



Faculty of Computer Science and Information Technology

***VOICESPACE: A PLATFORM FOR ANONYMOUS STUDENT  
CONFESSIONS***

Syamimi Binti Supian

Bachelor of Software Engineering with Honours

2025

**VOICESPACE: A PLATFORM FOR ANONYMOUS STUDENT  
CONFESSIONS**

**SYAMIMI BINTI SUPIAN**

This project is submitted in partial fulfilment of the  
requirements for the degree of  
Bachelor of Software Engineering with Honours

Faculty of Computer Science and Information Technology  
UNIVERSITI MALAYSIA SARAWAK

2025

# **VOICESPACE: PLATFORM UNTUK PENGAKUAN PELAJAR TANPA IDENTITI**

**SYAMIMI BINTI SUPIAN**

Projek ini merupakan salah satu keperluan untuk  
Ijazah Sarjana Muda Kejuruteraan Perisian dengan Kepujian

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## DECLARATION

I, Syamimi Binti Supian with matric number 78553, hereby solemnly declare that the report titled '**VoiceSpace: A Platform For Anonymous Student Confessions**' is prepared and completed authentically by me in partial fulfillment of the requirements for the degree of Bachelor of Software Engineering with Honours is a record of an original work carried out by me under the guidance of Associate Professor Dr. Johari bin Abdullah. I further declare that the work reported in this project has not been previously or concurrently submitted for any other degree at UNIVERSITI MALAYSIA SARAWAK (UNIMAS) or any other institution. I declare that I have not copied or plagiarised from any other sources except for quotations and citations which have been duly acknowledged.



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## **ABSTRACT**

The university environment plays a significant role in shaping students' emotional and psychological well-being. However, many students struggle with expressing their thoughts, concerns, and emotions openly due to fear of judgment or stigma which often leads to suppressed feelings and unaddressed issues. To address this challenge, this project proposes VoiceSpace: A platform for Anonymous Student Confessions, a web-based system tailored for UNIMAS students to provide a safe, inclusive, and anonymous space for their experiences. The platform incorporates an interactive comment section, real-time feedback through upvotes, downvotes and a polling feature to foster engagement. To enhance user experience, VoiceSpace also implements robust privacy measures such as one-time email authentication and end-to-end encryption to protect users' identities. By leveraging modern technologies, this system seeks to empower students to voice their thoughts without fear, promote peer support, and encourage healthier communication within the university community. VoiceSpace aspires to be a meaningful initiative contributing to mental well-being, social connectedness, and a culture of openness among students.

## ABSTRAK

Persekitaran universiti memainkan peranan penting dalam membentuk kesejahteraan emosi dan psikologi mahasiswa. Walau bagaimanapun, ramai mahasiswa menghadapi kesukaran untuk menyuarakan fikiran, kebimbangan, dan emosi mereka secara terbuka disebabkan ketakutan terhadap penilaian atau stigma stereotaip masyarakat. Bagi menyelesaikan masalah ini, projek ini mencadangkan sebuah sistem yang dipanggil sebagai *VoiceSpace*: Platform Pengakuan Pelajar Tanpa Identiti, iaitu sebuah sistem berasaskan web yang direka khas untuk mahasiswa UNIMAS bagi menyediakan ruang yang selamat, inklusif, dan kerahsiaan dalam meluahkan pengalaman mereka. Platform ini menggabungkan ciri-ciri canggih seperti semua hantaran memerlukan kelulusan pentadbir sebelum disiarkan. Pentadbir akan memastikan kandungan tidak mengandungi bahasa yang berunsur negatif, gangguan seksual, atau pbuluan. Selain itu, platform ini turut menyediakan bahagian khas sokongan kesihatan mental bagi memudahkan akses kepada kaunselor profesional apabila diperlukan, demi memastikan persekitaran yang selamat dan menyokong. Selain itu, fungsi tambahan juga termasuklah bahagian komen interaktif, maklum balas berdasarkan waktu sebenar, sistem undian, dan ciri undian yang mampu menarik minat mahasiswa. Dalam pada itu, bagi menarik minat mahasiswa menggunakan platform ini, *VoiceSpace* juga melaksanakan langkah-langkah keselamatan siber yang ketat seperti pengesahan e-mel sekali sahaja dan enkripsi dari hujung ke hujung untuk melindungi identiti pengguna. Dengan memanfaatkan teknologi moden, sistem ini mampu memberi hak kepuasan kepada mahasiswa dalam menyuarakan fikiran mereka tanpa rasa takut, dan menggalakkan komunikasi yang lebih sihat dalam komuniti universiti. Intihannya, *VoiceSpace* mampu menjadi inisiatif bermakna yang akan menyumbang kepada kesejahteraan mental, hubungan sosial, dan melahirkan budaya keterbukaan dalam kalangan mahasiswa.

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## LIST OF ABBREVIATIONS

|       |                                           |
|-------|-------------------------------------------|
| AI    | Artificial Intelligence                   |
| API   | Application Programming Interface         |
| ASE   | Adaptive Server Enterprise                |
| CASE  | Computer-Aided Software Engineering       |
| CPU   | Central Processing Units                  |
| CSS   | Cascading Style Sheets                    |
| Dev   | Developer/Development                     |
| ERD   | Entity Relationship Diagram               |
| ETC   | And other things                          |
| GB    | Gigabyte                                  |
| GPU   | Graphics Processing Units                 |
| HD    | High Definition                           |
| HDR   | High Dynamic Range                        |
| HTML  | Hypertext Markup Language                 |
| iOS   | iPhone Operating System                   |
| macOS | Macintosh Operating System                |
| ML    | Machine Learning                          |
| MP    | Megapixels                                |
| MySQL | My Structured Query Language              |
| NGL   | Not Going to Lie                          |
| NLP   | Natural Language Processing               |
| OS    | Operating System                          |
| PCIe  | Peripheral Component Interconnect Express |
| PHP   | Hypertext Preprocessor                    |
| RAD   | Random Access Memory                      |
| RAM   | Rapid Application Development             |
| RDBMS | Relational Database Management System     |
| RTX   | Ray Tracing Texel eXtreme                 |
| SQL   | Structured Query Language                 |
| SSD   | Solid-State Drive                         |
| SWAT  | Skilled with Advanced Tools team          |
| TPU   | Tensor Processing Unit                    |
| UI    | User Interface                            |
| URL   | Uniform Resource Locator                  |
| UWB   | Ultra-wideband                            |
| UX    | User Experience                           |
| VS    | Visual Studio                             |
| XDR   | Extreme Dynamic Range                     |

## **CHAPTER 1: INTRODUCTION**

### **1.1 Project Title**

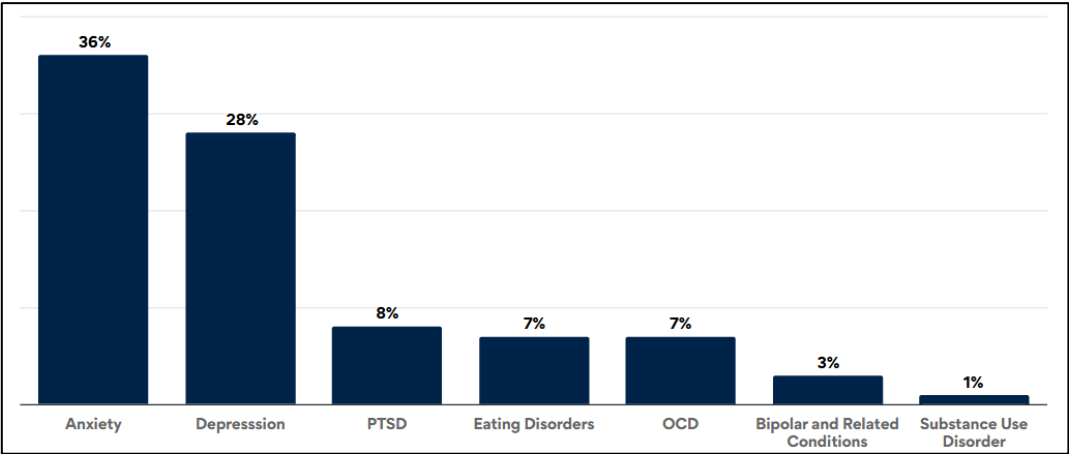
VoiceSpace: A Platform for Anonymous Student Confessions

### **1.2 Background**

Student mental health refers to students' emotional, physical, and psychological well-being, typically in educational settings like schools, colleges, and universities. The impact of maintaining good mental health is vital for students' academic success, personal development, and overall quality of life (Wardle, 2023). The ambition of students to grow professionally, relationship issues, and academic failures are some of the common factors that contribute to mental health in students (Shahid Shabeer Malik & Khan, 2023). Female university students are more likely than male university students to report mental health issues while males are more likely to commit suicide due to romantic relationships compared to females because they are more emotionally vulnerable. It is challenging to detect males showing symptoms of mental health disorders because males tend to hide their feelings and want to maintain their masculine images, leading to suicide (Ng Yi Xian et al., 2023).

By nearly every metric, student mental health is worsening. During the 2020–2021 school year, more than 60% of college students met the criteria for at least one mental health problem, according to the Healthy Minds Study, which collects data from 373 campuses nationwide. In another national survey, almost three-quarters of students reported moderate or severe psychological distress (Abrams, 2022). Student Voice survey of 5,025 undergraduates found two in five students say their mental health is impacting their ability to focus, learn, and perform academically, and one in 10 students rate their mental health

as poor (Mowreader, 2024). In ACHA’s survey, anxiety and depression are some of the college students most commonly diagnosed mental health conditions. Based on the survey, 36% of students had been diagnosed with anxiety, 28% had been diagnosed with depression, 8% had been diagnosed with a trauma or stressor-related disorder such as PTSD, and a significant number of students also manage other mental health diagnoses (Bryant & Welding, 2023).



*Figure 1.1: Mental Health Conditions Diagnosed in College Students (Mozafaripour, 2024).*

Anxiety and depression are both common mental health disorders. Anxiety and depression affect the ability to do daily tasks and live life fully. Anxiety is an ongoing feeling of worry, tension, and panic that can interfere with day-to-day life while depression is a mood disorder that involves persistent feelings of sadness, hopelessness, and loss of interest in previously enjoyable activities (Writers, 2024). Although the two conditions are different, both can happen at the same time (Watson, 2021). This is due to its overlapping symptoms which can cause sleep disturbances, fatigue, irritability or moodiness, problems concentrating, and muscle or body aches and pains (Bowman Medical Group, n.d.). The difference between anxiety and depression is depression tends to come with lower energy

and a loss of interest or motivation to do things while anxiety can cause one to feel high-strung and energized often fuelled by racing thoughts and worry (Clinic, 2024).

With demands for mental health support, universities address student well-being both inside and outside the classroom (Eva, 2019) by offering university counselling services. Counselling is when students talk with a qualified professional (counsellor) to help them make sense of and deal with the things they are going through (Healthdirect Australia, 2020) while a counsellor is trained in human behavior and he/she understands the importance of confidentiality (University of Nottingham Malaysia, 2024). The university counselling services help students address their personal or emotional problems that hinder them from having a positive experience at the university or doing well in their studies. Additionally, it is a free service, and cases are treated as strictly confidential as the counsellor's role is to offer support and understanding and to listen and respond in a non-judgmental way (Raffles University, 2024).

But nowadays, students may hesitate to share their thoughts or concerns due to fear of judgment or privacy concerns. Fear of judgment can discourage children from seeking feedback or constructive criticism. They may avoid challenging themselves or seeking new challenges that could lead to personal growth. By avoiding feedback and constructive criticism, they miss out on valuable opportunities for learning and improvement (McKechnie, 2024). Feeling fear can also cause stigma. There are three types of stigmas which is public stigma, self-stigma, and structural stigma. Public stigma involves the negative or discriminatory attitudes that others may have about mental illness while self-stigma refers to the negative attitudes, including internalized shame, that people with mental illness may have about their condition. Structural stigma is more systemic, involving policies of government and private organizations that intentionally or unintentionally limit opportunities for people with mental illness. Examples include lower

funding for mental illness research or fewer mental health services relative to other health care. The harmful effect of stigma is that it can contribute to worsening symptoms and reduced likelihood of getting treatment (Singhal, 2024).

This often leaves students feeling isolated, as they struggle without the guidance or emotional support they desperately need. The absence of a supportive environment can result in students feeling overwhelmed and disengaged, leading to lower academic achievement as they find it challenging to keep up with their coursework, which can lead to a decline in grades and performance, increased stress, and decreased mental health status.

### **1.3 Problem Statement**

Firstly, students often face challenges such as financial constraints, lack of academic support, inadequate technology, and limited access to resources such as textbooks, libraries, laboratories, and academic counselling (USIU-Africa, n.d.) which can further exacerbate their mental health issues. But nowadays, students may hesitate to share their thoughts or concerns due to fear of judgment or privacy concerns. A study shows that students emphasized their apprehension to disclose their mental health concerns with others over fear of judgment (Cogan et al., 2023).

Secondly, current social platforms lack the anonymity to allow students to freely express themselves in a safe, supportive environment. This is due to its multiple disadvantages such as establishing fake profiles and committing malicious and criminal acts without fearing retribution (Vault, 2024). While UNIMAS currently has confession platforms hosted on Facebook and Telegram, a significant disadvantage is that the identity of those submitting confessions can be known to the administrators, reducing the anonymity of the users.

Finally, there is currently no dedicated platform for students within the UNIMAS community to anonymously share confessions, seek advice, or discuss sensitive issues as the existing UNIMAS confession platforms are hosted on Facebook and Telegram. In response to the problems, this calls for a platform that balances anonymity with community guidelines to ensure respectful and supportive engagement.

#### **1.4 Project Objectives**

The main objective of the project is to design and develop an anonymous web-based system for UNIMAS students to share confessions safely and securely.

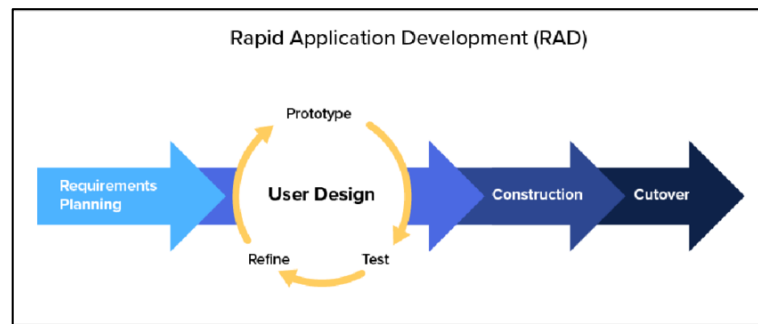
Other objectives include:

- i. To ensure all content is free from harmful language, sexual harassment, and bullying through active moderation by administrators.
- ii. To promote mental health awareness by providing a mental health article section and offering easy access to professional counsellors when needed.
- iii. To foster user interaction through upvoting, commenting, and polling features while maintaining anonymity.
- iv. To safeguard user privacy with robust security measures by implementing data anonymization and secure authentication mechanisms to ensure that no personally identifiable data is stored or shared.

#### **1.5 Brief Methodology**

Rapid Application Development (RAD) is the most appropriate methodology in this project. This is because Rapid Application Development (RAD) is known as developing

fast applications reliance on repeated user feedback. The Rapid Application Development (RAD) method reduces software development and maintenance costs and focuses on the development, testing, and feedback processes. Software development generally requires a minimum of 180 days, but using the Rapid Application Development (RAD) method can be completed in 30-90 days.



*Figure 1.2: Phases of Rapid Application Development (RAD) (Model, 2024).*

Based on Figure 1.2, the four phases of Rapid Application Development (RAD) follow a well-defined set of steps, which are requirements, user design, construction, and cutover (Lucidchart, 2018). During the requirements planning phase, goals and project expectations are identified by discussing with the target user of the system. Apart from the mentioned, the problems surrounding the platform for anonymous student confessions are addressed and the requirements for the project are also identified, gathered, and finalized with everyone's approval.

In the user design phase, the development of the project begins where user designs are built out through various prototype iterations. During this phase, target users are actively involved to ensure their needs are met at every design process step. The users will test the prototype each time they are built to see whether the prototype follows the right procedure for anonymous posting, moderation, and managing user interactions on the platform. These prototypes will be tweaked based on users' comments and feedback. The process will go on iteratively until they reach a satisfactory design.

In the construction phase, the prototype from the previous phase is converted into a functioning model in this phase. The whole process includes preparation for rapid construction, program, and website development, coding and unit, integration, and system testing.

The last phase of Rapid Application Development (RAD) which is the cutover is also called implementation. It includes data conversion, testing, and changeover to the new system, as well as user training. The online web-based VoiceSpace platform is finally made accessible for UNIMAS students to use for anonymous confessions.

## **1.6 Project Scope**

This section provides an overview of the project and outlines the key aspects of the platform for anonymous student confessions. The project study and idea are divided into two main sections such as the system's target user and administrator.

### **i. Target User**

The target users of this proposed system will be UNIMAS students. The system will enable the target users to remain completely anonymous while interacting on the platform. The users can engage with posts through upvotes and anonymous comments. This will help to foster an interactive and supportive community. The platform allows users to search confessions based on keywords, categories, or hashtags, making it easier to navigate the content. The users can also create polls in their confessions, which allow others to participate and provide feedback or opinions on various topics.

ii. Administrator

The administrator serves as a bridge between the student community and the university by gathering and forwarding relevant feedback from confessions that address university concerns. This ensures that constructive input from students reaches university decision-makers while maintaining the anonymity of users. Additionally, to ensure all content is free from harmful language, sexual harassment, and bullying, VoiceSpace will be actively moderated by administrators. When a confession is reported by users, the administrator reviews the flagged content and decides whether to approve and keep it on the platform or delete it if it contains offensive language or inappropriate content.

### **1.7 Significance of Project**

VoiceSpace will act as a platform that provides UNIMAS students with a safe space for them to share their stories, concerns, ideas, and experiences anonymously. The main purpose of the platform is to help students connect, share advice, and express themselves without fear of exposure or judgment, hence they will feel less pressured when trying to convey their feelings and they can even communicate their thoughts openly and freely.

In this fast-growing modern technology era, people nowadays, including students, spend a lot of their time with their electronic devices for a variety of different functions, therefore making it easier for them to access this platform at ease. VoiceSpace will be actively moderated by administrators to ensure all content is free from harmful language, sexual harassment, and bullying. This will ensure the platform can provide a respectful and supportive environment, contributing to the well-being of the student community.

Through their sharing of experiences via the platform, students will also be able to find themselves growing their social relationships with each other. They can freely react or comment

on the posts, which will also encourage connection bonding among students. By doing so, students will feel like they have people around them who will always listen to their stories and can always seek advice when needed. This will also develop empathy among them. On the other hand, students can use this platform to seek advice from seniors on exams, study tips, and academic challenges.

Since VoiceSpace operates by using virtual platforms and can be easily access anywhere through digital devices, the pieces of information shared can also be spread quickly, hence mitigating any delay on crucial updates. One of the functions of VoiceSpace is to act as a forum for open discussions. Students will be able to gather various information related to the concerns that they raised, and this will help to ease them in decision-making. On the contrary, students who have yet to face any concerns can relate by reading through the other posts on the platform. Thus, they can prepare themselves for any kind of issues that they might have to face in the future throughout their student life. Students will also find themselves easily related to the issues posted by their university mates.

Having a positive environment at the university will positively impact students' academic results as students will feel less stress about the negative environment around them and can focus more on their studies. Besides that, to ensure VoiceSpace remains as a positive platform, the administrators will monitor this platform while at the same time giving them insights anonymously on the current issue raised by students. This information can guide the development of better academic support systems as it is commonly known and proven by various studies that students tend to open up more to their peers compared to their lecturers.

## 1.8 Project Schedule

A project schedule is a timetable that outlines start and end dates and milestones that must be met for the project to be completed on time (Wrike, 2023). In this project, it will be divided into two main semesters, focusing on different aspects of the project whereas in Semester 1, the focus will be on Chapter 1, Chapter 2, and Chapter 3 which is research, planning, and system design. In Semester 2, the focus will shift to Chapter 4, Chapter 5, and Chapter 6 which is developing, testing, and finalizing the project. A Gantt Chart will be used to track the progress and ensure the timely completion of all tasks and milestones.

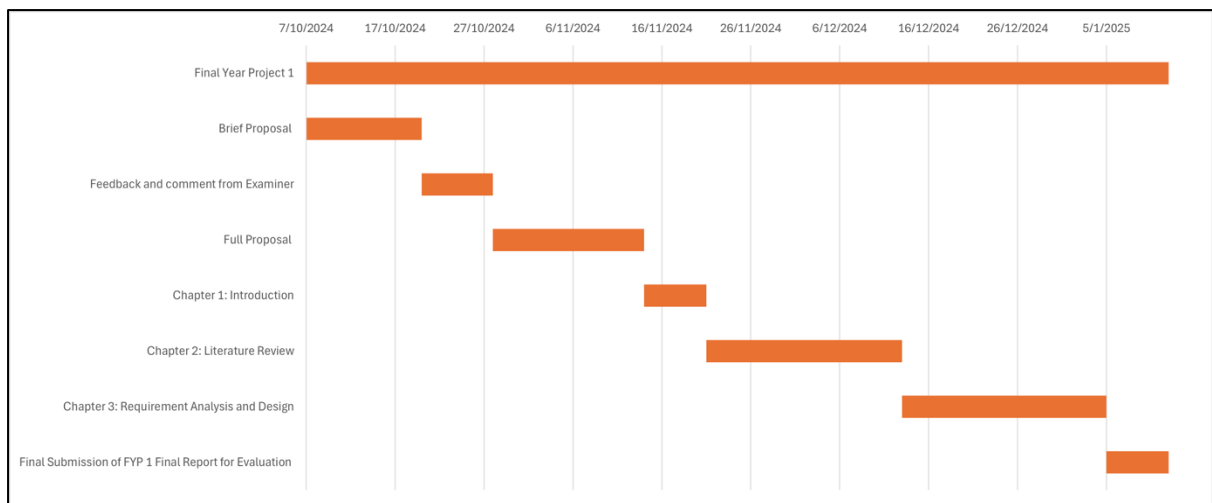


Figure 1.3: Gantt Chart for Project Schedule Final Year Project 1.

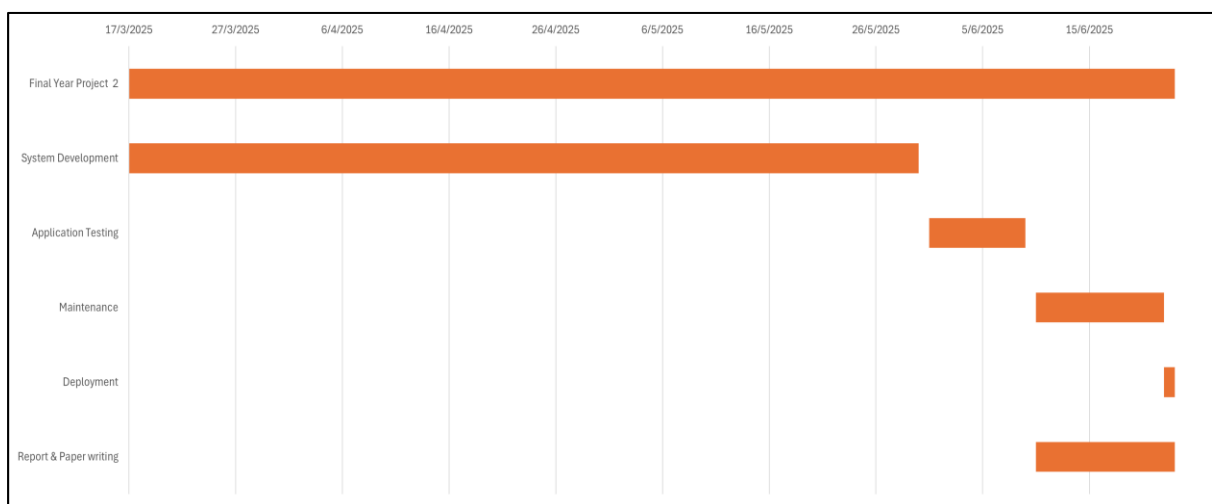


Figure 1.4: Gantt Chart for Project Schedule Final Year Project 2.

## 1.9 Project Expected Outcome

Upon completion of the project, the expected outcome is a fully functional system that enables UNIMAS students to post confessions anonymously and securely. The platform will effectively mask user identities while allowing students to engage with one another through upvoting, commenting, and reacting to posts. VoiceSpace will become a space where students can share without fear of judgment, which will help to decrease feelings of isolation and foster a culture of openness regarding mental health and personal struggles.

The system also offers a smooth and user-friendly experience with real-time feedback on interactions such as polls and votes. This aims to build peer engagement and empathy among students. It is expected that the platform will encourage positive interactions where students can offer words of encouragement and solidarity, which then will make others feel heard and supported. This engagement could create a network of peers who actively support each other. This will then contribute to a healthier student community.

Through its anonymous posting, VoiceSpace will reach students who may be hesitant to seek traditional counseling or mental health support. By enabling students to share their feelings in a supportive and non-judgmental environment, the platforms aim to serve as a first step toward mental well-being for many students, with the potential to reduce mental health challenges over time. Additionally, the system will promote mental health awareness by providing a mental health article section and offering easy access to professional counsellors when needed.

The platform will also uphold strong privacy and security standards, protecting user data and maintaining the anonymity of all users. This confidence in anonymity and data protection is expected to increase student participation which will allow them to fully utilize the platform without fear of their identity being revealed. The active moderation by

administrators will ensure all content is free from harmful language, sexual harassment, and bullying.

The platform also offers value to UNIMAS by providing insights into student well-being and common concerns. This information can help university administrators better understand student needs and proactively address issues impacting mental health. In this way, VoiceSpace serves as both a community support tool and a feedback mechanism that will allow UNIMAS to improve campus resources and mental health support initiatives.

Finally, VoiceSpace is expected to cultivate a positive online environment that can help to encourage respectful interactions among students. The platform aspires to be a model of anonymous online community support that not only facilitates open discussions around mental health but also contributes to a decrease in mental health struggles within the university community over time.

## 1.10 Project Outline

This paper consists of five chapters that describe the development of Voicespace: A Platform for Anonymous Student Confessions.

**Chapter 1: Introduction** provides an overview of the project in more detail, including its background, problem statement, project objectives, methodology, project scope, significance, project schedule, expected outcome, and project outline.

**Chapter 2: Literature Review** is concerned with presenting the background of the area of investigation and establishing the context of the problem, solidified from published materials such as journals.

**Chapter 3: Requirement Analysis and Design** discusses the methodology implemented in the project. The details of the implementation of Rapid Application Development (RAD), which is the selected methodology, will be further elaborated in this chapter.

**Chapter 4: Implementation** includes the implementation of the project according to the design of the project. It also includes a walk-through of the system to explain its behavior and relate it to the design.

**Chapter 6: Conclusion and Future Work** presents conclusions about the project. The chapter reflects on what has been done and the lessons learned from the overall project. Additionally, it outlines further work that would improve the project for the future.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter presents more in-depth information on selected mobile applications and a system with identical functionalities to VoiceSpace. The mobile applications are NGL: Ask Me Anything and Tellonym, and the system named Anonomia was chosen for analysis and review. By examining the applications and a system, a table will be created to compare the differences between the existing mobile applications and a system and the proposed systems. This table gives insight into the strengths and weaknesses of each application and system.

Moreover, this chapter also reviews the tools and technology used in the proposed system. This is to make it easy to choose the most suitable tools and technology that align with the proposed system development. The special features found in the existing anonymous mobile applications and systems will be included in the proposed systems such as these applications and systems allow users to post their confessions anonymously. This means that when someone shares a confession, others who read it would not know who shared it as the user's identity remains hidden.

### **2.2 Review of Similar Existing Systems**

This chapter presents the analysis and review of selected mobile applications and a system that share similar functionalities with the proposed system. The chosen mobile applications are NGL: ask me anything and Tellonym while the selected system is Anonomia.

The apps and system have been specifically chosen for in-depth study and review because they each have special and creative features that make them unique and different from others. For example, NGL: ask me anything. NGL is a popular social media platform that acts

as a personal inbox to receive anonymous messages from friends. The app is designed to work alongside Instagram but can also be used elsewhere (Pratt, 2022). Tellonym is an anonymous mobile messaging and social networking app enabling users to send messages or tell strangers without revealing their identity (Commissioner, 2022). Anonomia is a platform designed to allow users to share their anonymous confessions freely (Ramo, 2024).

The selected mobile applications and systems focus on general anonymous confession sharing and discussion. However, they are not directly aligned with the intended purpose of the proposed system, which is designed to provide a safe and moderated platform for anonymous student confessions within UNIMAS. Despite this difference, it is worth noting that these platforms do possess features like content moderation and user interaction tools. As a result, the selected mobile applications and systems serve as relevant points of comparison for evaluating the effectiveness of VoiceSpace which employs similar technological approaches.

### **2.2.1 NGL: ask me anything**

NGL is a social media shorthand for ‘not going to lie’. It is a newer iteration of the anonymous ask-me-anything format. It is among the latest iterations of the anonymous question tools that teens have used on social media for over a decade. According to its website (n.d.), it was launched in November 2021 by a small team of designers and engineers in Venice Beach, California. The app launched on iOS in December and launched on Google Play in May of the next year (Rosenblatt, 2022). Instagram users are flocking to download NGL which has topped 15 million global installs. NGL is now in the top 10 in the Apple App Store and much of its current growth is driven by Android users in markets (Tech Desk, 2022).

According to Rosenblatt (2022), NGL is an app that lets users send anonymous messages. The app is currently gaining enormous popularity on Instagram, especially among

young people. The app allows teens to use it through Instagram where users post questions on their stories and followers respond anonymously. Typically, users will post links to their NGL inboxes on their Instagram accounts asking followers to send questions or comments about them anonymously. The app which advertises itself as ‘a fresh take on anonymity’ has language filters intended to prevent harassment, but it was found that some phrases still made it through.

When the app was tested, slurs and terms like ‘KYS’ which stands for ‘kill yourself’ were filtered out. But the language filters allowed messages with more routine bullying terms to slip through including the phrases ‘You are fat’, ‘Everyone hates you’, ‘You are a loser’, and ‘You are ugly’. Users whose messages contained inappropriate language following messages that included slurs were not prevented from sending additional messages immediately.

NGL claims it tries to discourage bullying using world-class AI content moderation. The platform declares that it understands the lingo and can effectively filter out harmful messages. Users can block individuals if they experience bullying or harassment (NGL, n.d.). Additionally, the app offers a function for reporting abusive messages allowing users to either block the senders or escalate the issue to the NGL team.

To create an account on NGL, the Play Store on Android or App Store on iOS must be accessed, and the app should be downloaded. After installation, the app will prompt for the user’s age with a minimum age requirement of 17 years old. An Instagram username must also be provided. Once set up, two tabs will be displayed as shown in Figure 2.1 below which are Play and Inbox. On the ‘Play’ tab, a message for the NGL link can be selected. The dice icon may be tapped to choose from preset messages such as ‘send me anonymous messages!’ or ‘send me anonymous confessions.’

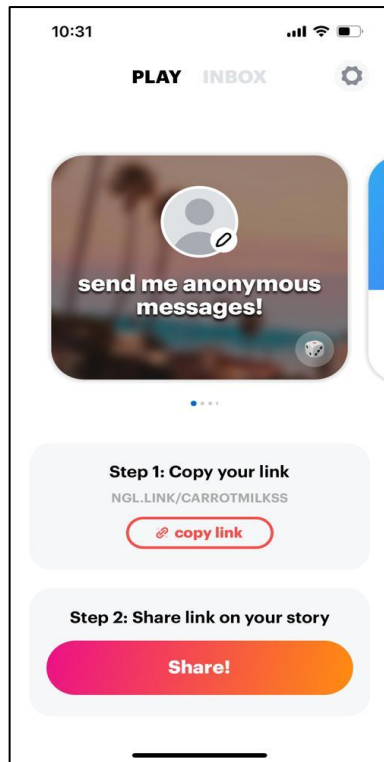


Figure 2.1: NGL's main page.

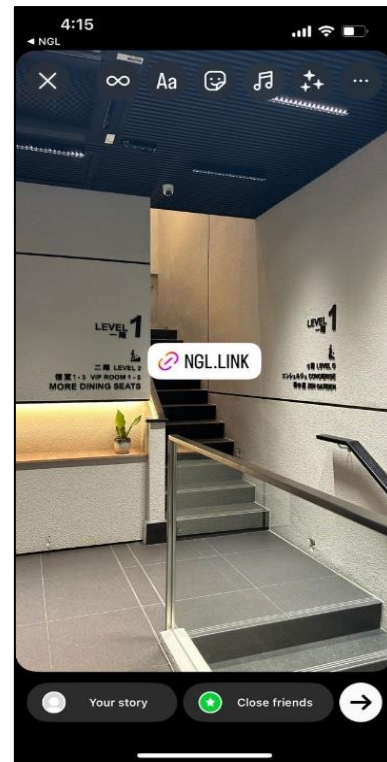


Figure 2.2: Share NGL's link using step 1.

A link must be generated to ask questions. The NGL app should be opened and there are two methods to share the NGL link as illustrated in Figure 2.1 above. The first method involves manually copying the link from NGL. Then, open the Instagram app, take a picture or import from the gallery, tap the smiley face icon, select the Link sticker, and paste the URL, as shown in Figure 2.2. The second method is simpler where just tap the 'Share!' option in the NGL app to share the link directly. This method provides helpful guidance for those unsure of what to post, as illustrated in Figure 2.3 (Lahoz, 2022).

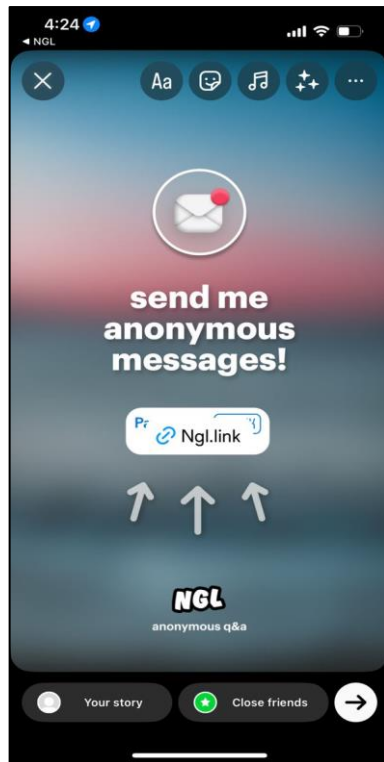


Figure 2.3: Share NGL's link using step 2.

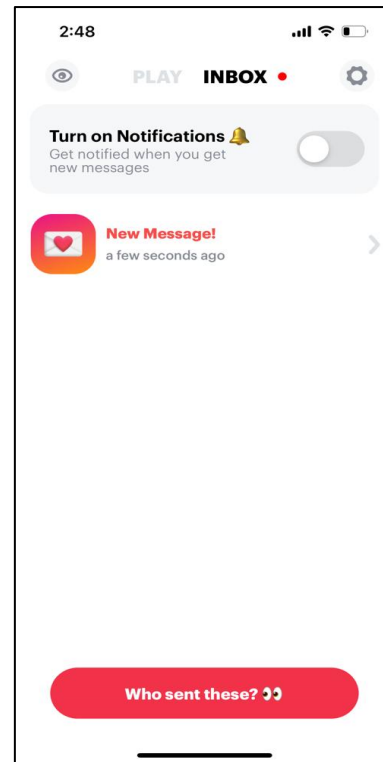


Figure 2.4: NGL's inbox.

All responses will be recorded in the Inbox of the NGL app. For each message received, a love letter emoji will appear, as shown in Figure 2.4. By clicking on the emoji, the message can be opened presenting two options which are 'Who sent this' or 'Reply', as illustrated in Figure 2.5 (Tech Desk, 2022). The 'Who sent this' option, as shown in Figure 2.6 is available only to users who subscribe to the Pro membership of NGL for \$9.99 per week. While it might be assumed that upgrading to an NGL Pro subscription offers added benefits especially the ability to identify the senders of anonymous messages that does not appear to be the case. User reviews indicate that the paid tiers are often viewed as poor value and rarely provide accurate details regarding the identity of message senders. Furthermore, the subscription fees are charged weekly rather than monthly which can accumulate quickly.

Since the platform's core function is built around anonymous messaging, revealing the identity of senders goes against its purpose. Although NGL claims to be developing features

that offer ‘more specific hints’ for Pro subscribers, it is unlikely that the identity of anonymous users will ever be revealed. As it stands, the Pro subscription has been recognized by many as a questionable offering from the app developers. Despite everything, Instagram users can continue to send messages on NGL links with confidence that their identities will remain concealed (Bhojnagarwala, 2022).

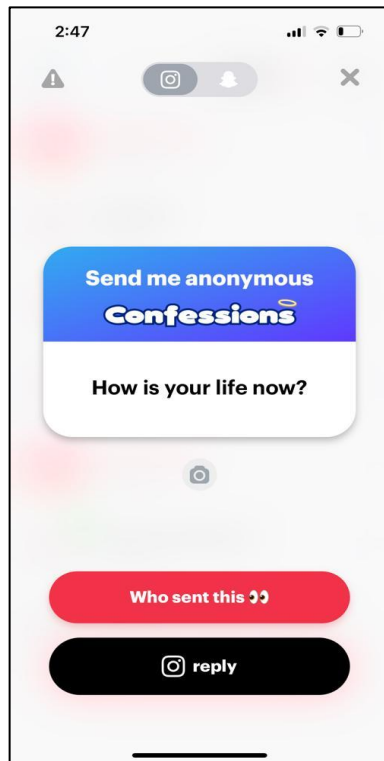


Figure 2.5: NGL's message.

