Peer to Peer Messaging App

Software Requirements Specification Document (SRS).

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# SRS Document

The following outlines the software requirements this ensures that the customer and software developer understand what the customer wants the software to do, and what features it should have.

## Introduction

### Purpose

The purpose of this software solution is to provide a cheap, secure and effective solution to student to teacher communication. This software solution is intended to be used in a school environment to help facilitate the communication between students and teachers of information such as task due dates, class changes, and other school related topics. The software solution must also have a way to make sure that all messages are school appropriate and have valid education context as required by the Victorian government (Victorian Goverment, 2023). Finaly due to the usually time sensitive nature of student teacher communication the software solution must ensure that all messages are received in a timely manner.

### Intended Audience and Use

#### Expected Users

##### High school Student

High school Students would likely have a consistent medium to high expertise in messaging apps. This is due to their age group’s high exposure to technology and the internet. Students would mostly use this software solution to ask teachers for clarification on due dates, task requirements, class changes along with many other queries. Therefore, the most important aspect for students is the ability to quickly and easily find the correct teacher for the query for example if a student wanted to change class they should be able to easily find which teacher to contact and be able to easily message them.

##### Teacher

Teachers due to the larger range of age and experience would have variable levels of expertise in messaging apps ranging from low to high levels of expertise this results in their need for a simple and intuitive user interface that can at the same time have complex feature for the more experienced to utilise. Teachers would mostly use this software solution to receive queries from students and either respond to them or find the student in person. Therefore, the most important feature for teachers is the ability to quickly and easily know if a student has messaged them as well as the ability to find relevant information about the student such as their student ID so as to most efficiently be able to look them up in the student database to find more relevant information that can help the teacher answer the query.

#### Possible users

#### Personal use

Private users would have a wide variety of expertise in messaging apps ranging from low to high. This results in their need for a simple and intuitive user interface that can at the same time have complex feature for the more experienced to utilise. Private users would likely use this software solution to privately communicate with friends or family, the private nature of this communication results in the need for effective encryption of the data to protect against leaks of potentially sensitive information. Unlike students and teachers, private users do not need the extra features such as the ability to search for the correct person to contact for various issues, yet more experienced users may find these features beneficial.

#### Summary

In summary the expected users of this software solution require an easy to learn user interface that also gives more experienced users the ability to configure it to properly mirror the school/organisations needs which are likely to be unique to each situation.

### Scope

This section outlines what the software solution will and won`t achieve.

#### In scope

* The ability to text messages to other clients
* End to end encryption
* Peer to peer network
* Storage of user data
* Encryption of stored data

#### Out of scope

* Sending images and other complex data types

### Constraints

#### Time and budget

* Budget: $0
* Time: until 20 September 2024

#### Technical limitations

* Developers must know Python

#### Hardware limitations

* Requires internet access
* Must run-on low-end devices

#### Legal

* “employees in schools do not contact a student via written or electronic means including email, text messages without a valid educational context” (Victorian Goverment, 2023)
  + Will implement a feature to validate the reason for contact.
* IPP 4 / APP 11 – data security
  + To abide by the 4th IPP data security all user data will be securely encrypted in all stages of transfer and storage.
* IPP 10 sensitive information
  + All sensitive information such as but not limited to private messages will be securely encrypted in all stages of transfer and storage.

#### Ethical

* Use for cyber bulling
  + Will implement a feature for easy and anonymous message reporting

### Definitions and Acronyms

* Graphic user interface
  + GUI
* Peer to peer
  + P2P

## User needs

Based on the intended audience and use for this software solution to effectively provide a reliable way to communicate with teachers the software solution must be used by at least ninety percent of teachers using it to promote its use. Therefore, the software solution must be easy to use for the lowest level of user expertise.

## Solution Features and Requirements

This section outlines the feature and requirement of the final software solution.

### Technical requirements:

Operating system: Android, Windows 10/11

CPU: intel I 5

RAM: 4GB

Storage: 128GB

Network: 1 mb up, 1 mb down

Other: Does not require Python (compiled)

### Functional and non-functional requirements

Functional and non-functional requirements outline what features the software solution must include to be functional and what could be added to the software solution to improve the user experience.

#### Functional requirements

* Send messages
  + A messaging app must by definition have the ability to send messages.
  + Input:
    - Message to send
  + Sequence of operations:
    - Input message
    - Encrypt message
    - Send message
  + Output:
    - Sends message across peer to peer (p2p) network
* Receive messages
  + A messaging app must by definition have the ability to receive messages
  + Input:
    - message from the p2p network
  + Sequence of operations:
    - Receive message
    - Decrypt
    - Display message
  + Output:
    - Message displayed to user.
* Secure accounts
  + - It was identified during the analysis that the user base values the security of their messaging platform over anything else.
  + Input:
    - Username
    - Password
  + Sequence of operations:
    - Create account with username and password
    - Encrypt user data from now on
    - Login check if password is correct
    - If so unencrypt data for use
    - Logout save encrypted user data to file
  + Output:
    - Encrypted user data / Unencrypted user data
* End to end encryption
  + It was identified during the analysis that the user base places a large amount of value on the security of their messaging platform.
  + Input:
    - Message to send
  + Sequence of operations:

1. Input message
2. Encrypt message
3. Message received
4. Decrypt message
   * Output:
     + Encrypted messages

#### Non-functional

* Intuitive graphic user interface (GUI)
  + - During analysis it was identified that the user base values easy to use and intuitive user interface.
* Cross platform
  + - The ability to massage users across different platforms was identified as important during analysis.
* Low cost
  + - During analysis it was identified that the final software solution being low cost was of extreme importance to the user base.
* Contact reason validation
  + A system that insures all student teacher messaging is solely for educational purposes. This would likely take the shape of a “network overseer” who could monitor student-teacher communication.
* Message reporting
  + A system to anonymously report cyber bullying to a nominated moderator.
* Find correct teacher to communicate with
  + A search system that will allow students to easily find the correct teacher based on their communication needs
* Add extra info to displayed user profile
  + The ability to have your profile display info other just name such as external contact info and user id
* Network moderation
  + Accounts can be linked to a network moderator who can manage the accounts
* Account types
  + The ability for network moderators to create different types of accounts for example students and teacher account types

References

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