirement: The software has a simple but efficient user interface, which can be used by all types of users, both technically sound as well as people not having so much technological knowledge. So, any user can use its functionalities without any sort of complications.

3.3.4 Reusability Requirement: The system components should be designed for reuse across different parts of the platform. Modules and functions should be modular and adaptable to ensure they can be repurposed for different features and functionalities as needed.

3.3.5 Reliability Requirement: The system provides storage of all databases on redundant computers with automatic switchover. The reliability of the overall program depends on the reliability of the separate components. The main pillar of reliability of the system is the backup of the database of the system which iscontinuously maintained and updated to reflect the most recent changes. Thus, all overall stability of the system depends on the stability of the machine container and its underlying operating system.

3.3.6 Maintainability Requirement: A professional technical checkup is used for maintaining the application server and functioning. In case of failure, a re-initialization of the program will be done. Also, the software design is being done with modularity in mind so that its maintainability can be done efficiently

3.3.7 Security Measures: Security becomes an important factor in software systems and hence this has been thoroughly taken care of by multiple checks to ensure a robust and risk free environment within the system.

3.4 User Characteristics

The application does not require any specific computer knowledge to use it except the developers and administrators of it. Standard users are thought to be from any gender and any nationality, who can use just a system using instructions displayed and typing in credentials. The textbox where credentials are to be entered is also displayed to avoid any confusion to the users. However, administrators and potential developers will need a high level of expertise to understand web technologies.

3.5 Design & Implementation Constraints

Any update regarding the article will have to be recorded and the correct information must be updated, and all the cost calculations must be done as soon as possible. The backup of all the development data must be done on multiple hard disks and cloud-based storage. Use of strong firewalls must be made, and proper antivirus scans must be done before use. There is no provision for experiencing security issues as the system's robustness and security is an important concern.

3.6 Assumptions & Dependencies

3.6.1 Assumptions:

- The code is bug free.
- The code is resistant to threats.
- The servers are behind multiple layers of firewalls.

• The network requests are logged for future security reference.

• The system should have an apt storage capacity and provide fast access.

• Users must insert enter correct credentials.

3.6.2 Dependencies:

• The product needs the following third-party applications for the development of the project:

o Android Studio (for development of android based applications).

o VS-Code for the web-based coding part.

o UI/ UX (for editing layouts, icons, buttons, interactive interface

etc.)O Developer tools and extensions

• A relational database management system for database connections with SQL, mongoose.

• There will be the availability of Internet via 3G, 4G, 5G or Wi-Fi at the branch

• Server uptime.

4 Interface Requirements

4.1 User Interface

The social networking platform will feature a user-friendly graphical interface designed for both technical and non-technical users. The interface will include:

o Welcome Page: A landing page for users to log in or create a new account.

o Home Feed: Displays updates, posts, and media shared by users.

o Profile Page: Allows users to view and edit their personal information and settings.

o Notifications Page: Shows recent interactions and updates.

o Messaging Interface: For sending and receiving direct messages and managing conversations.

o Settings Page: For managing account settings, privacy controls, and preferences.

4.2 Hardware Interfaces

The platform requires internet connectivity and compatible hardware for optimal performance:

o WAN-LAN Cable: For network connectivity and data transfer.

o Ethernet Cross-Cable: For direct hardware connections between network devices.

4.3 Software Interfaces

The platform relies on several software components to function effectively. It utilizes scripting languages such as PHP or JavaScript for server-side scripting and dynamic content generation. Database management systems like MySQL or MongoDB are used to store user data, posts, and interactions. DNS (Domain Name System) is employed to resolve domain names to IP addresses, facilitating user access to the platform. Additionally, users will need a modern web browser to interact with and navigate the platform.

4.4 Communication Interfaces

The social networking platform will support comprehensive integration with various external systems and services through APIs and integration tools. These 21 | P a g e will facilitate seamless data exchange and interaction between the platform and other applications, enabling functionalities like content sharing and user authentication across different services. The primary communication interface will be the application platform itself, which will handle interactions with external systems. The level and scope of these integrations will be determined based on security considerations and the specific needs of the platform.

5 Conclusion

In conclusion, the social networking platform is designed to provide a seamless and intuitive user experience while integrating robust technical and security measures. By leveraging user-friendly interfaces, reliable hardware and software components, and comprehensive communication protocols, the platform ensures efficient performance and accessibility. By carefully considering user needs and integration capabilities, the platform aims to offer a secure, engaging, and highly functional environment for users to connect and interact. The focus on scalability and adaptability further supports the platform's ability to evolve with emerging technologies and user expectations, ensuring long-term success and satisfaction