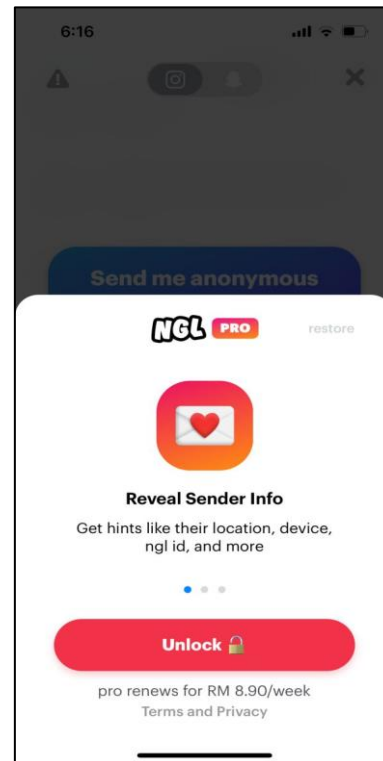
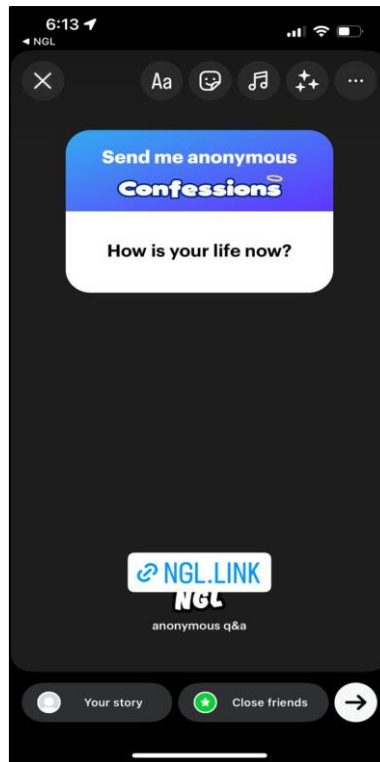


Figure 2.6: NGL's Pro Subscription.

The option ‘Reply’ as shown in Figure 2.7 directs users back to Instagram where they can create a new story featuring both the original message and their response. Since all friends can view the story, replies are always public. However, this environment can also encourage impulsive reactions. If a comment is hurtful, it might feel justified to respond emotionally and share more than is prudent. Private conversations are not possible on NGL because the only way to respond to a message is by posting it publicly on the Instagram story (Pratt, 2022).



*Figure 2.7: NGL's reply.*

To summarize, NGL has become quite popular with teens who posted the link of their anonymous page to their bio on Instagram and people would be able to ask questions while remaining anonymous (Tech Desk, 2022). Instagram users can send messages on NGL links without worrying about their identity being revealed (Bhojnagarwala, 2022). NGL provides this safe space for teens since young people do not have a space to share their feelings without judgment from friends or societal pressures (Rosenblatt, 2022).

### **2.2.2 Tellonym**

Tellonym is another app gaining popularity, joining a growing list of anonymous question-and-answer feedback platforms. It has been around since 2016 and has over 13 million users worldwide (Oglethorpe, 2019). It is accessible on the Web and through the Android and iOS applications. The name is derived from Tell and 'Anonym' which is the German word for

anonymously. Tellonym allows users to send messages through the platform both anonymous and non-anonymous.

Tellonym offers its users the opportunity to have more meaningful conversations and escape other platforms where status, likes, popularity, and impossible beauty standards are more important.

Tellonym users can receive messages through the platform which is referred to as Tells. Each Tell user receives initially lands in their private inbox which is visible only to the recipient. A Tell and its response become public only if the user decides to reply. This gives users complete control over what appears on their profile.

Users can also chat privately with the Direct Message feature. The Direct Message requests initially appear in a user's private inbox and are not anonymous. Users have the choice to either accept the chat request and respond privately or answer the message as a Tell which makes both the requester's message and their response public.

There are several control features available in Tellonym. Some of them are built-in while others need to be set up manually by users. The control features are:

### **1. Language Filters**

All messages sent are subjected to language filters built with advanced technologies and learning algorithms for continual improvement. The strength of a teen's language filters can be specified by navigating to the profile tab, opening the settings page, tapping 'Safety Options' adjusting the filter sensitivity, or customizing individual filters.

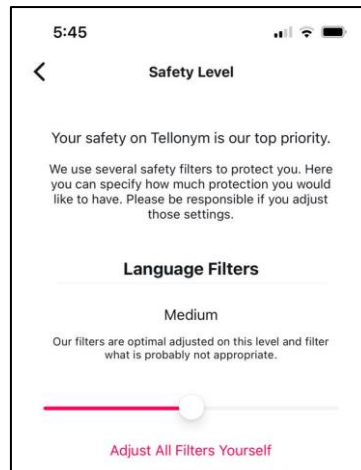


Figure 2.8: Language Filters setting.

## 2. Custom Word Filter

Users can add specific words to a custom filter to exclude topics. Messages containing the exact words are instantly removed without notice. General harsh language is already filtered so it is recommended to add words relevant to inappropriate messages often received by the teen. The function can be found in the settings menu.

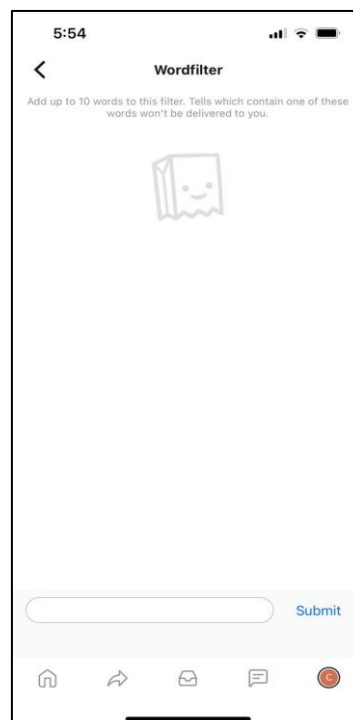


Figure 2.9: Custom Word Filter Setting.

### 3. Extensive Blocking Mechanism

Blocking mechanisms allow the exclusion of specific users. By pressing three dots on a profile, users can be blocked to prevent interaction with the teen. The sender of individual Tells can also be blocked. Blocking is effective for registered and non-registered users and anonymous senders are not informed of the block.

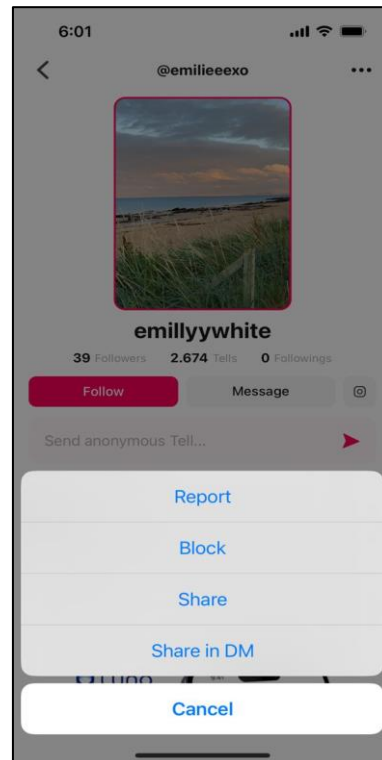
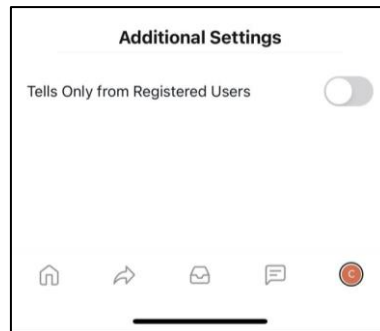


Figure 2.10: Block user setting.

### 4. Only Receive Tells from Registered Users

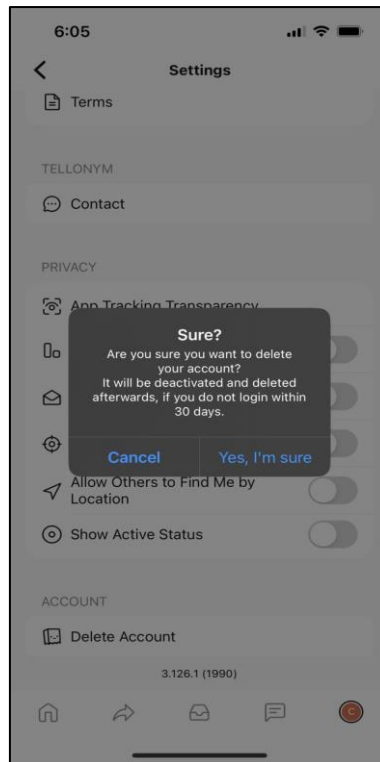
A switch in the 'Safety Options' can restrict message reception to registered users only to reduce inappropriate messages if blocking alone is ineffective. This option may significantly limit messages but can encourage teens to seek workarounds such as creating new accounts. Accounts found circumventing safety settings may be blocked.



*Figure 2.11: Additional settings.*

## **5. Deleting the Account**

Account deletion results in deactivation and removal from searches for 30 days. During this period, the account can be reactivated where after 30 days all account information is permanently deleted. Access to the connected registration method (phone number or email) is required for deletion. Steps include navigating to 'Profile', 'Settings', 'More', and 'Delete Account'.



*Figure 2.12: Account Deletion.*

### 2.2.3 Anonomia

Anonomia is a confession platform where users can share their secrets, confessions, and stories without fear of revealing their identities. It is a place where users can express their feelings, share their thoughts, and share their experiences that have been bothering them (Ramo, 2024).

Anonymity is the core principle of Anonomia. It is understood that everyone carries their own stories, secrets, and feelings. The chance to share feelings without revealing identity is provided through anonymity which means that users have the freedom to express themselves without revealing their identity to anyone.

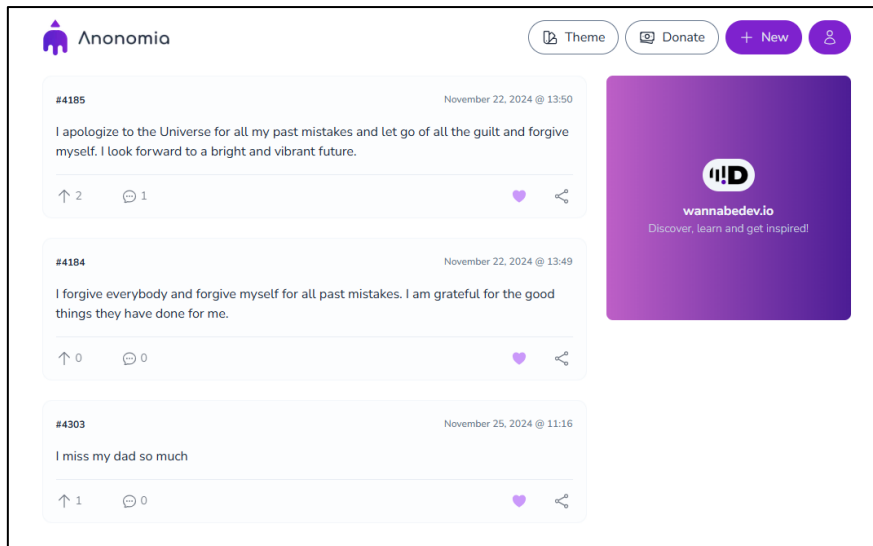
It is known that sharing thoughts and feelings can be helpful. Whether advice, support or a listening ear is needed, a safe space for sharing is provided by the platform. The power of sharing and its ability to bring relief are valued at Anonomia.

To ensure a positive and respectful community, guidelines have been established. Before publishing a confession on the website, the confession to adhere to the established guidelines. This is to ensure confessions pass through the approval process because only content deemed suitable for the public is published. Table 2.1 below shows Anonomia's guidelines.

*Table 2.1: Anonomia's guideline.*

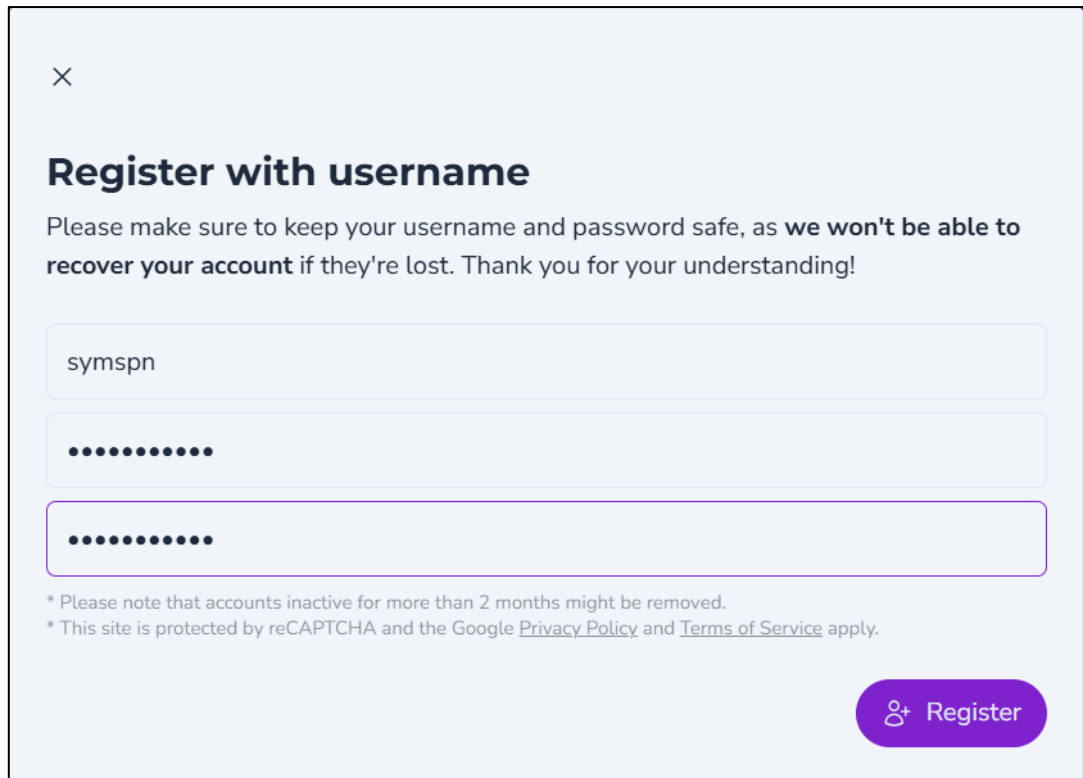
| <b>Guideline</b>                        | <b>Description</b>                                                                                                                              |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Respect privacy</b>                  | Personal information should not be shared, and the privacy of others must be respected by avoiding details that could identify individuals.     |
| <b>No inappropriate content</b>         | Avoid sharing content meant for adults only.                                                                                                    |
| <b>No hate speech or discrimination</b> | Hate or discrimination based on race, gender, religion, nationality, disability, sexual orientation, or age will be removed if posted.          |
| <b>No threats or harm</b>               | Confessions containing threats or promoting self-harm, harm to others or any form of violence should not be posted.                             |
| <b>Be respectful</b>                    | A respectful and considerate tone should be maintained when sharing confessions while offensive language or personal attacks should be avoided. |
| <b>No spam</b>                          | Repetitive, promotional, or irrelevant content unrelated to the platform's theme should not be submitted.                                       |
| <b>Original content</b>                 | Confessions must be written in English and should be original, not previously posted on the platform.                                           |

Anonomia also has many features such as favorite threads. Favorite threads allow other users' threads to be saved to a favorite list. A heart icon will appear next to every thread. The thread will be marked as a favorite when the icon is clicked. The list of favorite threads can be accessed on the dedicated account page.



*Figure 2.13: Favorite threads in Anonomia.*

Anonomia also allows users to create anonymous accounts. Creating an account is not required as users can still use it but with limited features. Creating an account helps the user to keep track of their threads. All the threads created can be accessed conveniently, making it easy to find personal content. When an account is created, no personal information is asked for. The only information required is a username and password. However, the downside is that recovery assistance cannot be provided if the credential is forgotten.



A registration form titled "Register with username" with a close button (X) in the top left. The form includes a warning message, three input fields (username, password, and confirm password), and a "Register" button. The username field contains "symspn". The password and confirm password fields are masked with dots. Below the fields are two asterisked notes. The "Register" button is purple with a user icon and the text "Register".

×

## Register with username

Please make sure to keep your username and password safe, as **we won't be able to recover your account** if they're lost. Thank you for your understanding!

symspn

.....

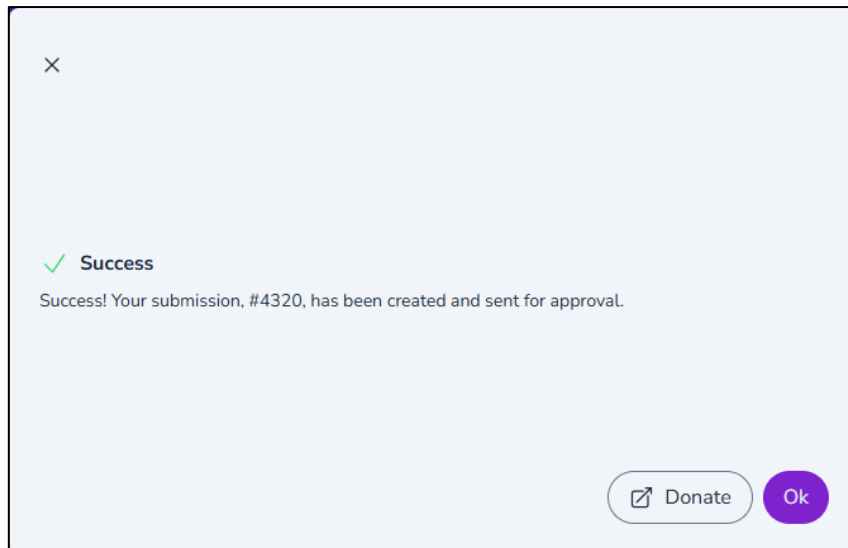
.....

\* Please note that accounts inactive for more than 2 months might be removed.  
\* This site is protected by reCAPTCHA and the Google [Privacy Policy](#) and [Terms of Service](#) apply.

 Register

*Figure 2.14: Register an account in Anonomia.*

Even though Anonomia is open to everyone, not everything can be shared publicly. Guidelines must be followed by everyone which is why the approval process is used for all confessions and comments. Whenever a confession is made or a comment is dropped, it is sent directly to the approval queue. It will be published only after it receives approval while if it not, it will be permanently deleted.



*Figure 2.15: Approval process.*

Each confession is accompanied by an upvote to show how others feel about the confession. Additionally, users can leave comments and share their confessions. To summarize, Anonomia is seen as more than just a website. It is a space for laughter, love, and connection through shared experiences.

## 2.3 Features Comparison of the Featured System

Table 2.2: Comparison of existing application/system and proposed system.

| Features                          | Existing System |          |          | Proposed System |
|-----------------------------------|-----------------|----------|----------|-----------------|
|                                   | NGL             | Tellonym | Anonomia | VoiceSpace      |
| Anonymous Posting                 | ✓               | ✓        | ✓        | ✓               |
| User Identity Masking             | ✓               | ✓        | ✓        | ✓               |
| One-time email authentication     | ✗               | ✗        | ✗        | ✓               |
| Content moderation                | ✓               | ✓        | ✓        | ✓               |
| Upvote system                     | ✗               | ✓        | ✓        | ✓               |
| Commenting                        | ✗               | ✓        | ✓        | ✓               |
| Polling feature                   | ✗               | ✗        | ✗        | ✓               |
| Mental Health Awareness           | ✗               | ✗        | ✗        | ✓               |
| Confessions Search feature        | ✗               | ✗        | ✗        | ✓               |
| User Privacy and Data Security    | ✓               | ✓        | ✓        | ✓               |
| Feedback Mechanism for University | ✗               | ✗        | ✗        | ✓               |

Based on the comparison shown in Table 2.2, NGL, Tellonym, and Anonomia do not fully meet the requirements for an anonymous confession platform. Firstly, none of these systems provide a one-time email authentication feature which is available in VoiceSpace. Secondly, while NGL, Tellonym, and Anonomia offer user identity masking, content moderation, only VoiceSpace includes advanced features such as a polling feature, and provide mental health awareness. Thirdly, features like confession search, as well as a feedback mechanism for universities, are absent in the existing systems. Lastly, while all systems ensure user privacy, VoiceSpace uniquely combines these with in-app tools for upvoting and comments. Overall, VoiceSpace stands as a comprehensive platform tailored to meet the unique needs of anonymous student confession communities.

## 2.4 Review of Tools and Technology

This section will discuss the software and hardware used to develop the proposed system. It will also explain the reasoning behind both software and hardware used.

### 2.4.1 Software

This section provides an overview of the software used in the development of the proposed system.

#### 2.4.1.1 Visual Studio Code

Visual Studio Code or VS Code for short is a popular code editor that has a variety of features that help developers write, debug, and deploy code more efficiently (Madura, 2023). It is available for Windows, macOS and Linux. It comes with built-in support for JavaScript, TypeScript, Node.JS and has a rich ecosystem of extensions for other languages such as C++, C#, Java, Python, PHP, Go and runtimes such as .NET and Unity (Cloud Analogy, 2020). Table 2.3 below shows some of the Visual Studio Code features.

*Table 2.3: Visual Studio Code features.*

| Features                | Justifications                                                                                                                            |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Language Support</b> | VS Code supports a wide range of programming languages such as JavaScript, TypeScript, Python, C#, Java, Go, Ruby, and others.            |
| <b>Intelli-Sense</b>    | VS Code can detect if any snippet of code is left incomplete and common variable syntax and variable declarations are made automatically. |
| <b>Repository</b>       | VS Code offers a place to store and manage code securely where it can be connected to a system for tracking changes in code such as Git.  |

|                            |                                                                                                                                                                                                                              |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Web-Support</b>         | VS Code comes with built-in support for Web applications.                                                                                                                                                                    |
| <b>Hierarchy Structure</b> | The code files are in files and folders.                                                                                                                                                                                     |
| <b>Improving Code</b>      | VS Code helps suggest better ways to write code to make it clearer or more efficient.                                                                                                                                        |
| <b>Terminal Support</b>    | VS Code includes a terminal, so users do not need to switch to another program for commands.                                                                                                                                 |
| <b>Multi-Projects</b>      | Multiple projects containing multiple files or folders can be opened simultaneously.                                                                                                                                         |
| <b>Git Support</b>         | VS Code allows downloading or uploading code to online repositories such as GitHub.                                                                                                                                          |
| <b>Git Integration</b>     | VS Code includes tools for managing code versions where users can track changes, combine updates, and manage projects.                                                                                                       |
| <b>Command Palette</b>     | The Command Palette is a useful tool that allows user to quickly execute commands and access various functionalities with just a few keystrokes.                                                                             |
| <b>Debugging Support</b>   | VS Code offers a robust debugging experience where it lets users to set breakpoints, inspect variables, step through code, and handle exceptions. This makes finding and fixing bugs in applications a more manageable task. |

According to the table above, Visual Studio Code has some unique features such as language support, intelli-sense, repository, web-support, hierarchy structure, improving code, terminal support, multi-projects, git support, git integration, command palette, and debugging support (Pedamkar, 2019).

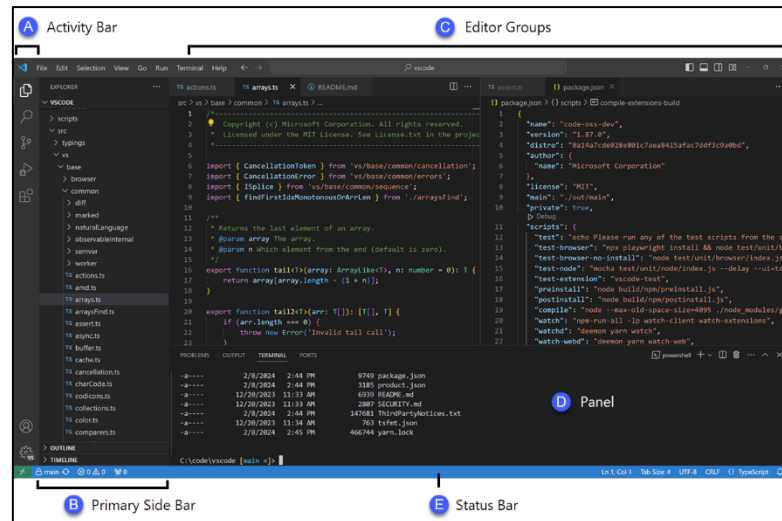


Figure 2.16: Visual Studio Code's Interface (Visual Studio Code, 2024).

### 2.4.1.2 MySQL

MySQL is an open-source Relational Database Management System (RDBMS) developed by Oracle Corporation, Sun Microsystems, that uses Structured Query language (SQL) to interact with databases. MySQL can be used to store, retrieve, manipulate, and process data that is in the form of tables (Simplilearn, 2024).

In the tech world today, there are various relational database management systems present, such as Microsoft SQL Server, Microsoft Access, Oracle, and DB2. One of the reasons why MySQL is preferred over other Database Management Systems is because it has Multiple Storage Engines. MySQL adheres to multiple storage engines, and each one of the storage engines possesses unique features, while other databases like SQL Server only support a single storage engine. MySQL also has high performance compared to other database management systems because of its simplicity in design and adherence to multiple storage engines. Next, MySQL is running on cross-platform such as Windows, Linux, and macOS. With this, it is clear why MySQL is used.

### 2.4.1.3 Figma

Unlike many other design tools, Figma is a cloud-based platform which means it runs online and brings a new level of teamwork to design projects. Designers can work together in real time, which helps facilitate design teams' collaboration. Figma's growing popularity among designers is due to several key factors. According to a study by Marketsplash, the number of Figma users has surpassed 4 million, owing to some of the best features for UI UX it offers. Its user-friendly approach makes it accessible to both beginners and experienced professionals. Features like its vector graphics tool let designers create detailed designs with precision. Figma also pays special attention to responsive design, ensuring that designs look good and work well on all devices and screen sizes. Figma is particularly attractive for UI UX designers because its features are specifically designed for their needs. It covers all aspects of the design process, from the initial stages of prototyping to the final steps of version control (Bhardwaj, 2023).

There are four main products under the Figma umbrella which are Figma Design, FigJam, Dev Mode, and Figma Slides. Figma Design is a collaborative design tool used to create various design assets and prototypes, as well as create and manage design systems. FigJam is a virtual whiteboard used for workshops, ideation sessions, and collaborative problem-solving and decision-making. Dev Mode is a workspace to facilitate collaboration between designers and developers and ensure smooth design handoff. Figma Slides is a collaborative presentation tool that enables design teams to co-create slide decks (Stevens, 2024).

Figma is one of the most accessible, user-friendly design tools around, which makes it highly popular among graphic designers, marketers, UI designers, and UX designers of all experience levels. Figma is commonly used for websites and mobile apps, especially in

creating static wireframes and mockups, as well as creating interactive prototypes and creating and managing design systems with reusable components and styles.

Figma is not only incredibly user-friendly but also packed with an impressive array of handy functions and features. Table 2.5 below shows some of the best Figma features that set this tool apart.

*Table 2.4: Figma's features.*

| Features                       | Descriptions                                                                                                                                                                                                                                                                                                  |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Auto-layout feature</b>     | This feature can help to speed up repetitive design tasks such as spacing adjustments around icons or resizing groups of elements. Multiple objects can be selected and manipulated simultaneously to eliminate the need for individual tweaks. It works automatically for selections of three or more items. |
| <b>Smart selection</b>         | This feature can help to proportionally resize layers and objects.                                                                                                                                                                                                                                            |
| <b>Variants</b>                | Different versions of a component are allowed to be created within a single parent component. Variations based on states, styles, or sizes are managed efficiently, simplifying and organizing the component library.                                                                                         |
| <b>Real-time collaboration</b> | Simultaneous collaboration on the same design file is facilitated which allows multiple users to make changes, view cursors, and communicate via cursor chat. This feature replicates in-person teamwork which makes it ideal for remote teams.                                                               |
| <b>UI kits</b>                 | Ready-made collections of components, styles, and layouts are provided to accelerate the creation of mockups and prototypes. Extensive libraries are included to cater to various operating systems.                                                                                                          |
| <b>Plugins</b>                 | A wide range of plugins is supported to enhance functionality. Plugins are available for tasks like wireframe creation, user flow development, and adding placeholder content.                                                                                                                                |
| <b>Templates</b>               | Customizable templates are offered to support specific design tasks or team                                                                                                                                                                                                                                   |

|  |                                                                                                                                    |
|--|------------------------------------------------------------------------------------------------------------------------------------|
|  | activities such as brainstorming, strategic planning, or user interviews. These templates can be adapted to suit individual needs. |
|--|------------------------------------------------------------------------------------------------------------------------------------|

When Figma was first launched in 2016, it was often compared to Sketch. Sketch is a vector graphics editor that works on MacOS and until Figma came along, it was considered by many as the go-to tool for designing and prototyping. Now, both tools have been around for some time, prompting comparisons about which is superior. As with most tool comparisons, the choice largely depends on individual needs and preferences. For those working on macOS and seeking a native Mac application, Sketch may be preferred. However, for collaborative work on any device, Figma is often selected as the tool of choice. In terms of design functionality, both tools are considered quite similar, although Figma is often described as more versatile. A notable distinction between Figma and Sketch lies in their pricing models. Figma provides a free plan for individual users and offers a subscription-based model starting at \$15 per editor per month.

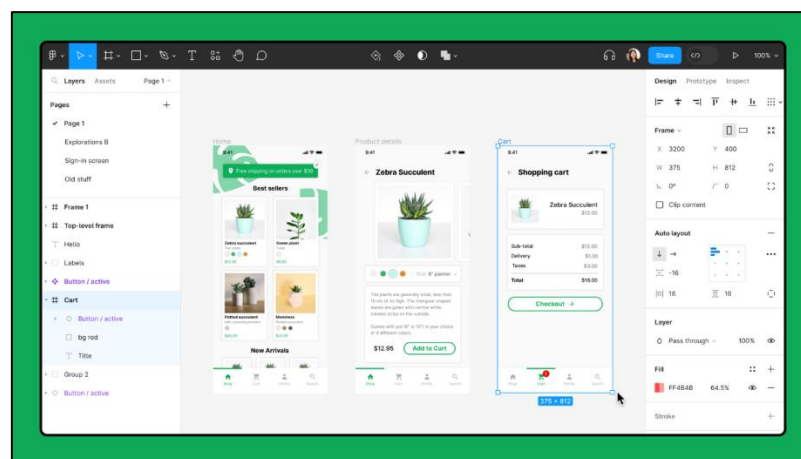


Figure 2.17: Figma (SNSCE, 2024).

#### 2.4.1.4 Bootstrap

Bootstrap was created by Mark Otto and Jacob Thornton on Twitter in 2011. It was released as an open-source project and quickly gained traction for its user-friendly and adaptable framework. Bootstrap 1.0 introduced a responsive grid system and basic components. Subsequent versions, including Bootstrap 2.0 and 3.0, enhanced its features with more sophisticated components, improved grid systems, and mobile-first design principles. The release of Bootstrap 4.0 marked a significant shift with Flexbox support and updated design elements. The latest version, Bootstrap 5.0, further refines the framework with improved customization options and new utilities, reflecting its ongoing evolution to meet modern web design needs (GeeksforGeeks, 2024).

Bootstrap simplifies web development by offering a responsive, mobile-first framework with pre-designed components. It streamlines the creation of modern, professional websites with its easy-to-use grid system and built-in JavaScript plugins. With extensive browser compatibility and a strong community, Bootstrap accelerates development time, ensuring consistent and visually appealing designs across all devices. Table 2.6 below shows some of the Bootstraps' features.

*Table 2.5: Bootstraps' features (leed, 2023).*

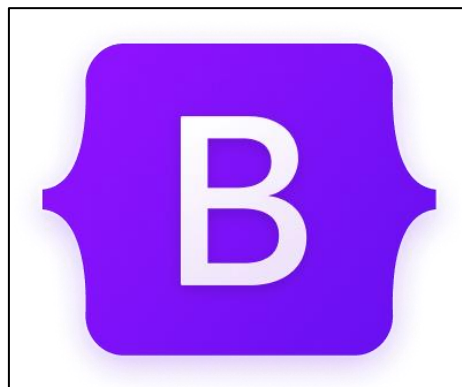
| Features                                | Justifications                                                                                                                                                                                                        |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Responsive Design</b>                | Bootstrap allows the website layout to adjust automatically, giving users a consistent experience across different devices.                                                                                           |
| <b>Mobile-First Approach</b>            | Bootstrap is built with a focus on mobile devices first which means that websites are designed to work well on mobile screens before being adapted to larger devices.                                                 |
| <b>Predefined Styles and Components</b> | Bootstrap offers a variety of ready-made components like buttons, forms, and navigation bars. These components can be easily added to a website, saving time and helping maintain a consistent look across all pages. |

|                                    |                                                                                                                                                                                                                                                   |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Extensive Documentation</b>     | Bootstrap has detailed documentation that is easy to follow. This will explain how to use each feature step by step, making it easier to build and fix things.                                                                                    |
| <b>Customizable</b>                | Bootstrap is very flexible and can be customized to fit the specific needs of the project.                                                                                                                                                        |
| <b>Cross-Browser Compatibility</b> | Bootstrap works well across all major browsers ensuring the website looks and functions the same no matter which browser is preferred.                                                                                                            |
| <b>JavaScript Plugins</b>          | Bootstrap includes JavaScript plugins that add interactive features to the website such as pop-ups and image sliders. These plugins are easy to use and can be customized to fit user's needs.                                                    |
| <b>Open-Source Community</b>       | Bootstrap is supported by a large community of developers who contribute updates and improvements. This community ensures Bootstrap stays current with the latest web development trends and provides many resources and tutorials to help users. |

Bootstrap offers a comprehensive suite of tools to streamline web development and enhance user experiences. Its grid system allows for the effortless creation of responsive layouts with a flexible grid system that adjusts seamlessly to various screen sizes. Developers can easily build user-friendly forms with diverse styles and functionalities, including validation. Customizable buttons of all shapes and sizes enhance the website's interactivity while navigation menus from simple dropdowns to advanced mega menus ensure smooth user navigation. With dismissible alerts, warnings, and success notifications can help developers to communicate effectively with users. Bootstrap also enhance website's visual appeal through responsive image handling and provides JavaScript Plugins integrate interactive features like modals, tooltips, and carousels using Bootstrap's JavaScript plugins.

To summarize, Bootstrap is a free and open-source front-end development framework for the creation of websites and web apps. It is designed to enable responsive development of

mobile-first websites where it provides a collection of syntax for template designs. As a framework, Bootstrap includes the basics for responsive web development, so developers only need to insert the code into a pre-defined grid system. The Bootstrap Framework is built on Hypertext Markup Language (HTML), cascading style sheets (CSS), and JavaScript. Using Bootstrap will help in developing VoiceSpace more efficiently as it can build websites much faster without spending time worrying about basic commands and functions (Zola, 2022).



*Figure 2.18: Bootstraps' logo (Bootstrap, 2022).*

#### **2.4.1.5 HTML, CSS and JavaScript**

HTML, CSS, and JavaScript are the foundational technologies of modern web development. HTML (HyperText Markup Language) provides the structure of a web page using elements and tags to define content such as headings, paragraphs, links, images, and multimedia. It serves as the backbone of a web page, allowing browsers to interpret and render content hierarchically. CSS (Cascading Style Sheets) is used to style and visually format HTML elements. It manages aspects such as colors, fonts, spacing, and layout, enabling consistent design across multiple pages and improving the overall user experience. JavaScript is a versatile scripting language that adds interactivity and dynamic behavior to web pages. It allows developers to create responsive interfaces, handle user input, manipulate content in real time, and communicate with servers, making modern web applications more functional and engaging.

#### **2.4.1.6 PHP**

PHP (Hypertext Preprocessor) is a widely used server-side scripting language designed for web development. Originally standing for ‘Personal Home Page,’ PHP has evolved into a powerful tool for building dynamic websites and web applications. It offers seamless integration with various database management systems, supports deployment across diverse computing environments, and is known for its flexibility and ease of use. Derived from the C programming language, PHP maintains a syntax that is accessible to beginners while remaining robust enough for complex, large-scale projects.

#### **2.4.1.7 Hostinger**

Hostinger is a widely used web hosting provider that offers developers the necessary tools and environment to build, deploy, and manage web-based systems. It supports a range of technologies suitable for both simple websites and complex web applications.

For backend development, Hostinger supports PHP as a core language and allows the use of popular frameworks such as Laravel and CodeIgniter. Advanced users on VPS or cloud hosting plans can also work with other programming languages like Node.js and Python. These technologies allow developers to create dynamic server-side logic and integrate with various databases and APIs.

On the frontend, developers can use standard technologies like HTML, CSS, and JavaScript, along with libraries and frameworks such as Bootstrap, Tailwind CSS, React.js, and Vue.js. These are either uploaded manually or managed through custom configurations on advanced plans.

Hostinger also provides access to phpMyAdmin for managing MySQL or MariaDB databases. This tool offers a graphical interface for database operations like creating tables, running queries, and managing users. This is essential for storing and retrieving data in web systems.

The hosting service uses the LiteSpeed Web Server, known for its speed and performance enhancements over traditional Apache servers. LiteSpeed includes built-in

caching and improved security, which contribute to faster loading times and better resource management.

Management of the hosting environment is done through hPanel, Hostinger's custom control panel. It includes tools for file management, database setup, domain configuration, and email hosting. Developers also benefit from features such as FTP/SFTP, SSH access, Git integration, and cron jobs, which automate repetitive tasks and support modern development workflows.

Security is a priority on Hostinger. The platform includes free SSL certificates, DDoS protection, firewall configurations, automatic backups, and access to access and error logs, all of which are crucial for maintaining system integrity and diagnosing issues during development and operation.

For those without coding experience, Hostinger provides a drag-and-drop website builder and AI-powered design tools, enabling users to quickly prototype or publish professional websites without technical knowledge.

In summary, Hostinger offers a comprehensive set of software tools that support the full development cycle of a web-based system, including backend and frontend programming, database integration, deployment utilities, and robust security features.

#### **2.4.1.8 XAMPP**

XAMPP is an open-source web development package named after its core components, X for cross-platform, A for Apache, M for MySQL (or MariaDB), and P for both PHP and Perl. It provides a complete Apache distribution that includes essential modules and tools such as the Apache server, MariaDB, PHP, and Perl, along with useful command-line utilities.

XAMPP is widely used as a local development environment, allowing developers to build, test, and validate websites or web applications on their personal computers before deploying them to a live server. It simplifies the development process by offering a pre-configured stack for projects that rely on Apache, PHP, Perl, and database systems like MySQL or its popular fork, MariaDB.

In this setup, PHP acts as the primary backend scripting language, Perl offers versatile programming capabilities for web tasks, and MariaDB serves as a robust, widely adopted relational database system.

## **2.4.2 Hardware**

This section provides an overview of the hardware used in the development of the proposed system. The proposed system requires iPhone 14 and Victus by HP Gaming Laptop 15-fa1330TX.

### **2.4.2.1 iPhone 14**

The Apple iPhone 14 is a high-performance smartphone designed with a blend of innovation, reliability, and style. According to Apple (n.d.), it features a 6.1-inch Super Retina XDR display (1170 x 2532 pixels, 460 ppi with HDR10, Dolby Vision and True Tone technology. All the features mentioned can help to deliver vibrant and accurate colours for an immersive viewing experience. The display supports a 1200 nits peak brightness to ensure excellent visibility in various lighting conditions. The phone is powered by the A15 Bionic chip with a 6-core CPU with 2 performance and 4 efficiency cores, a 5-core GPU, and a 16-core Neural Engine. All the chips mentioned are capable of handling demanding applications, gaming, and multitasking with ease.

It also includes a dual-camera system on the rear w, which consists of a 12MP main camera with a larger sensor for improved low-light performance and a 12MP ultra-wide camera that captures a wider field of view. The front is equipped with a 12MP True Depth camera with autofocus for crisp selfies and high-quality video calls. These cameras are capable of 4K HDR recording and cinematic mode, which offers a level of photography and videography.

The iPhone 14 comes with a storage of 256 GB which can provide ample space for apps, photos and videos. It runs on iOS 18 which is the latest version of Apple's operating system which ensures a seamless and secure user experience. Its battery life is optimized with a built-in Ion battery that supports up to 20 hours of video playback. Fast charging, MagSafe wireless charging and Qi wireless charging are also supported to ensure convenience while on the go.

The device is equipped with advanced connectivity features including 5G support, Bluetooth 5.3, Wi-Fi 6 and an ultra-wideband (UWB) chip for spatial awareness. Additional features like Face ID, crash detection and water resistance (IP68) enhance the phone's usability and safety in various scenarios (Apple, n.d.). Figure 2.21 below shows an image of the iPhone 14 features.

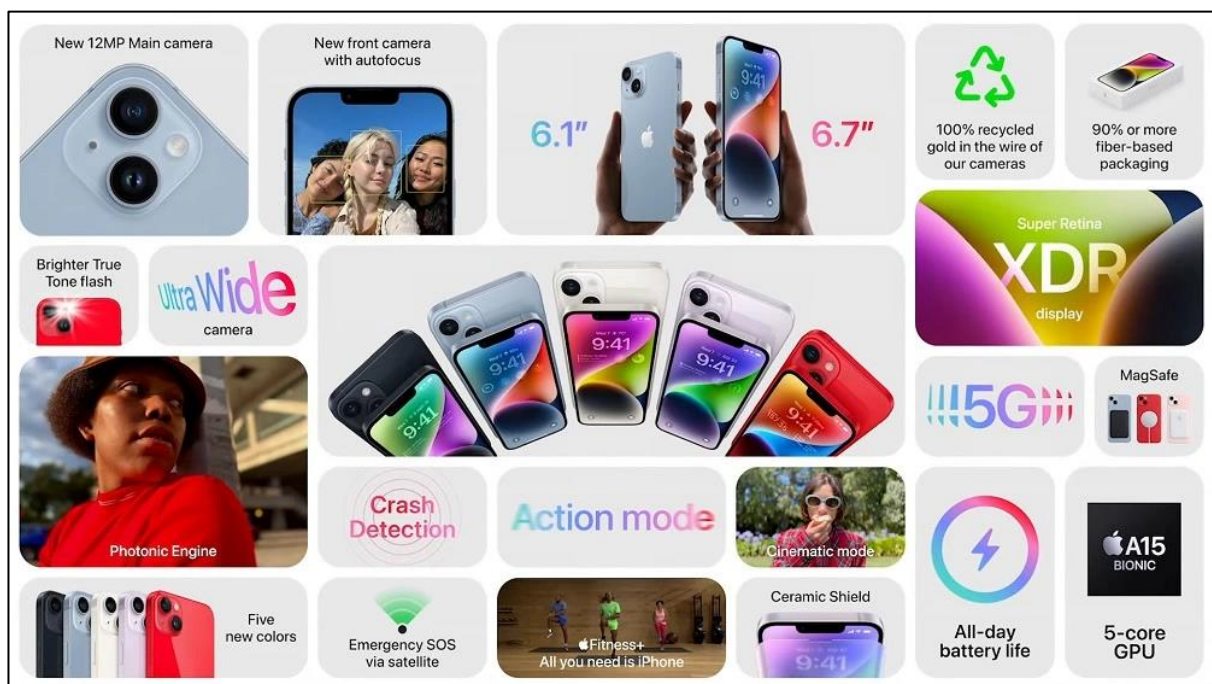


Figure 2.19: iPhone 14 features (Chee, 2022).

#### 2.4.2.2 Victus by HP Gaming Laptop 15-fa1330TX

The Victus by HP Gaming Laptop 15-fa1330TX is a gaming laptop series developed by HP. This model is designed with a modern aesthetic that attracts gamers featuring a 15.6-inch display that provides an immersive viewing experience for gaming and multitasking purposes. Equipped with an Intel core i5 processor and NVIDIA GeForce RTX graphics, it is capable of handling demanding applications and gaming tasks. Additionally, the laptop offers various configurations including up to 16 GB of RAM and 512GB PCIe SSD to ensure faster data access and efficient multitasking. While the build is not as lightweight as ultraportable laptops, it remains manageable for on-the-go users who require powerful hardware. The Victus series is positioned as a budget-friendly gaming laptop where that offers advanced features at a competitive price which makes it ideal for students on a budget. Despite being a gaming laptop, it remains portable enough for use in different work environments (hp, 2024). Figure 2.22 below shows an image of the Victus by HP Gaming Laptop 15-fa1330TX.



*Figure 2.20: Victus by HP Gaming Laptop 15-fa1330TX.*

## **2.5 Summary**

To summarize, Chapter 2 presents a comprehensive review of comparable existing mobile applications and a system with almost identical features. The comparison of features between the existing mobile applications and a system with the proposed systems can be seen in Table 2.2. The table also serves to give insight into the strengths and weaknesses of each application. Furthermore, this chapter also reviews the tools and technology used in the proposed system which was divided into 2 subsections: Software and Hardware.

## **CHAPTER 3: REQUIREMENT ANALYSIS AND DESIGN**

### **3.1 Introduction**

Chapter 3 will provide a detailed explanation of the chosen research methodology for developing the proposed application. Research methodology is a way of explaining how research is intended to be carried out. It serves as a logical and systematic plan to resolve a research problem. A methodology details the approach taken to ensure reliable and valid results that address the research aims and objectives. It encompasses the data to be collected, the sources of this data, and the methods of data collection and analysis (Indeed, 2023). According to McCombes and George (2022), the methodology should include the type of research conducted, any tools or materials used in the research, explaining how research biases were mitigated or avoided, and the reasons for choosing these methods. From among the available methodologies, Rapid Application Development (RAD) has been selected as the methodology in the development process. The RAD model is a form of agile methodology that focuses on iterations and prototypes based on user feedback. Updates are incorporated based on usage rather than a rigid development plan. By using RAD, changes can be made to the design, features can be removed or added, and interfaces can be edited without affecting the entire process while also addressing changing requirements as they occur based on user feedback. Hence, this results in rapid prototypes for testing and additional improvements (Egeonu, 2022).

### **3.2 Rapid Application Development (RAD)**

Rapid Application Development (RAD) is an adaptive software development model based on prototyping and quick feedback with less emphasis on specific planning. In general, the RAD approach prioritizes development and building a prototype rather than planning. With rapid application development, a developer can quickly make multiple iterations and updates

to the software without starting from scratch. This helps ensure that the outcome is more quality-focused and aligns with the end users' requirements (Team Kissflow, 2022).

Given the emerging fast-paced world of digital products in the early 90's, a different approach to the Waterfall method became necessary. This is because the Waterfall method often leads to projects running over time and budget constraints. In 1991, a famed IT engineer, James Martin published his book where he described RAD as a development lifecycle designed to give much faster development and higher-quality results than those achieved with the traditional lifecycle.

Adopters of RAD aimed for higher-quality outcomes that met user needs while avoiding the challenges associated with waterfall development. However, despite its focus on the user, this people-first approach often overlooked the needs of a developer. This was due to its reliance on expert input and the tendency for the overall vision to become obscured in fragmented prototyping cycles. In response, a group of engineers collaborated in the early 2000s to create the Agile Manifesto which achieved over 50 percent adoption between 2012 and 2015 under the promotion of the Agile Alliance.

Agile introduced practical, structured working methods such as stand-ups and sprint cycles. These methods aligned RAD's rapid prototyping principle with systematic process management organized by features and integrated into layered user journeys. This approach provides visibility on progress, clear accountability for the developer, and the flexibility to adjust priorities as needed (Borg, 2021).

The RAD model is a type of incremental process model in which there is a concise development cycle. The RAD model is used when the requirements are fully understood, and the component-based construction approach is adopted. The critical feature of this model is the use of powerful development tools and techniques. A software project can be implemented

using this model if the project can be broken down into small modules wherein each module can be handled independently. These modules can finally be combined to form the final product. Development of each module involves the various basic steps as in the waterfall model such as analyzing, designing, coding, and then testing. Another striking feature of this model is the short period such as the time frame for delivery(time-box) is generally 60-90 days. The use of powerful developer tools such as JAVA, C++, Visual BASIC, and XML is also an integral part of the projects (geeksforgeeks, 2018).

The four rapid application development phases are requirements planning, user design, construction, and cutover.

#### 1. Requirements Planning

In the requirements planning phase, the groundwork for the entire project is laid out. The developer and users collaborate closely to define the project scope, identify key requirements, and establish objectives. It emphasizes gathering detailed information quickly and effectively, allowing the developer to move forward with a solid blueprint that guides the subsequent stages of development. This collaborative approach ensures that all parties have a clear understanding of the project needs and user expectations, leading to a comprehensive project plan.

#### 2. User Design

The user design phase focuses on creating detailed models and prototypes based on the requirements gathered in the planning phase. In this stage, the developer and users work together to design the system's interface, architecture, and functionality through iterative cycles of feedback and refinement. Prototypes are built and continuously adjusted to ensure they meet user needs and expectations, allowing users to interact with early versions of the system and provide real-time feedback. This iterative process ensures that any issues or changes in requirements

are addressed early, resulting in a design that is both user-centric and aligned with project goals. By the end of the user design phase, there is a clear, validated blueprint to guide the rapid construction phase.

### 3. Construction

In the rapid construction phase of RAD, the focus shifts to building the actual application. This phase leverages the detailed prototypes and design models created during the user design phase to develop the system's core functionality. Using iterative and incremental development techniques, the developer constructs components and integrates them into the overall system. Frequent testing and user feedback are integral during this phase because they allow the developer to make continuous adjustments and improvements. By the end of the rapid construction phase, the application is typically fully functional.

### 4. Cutover

The cutover or implementation phase is the final rapid application deployment stage in which the completed system is fully deployed into the production environment. This involves finalizing any last-minute changes, conducting thorough testing, and ensuring the system operates as intended in a live setting. The goal is to ensure a smooth transition with minimal disruption to project operations. Any issues that arise are quickly addressed, and users are supported as they adapt to the new system. By the end of this phase, the application is fully operational, and the developer transitions into ongoing maintenance and support to ensure the system continues to meet user needs and performs reliably (Kolosky, 2024).

### **3.3 Requirements Planning**

Requirements planning serves as the foundation for VoiceSpace, focusing on identifying key challenges students face and defining clear objectives for the platform. This process involves brainstorming, interviews, and the creation of an initial project roadmap. To ensure alignment between students' needs and system capabilities, a series of discussions is held to refine requirements collaboratively. Gathering insights from students is crucial to shaping a platform that truly reflects their experiences and concerns. Additionally, this phase requires an in-depth exploration of existing anonymous discussion platforms to identify gaps and areas for improvement. Understanding these systems helps refine VoiceSpace's approach to student confessions and engagement. Before moving into the design phase, finalizing requirements ensures clarity, minimizing miscommunication between the developer and users. The most effective way to gather requirements is through questionnaires, where students can anonymously share their thoughts. This feedback undergoes thorough analysis to shape a platform that genuinely resonates with the student community.

#### **3.3.1 Analysis on Similar Existing Systems**

Anonymous confession platforms like NGL, Tellonym, and Anonomia provide users with a way to share their thoughts and feelings without revealing their identity. While these systems offer valuable tools for interaction, they exhibit limitations in features that the proposed system seeks to address. Mental health resources are largely absent from these systems. While existing platforms focus on one-to-one interactions or small group discussions, they lack broader community features such as upvote systems, commenting threads, and polling, all of which can enhance engagement and foster dialogue. None of the analyzed

systems cater specifically to institutions like universities which makes it difficult to address the unique challenges of students' confessions in a targeted manner.

### **3.3.2 Analysis on Proposed Systems**

The proposed system addresses the limitations of existing platforms for anonymous student confessions. Following a detailed analysis of similar systems, the proposed solution focuses on bridging critical gaps in functionality, safety, and user engagement while prioritizing privacy and mental health support. The primary objective of VoiceSpace is to create a secure, feature-rich platform for students to share their experiences anonymously while fostering a supportive and moderated community.

The platform enables users to post confessions anonymously with identity masking and one-time email authentication for verification. A robust reaction and voting system support real-time feedback while commenting and discussion threads encourage engagement within the community. Additional functionalities include advanced confession search and filtering options, and polling features. The platform emphasizes user privacy through secure data encryption and adheres to community guidelines with an accessible reporting mechanism for moderation. For institutional feedback, VoiceSpace includes tools to gather insights from users anonymously.

#### **Detailed Features of the Proposed System:**

1. Anonymous Confession Posting

- Secure identity masking with one-time email authentication.
- Confessions restricted to university-related audiences.

## 2. Community Engagement Tools

- Reaction system with upvotes for real-time feedback.
- Commenting and discussion threads for extended interaction.
- Polling options within confessions.

## 3. Mental Health Awareness

- Provide informative articles related to mental health topics, including stress management, anxiety, depression, and emotional well-being. These resources aim to educate users and reduce the stigma surrounding mental health issues.
- Include a dedicated section where users can view contact details and profiles of licensed mental health practitioners. This feature ensures that individuals can easily reach out for professional support whenever needed, promoting timely intervention and care.

## 4. Confession Search Feature

## 5. Feedback Mechanism

- Tools to gather anonymous insights for institutional improvements.

## 6. Data Security

- End-to-end encryption to protect user data.
- Compliance with community guidelines and privacy regulations.

In this proposed system, there are two types of users which are UNIMAS students and administrators, as outlined below.

### **User Functionalities**

1. Users can perform the following actions:
2. **Sign Up:** Create an account using an email address.

3. **Log In:** Access their account securely.
4. **Post Anonymously:** Submit confessions or polls without revealing identity.
5. **Participate in Polls:** Engage in polls embedded within confessions.
6. **React to Content:** Upvote or downvote posts and comments.
7. **Comment:** Add comments on confessions.
8. **Search:** Find confessions using keywords or by browsing categories.
9. **Report:** Flag inappropriate posts or comments for review.
10. **Access Resources:** Read mental health-related articles.
11. **View Practitioners:** Browse mental health practitioner profiles and contact details.

### **Administrator Functionalities**

Administrators can manage the platform through the following actions:

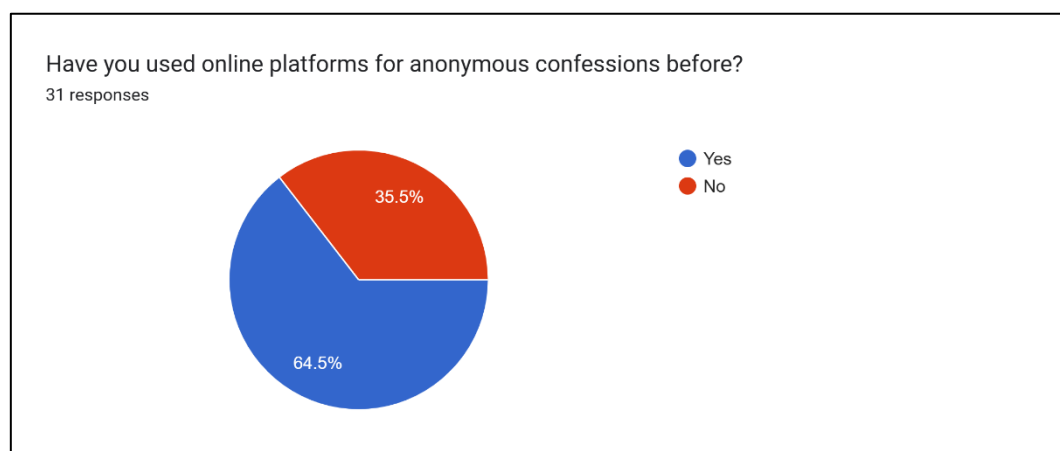
1. **Content Moderation:**
  - Accept or reject submitted confessions and polls.
  - Review and handle reported posts and comments.
2. **Feedback Management:**
  - Provide feedback or updates related to the university.
3. **Account Access:**
  - Log in to the admin dashboard.
4. **Content Management:**
  - Add, edit, or delete mental health articles.
  - Add, edit, or remove practitioner information.
5. **Search & Maintenance:**
  - Search records and perform account or system resets as needed.

### 3.3.3 Questionnaire

In this study, a Google Form was utilized to distribute the questionnaire to gather responses from participants to assess the functional and usability aspects of VoiceSpace, an anonymous confession platform for UNIMAS students. The questionnaire is divided into four sections with a total of 30 questions comprising both open-ended questions and close-ended formats. The survey results were visualized using stacked bar charts, pie charts, and column bar charts to analyze critical insights. These visualizations provide a clear understanding of participants's perspectives which are instrumental in refining the platform's features and ensuring its relevance to the target audience.

#### Section A: Demographic Questions

This section includes six questions aimed at understanding the participants' background such as age, gender, student status at UNIMAS, year of study, faculty and prior use of anonymous confession platforms. These responses help contextualize the data and ensure that the feedback is representative of the intended user base. Figure 3.1 below shows the pie chart shows that 64.5% of 31 respondents have used online platforms for anonymous confessions while 35.5% have not.



*Figure 3.1: Question regarding prior use of online platforms for anonymous confessions.*

## Section B: Feedback on features

This section contains 11 questions exploring participant's opinions on the core features of VoiceSpace such as anonymity, privacy safety measures, and content preferences. Participants were asked about their motivations for using the platform, the type of content they would share, and their concerns regarding data security. Close-ended questions with multiple choice options and Likert scales were primarily used here, supplemented by an open-ended question inviting suggestions for feature improvements. Figure 3.2 below shows that 77.4% of 31 respondents would use a platform like VoiceSpace to express their thoughts anonymously while 22.6% would not.

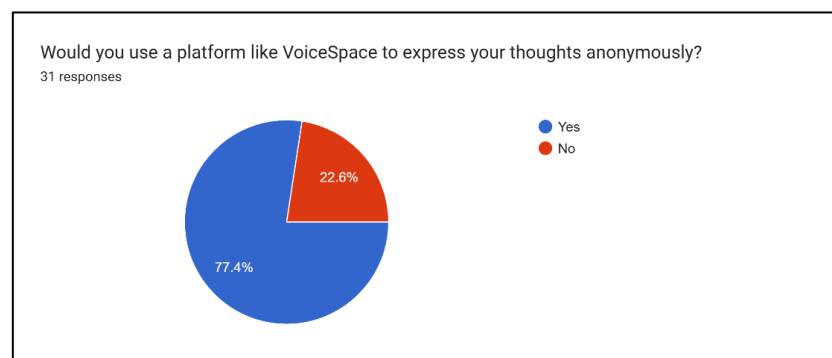


Figure 3.2: Interest in using a platform like VoiceSpace for anonymous expression.

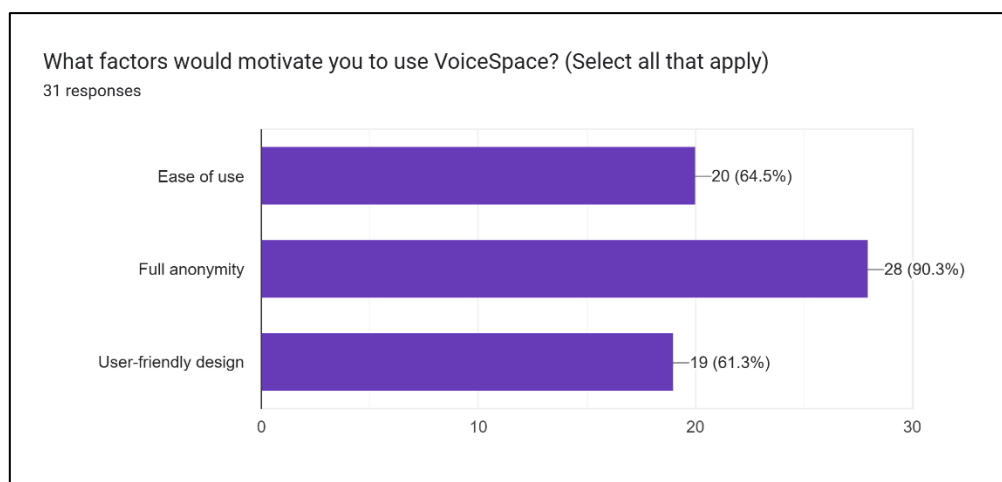
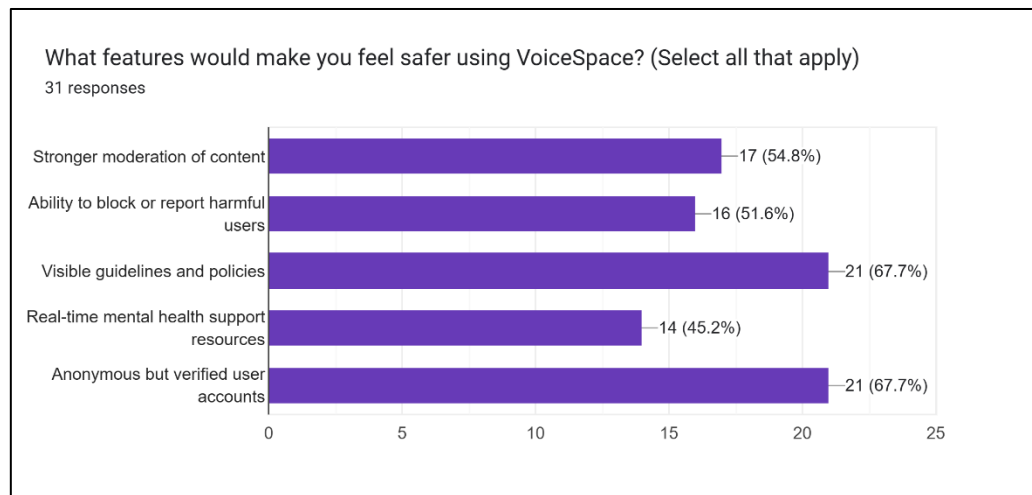


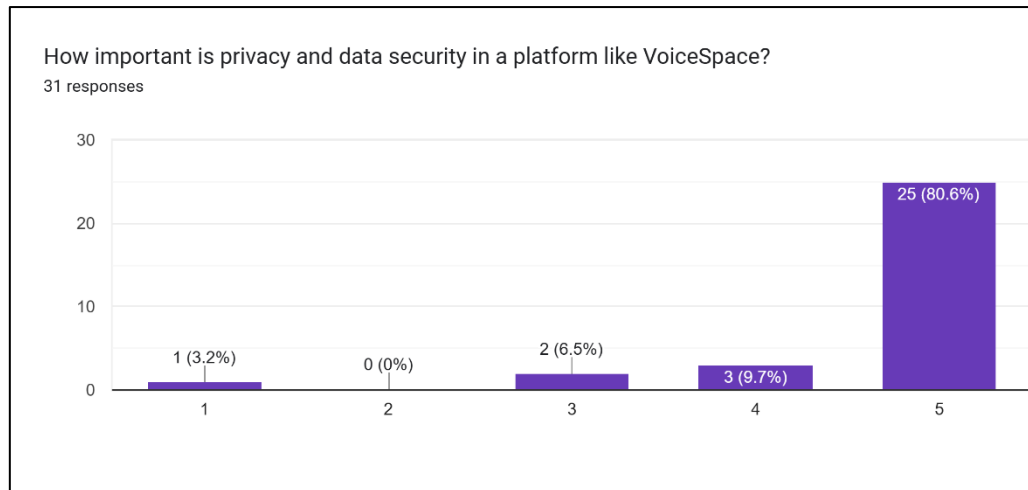
Figure 3.3: Factors that would motivate users to use VoiceSpace.

In Figure 3.3, the bar chart shows the factors that would motivate participants to use VoiceSpace where full anonymity is the top motivator with 28 respondents (90.3%) citing it as a factor. Ease of use is the second most important factor selected by 20 respondents (64.5%). User-friendly design is also a significant motivator chosen by 19 respondents (61.3%).

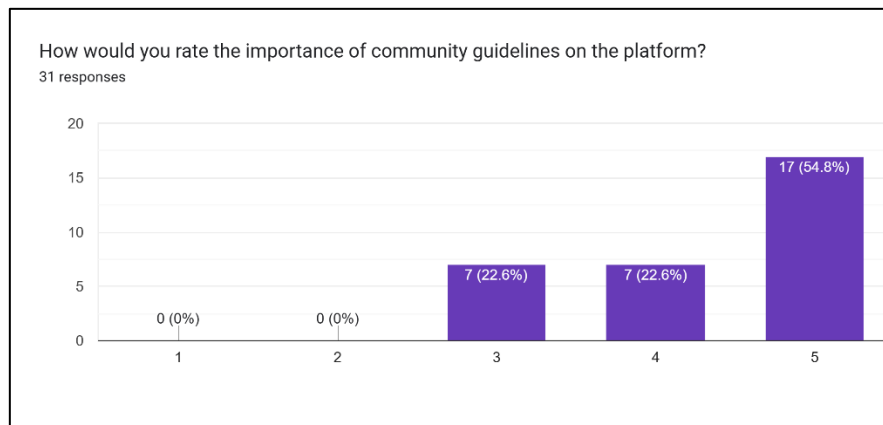


*Figure 3.4: Features that would make users feel safer using VoiceSpace.*

The bar chart in Figure 3.4 shows the features that would make people feel safer using VoiceSpace where visible guidelines and policies and anonymous but verified user accounts are the top feature selected by 21 respondents (67.7%). Stronger moderation of content is a significant feature selected by 17 respondents (54.8%). Ability to block or report harmful users is also a significant feature chosen by 16 respondents (51.6%). Real-time mental health support resources are the least important feature selected by 14 respondents (45.2%).



*Figure 3.5: The importance of privacy and data security.*



*Figure 3.6: The importance of community guidelines on the platform.*

The bar chart in Figure 3.5 shows that 80.6% of 31 respondents consider privacy and data security to be very important in a platform like VoiceSpace. In Figure 3.6, 54.8% respondents rated the importance of community guidelines as very important while 22.6% rated it as important and the other 22.6% rated it as neutral.

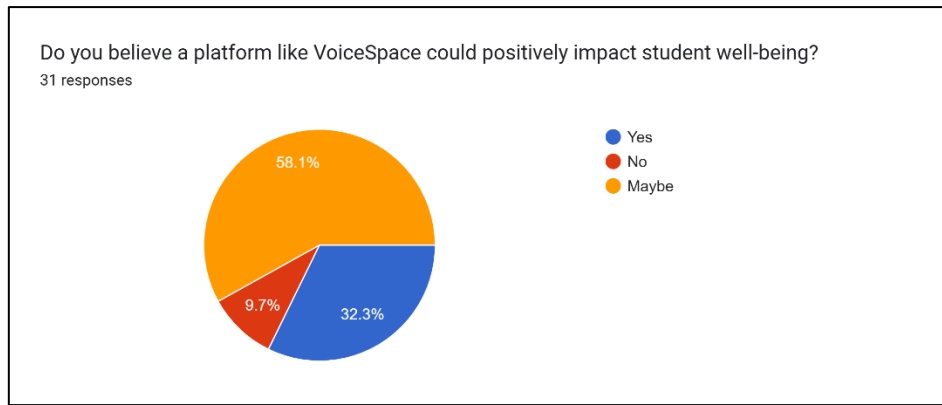


Figure 3.7: Question regarding user's belief in whether VoiceSpace could positively impact student well-being.

The pie chart in Figure 3.7 shows the results of asking participants whether they believe a platform like VoiceSpace could positively impact student well-being where 58.1% of respondents believe VoiceSpace could positively impact student well-being while 32.3% of respondents are unsure or believe VoiceSpace could have both positive and negative impacts on student well-being and 9.7% respondents do not believe VoiceSpace could positively impact student well-being.

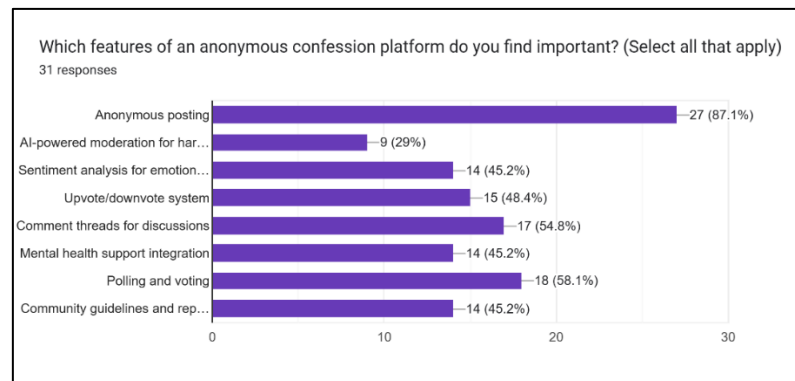
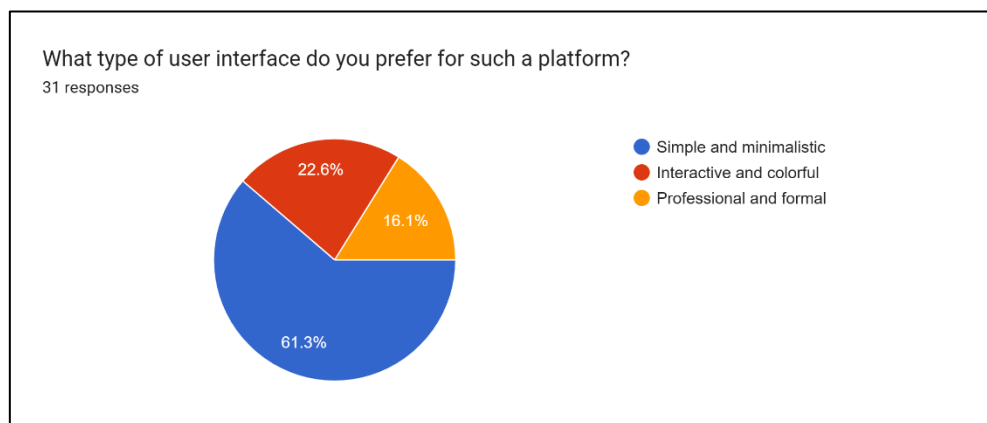


Figure 3.8: Question regarding which features of an anonymous confession platform users find important.

The bar chart in Figure 3.8 shows the features of an anonymous confession platform that participants find important where anonymous posting is the most important feature while AI-powered moderation for harmful content is the least important feature selected.

## Section C: Usability and Design Preferences

This section comprises 10 questions focusing on the design and usability aspects of VoiceSpace. Participants provided input on interface preferences, tutorial requirements, notification types, real-time feedback, and gamification features. The responses also shed light on the frequency of platform usage and the ideal moderation response times to enhance the user experience.



*Figure 3.9: Question regarding the preferred user interface.*

The pie chart in Figure 3.9 shows the results of asking participants what type of user interface they prefer where 61.3% prefer a simple and minimalistic user interface that focuses on clean design with minimal elements, utilizes ample white space, simple typography, and limited colours, and prioritizes ease of navigation while reducing distractions. Meanwhile, 22.6% prefer an interactive and colourful user interface, characterized by vibrant colours, engaging animations, and dynamic elements that enhance user interaction. Lastly, 16.1% prefer professional and formal user interface which emphasizes structured layouts, neutral colour schemes, and a business-like appearance to ensure clarity and professionalism.

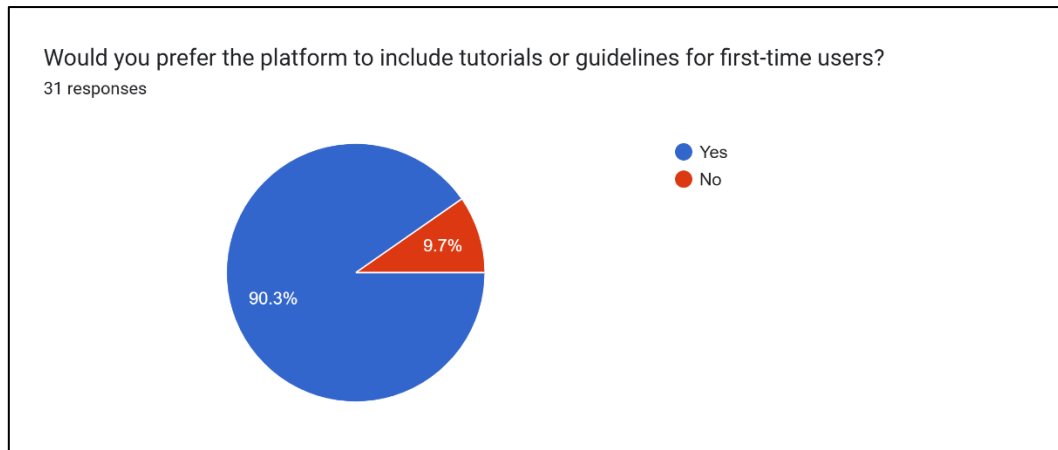


Figure 3.10: Question whether users would prefer the platform to include tutorials or guidelines for first-time users.

The pie chart in Figure 3.10 shows that 90.3% of respondents would prefer the platform to include tutorials or guidelines for first-time users while 9.7% would not.

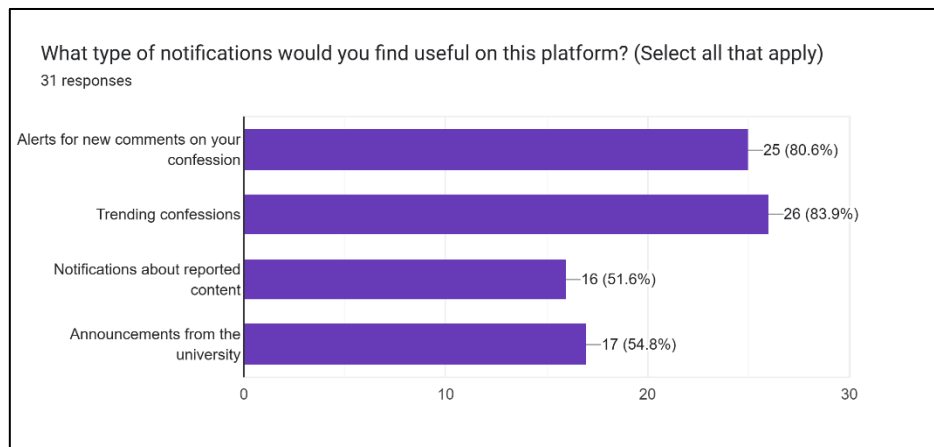


Figure 3.11: Questions regarding what types of notifications users would find useful.

The bar chart in Figure 3.11 shows the types of notifications that participants would find useful on this platform where trending confessions are the most useful notification, alerts for new comments on your confession are the second most useful notification, and announcements from the university are the least useful notification.

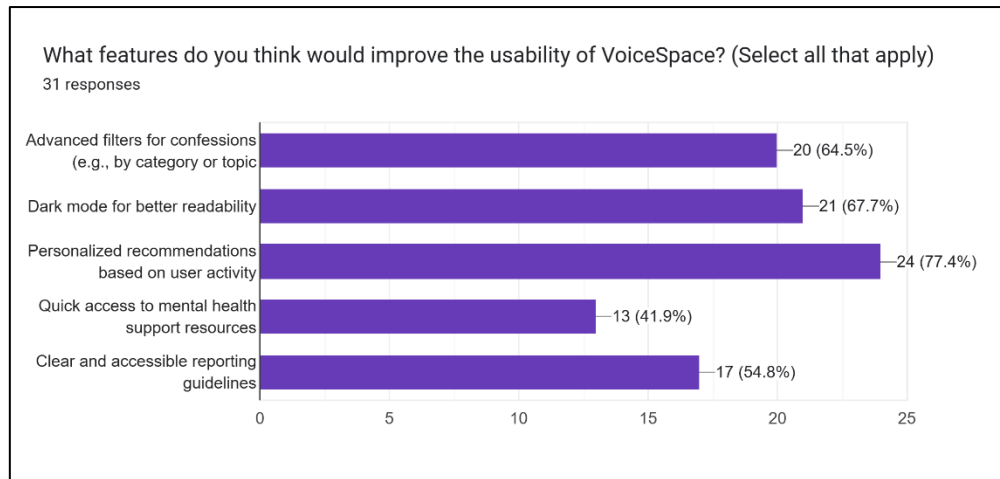


Figure 3.12: Question regarding features users think would improve the usability of VoiceSpace.

The bar chart in Figure 3.12 shows the features that participants think would improve the usability of VoiceSpace where personalized recommendations based on user activity are the most important feature while advanced filters for confessions such as category or topic are the second most important feature.

## Section D: Additional Feedback

This final section includes three open-ended questions that allow participants to suggest improvements, voice concerns, and provide opinions on integrating mental health resources into the platform. These qualitative responses offer valuable insights for tailoring the platform to meet user needs effectively. The table below shows the summary of user responses for Section D.

Table 3.1: Additional Feedback on VoiceSpace.

| Question                       | Key Themes                                                                                                                                   | Example of responses                                                                                                     |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| 1. Suggestions for Improvement | <ul style="list-style-type: none"> <li>Privacy and Security Enhancements</li> <li>Content Filtering</li> <li>Interactive Features</li> </ul> | <ul style="list-style-type: none"> <li>Strengthen end-to-end encryption</li> <li>Filter inappropriate content</li> </ul> |

|                                          |                                                                                                                                           |                                                                                                                                                                                                                         |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          |                                                                                                                                           | <ul style="list-style-type: none"> <li>• ‘Box of frustration’ for emotional venting</li> <li>• Make the platform more interactive</li> </ul>                                                                            |
| 2. Potential Risks and Concerns          | <ul style="list-style-type: none"> <li>• Privacy Breach</li> <li>• Data Security</li> <li>• Misuse and Abuse of Platform</li> </ul>       | <ul style="list-style-type: none"> <li>• Privacy leakage</li> <li>• Misleading information</li> <li>• Hate speech and racism</li> <li>• Misuse of the platform</li> </ul>                                               |
| 3. Support for Mental Health Integration | <ul style="list-style-type: none"> <li>• Positive Reception</li> <li>• Emotional Support</li> <li>• Awareness of Mental Health</li> </ul> | <ul style="list-style-type: none"> <li>• Immediate access to mental health resources</li> <li>• Venting helps emotional well-being</li> <li>• Promotes awareness among students</li> <li>• Reduces self-harm</li> </ul> |

To summarize, an in-depth analysis of the collected data has been conducted to summarize the findings in the subsequent sections. The insights gathered serve as a foundation for developing VoiceSpace to address users’ concerns and prioritize features that align with their preferences and expectations.

### 3.3.4 Software Requirements

The software requirements for the proposed system, VoiceSpace have been thoroughly reviewed and selected to facilitate effective development and ensure optimal functionality. The table below provides an overview of the software components that will be employed in developing this platform.

*Table 3.2: Software Requirements.*

| Software           | Description                                                                                                         |
|--------------------|---------------------------------------------------------------------------------------------------------------------|
| Visual studio Code | A versatile source-code editor used for the development of both the backend and frontend of VoiceSpace. It supports |

|           |                                                                                                                                                                                           |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | extensions, debugging and integrated version control for efficient coding workflows.                                                                                                      |
| MySQL     | An integrated tool used for designing, managing and querying the database to enable the efficient handling of user data, confessions and community interaction records.                   |
| Figma     | A web-based design tool used for creating high-fidelity prototypes and wireframes of the VoiceSpace platform to ensure a user-friendly and visually appealing interface.                  |
| Bootstrap | A CSS framework used to streamline frontend development to enable responsive and visually consistent design for features such as the confession forms, voting system and comment threads. |

### 3.3.5 Hardware Requirements

The hardware requirements for the development of the VoiceSpace platform are carefully identified to ensure a smooth development and testing process. The table below presents the essential hardware components utilized during the development phase.

*Table 3.3: Hardware Requirements.*

| Hardware                               | Description                                                                                                                                                                                                             |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| iPhone 14                              | A smartphone is used for testing the platform's mobile responsiveness and user experience. It ensures the interface is compatible with varying screen sizes and resolutions.                                            |
| Victus by HP Gaming Laptop 15-fa1330TX | The primary development device is a laptop with an Intel Core i5 processor, 16GB RAM 512GB SSD storage and a 15.6-inch Full HD display. It serves as the main workstation for coding, database management, and testing. |

### 3.4 User Design

Once the requirements are set, the development phase begins. Here, the developer rapidly creates prototypes and mock-ups of VoiceSpace's interface and core functionalities, focusing on usability rather than aesthetics. This stage thrives on active collaboration between

developers and students, ensuring continuous feedback loops to refine the platform. The iterative process continues until the prototypes align with the agreed-upon requirements. The goal is to visually represent VoiceSpace in a way that helps both users and the developer understand its overall structure and experience. Key elements of this phase include designing the platform's interactive modules, and user engagement features. Through repeated prototyping and testing, potential issues such as usability challenges or misinterpretations of student needs are identified and resolved. The development progresses only after validating the prototypes with feedback from potential users. The finalized design consists of scenario illustrations, user interaction flows, wireframes, and essential UML diagrams like the Use Case Diagrams, Sequence Diagrams, and Class Diagrams.

### 3.4.1 Use Case

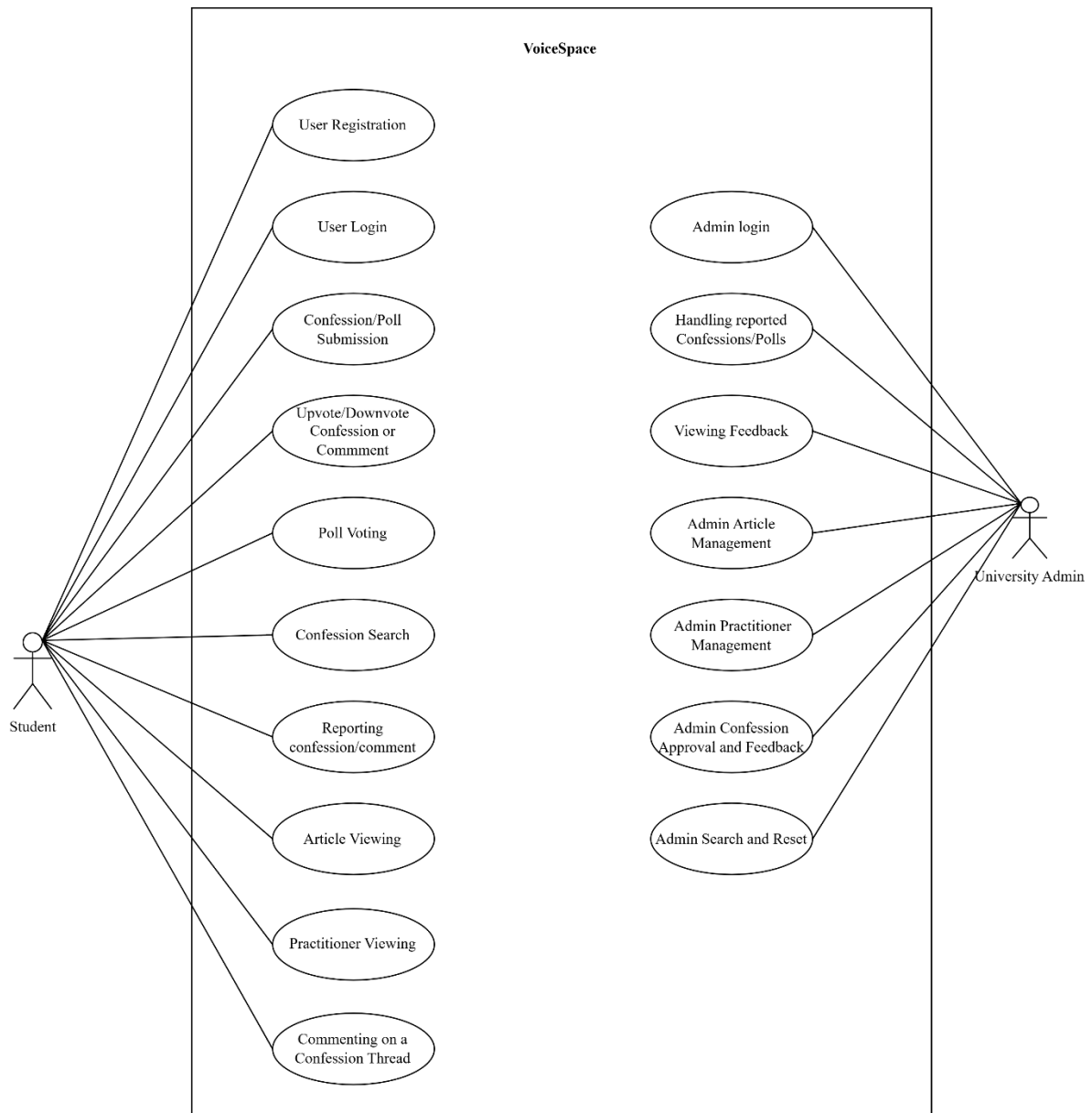


Figure 3.13: Use Case of VoiceSpace system.

The VoiceSpace system is a confession-based social platform designed for university students to anonymously post confessions, participate in polls, comment, upvote/downvote content, and report inappropriate posts. Admins play a crucial role in moderating content, reviewing

feedback, and managing article and practitioner information. Figure 3.13 above shows the Use Case Diagram of the VoiceSpace System, representing the functional scope and interactions of both users and admins with the system. Meanwhile, Table 3.4 – 3.20 below shows the detailed use case tables for each functional scenario. These tables outline the purpose, flow, conditions, and exception handling for every use case, ensuring a clear understanding of how the system responds to user and admin actions, ultimately contributing to a structured and well-defined system design.

### 3.4.1.1 Use Case Table for User

*Table 3.4: Use Case Table for User Registration.*

| Field                   | Details                                                                                                                                                                                                                                                                                                                              |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>      | Allows a new user to register using their email and password.                                                                                                                                                                                                                                                                        |
| <b>Precondition</b>     | The user must have a valid UNIMAS email.                                                                                                                                                                                                                                                                                             |
| <b>Postcondition</b>    | The user account is created and stored in the database.                                                                                                                                                                                                                                                                              |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. User accesses the registration page.</li> <li>2. User enters email and password.</li> <li>3. System validates the email.</li> <li>4. System sends a verification code.</li> <li>5. User enters verification code.</li> <li>6. System verifies the code and creates the account.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                                                                                                                                                                                 |
| <b>Exception Paths</b>  | 3a. If email validation fails, registration is rejected.<br>6a. If the verification code is incorrect, registration fails.                                                                                                                                                                                                           |

*Table 3.5: Use Case Table for User Login.*

| Field               | Details                                                 |
|---------------------|---------------------------------------------------------|
| <b>Description</b>  | Allows a user to log in using their email and password. |
| <b>Precondition</b> | The user must be registered and verified.               |

|                         |                                                                                                                                                                                                                         |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Postcondition</b>    | The user is authenticated and logged in.                                                                                                                                                                                |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. User accesses the login page.</li> <li>2. User enters credentials.</li> <li>3. System checks credentials in the database.</li> <li>4. If valid, user is logged in.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                                                                    |
| <b>Exception Paths</b>  | 3b. If credentials are incorrect, login fails.                                                                                                                                                                          |

Table 3.6: Use Case Table for Confession/Poll Submission.

| Field                   | Details                                                                                                                                                                                                                |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>      | Allows users to submit confessions or polls anonymously.                                                                                                                                                               |
| <b>Precondition</b>     | User must be logged in.                                                                                                                                                                                                |
| <b>Postcondition</b>    | Confession/poll is saved and sent to admin for review.                                                                                                                                                                 |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. User accesses confession page.</li> <li>2. User writes confession or poll.</li> <li>3. System saves it to the database.</li> <li>4. Admin is notified for review.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                                                                   |
| <b>Exception Paths</b>  | 3a. If required fields are empty, submission fails.                                                                                                                                                                    |

Table 3.7: Use Case Table for Upvote/Downvote Confession or Comment.

| Field                   | Details                                                                                                                                                                     |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>      | Allows users to upvote/downvote confessions or comments.                                                                                                                    |
| <b>Precondition</b>     | User is logged in.                                                                                                                                                          |
| <b>Postcondition</b>    | Vote is saved and count is updated.                                                                                                                                         |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. User views confession.</li> <li>2. User clicks upvote/downvote.</li> <li>3. System updates vote count in the database.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                        |
| <b>Exception Paths</b>  | 3a. If DB update fails, vote is not counted.                                                                                                                                |

Table 3.8: Use Case Table for Poll Voting.

| Field               | Details                                      |
|---------------------|----------------------------------------------|
| <b>Description</b>  | Allows users to vote in a poll.              |
| <b>Precondition</b> | User must be logged in. Poll must be active. |

|                         |                                                                                                                                                                   |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Postcondition</b>    | Vote is recorded and poll results are updated.                                                                                                                    |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. User views poll.</li> <li>2. User selects option.</li> <li>3. System saves the vote and updates poll result.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                              |
| <b>Exception Paths</b>  | 3a. If vote fails to save, system shows error.                                                                                                                    |

*Table 3.9: Use Case Table Confession Search.*

| <b>Field</b>            | <b>Details</b>                                                                                                                                    |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>      | Allows users to search for confessions using keywords.                                                                                            |
| <b>Precondition</b>     | User is on the confession page.                                                                                                                   |
| <b>Postcondition</b>    | Matching results are displayed.                                                                                                                   |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. User enters keyword.</li> <li>2. System queries database.</li> <li>3. Results are displayed.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                              |
| <b>Exception Paths</b>  | 3a. No results found — display appropriate message.                                                                                               |

*Table 3.10: Use Case Table Reporting Confession/Comment.*

| <b>Field</b>            | <b>Details</b>                                                                                                                                                                                  |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>      | Allows users to report inappropriate content.                                                                                                                                                   |
| <b>Precondition</b>     | User must be logged in.                                                                                                                                                                         |
| <b>Postcondition</b>    | Report is stored and sent to admin.                                                                                                                                                             |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. User views confession/comment.</li> <li>2. User clicks 'Report'.</li> <li>3. User selects reason and submits.</li> <li>4. Report is saved.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                                            |
| <b>Exception Paths</b>  | 3a. If no reason selected, system prompts for it.                                                                                                                                               |

*Table 3.11: Use Case Table Article Viewing.*

| <b>Field</b>        | <b>Details</b>                               |
|---------------------|----------------------------------------------|
| <b>Description</b>  | Allows users to view mental health articles. |
| <b>Precondition</b> | None                                         |

|                         |                                                                                                                                                                                            |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Postcondition</b>    | Selected article content is displayed.                                                                                                                                                     |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. User accesses article page.</li> <li>2. System fetches articles.</li> <li>3. User selects one.</li> <li>4. System shows full article.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                                       |
| <b>Exception Paths</b>  | None                                                                                                                                                                                       |

*Table 3.12: Use Case Table Practitioner Viewing.*

| <b>Field</b>            | <b>Details</b>                                                                                                                                    |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>      | Allows users to view mental health practitioners.                                                                                                 |
| <b>Precondition</b>     | None                                                                                                                                              |
| <b>Postcondition</b>    | Practitioner list is displayed.                                                                                                                   |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. User accesses practitioner page.</li> <li>2. System fetches data.</li> <li>3. List is shown.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                              |
| <b>Exception Paths</b>  | None                                                                                                                                              |

*Table 3.13: Use Case Table for Commenting on a Confession Thread.*

| <b>Field</b>            | <b>Details</b>                                                                                                                                                                               |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>      | Allows users to comment on confession threads.                                                                                                                                               |
| <b>Precondition</b>     | User must be logged in.                                                                                                                                                                      |
| <b>Postcondition</b>    | Comment is saved and shown in the thread.                                                                                                                                                    |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. User views confession.</li> <li>2. User writes and submits comment.</li> <li>3. System saves comment.</li> <li>4. Comment is displayed.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                                         |
| <b>Exception Paths</b>  | None                                                                                                                                                                                         |

### 3.4.1.2 Use Case Table for Admin

*Table 3.14: Use Case Table for Admin Login.*

| <b>Field</b>       | <b>Details</b>                          |
|--------------------|-----------------------------------------|
| <b>Description</b> | Allows admin to access the admin panel. |

|                         |                                                                                                                                                                                         |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Precondition</b>     | Admin account exists.                                                                                                                                                                   |
| <b>Postcondition</b>    | Admin is logged in.                                                                                                                                                                     |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. Admin accesses login page.</li> <li>2. Enters credentials.</li> <li>3. System authenticates admin.</li> <li>4. Admin is logged in.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                                    |
| <b>Exception Paths</b>  | 3a. Wrong credentials — access denied.                                                                                                                                                  |

*Table 3.15: Use Case Table for Handling Reported Confessions/Polls.*

| <b>Field</b>            | <b>Details</b>                                                                                                                                                                                             |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>      | Admin handles reported content.                                                                                                                                                                            |
| <b>Precondition</b>     | Reports exist in the system.                                                                                                                                                                               |
| <b>Postcondition</b>    | Report is resolved.                                                                                                                                                                                        |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. Admin accesses report page.</li> <li>2. System fetches reports.</li> <li>3. Admin reviews and rejects/deletes/ignores.</li> <li>4. System updates DB.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                                                       |
| <b>Exception Paths</b>  | None                                                                                                                                                                                                       |

*Table 3.16: Use Case Table for Viewing Feedback.*

| <b>Field</b>            | <b>Details</b>                                                                                                                                                                                  |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>      | Allows admin to view feedback submitted by users regarding their experience or platform issues.                                                                                                 |
| <b>Precondition</b>     | Admin must be logged in. Feedback must exist in the system.                                                                                                                                     |
| <b>Postcondition</b>    | Feedback entries are retrieved and displayed.                                                                                                                                                   |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. Admin accesses the Feedback page.</li> <li>2. System retrieves feedback from the database.</li> <li>3. Feedback is displayed to the admin.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                                            |
| <b>Exception Paths</b>  | 2a. If no feedback is available, show "No feedback yet".                                                                                                                                        |

Table 3.17: Use Case Table for Admin Article Management.

| Field                   | Details                                                                                                                                                                      |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>      | Admin adds, edits, or deletes articles entries.                                                                                                                              |
| <b>Precondition</b>     | Admin must be logged in.                                                                                                                                                     |
| <b>Postcondition</b>    | Record is updated in the database.                                                                                                                                           |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. Admin selects Add/Edit/Delete.</li> <li>2. Fills in/edit info or selects item.</li> <li>3. System saves/deletes record.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                         |
| <b>Exception Paths</b>  | None                                                                                                                                                                         |

Table 3.18: Use Case Table for Admin Practitioner Management.

| Field                   | Details                                                                                                                                                                      |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>      | Admin adds, edits, or deletes practitioner entries.                                                                                                                          |
| <b>Precondition</b>     | Admin must be logged in.                                                                                                                                                     |
| <b>Postcondition</b>    | Record is updated in the database.                                                                                                                                           |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. Admin selects Add/Edit/Delete.</li> <li>2. Fills in/edit info or selects item.</li> <li>3. System saves/deletes record.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                         |
| <b>Exception Paths</b>  | None                                                                                                                                                                         |

Table 3.19: Use Case Table for Admin Confession Approval and Feedback.

| Field                   | Details                                                                                                                                                                  |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>      | Admin approves, rejects, or marks a confession as feedback.                                                                                                              |
| <b>Precondition</b>     | Admin is logged in and content is pending.                                                                                                                               |
| <b>Postcondition</b>    | Confession is either published, rejected, or saved as feedback.                                                                                                          |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. Admin views confession.</li> <li>2. Chooses Approve/Reject/Feedback.</li> <li>3. System updates status accordingly.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                     |
| <b>Exception Paths</b>  | None                                                                                                                                                                     |

Table 3.20: Use Case Table for Admin Search and Reset.

| Field                   | Details                                                                                                                                                                                                                                                         |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>      | Allows admin to search confessions by keyword and reset the search to display all confessions.                                                                                                                                                                  |
| <b>Precondition</b>     | Admin must be logged in and on the confession management page.                                                                                                                                                                                                  |
| <b>Postcondition</b>    | Matching search results are displayed, or the full list is restored.                                                                                                                                                                                            |
| <b>Basic Path</b>       | <ol style="list-style-type: none"> <li>1. Admin enters keyword in search bar.</li> <li>2. System queries the database.</li> <li>3. Matching confessions are displayed.</li> <li>4. Admin clicks 'Reset'.</li> <li>5. System reloads all confessions.</li> </ol> |
| <b>Alternative Path</b> | None                                                                                                                                                                                                                                                            |
| <b>Exception Paths</b>  | 3a. If no matches are found, system displays 'No results'.                                                                                                                                                                                                      |

### 3.4.2 Sequence Diagram

Figure 3.14 – 3.30 below illustrates the Sequence Diagrams of the VoiceSpace system, detailing the step-by-step interactions between users, the system, and external components such as the database and email verification service. These diagrams visualize the complete flow of activities, including user registration and login, posting confessions or polls, viewing and interacting with content, and various admin functionalities such as managing content, reviewing feedback, and moderating reports. The sequence diagrams serve as a blueprint for understanding how requests are handled, data is exchanged, and processes are coordinated to ensure smooth system functionality.

### 3.4.2.1 Sequence Diagram for User

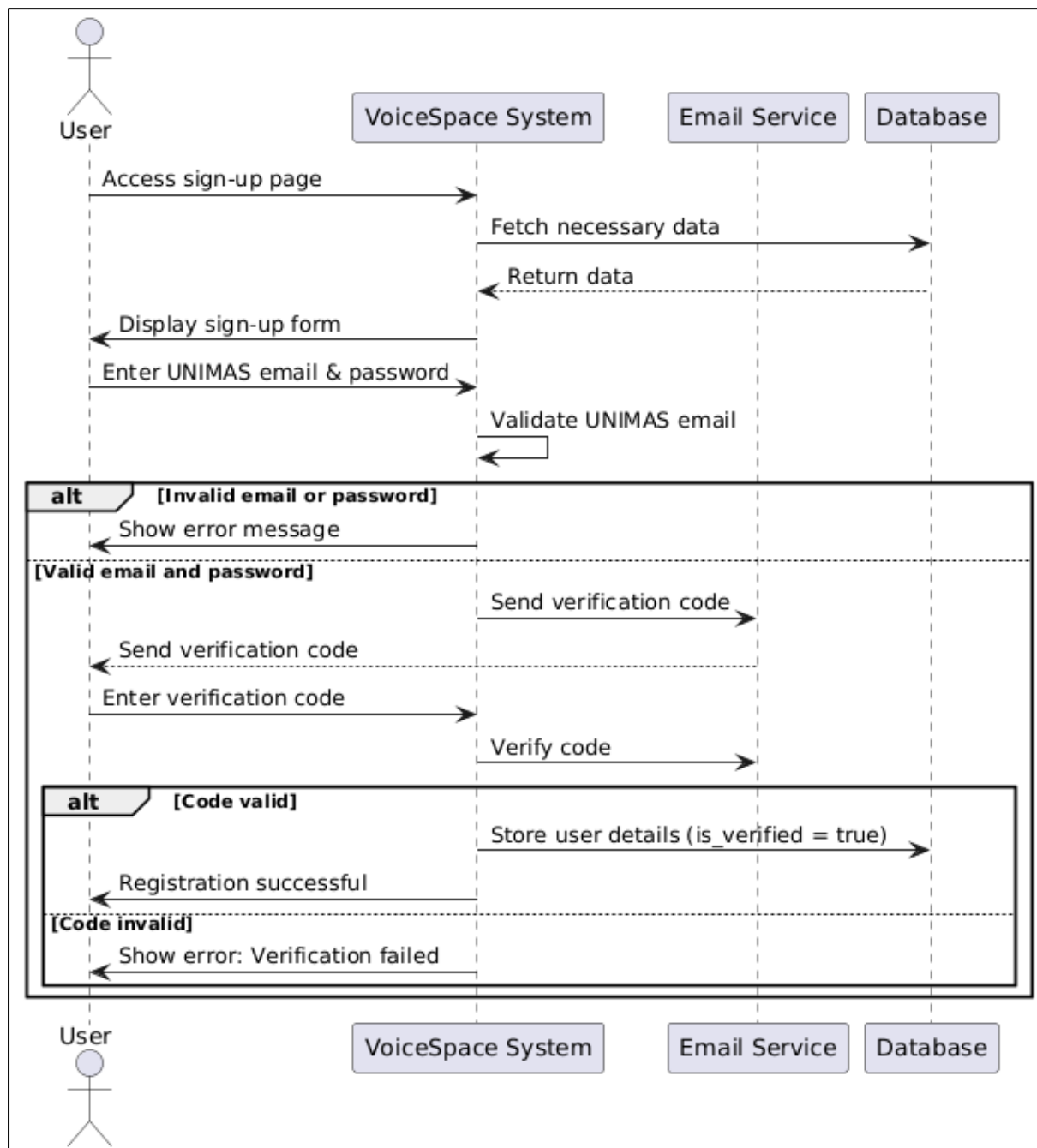


Figure 3.14: Sequence Diagram for User Registration.

Figure 3.14 shows the Sequence Diagram for User Registration in the VoiceSpace system. It begins when the user accesses the sign-up page. The system fetches necessary data from the database and displays the registration form. Once the user enters their UNIMAS email and password, the system validates the email and password format. If the email and password are

invalid, the process ends with an error. If valid, the system sends a verification code to the user's email. The user inputs the code, and the system verifies it. If the code is valid, the user's information is stored in the database, and the registration is marked successful. Otherwise, the registration is rejected.

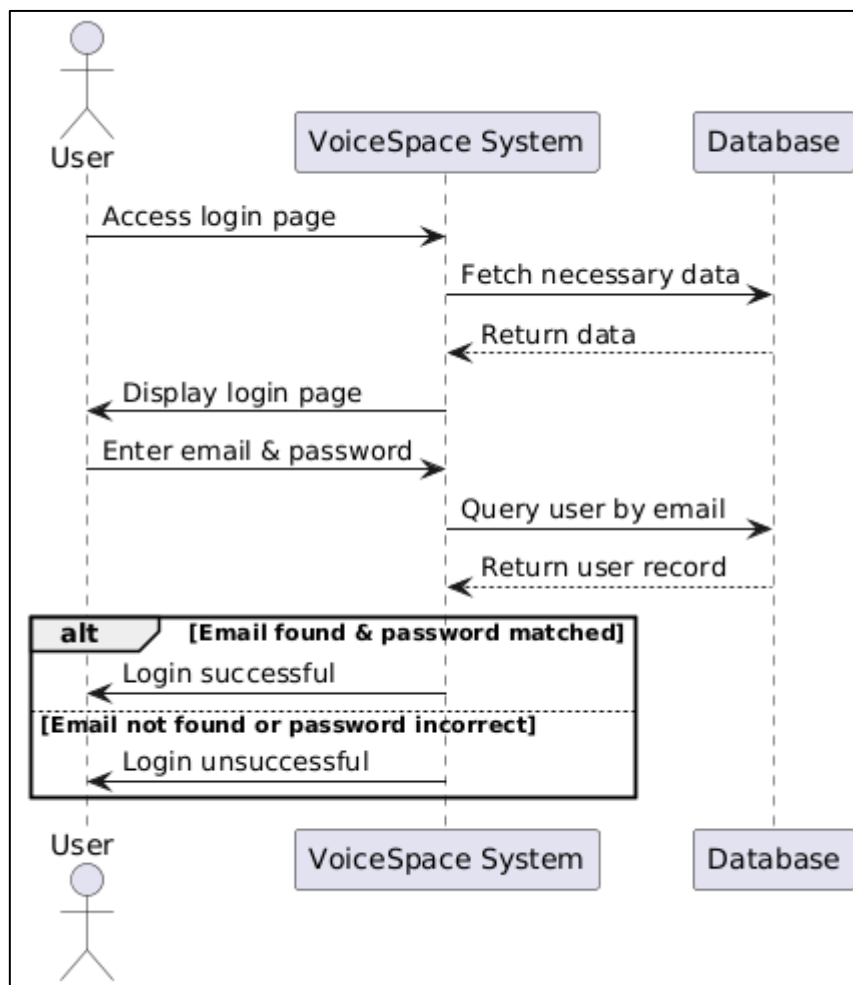


Figure 3.15: Sequence Diagram for User Login.

Figure 3.15 illustrates the login flow for a user in the VoiceSpace system. The user accesses the login page, and the system fetches the necessary data from the database. Upon entering credentials, the system queries the database for the user record. If the email and password

match, the login is successful. Otherwise, the system notifies the user of a failed attempt.

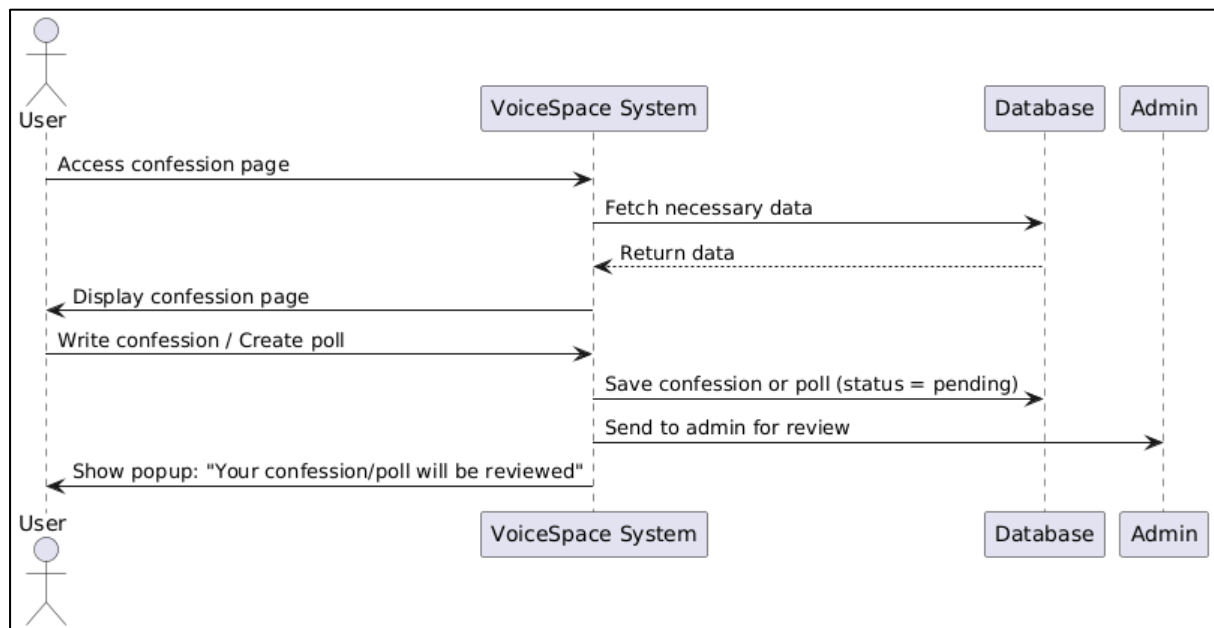


Figure 3.16: Sequence Diagram for Confession/Poll Submission.

Figure 3.16 describes how a user submits a confession or creates a poll. After accessing the confession page and viewing the form, the user writes their content. The system saves the submission in the database with a 'pending' status and sends it to the admin for moderation. A message is then shown to the user indicating that their content is under review.

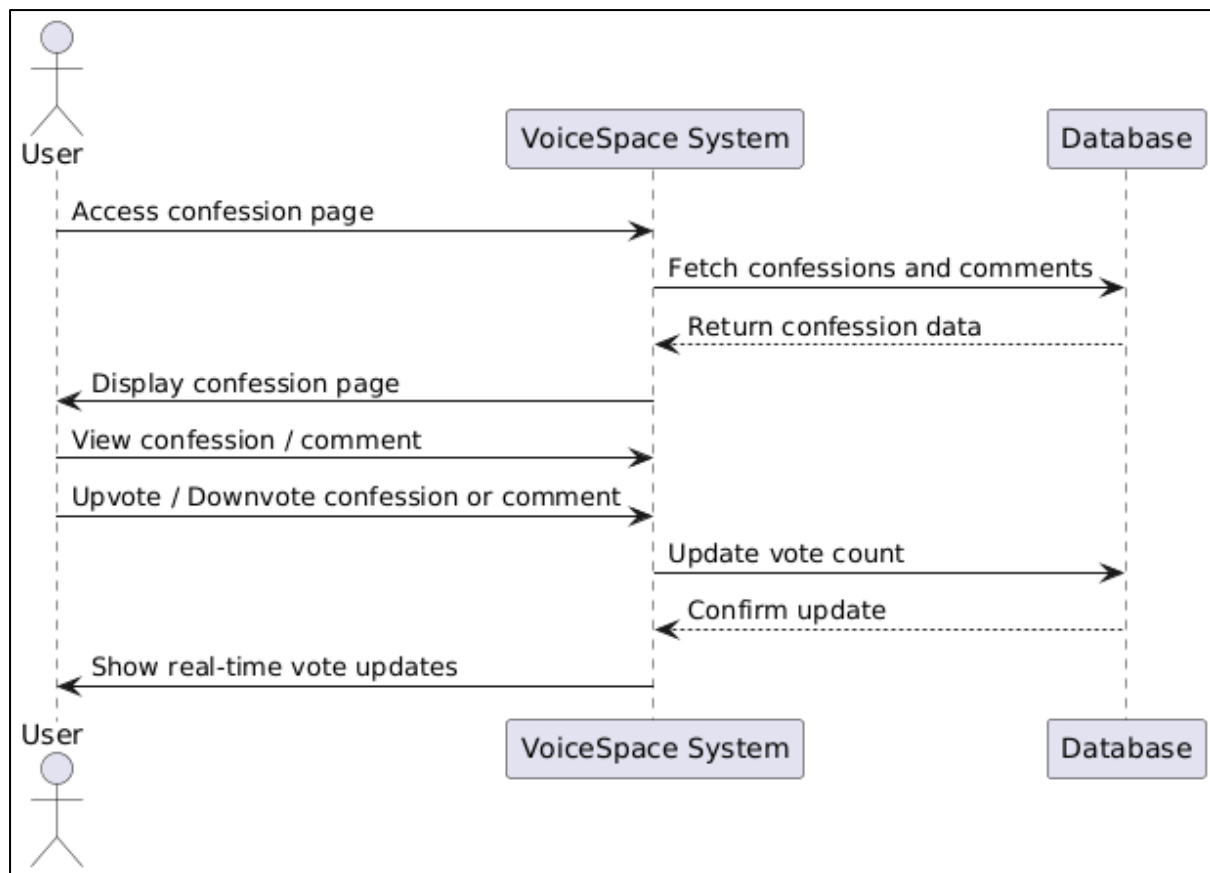


Figure 3.17: Sequence Diagram for Upvote/Downvote Confession or Comment.

Figure 3.17 presents the interaction for viewing and reacting to confessions or comments. The user accesses the confession page, and the system retrieves content and comments from the database. The user can upvote or downvote, and the system updates the vote count in real time.

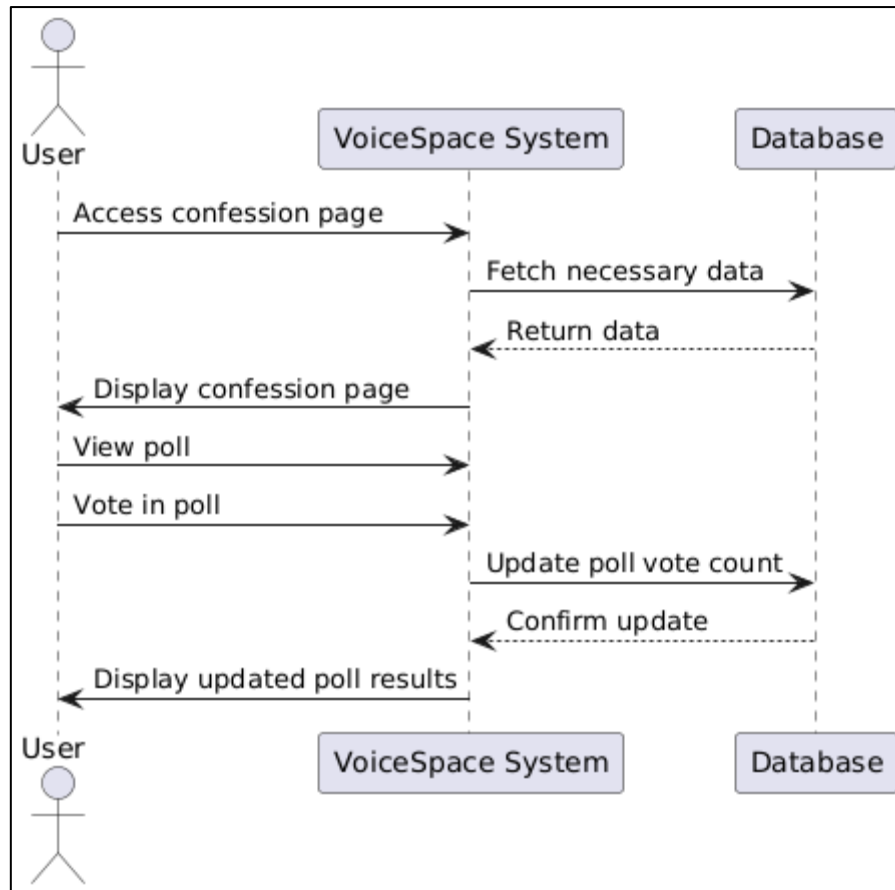


Figure 3.18: Sequence Diagram for Poll Voting.

Figure 3.18 illustrates how users interact with poll confessions. After accessing the confession page, the user selects a poll and submits a vote. The system updates the vote count in the database and displays the updated results to the user.

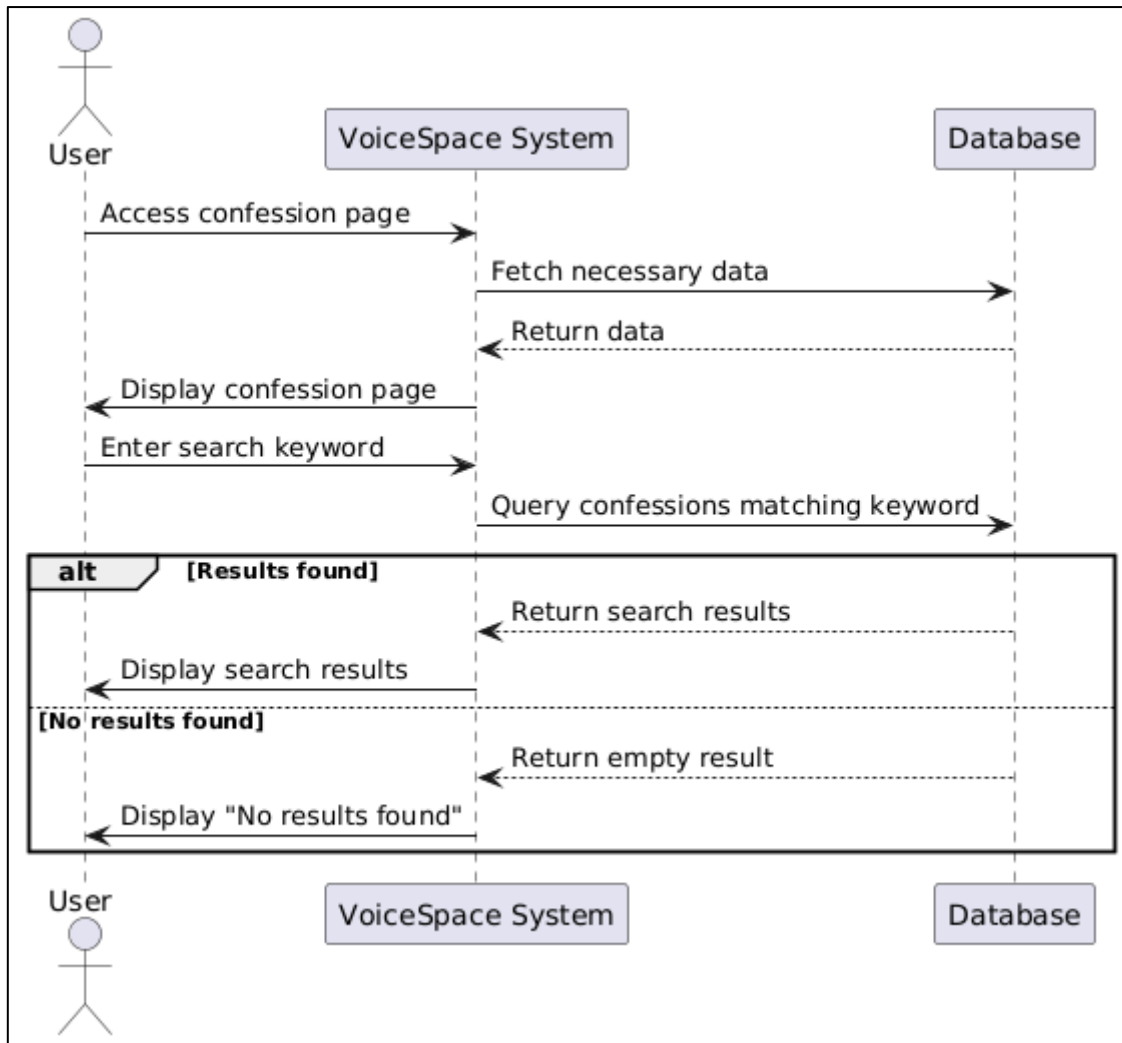


Figure 3.19: Sequence Diagram for Confession Search.

Figure 3.19 outlines the search process for confessions. The user enters a keyword, and the system queries the database. If matching results exist, they are displayed. If not, a ‘no results found’ message appears.

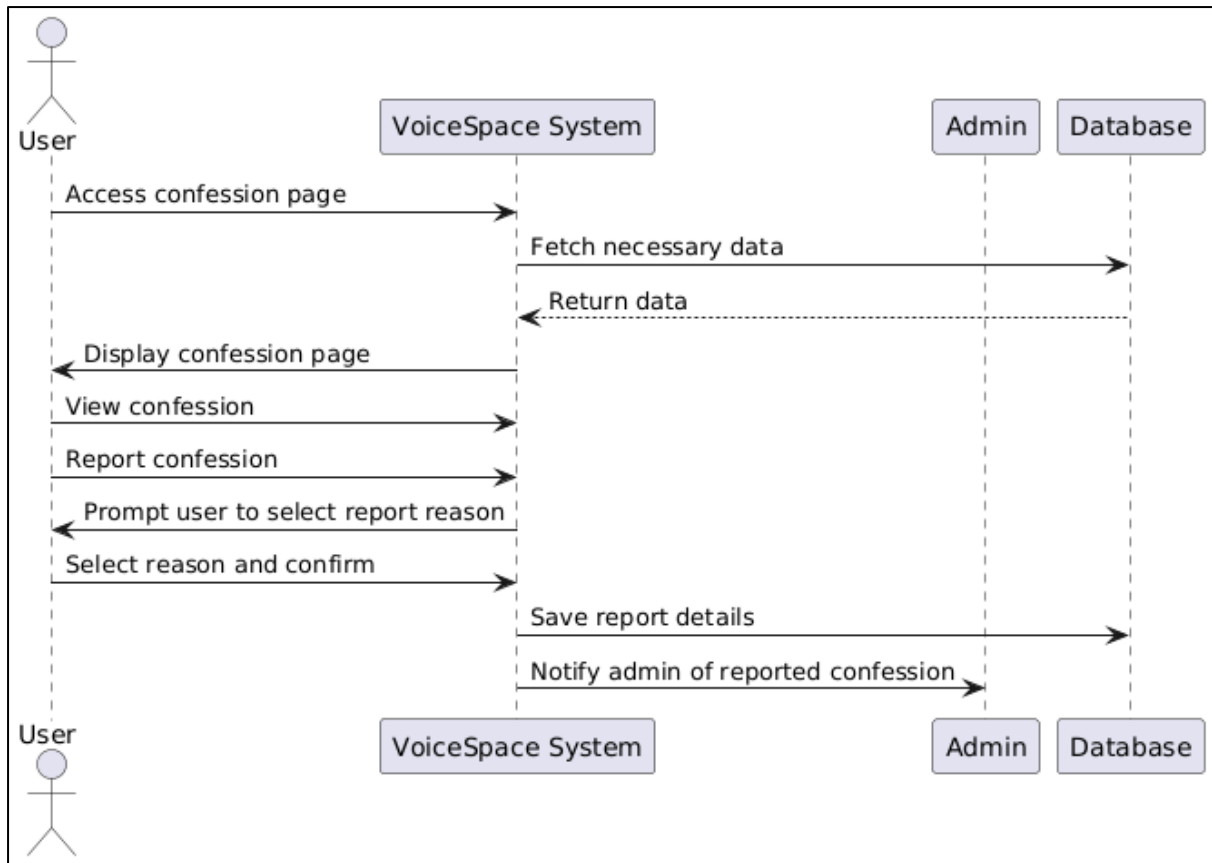


Figure 3.20: Sequence Diagram for Reporting Confession/Comment..

Figure 3.20 shows the steps for reporting a confession. The user selects a confession and submits a report with a selected reason. The system saves the report to the database and sends it to the admin for further action.

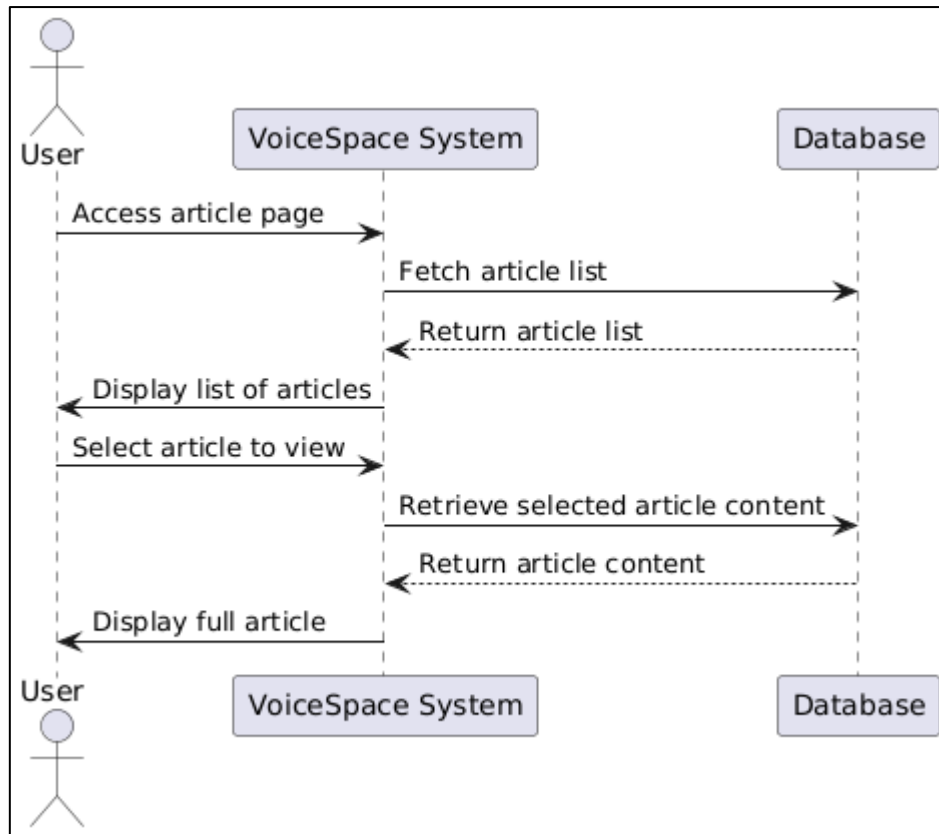


Figure 3.21: Sequence Diagram for Article Viewing.

Figure 3.21 explains how users view articles. The system fetches and displays a list of articles. When the user selects one, the system retrieves and displays the full content.

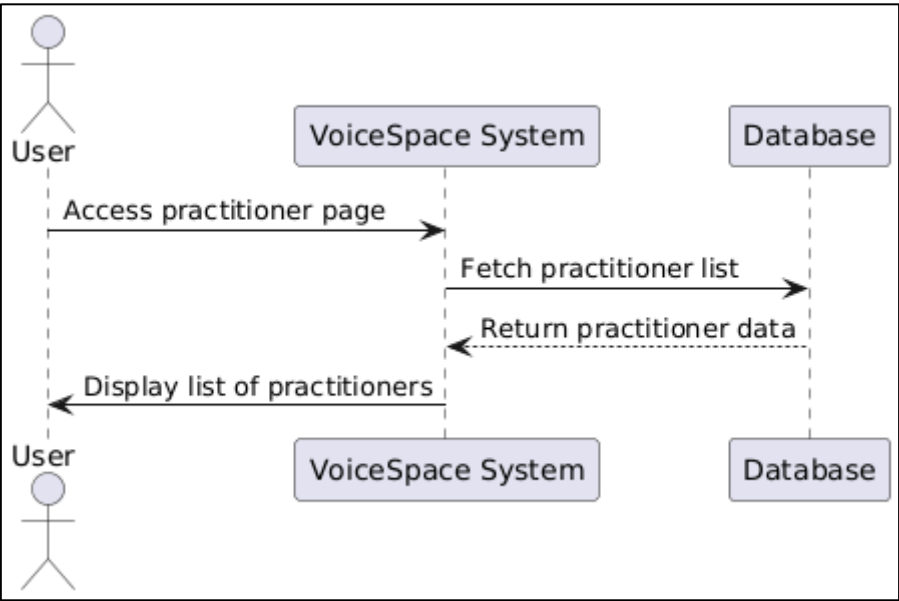
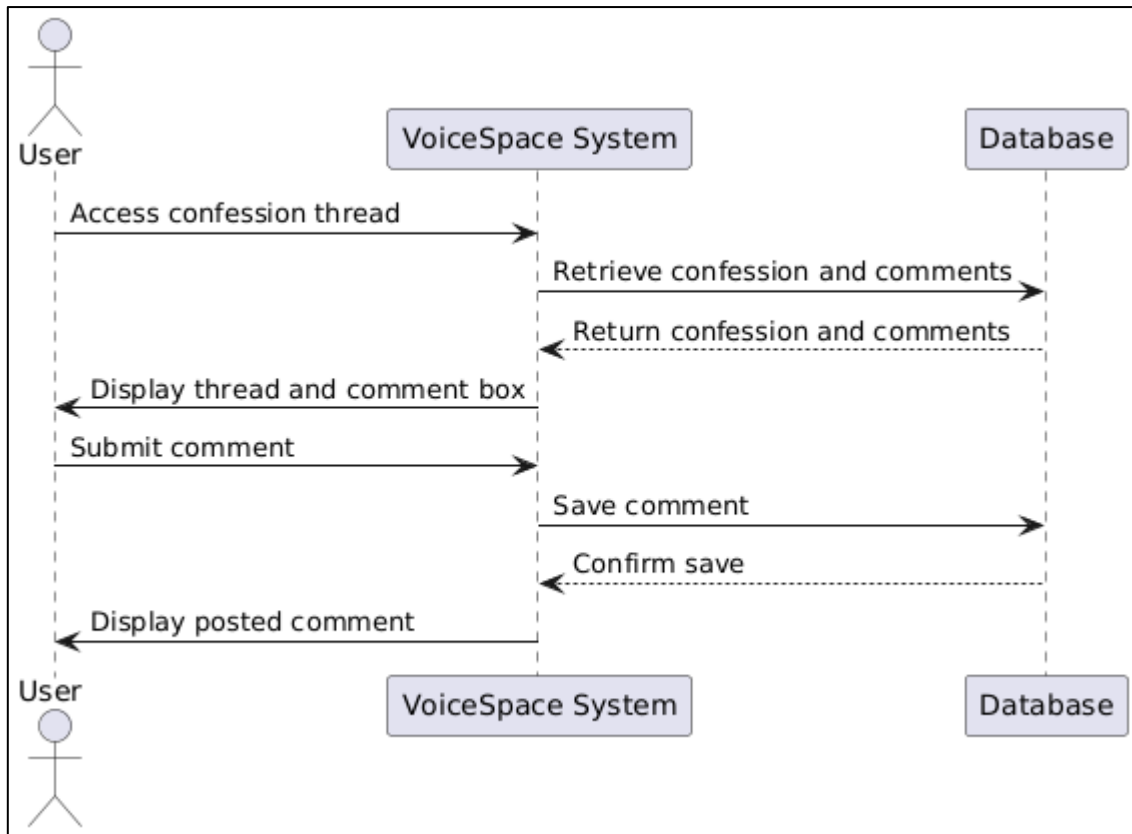


Figure 3.22: Sequence Diagram for Practitioner Viewing.

Figure 3.22 demonstrates the process of viewing practitioners. The system fetches practitioner data from the database and displays it in a list for the user.



*Figure 3.23: Sequence Diagram for Commenting on a Confession Thread.*

Figure 3.23 details the comment submission process. After viewing a thread, the user writes a comment. The system stores the comment in the database and updates the interface to show the posted comment.

### 3.4.2.2 Sequence Diagram for University Admin

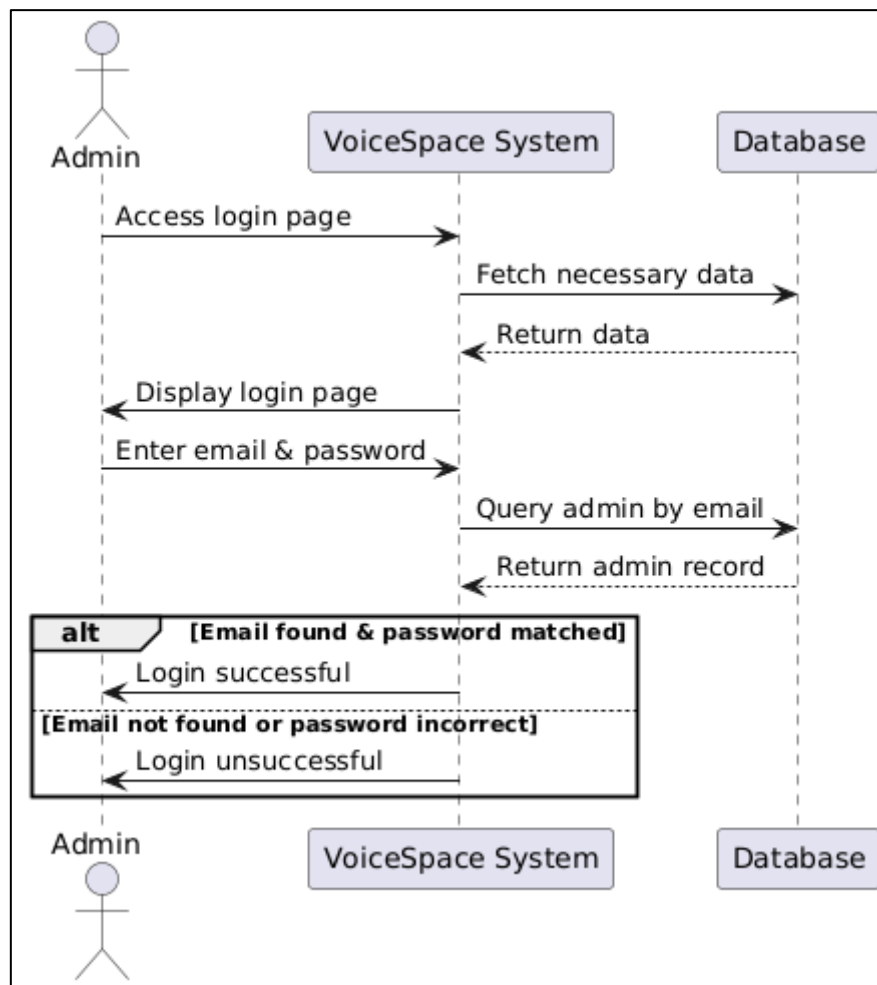


Figure 3.24: Sequence Diagram for Admin Login.

Figure 3.22 depicts the login process for an admin. The system fetches the required data, and after credential input, verifies the admin via the database. It then responds with either a success or a failure message.

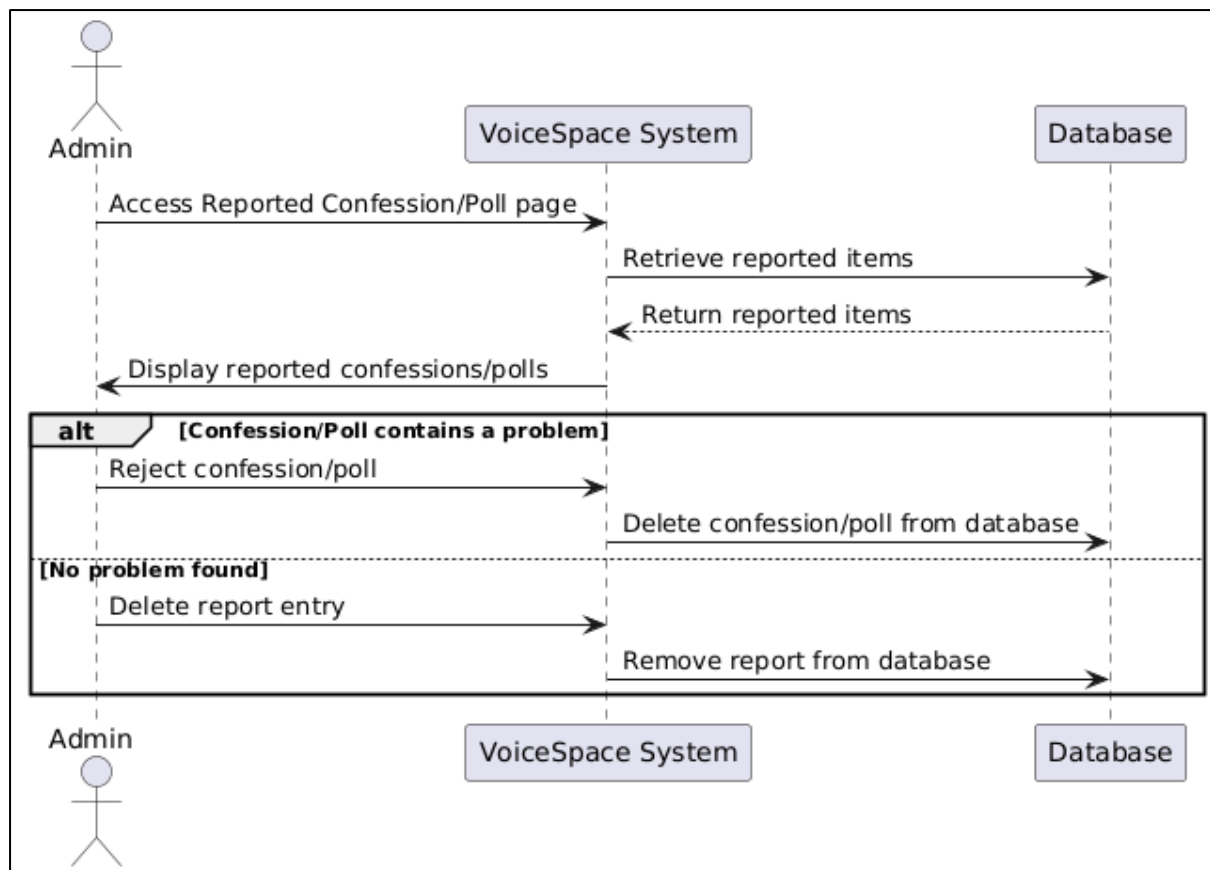
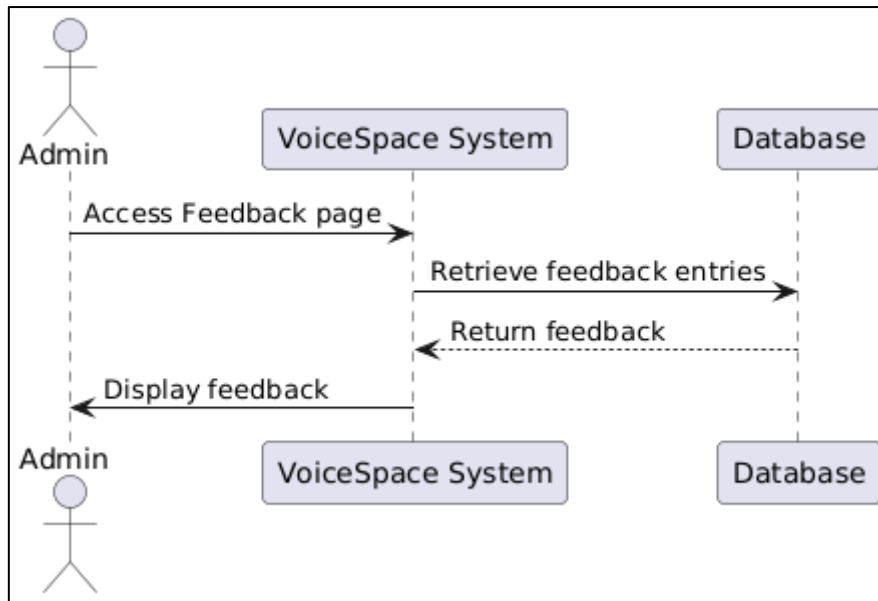


Figure 3.25: Sequence Diagram for Handling Reported Confessions/Polls.

Figure 3.23 explains how admins handle reported content. The system fetches reported items and displays them. If an issue is found, the confession or poll is deleted. If no issue exists, the report is dismissed from the database.



*Figure 3.26: Sequence Diagram for Viewing Feedback.*

Figure 3.24 shows how feedback submitted by users is retrieved and displayed to the admin for review.

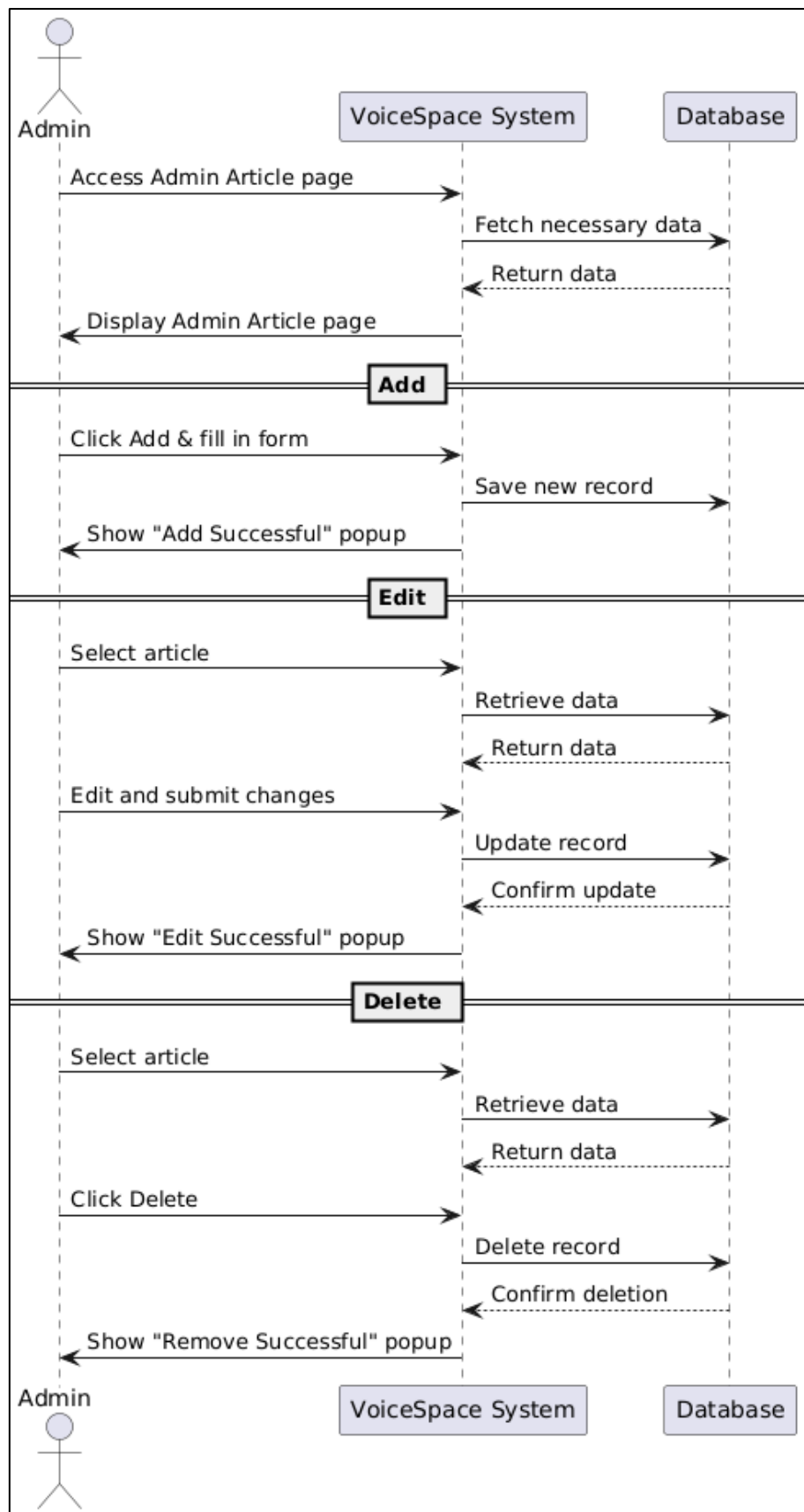


Figure 3.27: Sequence Diagram for Admin Article Management.

Figure 3.27 outlines how admins manage articles. It includes adding, editing, and deleting articles. Each action interacts with the database and provides visual feedback to the admin after execution.

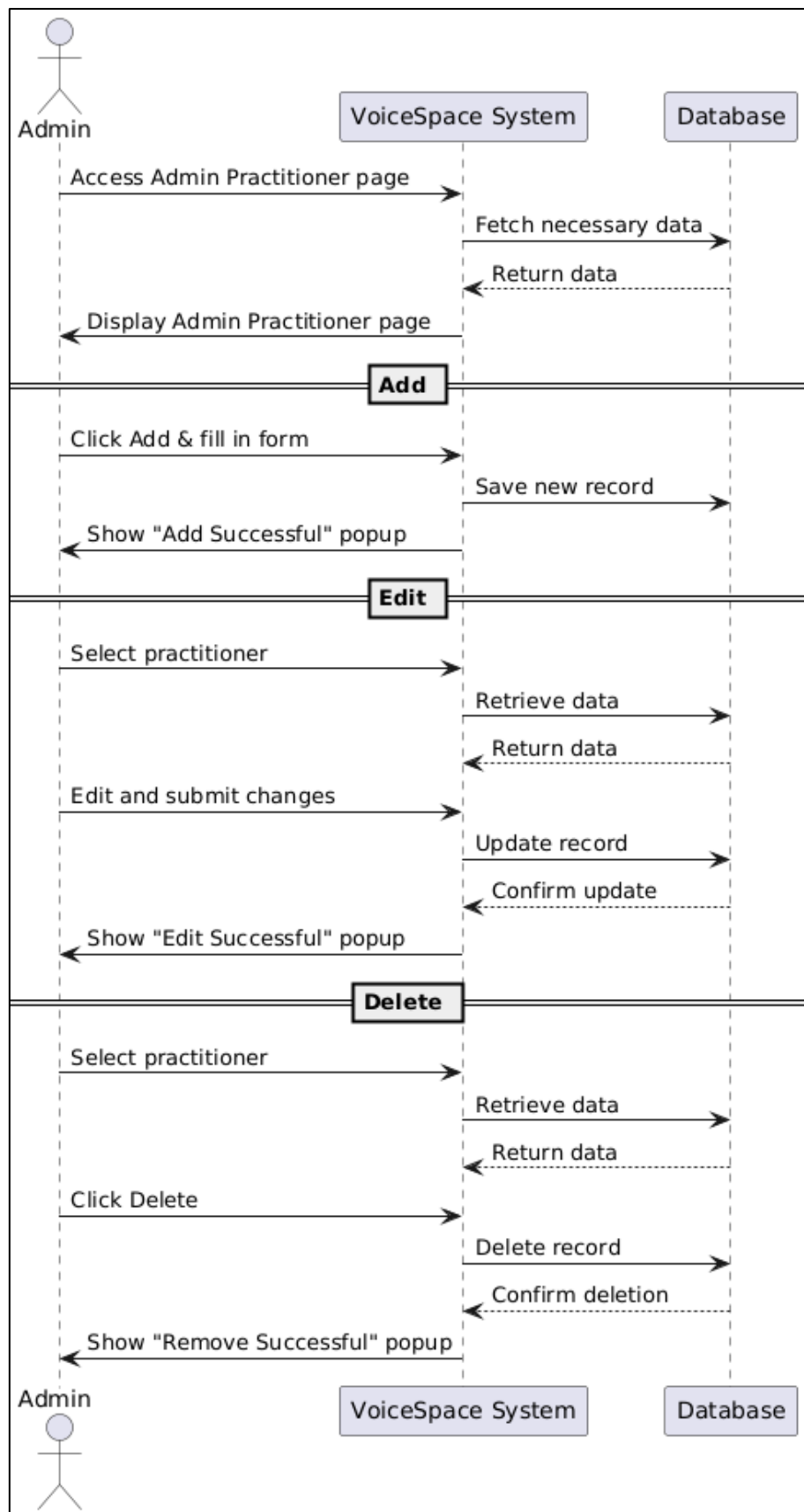


Figure 3.28: Sequence Diagram for Admin Practitioner Management.

Figure 3.28 describes how admins manage practitioner records with similar interactions as article management: add, edit, and delete, each with database operations and system feedback.

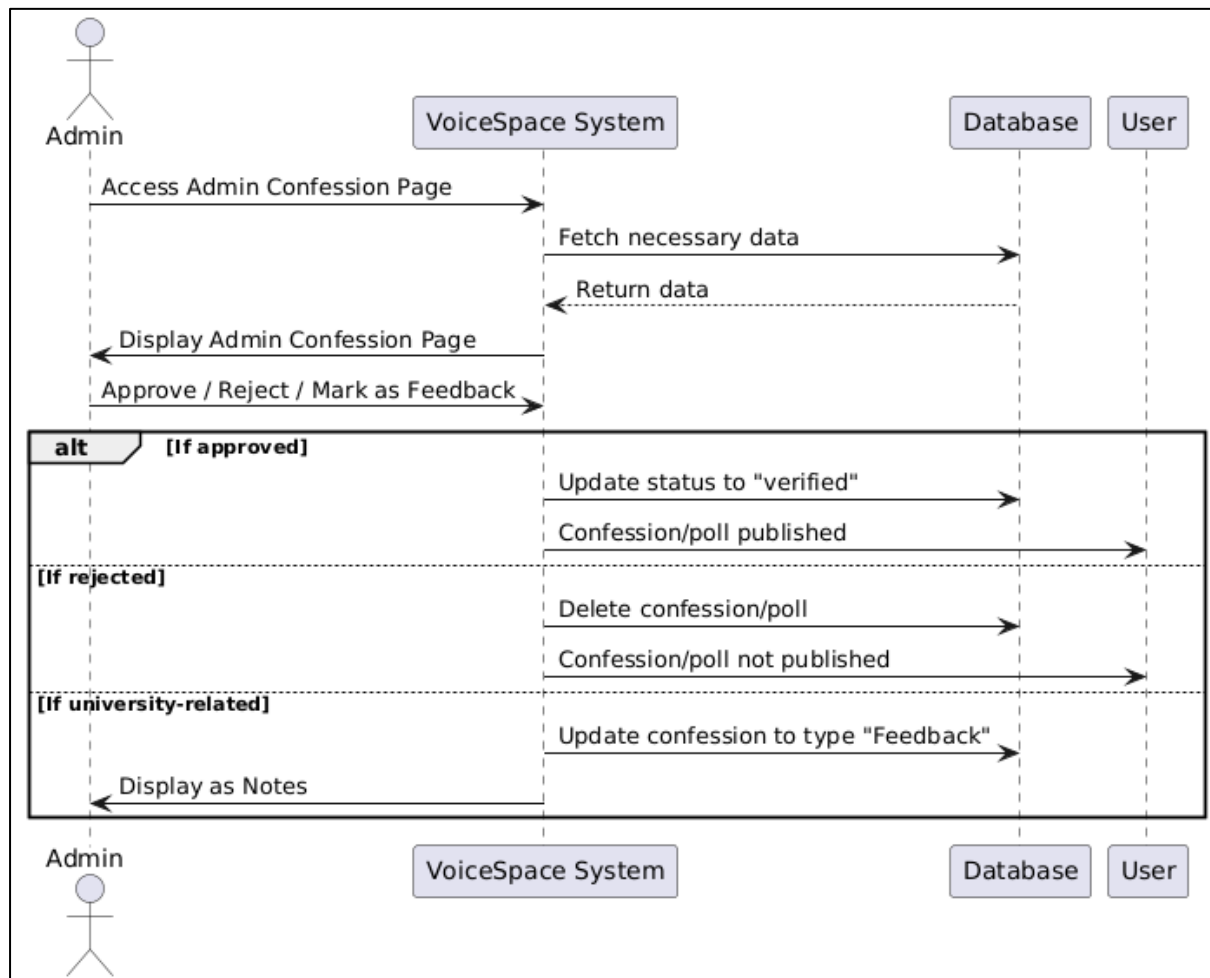


Figure 3.29: Sequence Diagram for Admin Confession Approval and Feedback.

Figure 3.29 details how the admin approves, rejects, or marks a confession as university related. Depending on the action, the system updates the database accordingly and either approves/rejects the confession or logs the confession as internal feedback.

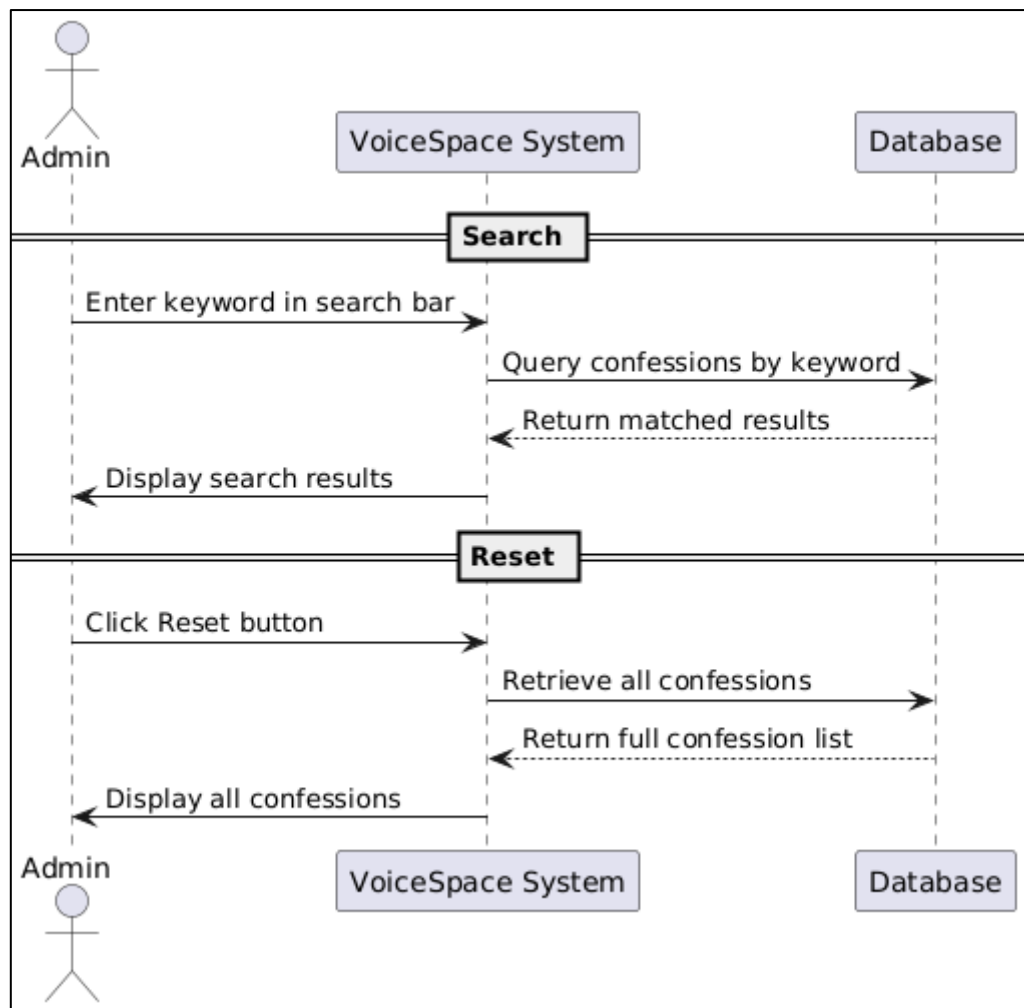


Figure 3.30: Sequence Diagram for Admin Search and Reset.

Figure 3.30 illustrates the admin's ability to search confessions using keywords and reset filters to view all entries again. The system queries the database based on the input and displays the results.

### 3.4.3 Class Diagram

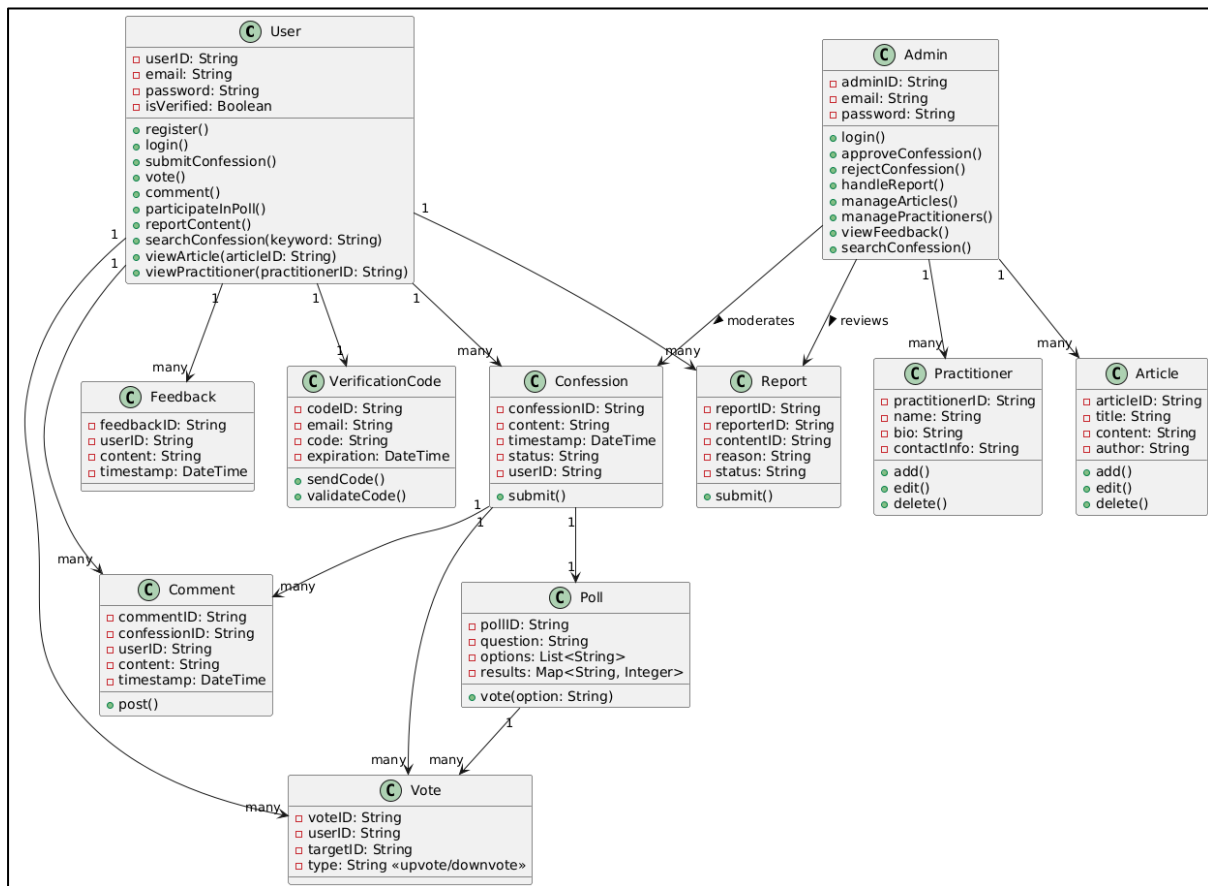


Figure 3.31: Class Diagram.

A class diagram is a type of UML (Unified Modeling Language) diagram that visually represents the structure of a system by showing its classes, attributes, methods, and the relationships between those classes. It helps developers, designers, and stakeholders understand how different components of the system are organized and interact with each other. Figure 3.31 shows the Class Diagram of the VoiceSpace System, which models the architecture of an anonymous confession platform where students can submit confessions and polls, vote, comment, and report content, while administrators moderate and manage the platform. The main components of the class diagram are described below:

#### User Class

- The User class represents a general user of the system, containing attributes like email, password, and isVerified.

- It includes methods such as:
  - register()
  - login()
  - submitConfession()
  - vote()
  - comment()
  - participateInPoll()
  - reportContent()
  - searchConfession()
  - viewArticle() and viewPractitioner()
- It acts as the core actor for user-side features and is associated with various system entities such as Confession, Comment, Vote, Report, and Feedback.

### **Admin Class**

- The Admin class represents platform moderators who manage confessions, polls, reports, articles, practitioners, and user feedback.
- Admin-specific methods include:
  - approveConfession()
  - rejectConfession()
  - handleReport()
  - manageArticles()
  - managePractitioners()
  - viewFeedback()
  - searchConfession()
- The admin interacts with the Confession, Report, Article, Practitioner, and Feedback classes.

### **Confession Class**

- Represents a student's anonymous post, with attributes such as content, timestamp, and status.

- Confessions can include or be linked to polls and are associated with multiple comments and votes.
- Includes behaviors like:
  - submit()

### **Poll Class**

- Attached to a confession, this class allows users to vote on a question with multiple options.
- Key attributes include question, options, and results.
- Method:
  - vote(option: String)

### **Comment Class**

- Represents comments made by users on confessions.
- Attributes include commentID, content, timestamp, and userID.
- Method:
  - post()

### **Vote Class**

- Allows users to upvote or downvote confessions or comments.
- Stores the type of vote and the target content ID.
- Associated with both Confession and Poll content.

### **Article and Practitioner Classes**

- The Article class stores mental health-related articles written or managed by admins.
- The Practitioner class stores professional profiles such as psychologists or counselors.

- Admins can:
  - add(), edit(), and delete() records in both classes.
- Users can view but not modify these records.

### **Report Class**

- Stores user-submitted reports regarding inappropriate confessions or polls.
- Contains reportID, reason, and status.
- Method:
  - submit()
- Admins review and act on the submitted reports.

### **Feedback Class**

- Stores feedback submitted by users about the platform.
- Contains basic metadata such as user ID, content, and timestamp.

### **Verification Code Class**

- Handles email verification logic during user registration.
- Attributes include email, code, and expiration.
- Methods:
  - sendCode()
  - validateCode()

This class diagram effectively demonstrates the core structure of the VoiceSpace platform, highlighting the interactions between anonymous users, admin moderators, system content (confessions, comments, polls), and supporting services (email verification, feedback

collection). It promotes an organized, role-based, and modular system architecture to ensure scalability, privacy, and moderation control.

### 3.4.4 Wireframe

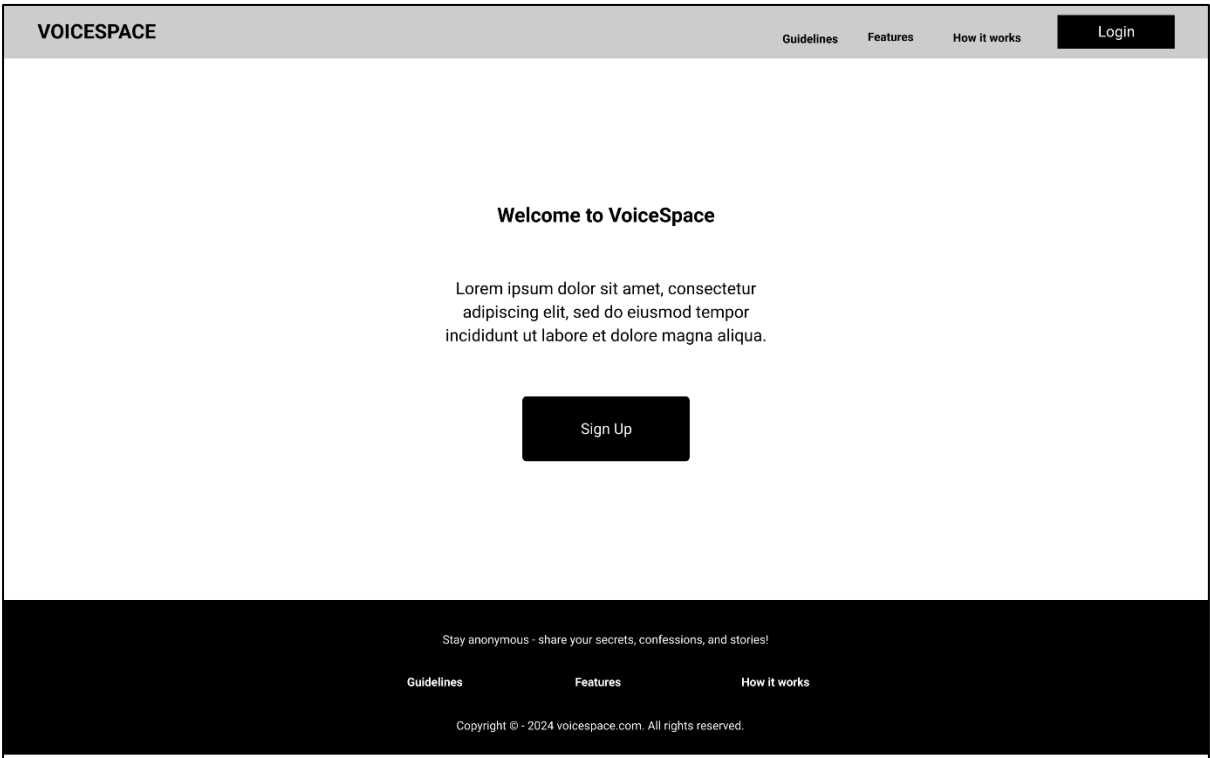


Figure 3.32: Welcome Page.

Figure 3.26 above shows the interface of the VoiceSpace welcome page. It is designed with a minimalist layout. The header includes the platform logo and a Login button. Below the header, a welcome message greets users. This follows a brief introductory paragraph explaining the platform’s purpose or core values. A Sign-Up button encourages users to create an account and explore the platform further. This is the primary call to action, guiding users towards engagement. The footer section provides essential information and navigational links. It displays the VoiceSpace tagline. This tagline hints at the platform’s core function and target audience. Navigation links to Guidelines, Features, and How it works are provided allowing

users to learn more about the platform’s rules, functionalities, and usage. The copyright information is also displayed. Overall, the homepage presents a clean and user-friendly interface.

VOICESPACE

Sign Up

email

password

Already a member? [Login here](#)

Register

Stay anonymous - share your secrets, confessions, and stories!

[Guidelines](#) [Features](#) [How it works](#)

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*Figure 3.33: Sign Up page.*

Figure 3.27 shows the interface of the VoiceSpace Sign Up page. This page is designed for new users to create an account. It has a simple layout with a clear heading. Users are required to enter their email and choose a password. A login link is provided for existing users instead of creating a new account. A Register button allows users to submit their information and create their VoiceSpace account.

VOICESPACE

Verify Your Email

Please enter the verification code  
we send to \*\*\*\*\*@siswa.unimas.my

○ ○ ○ ○ ○

Confirm

Stay anonymous - share your secrets, confessions, and stories!

[Guidelines](#) [Features](#) [How it works](#)

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*Figure 3.34: Verify the Email page.*

Figure 3.28 shows the interface of the VoiceSpace email verification page. Once registered, an email will be sent with five-digit code. A series of circles is provided for the user to enter the five-digit code. This visual makes the code entry process more intuitive and user-friendly compared to a simple text box. A Confirm button is displayed encouraging the user to submit the entered code for verification.

VOICESPACE

Login

email

password

Not yet a member? [Sign Up here](#)

Register

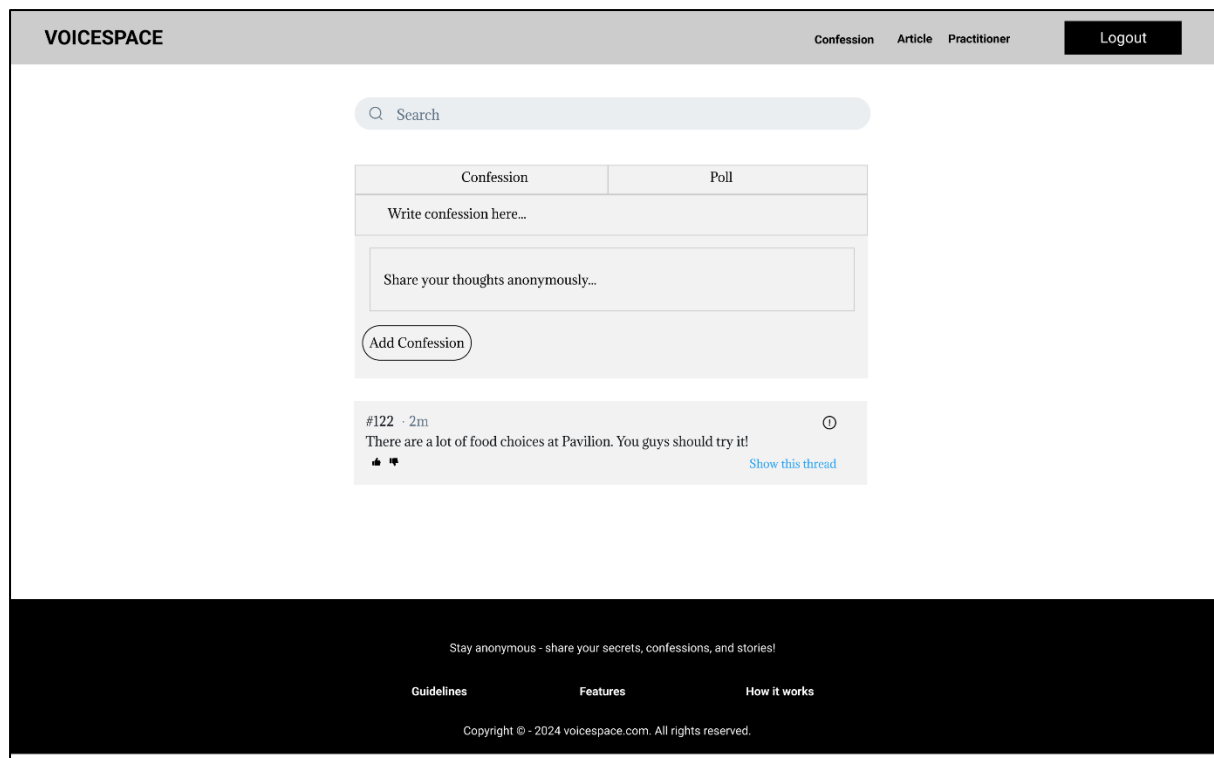
Stay anonymous - share your secrets, confessions, and stories!

[Guidelines](#) [Features](#) [How it works](#)

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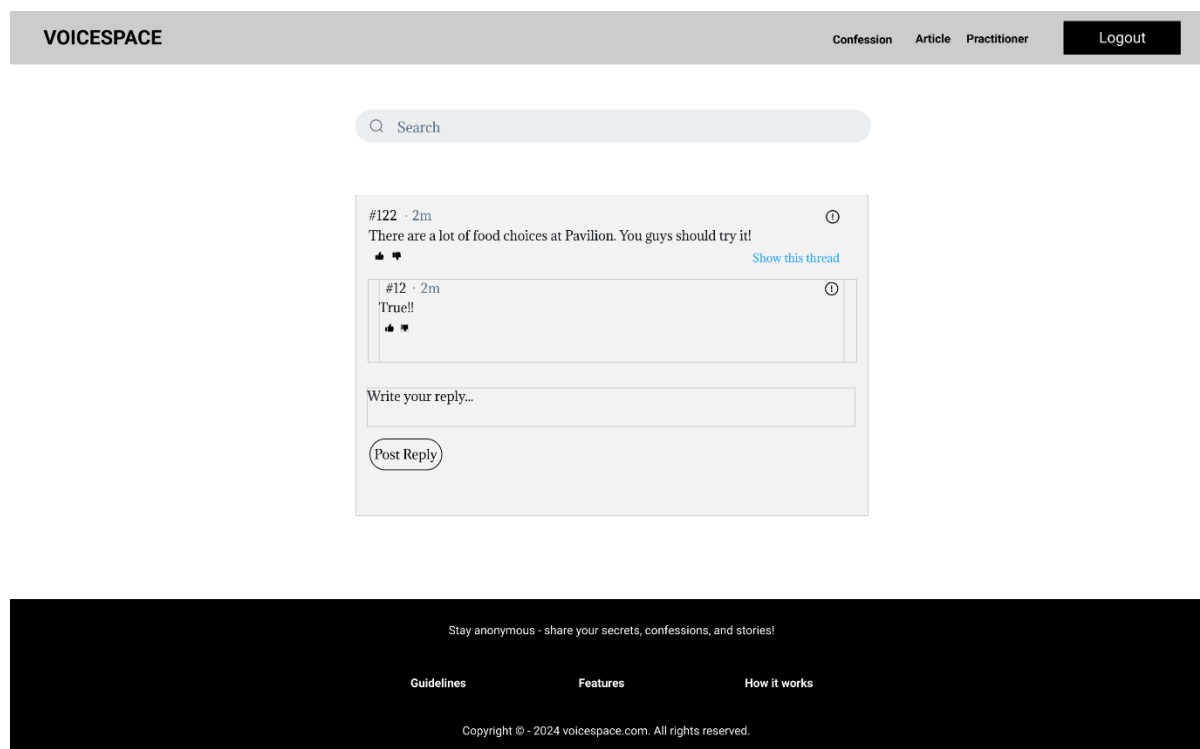
*Figure 3.35: Login Page.*

Figure 3.29 shows the interface of the VoiceSpace login page. Once registered and the account is verified, users can login by submitting their email and password. A sign-up link is provided for new users to create account.



*Figure 3.36: Home page.*

Figure 3.30 shows the interface of the VoiceSpace home page. This interface includes two buttons which are Add Confession, and Logout which provide easy navigation for users. A search bar allows users to quickly search for specific confessions or topics within the platform. The main content area displays a list of confessions each identified by a unique number such as #122. Each confession features the actual message shared by the user, a time stamp indicating when it was posted, thumbs up icons for users to upvote while thumbs down for user to downvote, a report icon for reporting inappropriate content, and Show this thread to view reply or post reply.



*Figure 3.37: Comment section.*

Figure 3.31 shows the interface of the VoiceSpace comment section. Below the confession, the comment section is displayed. It shows a list of comments related to the confession, including A Post Reply button. This button allows users to add their comments to the discussion.

VOICESPACE

Confession Article Practitioner Logout

Search

Confession Poll

Create a Poll

What's your question?

Option 1

Option 2

Option 3

Add Poll

Stay anonymous - share your secrets, confessions, and stories!

Guidelines Features How it works

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*Figure 3.38: Poll confession.*

Figure 3.32 shows the interface of the VoiceSpace poll confession feature. The main content area allows users to create a poll by entering a question and providing up to three options for responses. Each option is displayed in a text input field labeled "Option 1," "Option 2," and "Option 3." Once the inputs are filled, users can click the "Add Poll" button to submit their poll.

*Figure 3.39: Report confession.*

Figure 3.33 shows the interface of the VoiceSpace report page. This interface allows users to report a confession by selecting one of three predefined reasons: "Harassment or Cyberbullying," "Inappropriate Content," or "Misinformation or Fake News."

### 3.5 Construction

The construction phase of VoiceSpace is where the platform takes shape, transforming the prototype into a fully functional system. Building on the foundation set during the design phase, this stage involves coding, refining features, and integrating feedback to ensure the platform meets user expectations. Since VoiceSpace thrives on user engagement, this phase remains highly iterative, allowing continuous adjustments based on real-time input from students. Iterative prototyping plays a crucial role in addressing concerns and refining the

anonymous posting system. The developer works closely with users, testing features to ensure seamless interactions, privacy protection, and an intuitive experience. Active feedback loops guide improvements, ensuring that every aspect of the platform from its interface to its security protocols aligns with the needs of the student community. The focus remains on agility, rapid iteration, and delivering a platform that resonates with its users.

### **3.6 Cutover**

The cutover phase marks the transition of VoiceSpace from development to live deployment, ensuring a smooth shift to operational use. This stage encompasses critical tasks such as data migration, user training, issue tracking, technical documentation, thorough testing, final adjustments, and system deployment. The developer focus on integrating backend data seamlessly while determining which components are ready for the live platform. The iterative nature of VoiceSpace's development allows for refinements based on user feedback, ensuring that each prototype aligns with student expectations before the final launch. As the platform goes live, continuous maintenance and updates are necessary to address issues, enhance features, and sustain an engaging experience for students. Unlike the prototype phase, this stage demands rigorous testing to ensure a seamless launch. The deployment of VoiceSpace marks the culmination of its development cycle, bringing the final vision to life for the student community.

### **3.7 Summary**

To summarize, this chapter explores the chosen methodology which is Rapid Application Development (RAD) for the development of the proposed system. The requirements planning phase involves analyzing the proposed system and gathering user feedback through questionnaires to ensure the system meets user needs and objectives. The design phase focuses on creating comprehensive design elements including Use Case Diagrams, Sequence Diagrams, and Class Diagrams which illustrate the system's structure and functionality. High-fidelity wireframes are also developed to provide a clear visualization of the platform's layout. The construction phase adopts an iterative approach involving deployment phases, emphasizing their importance in ensuring the system's functionality and successful implementation.

## **CHAPTER 4: IMPLEMENTATION**

### **4.1 Introduction**

This chapter focuses on implementing the proposed system based on the requirement analysis and design in Chapter 3, using the software and hardware described in previous chapters. Overall, the implementation phase described in this chapter is simply the construction phase in the Rapid Application Development methodology, where the prototype created in the previous chapter's design phase is converted into a working model.

### **4.2 Feature Implementation**

Several software is required to be installed ahead of time before starting the development of the proposed system. Proper installation and configuration of the required software development tools ensure the smooth functioning of the proposed system. The system components utilized in constructing this proposed system must be accurately configured and installed to guarantee the effective operation of all system features and the complete implementation of the system.

#### **4.2.1 Installation of Visual Studio Code**

Visual Studio Code is used for writing code in both front-end and back-end development of the proposed system. HTML, CSS, and JavaScript are used for front-end development, while PHP is used for back-end development.

The first step to install Visual Studio Code is to navigate to Visual Studio Code's official website using any browser. Then download Visual Studio Code and select the installer depending on the OS as shown in Figure 4.1 below.

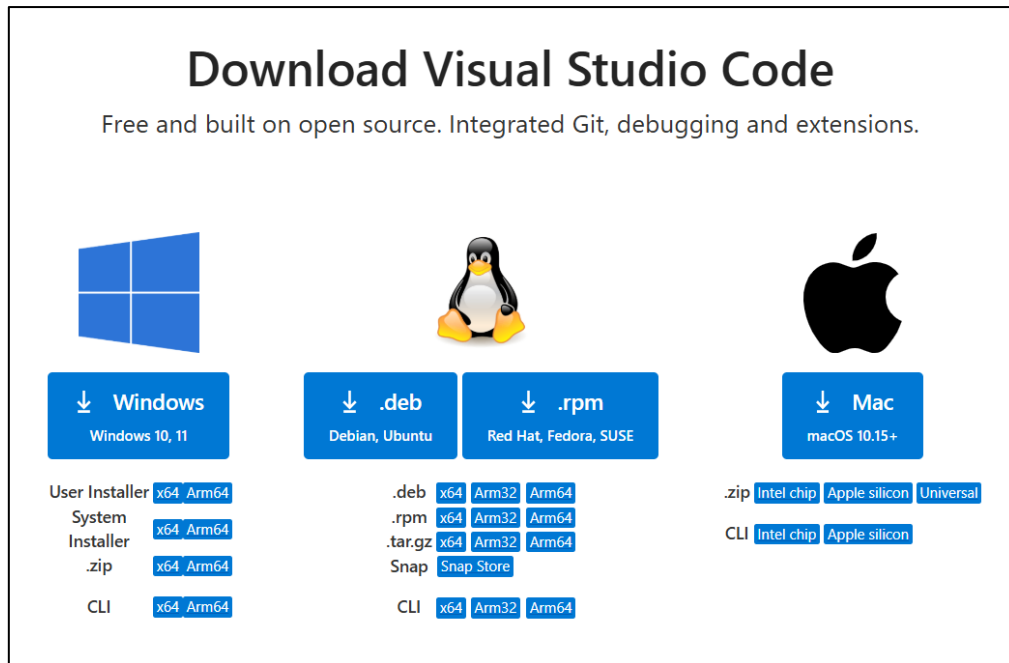


Figure 4.1: Download Visual Studio Code.

The installation process started right after the download was finished. Figure 4.2 below shows the license agreement. Select ‘I accept the agreement’.

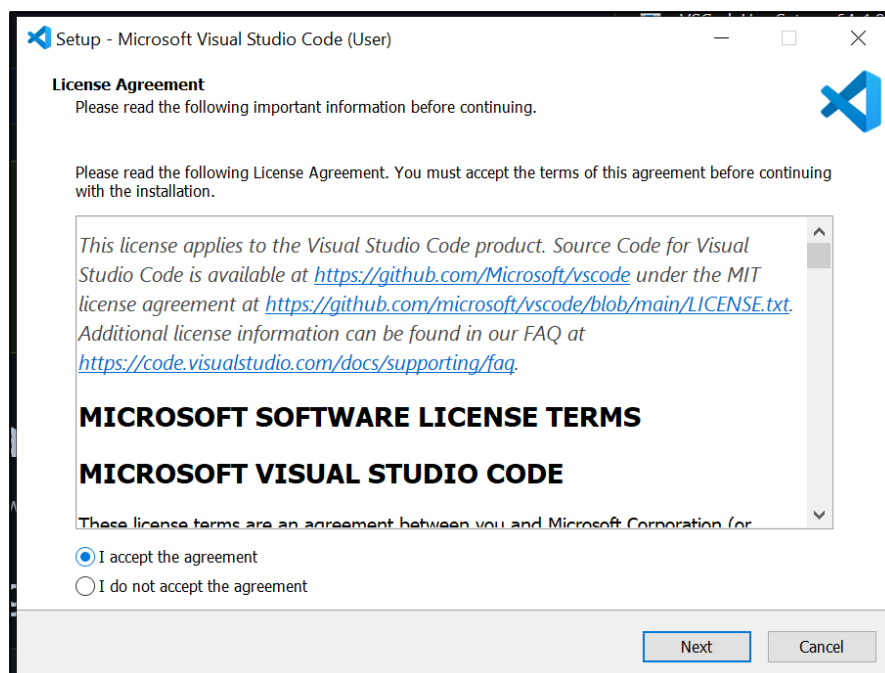


Figure 4.2: Visual Studio Code’s License Agreement.

Select the Destination Location to run Visual Studio Code. Follow the default path or browse to select a different folder as shown in Figure 4.3 below. Complete remaining steps, such as

selecting the start menu folder to create the program's shortcuts and select additional tasks if needed.

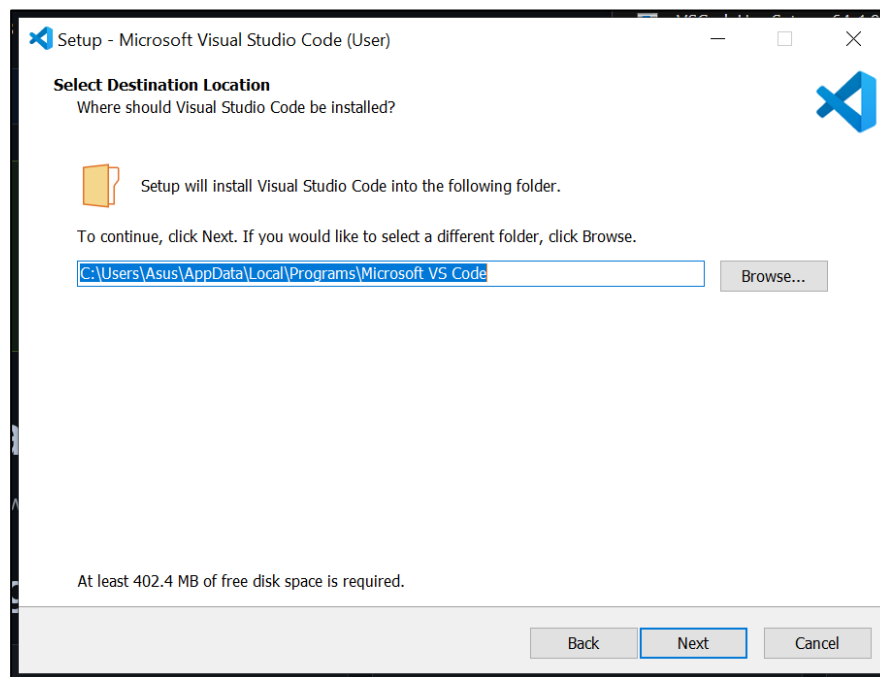


Figure 4.3: Select the Destination Location to install Visual Studio Code.

Finally, select Install as shown in Figure 4.4 below and launch Visual Studio Code. After launching, click new file to open a new file.

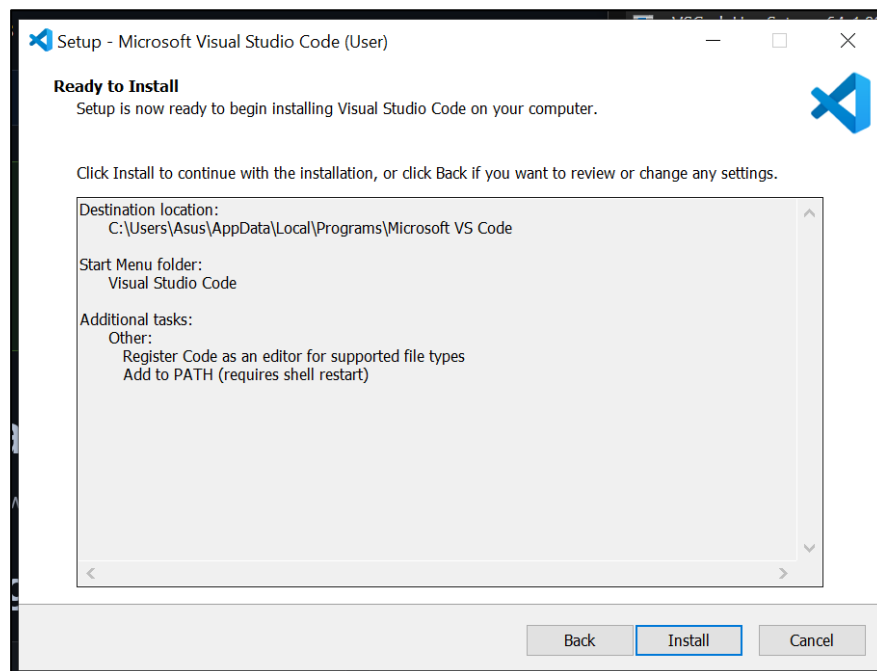
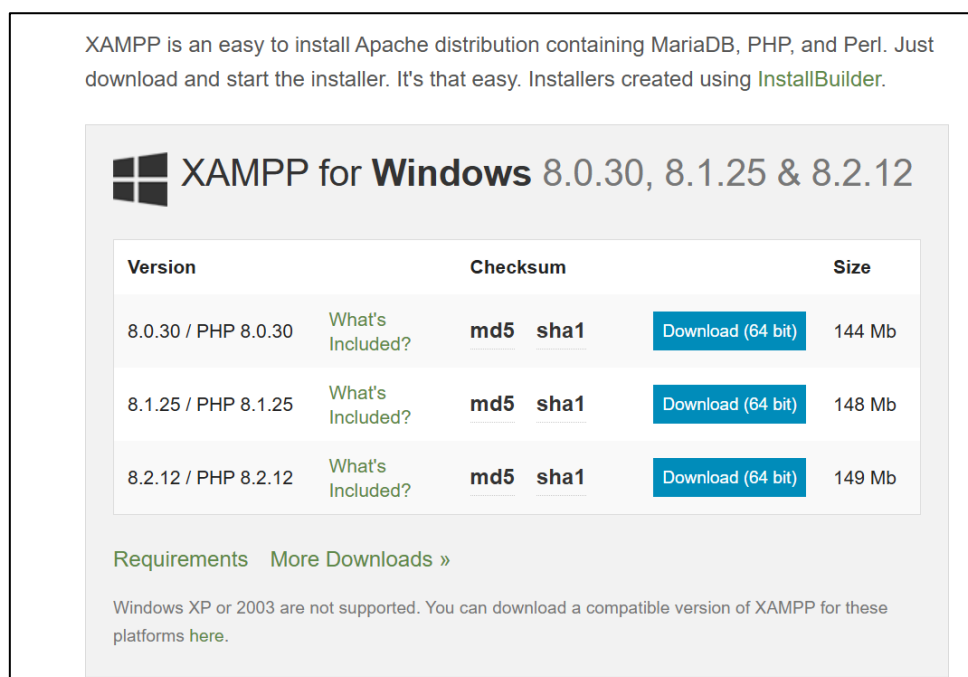


Figure 4.4: Installing Visual Studio Code.

### 4.2.2 Installation of XAMPP

In order to develop and test VoiceSpace programmes locally, the cross-platform web server XAMPP is used. Along with modules like Apache server, PHP, Perl, and MySQL, which is the database used to store the data of VoiceSpace, it includes an Apache distribution for many servers and command-line executables.

To install XAMPP, navigate to XAMPP's official website using any browser. Then download XAMPP and select the latest version shown in Figure 4.5 below.



XAMPP is an easy to install Apache distribution containing MariaDB, PHP, and Perl. Just download and start the installer. It's that easy. Installers created using [InstallBuilder](#).

### XAMPP for Windows 8.0.30, 8.1.25 & 8.2.12

| Version             |                                  | Checksum            |                      | Size                                     |
|---------------------|----------------------------------|---------------------|----------------------|------------------------------------------|
| 8.0.30 / PHP 8.0.30 | <a href="#">What's Included?</a> | <a href="#">md5</a> | <a href="#">sha1</a> | <a href="#">Download (64 bit)</a> 144 Mb |
| 8.1.25 / PHP 8.1.25 | <a href="#">What's Included?</a> | <a href="#">md5</a> | <a href="#">sha1</a> | <a href="#">Download (64 bit)</a> 148 Mb |
| 8.2.12 / PHP 8.2.12 | <a href="#">What's Included?</a> | <a href="#">md5</a> | <a href="#">sha1</a> | <a href="#">Download (64 bit)</a> 149 Mb |

[Requirements](#) [More Downloads »](#)

Windows XP or 2003 are not supported. You can download a compatible version of XAMPP for these platforms [here](#).

Figure 4.5: Download XAMPP.

The installation process started right after the download was finished. Select the components that wanted to be installed as shown in Figure 4.6 below. Next, choose a folder to install the folder. Next, choose the desired language as XAMPP Control Panel for Windows supports different languages.

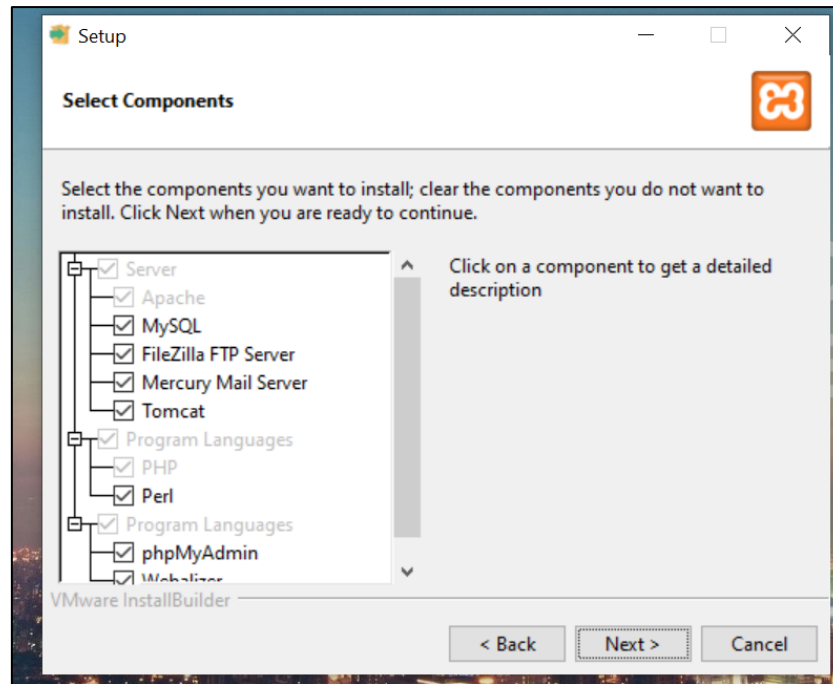


Figure 4.6: Components in XAMPP.

Figure 4.7 below shows that XAMPP is now ready to install.

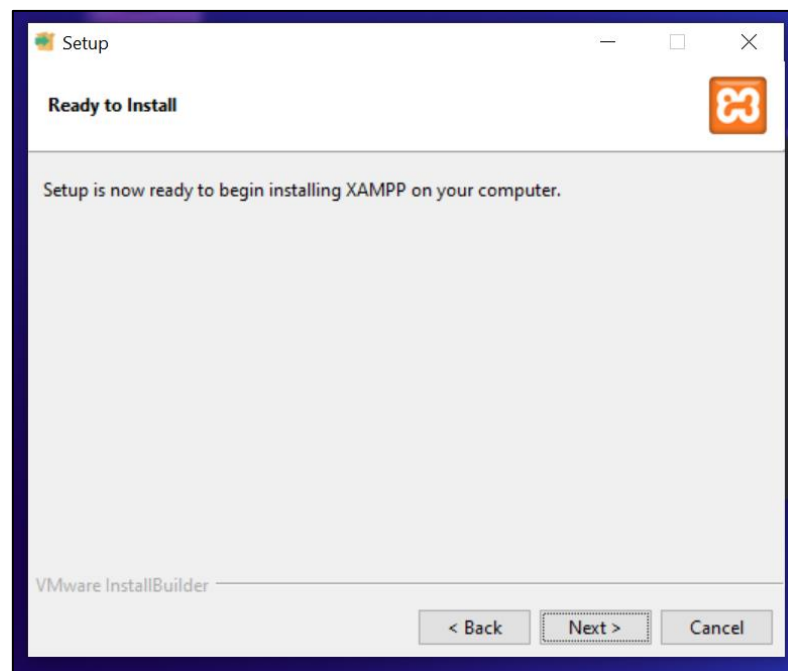


Figure 4.7: Installing XAMPP.

Once the installation process is completed, start the Control Panel. Next, start Apache and MySQL modules as shown in Figure 4.8. This is because only the Apache and MySQL modules need to be started initially for app development purposes.

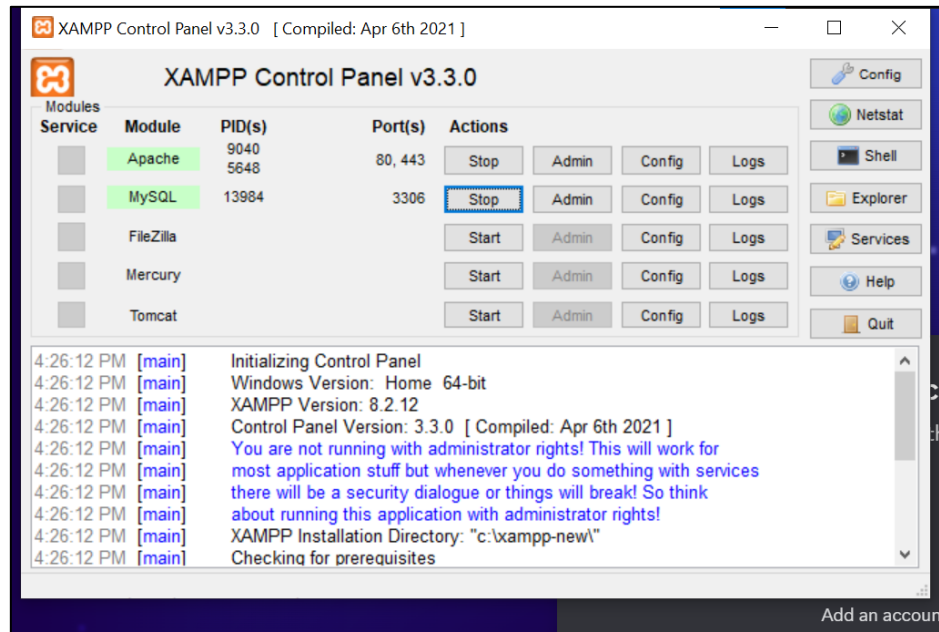
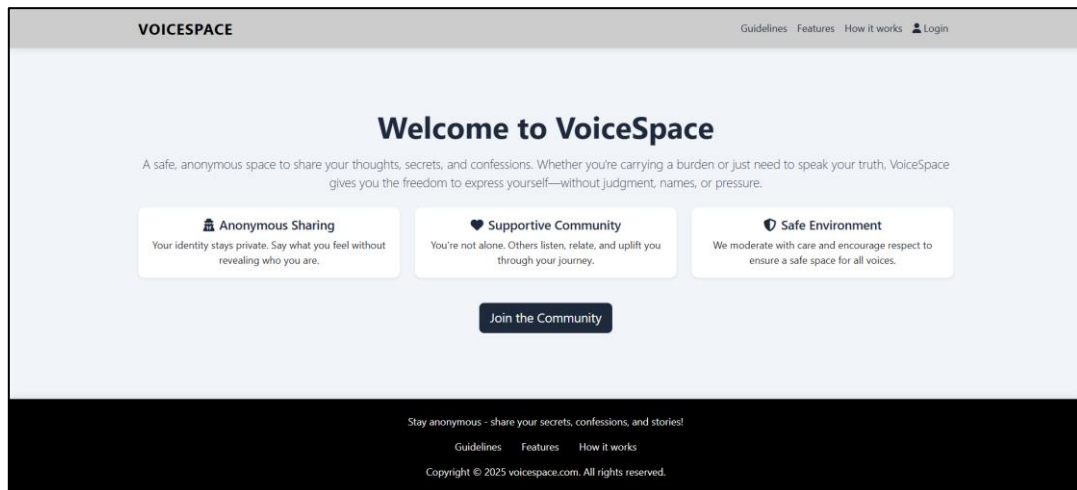


Figure 4.8: XAMPP Control Panel.

### 4.3 Proposed System Implementation

This section provides an overview of the proposed system, VoiceSpace, through screenshots that illustrate its functionality for end users. The functionalities provided to users and the access restrictions in VoiceSpace differ based on the type of user: students and admin. Nevertheless, when users or admin access the system, they are directed to the website's welcome page, which serves as VoiceSpace's homepage.

### 4.3.1 Users



*Figure 4.9: VoiceSpace's homepage.*

Figure 4.9 above shows the homepage of VoiceSpace that serves as a welcoming introduction to the platform, highlighting its core mission and key features. It explains that VoiceSpace is a safe, anonymous space where users can share their thoughts, secrets, and confessions without fear of judgment or exposure. It emphasizes three main pillars:

- **Anonymous Sharing:** Users can express themselves while keeping their identity hidden.
- **Supportive Community:** A space where others listen, relate, and offer encouragement.
- **Safe Environment:** Moderators ensure a respectful and secure space for all voices.

Additionally, through this homepage, users can:

- View the system guidelines as seen in Figure 4.10.
- Explore the system features as shown in Figure 4.11.
- Understand how the system works, as illustrated in Figure 4.12.
- Access the Login button to sign into the platform.
- Access Join the Community button to encourage new users to get started and be part of the supportive VoiceSpace environment.

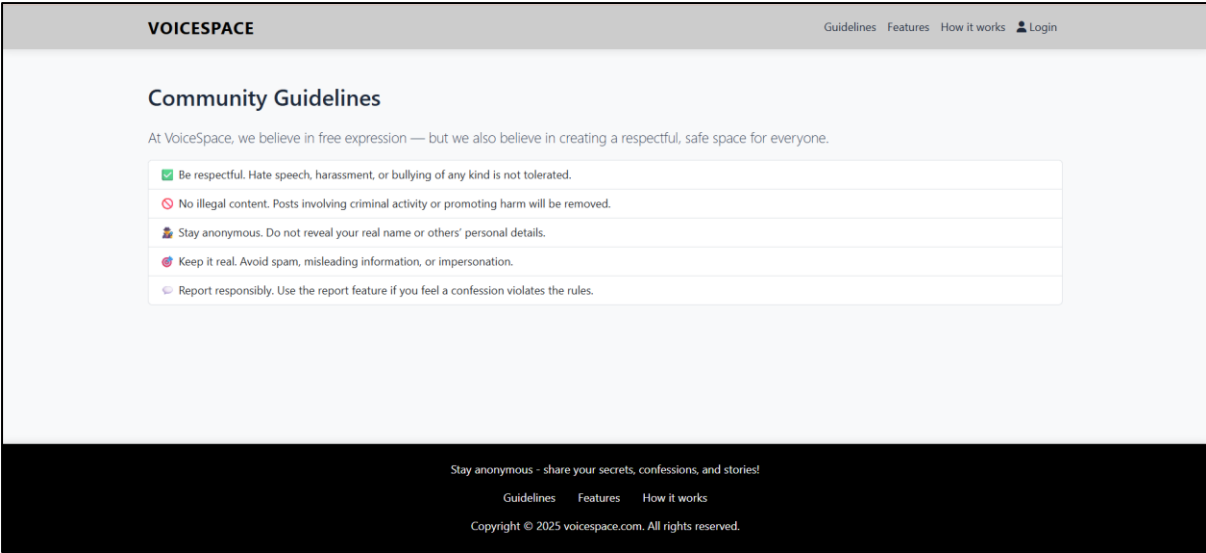


Figure 4.10: Guidelines.

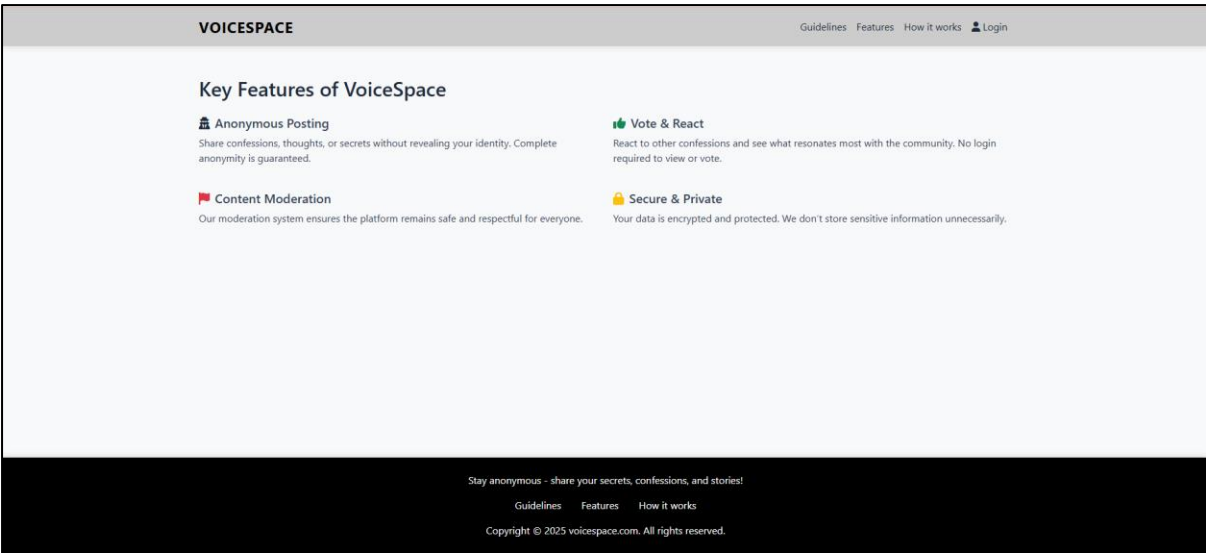
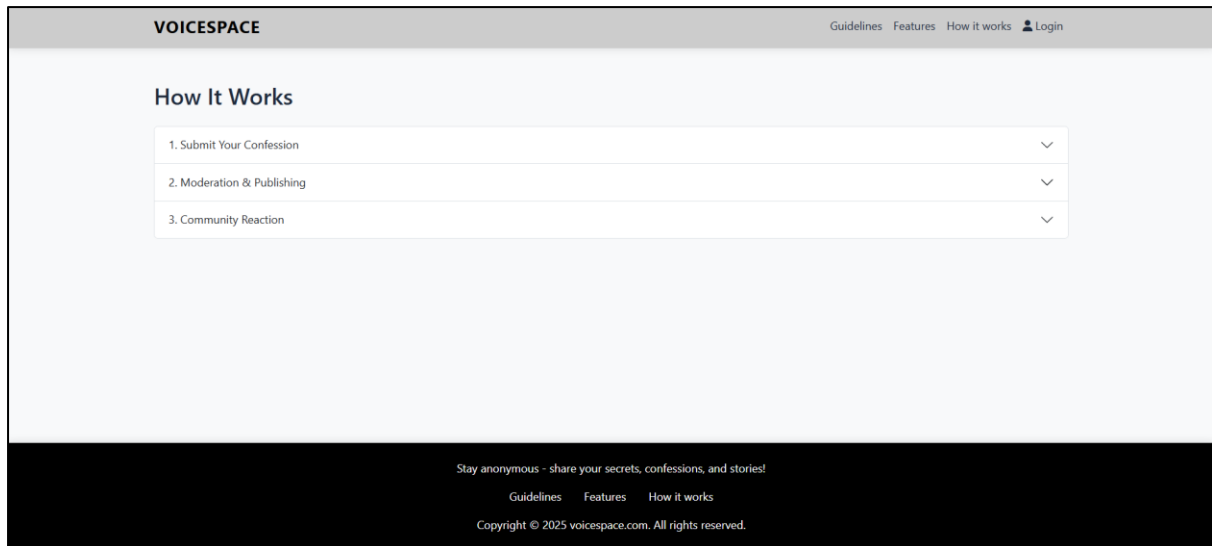
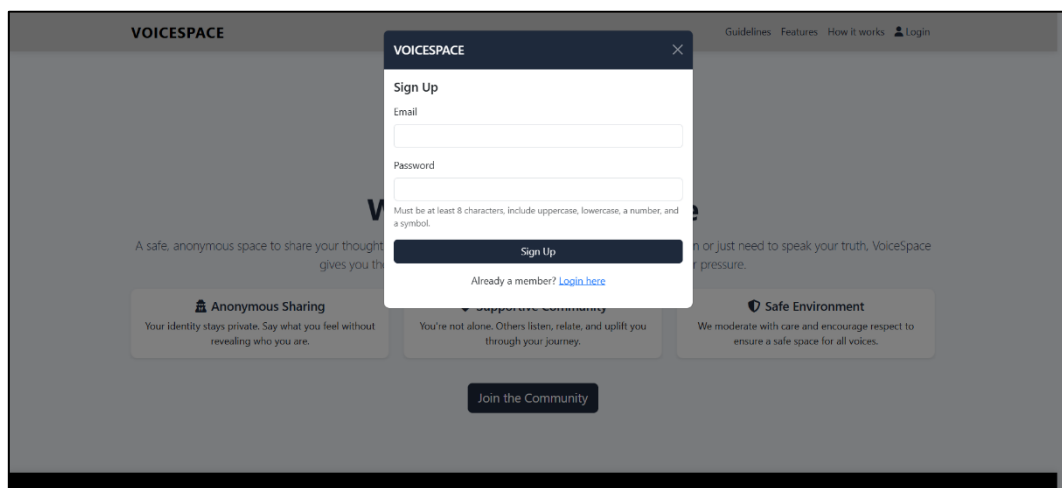


Figure 4.11: Features.



*Figure 4.12: How it works.*



*Figure 4.13: Sign up Page.*

Figure 4.13 above shows the Sign-Up Page of VoiceSpace that allows new users to register for an account using their UNIMAS student email and a secure password. To ensure authenticity and security, only email addresses ending with @siswa.unimas.my are accepted while the password must meet strong security requirements such as:

- Minimum of 8 characters
- At least one uppercase letter
- At least one lowercase letter

- At least one symbol
- At least one number

If the email and password meet the requirements, a popup notification will appear to inform the user that a verification code has been sent to their email. Upon receiving the email, the user must click on the verification link and enter the provided code, as shown in Figure 4.14. Once verified, the user will be automatically logged in to the platform and redirected to the Confession Page. For users who have already registered, a login link is available on the Sign Up page for quick access to the login interface.

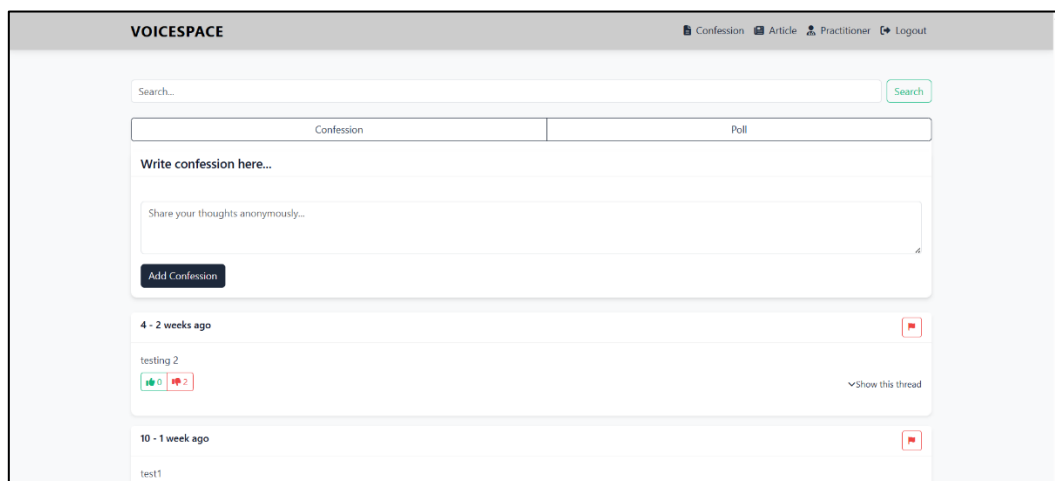
Figure 4.14: Verify code page.

Figure 4.15: Login Page.

Figure 4.15 above shows the Login Page of VoiceSpace that requires users to authenticate themselves using a valid email and a strong password. To ensure secure access, the system only accepts email addresses ending with @siswa.unimas.my, and passwords must meet the following criteria:

- Minimum 8 characters
- At least one uppercase letter
- At least one lowercase letter
- At least one symbol
- At least one number

If the entered email and password do not match any records in the database, an error message will be displayed saying ‘Error! Please try again’. However, if the credentials are valid and successfully authenticated, the user will be redirected to the Confession Page, as illustrated in Figure 4.16. For users who have not registered, a sign-up link is provided directly on the login page to guide them to the registration process.

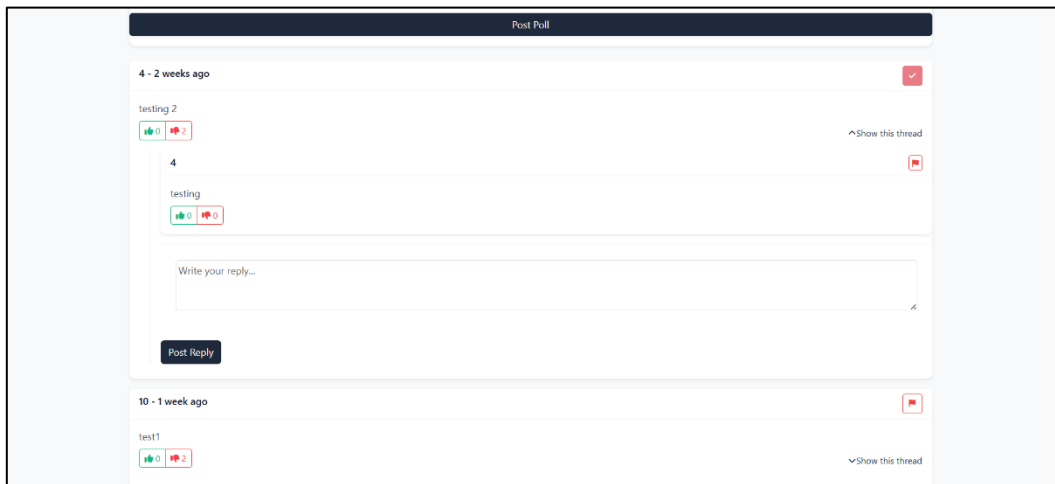


*Figure 4.16: Confession Page.*

Figure 4.16 above shows the confession page. The Confession Page is the main feature of the VoiceSpace platform, where users can anonymously express their thoughts or create interactive polls. At the top of the page, the header includes three main navigation options:

- **Confession:** Returns to the main confession interface.
- **Article & Practitioner:** Provides access to mental health resources and professional support.
- **Logout:** Allows the user to securely sign out from the system.

As this page allows users to write a confession or create a poll, each submission is reviewed by the admin before it becomes public. If the content contains no profanity or harmful content, it will be approved and published while if it violates any guidelines (e.g., includes offensive or inappropriate content), it will be deleted. This moderation process ensures the platform remains a safe and respectful environment for all users. Users can also view confessions submitted by others and search for specific confessions using keywords or topics.



*Figure 4.17: Comment section.*

In addition to viewing confessions submitted by other users, the Comment Section as shown in Figure 4.17 enhances interaction and engagement within the VoiceSpace platform where users can upvote or downvote confessions to show agreement or disagreement with the content and comment on confessions by clicking the ‘Show This Thread’ button. Upon clicking ‘Show This Thread’, the user will be able to read comments left by others. Users can post their own comments in response to the confession, and comments can also receive likes or dislikes, allowing others to express their support or disagreement with the opinions shared.

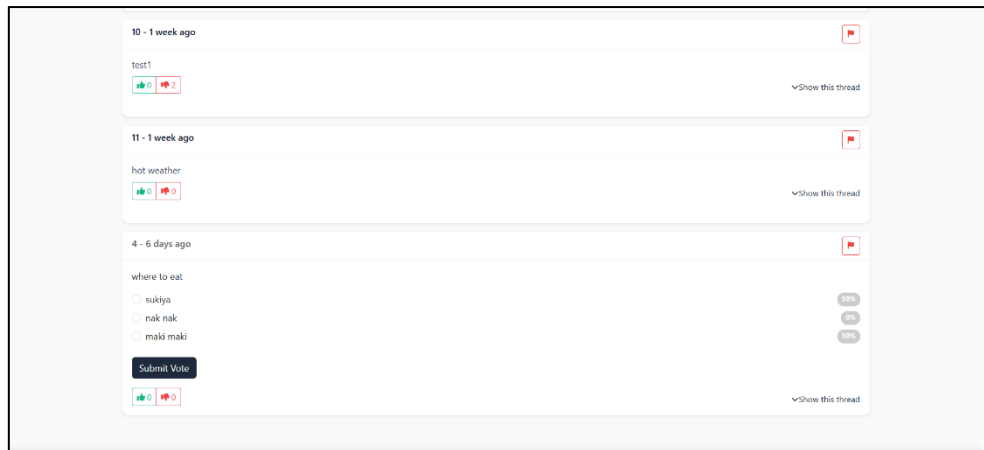


Figure 4.18: Poll.

To foster user interaction and engagement, VoiceSpace includes an interactive polling feature that allows students to both create and participate in polls anonymously. Students can create their own polls by entering a question and multiple-choice options, encouraging open discussions and feedback within the community. Other users can join or vote in polls, contributing to the collective voice on various topics. Once a user participates in a poll, they will instantly see the real-time results displayed in percentages, as shown in Figure 4.18. Just like confessions, polls can be liked or disliked, commented on by other users, where each comment can also receive likes or dislikes, and reported if the poll contains inappropriate or offensive content.

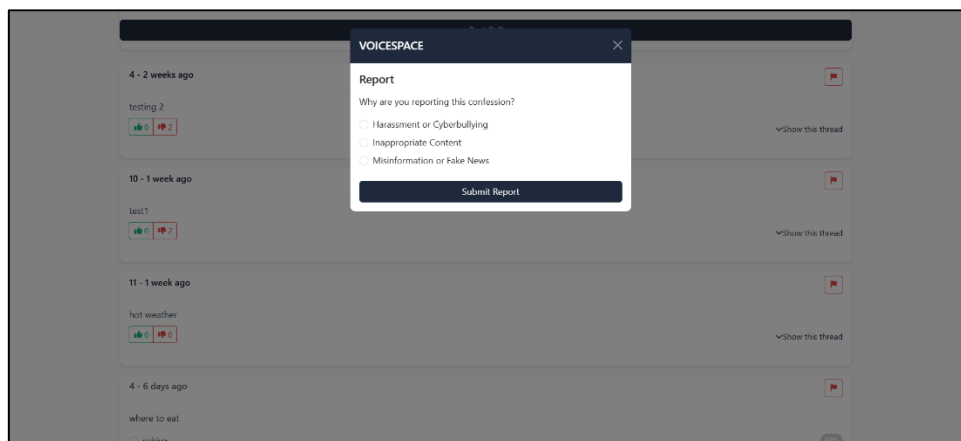
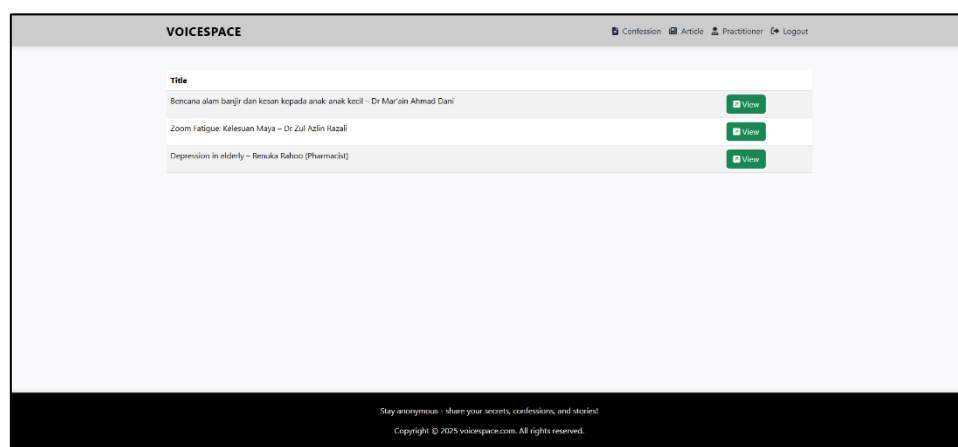


Figure 4.19: Report Confession.

The Report Page as seen in Figure 4.19 allows users to help maintain a safe and respectful environment on VoiceSpace by reporting confessions that violate the platform's guidelines.

When a user comes across a confession that contains inappropriate content such as sexual harassment, bullying, hate speech, or any other form of harmful or offensive material, they can click on the flag (report) button located on the confession post. After clicking the flag, a list of report reasons will appear, allowing the user to select the most relevant reason, as shown in Figure 4.19. Once a reason is selected, a confirmation popup will appear with a message such as ‘Thank you for your report. We will review it shortly’. The report is then sent to the admin dashboard, where the admin will review the content and take appropriate action either remove the confession or dismiss the report if it is invalid. This feature ensures that the platform remains a moderated and supportive space for all users.



*Figure 4.20: Articles.*

The system includes a dedicated section for articles. This feature is designed to promote mental health education by providing easily accessible information that students can read to gain knowledge, coping strategies, and emotional support. The main objective is to raise awareness and encourage positive mental health practices among students. By educating users, this section aims to help reduce mental health issues within the university community. Students will see a list of article titles, which are updated weekly to ensure fresh and relevant content. To read a full article, students can simply click the ‘View’ button, as shown in Figure 4.20. Then, the student will be directed to view the article in full detail, for example, as shown in Figure 4.21, where they can read the content at their own pace. Articles may cover various topics such as stress management, anxiety, depression, mindfulness, and healthy lifestyle habits.

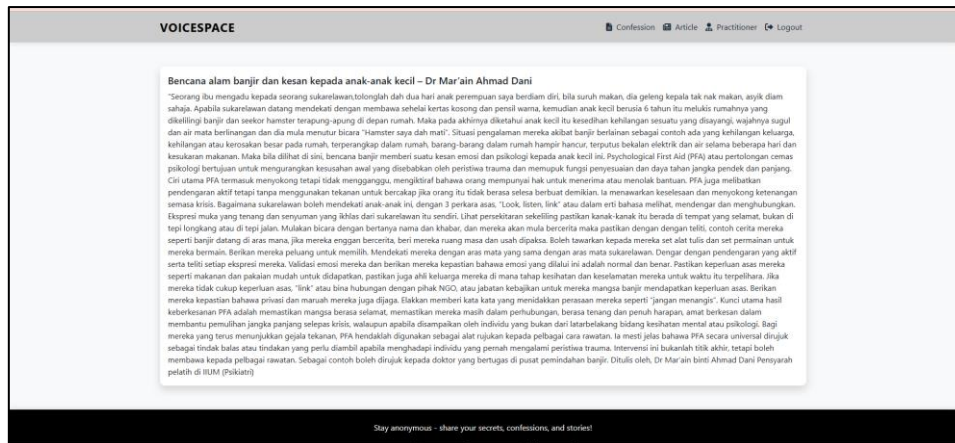


Figure 4.21: View articles.

**VOICESPACE** Confession Article Practitioner Logout

| Name                                           | Phone          | Email                   | Open Hours                                |
|------------------------------------------------|----------------|-------------------------|-------------------------------------------|
| The Malaysian Mental Health Association (MMHA) | +603 2780 6803 |                         | Mon-Fri, 9am-5pm, except public holidays  |
| Talian Kasih 15999                             | +60192615999   |                         | 24-hour Nationwide Helpline & Counselling |
| The Befrienders (KL)                           | 603 7627 2929  | sam@befrienders.org.my  | (24 hours)                                |
| The Befrienders (PG)                           | 604 2910 100   | pati@befrien.org        | (24 hours)                                |
| The Befrienders (N9)                           | +606 6321 772  | sam@befrienders.org.my  | (24 hours)                                |
| The Befrienders (SBH)                          | 6088 255 788   | befrienderskl@gmail.com | (24 hours)                                |
| syamini                                        | 0123456789     | syamini@gmail.com       | mon-fri 8am-5pm                           |

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Figure 4.22: Practitioner.

In addition to the mental health articles, VoiceSpace also provides a Practitioner Section to offer students easy access to professional counselors when personal support is needed. This section is designed to bridge the gap between students and mental health professionals, especially in times of emotional distress or crisis. It ensures that help is always within reach. When students access this section, they will see a list of available counselors, along with full name, contact information such as phone numbers and email addresses, and office/open hours for scheduled support or consultations. This information is presented in a clear and organized layout to make it easy for students to quickly find and reach out to a counselor. In case of emergencies, this section acts as a lifeline, guiding students to immediate professional help.

### 4.3.2 Admin

As mentioned earlier, when users or admins access the system through the official website, they are first directed to the website's Welcome Page, which also functions as the VoiceSpace homepage, as shown in Figure 4.9. From this starting point, admins can proceed to log in as shown in Figure 4.15 using their admin credentials. In addition, admins can also view the system guidelines as seen in Figure 4.10 and explore a summary of system features as seen in Figure 4.11, and learn how the system works as illustrated in Figure 4.12. However, unlike regular users, admins do not need to sign up, as their access is pre-configured and controlled by the system.

While the homepage serves both users and admins, the admin interface is role-based, meaning only users with administrative rights will see the additional admin control features after logging in. This approach ensures a centralized entry point for both regular users and admins, while still maintaining secure access control and role-specific functionality.

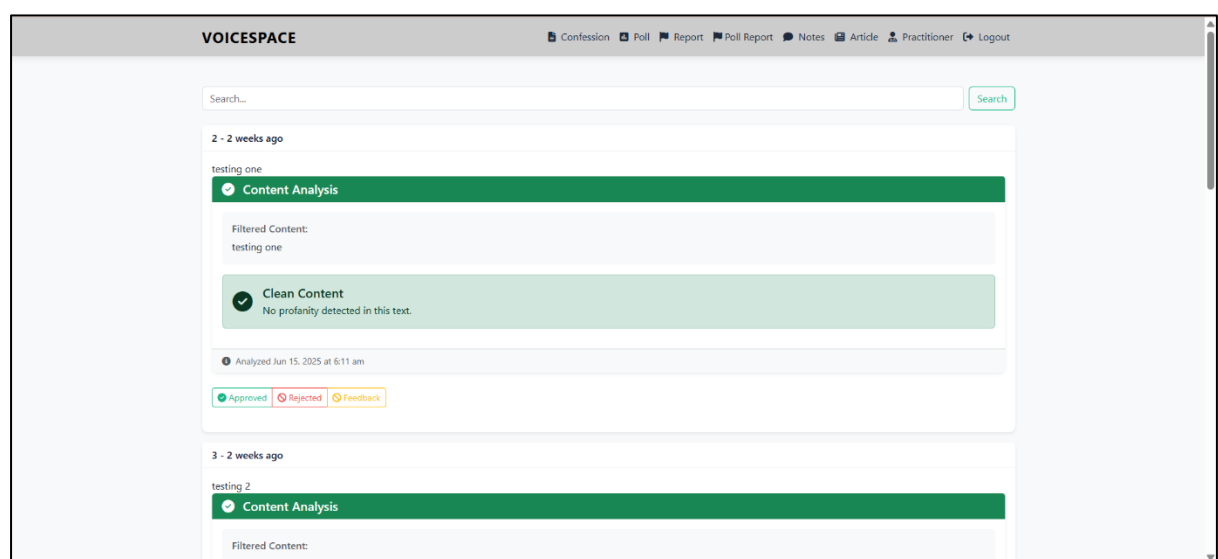
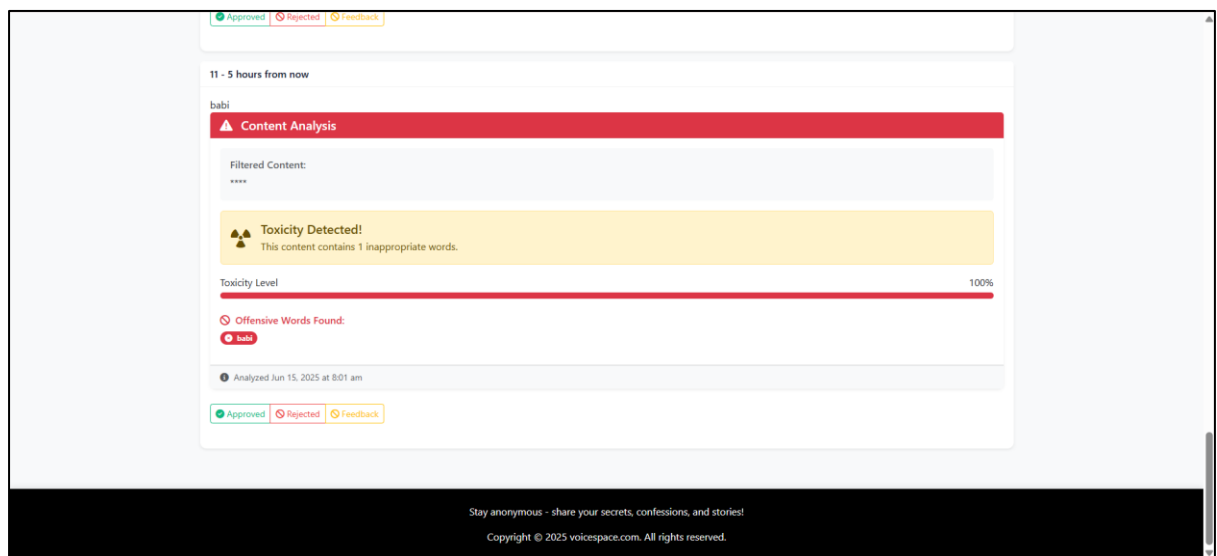


Figure 4.23: Admin Confession Page.

Figure 4.23 above shows the Admin Confession Page which is a crucial feature in VoiceSpace that allows administrators to review and moderate all submitted confessions before they are published on the platform. Every confession submitted by a user is first routed to this page for admin review. The admin is responsible for ensuring that the content complies with the platform's community guidelines. Admins are provided with three main action options for each confession:

- **Approve:** If the content is appropriate.
- **Reject:** If the content violates any rules.
- **Notes:** If the content contains valuable feedback or suggestions relevant to the university.

To assist admins in quickly identifying the nature of each confession, the system uses color-coded labels based on content analysis. If the confession contains no profanity or harmful content, it will be highlighted in green and labeled as ‘Clean Content’, as shown in Figure 4.23. The admin can then approve it, and the confession will be published on the User Confession Page while if the confession violates platform guidelines, such as including offensive, harmful, or inappropriate language, it will appear in red and be labeled as ‘Toxicity Detected’, as shown in Figure 4.24. The admin will then reject the confession, and it will be permanently deleted from both the system interface and the database to ensure that harmful content does not remain stored in the backend.



*Figure 4.24: Toxicity Detected Confession.*

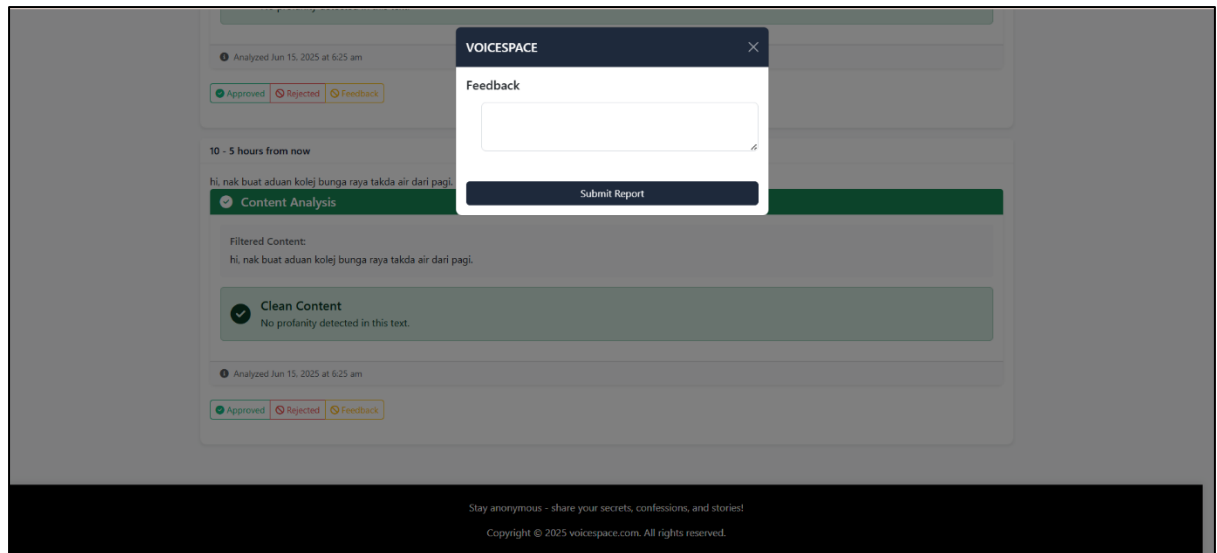


Figure 4.25: Admin add Notes.

In cases where a confession contains constructive feedback or concerns about university services or facilities, the admin can click the ‘Notes’ option, as illustrated in Figure 4.25. For example, if the confession relates to Kolej Bunga Raya, the admin will take note of it and proactively contact the relevant party to address the issue or suggest improvements.

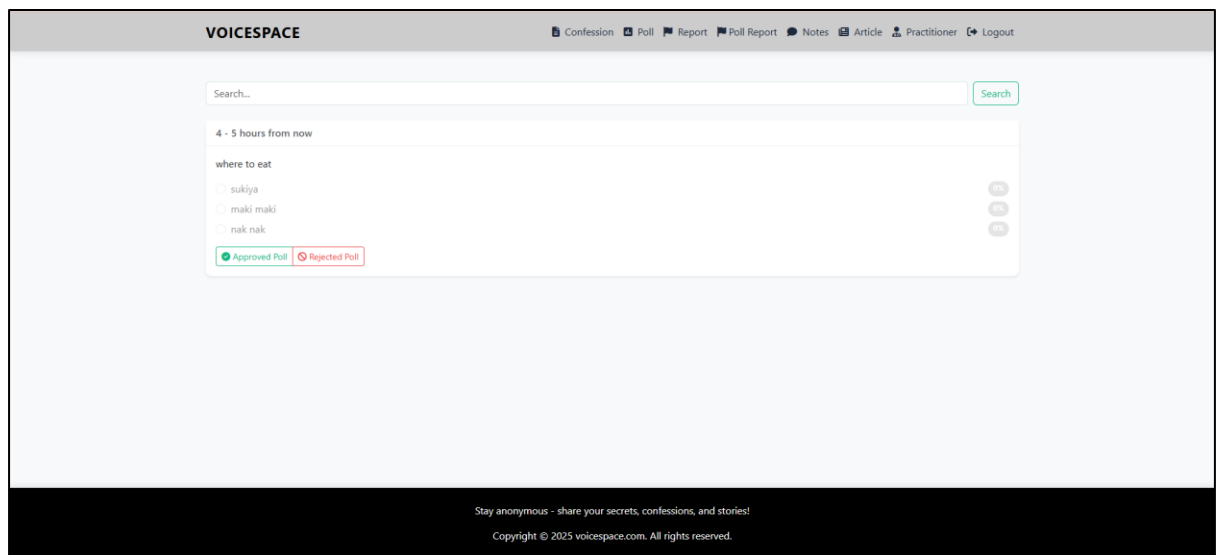


Figure 4.26: Admin Poll Page.

Figure 4.26 above shows the Admin Poll Page. Just like confessions, all polls submitted by users in VoiceSpace must first go through an admin review process before being published on

the platform. When a user creates a poll, it is sent to the Admin Poll Page, where the admin is responsible for checking the content to ensure it is appropriate, respectful, and complies with the system’s guidelines. For each poll, the admin has two main action options:

- **Approve:** If the poll content is appropriate and follows the rules, it will be approved and published on the User Poll Page, making it visible and accessible for other users to participate.
- **Reject:** If the poll contains inappropriate, offensive, or irrelevant content, the admin will reject it.

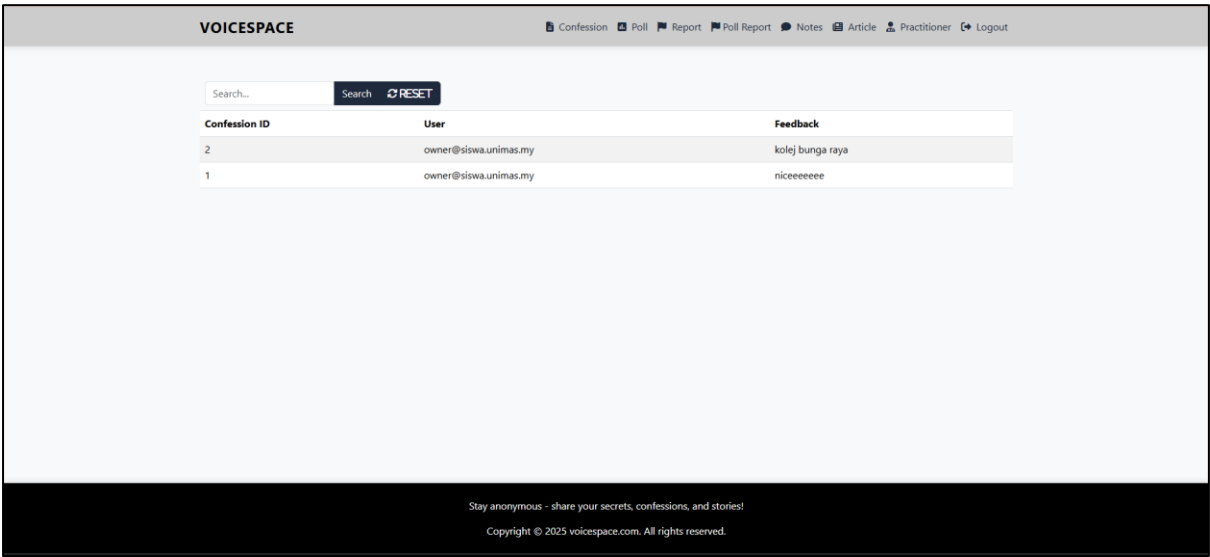


Figure 4.27: Admin Notes.

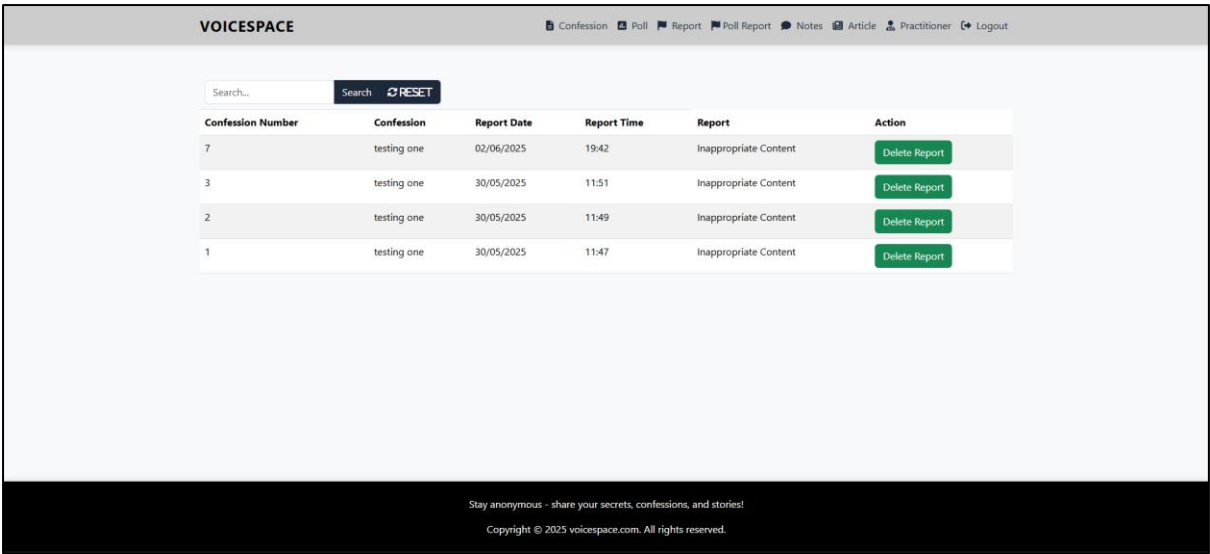
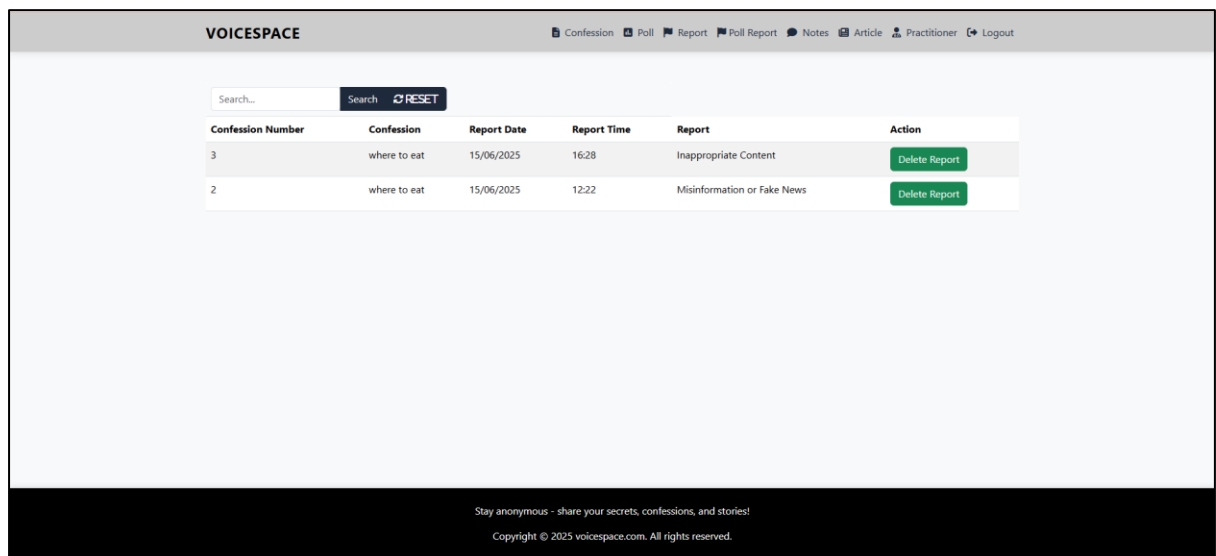


Figure 4.28: Admin Confession Report.

Figure 4.28 above shows the Admin Confession Report where it displays all confessions that have been reported by users. When a user clicks the report button on a confession and selects a reason, that report is sent to this page for admin review. The admin can then view the full confession content along with the reason for the report decide to either:

- **Delete the confession:** If the report is valid and the content truly violates platform guidelines (e.g., contains inappropriate or offensive material).
- **Ignore the report:** If, upon review, the content is actually appropriate and the report was made in error (e.g., misunderstanding or accidental reporting by the user).

This feature helps ensure that user concerns are taken seriously while also preventing false reports from affecting appropriate content. It supports a balanced and fair moderation process within VoiceSpace. To support efficient moderation, the Admin Confession Report Page includes a search bar that allows admins to search for specific reported confessions using keywords or IDs. A Reset button is also provided to clear the search and return the page view to the full list of reported confessions.



| Confession Number | Confession   | Report Date | Report Time | Report                      | Action        |
|-------------------|--------------|-------------|-------------|-----------------------------|---------------|
| 3                 | where to eat | 15/06/2025  | 16:28       | Inappropriate Content       | Delete Report |
| 2                 | where to eat | 15/06/2025  | 12:22       | Misinformation or Fake News | Delete Report |

Figure 4.29: Admin Poll Report.

In addition to confessions, polls can also be reported by users if found to contain inappropriate or misleading content. When a poll is reported, it will appear on the Admin Poll Report section, where the admin can review the reported poll and the reason given and decide to:

- **Delete the poll:** If the content is found to be offensive, irrelevant, or violates platform rules.
- **Ignore the report:** If the poll is valid and the report is inaccurate or made in error.

Both report pages aim to maintain the platform’s integrity by ensuring all user-generated content is monitored and moderated effectively, while also giving admins control tools like search and reset for easier navigation and management.

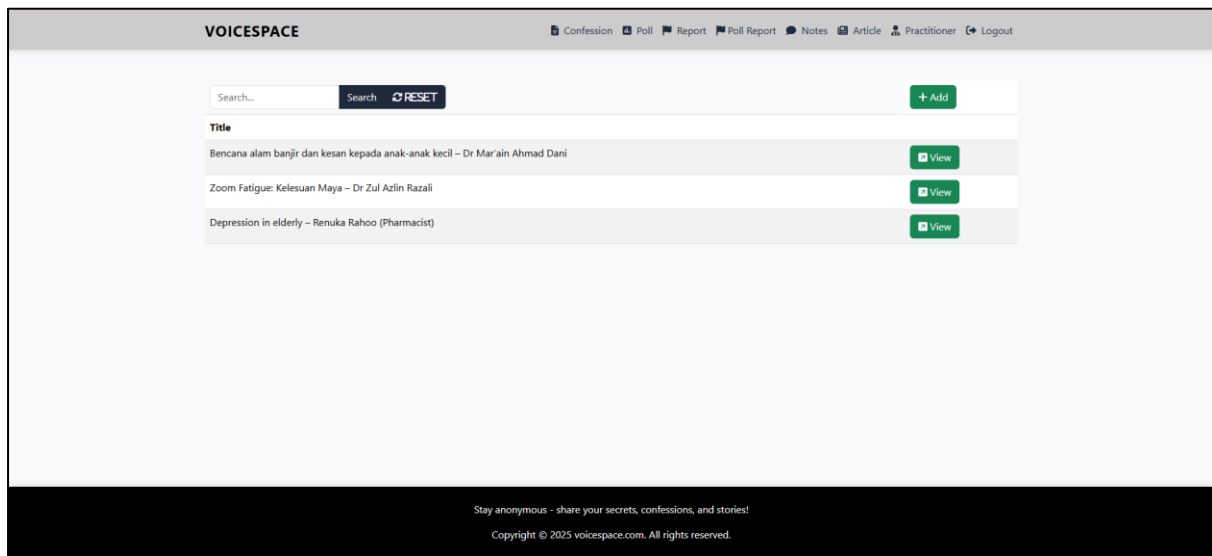


Figure 4.30: Admin Article.

Figure 4.30 above shows the Admin Article Page where it is a dedicated section in VoiceSpace that allows administrators to manage the mental health awareness articles displayed to users. This page provides admins with full control over the article content, including the ability to add new articles, edit existing articles, and delete articles as illustrated in Figure 4.31. Admins can create and upload new articles related to mental health, well-being, or any topics that may benefit students. Each article includes a title, and content. These articles are then displayed in the user-facing article section of the platform. If updates are needed such as fixing grammar, updating information, or correcting outdated data, admins can edit existing articles to keep the content accurate and relevant. Articles that are no longer needed, outdated, or incorrectly uploaded can be removed from the system by the admin. Once deleted, the article will no longer be visible to users. This page helps ensure that the platform’s article section remains up-to-date, informative, and supportive of the system’s goal to raise mental health awareness among students.

**VOICESPACE** Confession Poll Report Poll Report Notes Article Practitioner Logout

+ Add Edit Delete

Title

Bencana alam banjir dan kesan kepada anak-anak kecil – Dr Mar'ain Ahmad Dani

Description

"Seorang ibu mengadu kepada seorang sukarelawan,tolonglah dah dua hari anak perempuan saya berdiam diri, bila suruh makan, dia geleng kepala tak nak makan, asyik diam sahaja. Apabila sukarelawan datang mendekati dengan membawa sehelai kertas kosong dan pensil warna, kemudian anak kecil berusia 6 tahun itu melukis rumahnya yang dikelilingi banjir dan seekor hamster terapung-apung di depan rumah. Maka pada akhirnya diketahui anak kecil itu kesedihan kehilangan sesuatu yang disayangi, wajahnya sugul dan air mata berlinangan dan dia mula menutur bicara "Hamster saya dah mati".

Situasi pengalaman mereka akibat banjir berlainan sebagai contoh ada yang kehilangan keluarga, kehilangan atau kerosakan besar pada rumah, terperangkap dalam rumah, barang-barang dalam rumah hampir hancur, terputus bekalan elektrik dan air selama beberapa hari dan kesukaran makanan.

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Figure 4.31: Admin Add/Edit/Delete Article.

**VOICESPACE** Confession Poll Report Poll Report Notes Article Practitioner Logout

Search... Search RESET + Add

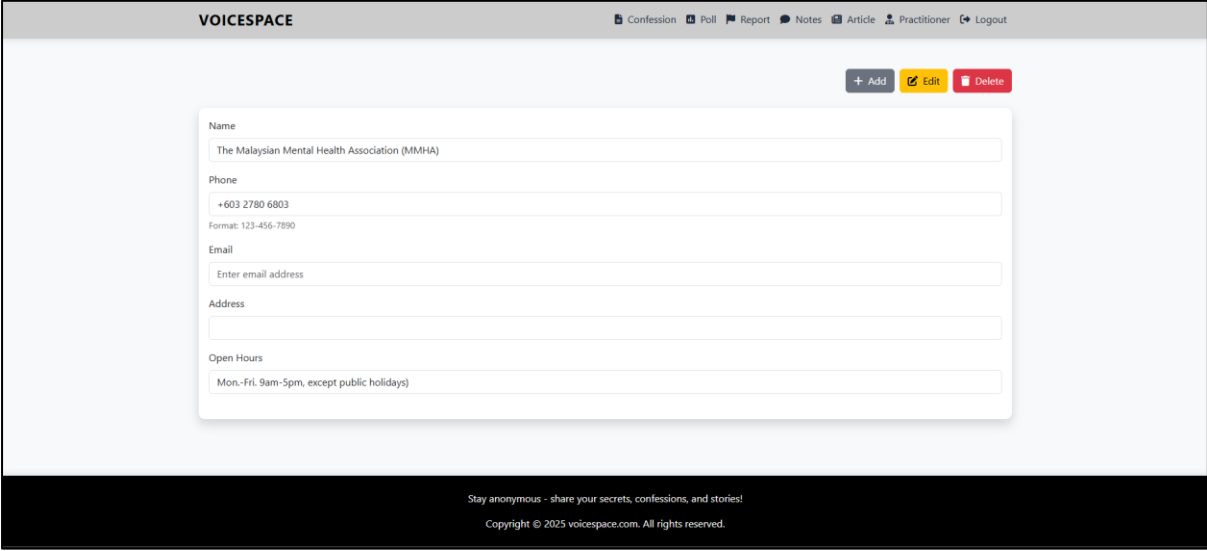
| Name                                           | Phone          | Email                   | Open Hours                                 |                      |
|------------------------------------------------|----------------|-------------------------|--------------------------------------------|----------------------|
| The Malaysian Mental Health Association (MMHA) | +603 2780 6803 |                         | Mon.-Fri. 9am-5pm, except public holidays) | <a href="#">View</a> |
| Talian Kasih 15999                             | +60192615999   |                         | 24-hour Nationwide Helpline & Counselling  | <a href="#">View</a> |
| The Befrienders (KL)                           | 603 7627 2929  | sam@befrienders.org.my  | (24 hours)                                 | <a href="#">View</a> |
| The Befrienders (PG)                           | 604 2910 100   | pat@befpen.org          | (24 hours)                                 | <a href="#">View</a> |
| The Befrienders (N9)                           | +606 6321 772  | sam@befrienders.org.my  | (24 hours)                                 | <a href="#">View</a> |
| The Befrienders (SBH)                          | 6088 255 788   | befrienderskk@gmail.com | (24 hours)                                 | <a href="#">View</a> |
| syamimi                                        | 0123456789     | syamimi@gmail.com       | mon-fri 8am-5pm                            | <a href="#">View</a> |

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Figure 4.32: Admin Practitioner.

The Admin Practitioner Page is the section where administrators manage the list of professional counsellors displayed to students in the Practitioner section of the platform. This feature supports the system's goal of offering students quick and reliable access to mental health support when needed. From this page, the admin can add new practitioners, edit practitioner information, and delete practitioners as seen in Figure 4.33. Admins can add details of certified counsellors, including their name, contact number, email address, and available hours/consultation schedule. These details are then made visible on the user side so students

can reach out when necessary. If there are updates such as a new phone number, changed schedule, or corrections to the counsellor's name, the admin can easily edit and update the practitioner's information. If a practitioner is no longer available or needs to be removed, the admin can delete the entry, and it will no longer be shown to students. This section ensures that students are always presented with accurate and up-to-date contact information for trusted counsellors, especially during times of urgency or crisis.



The screenshot shows the VOICESPACE Admin interface for adding, editing, or deleting a practitioner. The header bar includes the VOICESPACE logo and navigation links: Confession, Poll, Report, Notes, Article, Practitioner, and Logout. Below the header, there are three buttons: '+ Add' (grey), 'Edit' (yellow), and 'Delete' (red). The main form is a white box with the following fields:

- Name:** The Malaysian Mental Health Association (MMHA)
- Phone:** +603 2780 6803  
Format: 123-456-7890
- Email:** Enter email address
- Address:**
- Open Hours:** Mon-Fri. 9am-5pm, except public holidays

At the bottom of the page, there is a footer with the text: "Stay anonymous - share your secrets, confessions, and stories!" and "Copyright © 2025 voicespace.com. All rights reserved."

*Figure 4.33: Admin Add/Edit/Delete Practitioner.*

## 4.4 Summary

To summarize, this chapter discusses the implementation phase of the proposed system called VoiceSpace. It begins by outlining the development tools, environment setup, and software used during the creation of the system. The chapter then presents the system's core structure and functionality through detailed interface explanations and visual screenshots of each major page.

## **CHAPTER 5: TESTING**

### **5.1 Introduction**

This chapter focuses on the proposed system's testing phase. Testing is a crucial stage in assessing the developed system to see if it is capable of performing well, if it meets all of the requirements listed in Chapter 3, and if it adheres to the project's goals and objectives. The phase also involves identifying any system errors or undesirable behaviours that could degrade the system's performance and quality. The goal of this phase is to ensure that the developed system is of high quality and performs well. Functional testing and non-functional testing are the two types of testing that are done.

### **5.2 Functional Testing**

Functional testing is used to ensure that the developed system meets the functional requirements, which are the system's features. Functional tests are designed to test each system function by providing appropriate input and comparing the output to the functional requirements. Understanding the functional requirements, identifying test data based on requirements, defining the expected results with selected test data, executing test cases, and comparing the actual results to the expected results are all steps in the functional testing process.

#### **5.2.1 Unit Testing**

Unit testing is the process of testing individual components or modules of the software in isolation. Each unit, typically the smallest testable part of an application, such as a function or a method, is tested independently to ensure it performs correctly. The purpose of unit testing is to identify and fix bugs at an early stage, making the development process more efficient and reducing the likelihood of defects in the later stages. By focusing on individual units, developers can ensure that each part of the system works as expected before integrating them into the larger system. Unit testing enables developers and testers to understand the base of the code, allowing them to quickly identify and modify the code that causes errors. This practice employs a white box testing approach, where the internal structure of the code is tested. In this

project, unit testing was carried out to verify the accuracy and functionality of individual pieces of code, ensuring a solid foundation for the overall system.

The test cases for the proposed system are shown in Table 5.1 to 5.15.

### 5.2.1.1 User

Table 5.1: Unit Test Case Table for User Registration.

| <b>Module Name:</b> User Registration<br><b>Test Case Description:</b> Verify new user registration functionality with valid and invalid inputs.<br><b>Testing Objective:</b> Ensure that only eligible UNIMAS students can register using a valid email and a strong password.<br><b>Remarks:</b> Email must end with @siswa.unimas.my |                                 |                                                                                     |                                                                                               |                                       |                             |        |                  |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------|--------|------------------|-------|
| Test Case ID                                                                                                                                                                                                                                                                                                                            | Test Scenario                   | Test Steps                                                                          | Test Data                                                                                     | Expected Result                       | Actual Result               | Status | Severity Failure | Notes |
| TC-UR-01                                                                                                                                                                                                                                                                                                                                | Register with valid credentials | 1. Join the Community<br>2. Enter a valid email and password<br>3. Click Sign Up    | <b>Email:</b> user@siswa.unimas.my<br><b>Password:</b> Abc@1234                               | Email sent                            | As Expected                 | Pass   | High             |       |
| TC-UR-02                                                                                                                                                                                                                                                                                                                                | Register with an invalid email  | 1. Join the Community<br>2. Enter an invalid email and password<br>3. Click Sign Up | <b>Email:</b> <a href="mailto:user@gmail.com">user@gmail.com</a><br><b>Password:</b> Abc@1234 | <b>Error:</b> Invalid Email           | As Expected                 | Pass   | Medium           |       |
| TC-UR-03                                                                                                                                                                                                                                                                                                                                | Register with a weak password   | 1. Join the Community<br>2. Enter a valid email and password<br>3. Click Sign Up    | <b>Email:</b> user@siswa.unimas<br><b>Password:</b> abcd123                                   | <b>Error:</b> Weak Password           | As Expected                 | Pass   | Medium           |       |
| TC-UR-04                                                                                                                                                                                                                                                                                                                                | Leave all fields empty          | Try to sign up with no input                                                        | Empty fields                                                                                  | <b>Error:</b> All fields are required | <b>Error:</b> Invalid Email | Fail   | Medium           |       |

Table 5.2: Unit Test Case Table for User Login.

| <b>Module Name:</b> User Login<br><b>Test Case Description:</b> Validate login functionality for registered and unregistered users.<br><b>Testing Objective:</b> Ensure only valid users can log in.<br><b>Remarks:</b> Redirect to Confession Page if successful. |                                |                                                        |                                                                                                               |                                                    |                             |        |                  |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------|--------|------------------|-------|
| Test Case ID                                                                                                                                                                                                                                                       | Test Scenario                  | Test Steps                                             | Test Data                                                                                                     | Expected Result                                    | Actual Result               | Status | Severity Failure | Notes |
| TC-UL-01                                                                                                                                                                                                                                                           | Login with correct credentials | 1. Open Login<br>2. Enter valid email & password       | <b>Email:</b><br><a href="mailto:user@siswa.unimas.my">user@siswa.unimas.my</a><br><b>Password:</b> Abc@1234  | 1. Login successful<br>2. Redirected to Confession | As Expected                 | Pass   | High             |       |
| TC-UL-02                                                                                                                                                                                                                                                           | Login with wrong password      | 1. Open Login<br>2. Enter valid email & wrong password | <b>Email:</b><br><a href="mailto:user@siswa.unimas.my">user@siswa.unimas.my</a><br><b>Password:</b> wrongpass | <b>Error</b>                                       | As Expected                 | Pass   | Medium           |       |
| TC-UL-03                                                                                                                                                                                                                                                           | Leave fields empty             | Click Login without entering data                      | Empty fields                                                                                                  | <b>Error:</b> Fields required                      | <b>Error:</b> Invalid Email | Fail   | Medium           |       |

Table 5.3: Unit Test Case Table for Upvotes/Downvotes.

| <b>Module Name:</b> Upvotes/Downvotes<br><b>Test Case Description:</b> Test voting on confessions<br><b>Testing Objective:</b> Ensure user votes are recorded correctly<br><b>Remarks:</b> One vote per user per post |                       |                               |                   |                                 |               |        |                  |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|-------------------|---------------------------------|---------------|--------|------------------|-------|
| Test Case ID                                                                                                                                                                                                          | Test Scenario         | Test Steps                    | Test Data         | Expected Result                 | Actual Result | Status | Severity Failure | Notes |
| TC-VD-01                                                                                                                                                                                                              | Upvote a confession   | 1. Click on the upvote icon   | Confession ID: 19 | The upvote count increases by 1 | As Expected   | Pass   | Low              |       |
| TC-VD-02                                                                                                                                                                                                              | Downvote a confession | 1. Click on the downvote icon | Confession ID: 19 | The vote count increases by 1   | As Expected   | Pass   | Low              |       |

Table 5.4: Unit Test Case Table for Add Confession/Poll.

| <b>Module Name:</b> Add Confession/Poll<br><b>Test Case Description:</b> Test adding a new confession or poll<br><b>Testing Objective:</b> Ensure confessions and polls go to admin for review<br><b>Remarks:</b> Not published until approved |                     |                             |                        |                                  |               |        |                  |       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------------|------------------------|----------------------------------|---------------|--------|------------------|-------|
| Test Case ID                                                                                                                                                                                                                                   | Test Scenario       | Test Steps                  | Test Data              | Expected Result                  | Actual Result | Status | Severity Failure | Notes |
| TC-CP-01                                                                                                                                                                                                                                       | Submit a confession | 1. Enter text<br>2. Submit  | 'I feel anxious today' | Confession sent for admin review | As Expected   | Pass   | High             |       |
| TC-CP-02                                                                                                                                                                                                                                       | Submit a poll       | 1. Create poll<br>2. Submit | 'Are you stressed?'    | Poll sent for admin review       | As Expected   | Pass   | High             |       |

Table 5.5: Unit Test Case Table for Search Feature.

| <b>Module Name:</b> Search Feature<br><b>Test Case Description:</b> Search for confessions<br><b>Testing Objective:</b> Ensure search returns relevant posts<br><b>Remarks:</b> Case-insensitive search |                   |                             |           |                                           |               |        |                  |       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------|-----------|-------------------------------------------|---------------|--------|------------------|-------|
| Test Case ID                                                                                                                                                                                            | Test Scenario     | Test Steps                  | Test Data | Expected Result                           | Actual Result | Status | Severity Failure | Notes |
| TC-SF-01                                                                                                                                                                                                | Search by keyword | Enter keyword in search bar | 'matcha'  | Confessions containing 'matcha' are shown | As Expected   | Pass   | Medium           |       |

Table 5.6: Unit Test Case Table for Post Reply (Comment).

| <b>Module Name:</b> Post Reply (Comment)<br><b>Test Case Description:</b> Post and view comments<br><b>Testing Objective:</b> Allow users to comment and react to others<br><b>Remarks:</b> Comments can be liked/disliked |                       |                                      |                     |                                 |               |        |                  |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|---------------------|---------------------------------|---------------|--------|------------------|-------|
| Test Case ID                                                                                                                                                                                                               | Test Scenario         | Test Steps                           | Test Data           | Expected Result                 | Actual Result | Status | Severity Failure | Notes |
| TC-PR-01                                                                                                                                                                                                                   | Comment on confession | 1. Click 'Show thread'<br>2. Comment | 'I relate to this.' | Comment posted under confession | As Expected   | Pass   | Medium           |       |

Table 5.7: Unit Test Case Table for Submit Report.

| <b>Module Name:</b> Submit Report<br><b>Test Case Description:</b> Report inappropriate content<br><b>Testing Objective:</b> Ensure the report is submitted to the admin<br><b>Remarks:</b> Admin can delete or ignore |                   |                                                      |                         |                                                                       |               |        |                  |       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------------------------------------|-------------------------|-----------------------------------------------------------------------|---------------|--------|------------------|-------|
| Test Case ID                                                                                                                                                                                                           | Test Scenario     | Test Steps                                           | Test Data               | Expected Result                                                       | Actual Result | Status | Severity Failure | Notes |
| TC-SR-01                                                                                                                                                                                                               | Report confession | 1. Click the flag<br>2. Choose a reason<br>3. Submit | <b>Reason:</b> Bullying | <b>Popup:</b> ‘Thank you for your report. We will review it shortly’. | As Expected   | Pass   | High             |       |

Table 5.8: Unit Test Case Table for View Article.

| <b>Module Name:</b> View Article<br><b>Test Case Description:</b> View mental health articles<br><b>Testing Objective:</b> Ensure articles are readable and up to date.<br><b>Remarks:</b> Articles updated weekly |               |                        |                         |                               |               |        |                  |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------|-------------------------|-------------------------------|---------------|--------|------------------|-------|
| Test Case ID                                                                                                                                                                                                       | Test Scenario | Test Steps             | Test Data               | Expected Result               | Actual Result | Status | Severity Failure | Notes |
| TC-VA-01                                                                                                                                                                                                           | View article  | Click on ‘View’ button | Article: ‘Anxiety Tips’ | The full article is displayed | As Expected   | Pass   | Low              |       |

### 5.2.1.2 Admin

Table 5.9: Unit Test Case Table for Admin Login.

| <b>Module Name:</b> Admin Login                                                                       |                               |                                                                         |                                                                   |                                     |               |        |                  |                        |
|-------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------|---------------|--------|------------------|------------------------|
| <b>Test Case Description:</b> To test the login functionality using correct and incorrect credentials |                               |                                                                         |                                                                   |                                     |               |        |                  |                        |
| <b>Testing Objective:</b> Ensure only valid admin credentials can access the admin dashboard          |                               |                                                                         |                                                                   |                                     |               |        |                  |                        |
| <b>Remarks:</b> Admin credentials are predefined                                                      |                               |                                                                         |                                                                   |                                     |               |        |                  |                        |
| Test Case ID                                                                                          | Test Scenario                 | Test Steps                                                              | Test Data                                                         | Expected Result                     | Actual Result | Status | Severity Failure | Notes                  |
| TC-ADM-001                                                                                            | Admin login with valid data   | 1. Go to login page<br>2. Enter valid credentials<br>3. Click login     | <b>Email:</b> admin@siswa.unimas.my<br><b>Password:</b> Admin@123 | Redirected to Confession Page       | As expected   | Pass   | High             | Valid admin login flow |
| TC-ADM-002                                                                                            | Admin login with invalid data | 1. Go to login page<br>2. Enter incorrect credentials<br>3. Click login | <b>Email:</b> wrong@unimas.my<br><b>Password:</b> wrongpass       | Error message 'Invalid email' shown | As expected   | Pass   | Medium           | Invalid login blocked  |

Table 5.10: Unit Test Case Table for Admin Accept/Reject Confession/Poll.

| <b>Module Name:</b> Admin Accept/Reject Confession/Poll<br><b>Test Case Description:</b> To verify that admin moderation works for user-submitted content<br><b>Testing Objective:</b> Ensure only appropriate content is published<br><b>Remarks:</b> Approved goes live, rejected gets deleted |                              |                                                                   |                     |                                       |               |        |                  |                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------------------------------------------|---------------------|---------------------------------------|---------------|--------|------------------|---------------------------|
| Test Case ID                                                                                                                                                                                                                                                                                     | Test Scenario                | Test Steps                                                        | Test Data           | Expected Result                       | Actual Result | Status | Severity Failure | Notes                     |
| TC-ADM-003                                                                                                                                                                                                                                                                                       | Accept a clean confession    | 1. View new confession<br>2. Review content<br>3. Click 'Approve' | Confession ID: 1101 | Confession marked clean and published | As expected   | Pass   | High             |                           |
| TC-ADM-004                                                                                                                                                                                                                                                                                       | Reject an inappropriate poll | 1. View new poll<br>2. Review content<br>3. Click 'Reject'        | Poll ID: 2031       | Poll deleted from system and database | As expected   | Pass   | High             | Confirms moderation logic |

Table 5.11: Unit Test Case Table Admin Add Notes.

| <b>Module Name:</b> Admin Add Notes<br><b>Test Case Description:</b> Add notes to confession for institutional improvement<br><b>Testing Objective:</b> Verify admin can flag and act on feedback<br><b>Remarks:</b> May be forwarded to departments |                                 |                                                                      |                          |                        |               |        |                  |                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------|--------------------------|------------------------|---------------|--------|------------------|--------------------------|
| Test Case ID                                                                                                                                                                                                                                         | Test Scenario                   | Test Steps                                                           | Test Data                | Expected Result        | Actual Result | Status | Severity Failure | Notes                    |
| TC-ADM-005                                                                                                                                                                                                                                           | Add note to relevant confession | 1. Click 'Notes' on a selected confession<br>2. Type note<br>3. Save | Note: Refer to Kolej XYZ | Adding note successful | As expected   | Pass   | Medium           | Useful for future action |

Table 5.12: Unit Test Case Table Admin Add Search.

| <b>Module Name:</b> Admin Search<br><b>Test Case Description:</b> Test search feature for locating confessions/polls<br><b>Testing Objective:</b> Ensure admin can efficiently filter data<br><b>Remarks:</b> Includes reset function |                            |                                                  |                   |                                 |               |        |                  |                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------------------------------|-------------------|---------------------------------|---------------|--------|------------------|--------------------------|
| Test Case ID                                                                                                                                                                                                                          | Test Scenario              | Test Steps                                       | Test Data         | Expected Result                 | Actual Result | Status | Severity Failure | Notes                    |
| TC-ADM-006                                                                                                                                                                                                                            | Search reported confession | 1. Enter keyword in search bar<br>2. Press Enter | Keyword: bullying | Only matching results displayed | As expected   | Pass   | Medium           | Reset button also tested |

Table 5.13: Unit Test Case Table for Admin Manage Reported Confession/Poll.

| <b>Module Name:</b> Admin Manage Reported Confession/Poll<br><b>Test Case Description:</b> Review and act on reported content<br><b>Testing Objective:</b> Ensure reported content is handled correctly<br><b>Remarks:</b> Delete if valid, ignore if not |                                  |                                                               |                     |                                   |               |        |                  |                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------|---------------------|-----------------------------------|---------------|--------|------------------|---------------------------|
| Test Case ID                                                                                                                                                                                                                                              | Test Scenario                    | Test Steps                                                    | Test Data           | Expected Result                   | Actual Result | Status | Severity Failure | Notes                     |
| TC-ADM-007                                                                                                                                                                                                                                                | Delete valid reported confession | 1. Click Report page<br>2. View confession<br>3. Click Delete | Reason: Harassment  | Confession removed from system    | As expected   | Pass   | High             |                           |
| TC-ADM-008                                                                                                                                                                                                                                                | Ignore false report              | 1. Click Report page<br>2. View content<br>3. Click Ignore    | Reason: Not harmful | Report dismissed, content remains | As expected   | Pass   | Medium           | Misreporting handled well |

Table 5.14: Unit Test Case Table for Admin Manage Articles.

| <b>Module Name:</b> Admin Manage Articles<br><b>Test Case Description:</b> Add, edit, delete mental health articles<br><b>Testing Objective:</b> Ensure admin can manage article content<br><b>Remarks:</b> Articles are updated weekly |                 |                                                                    |                                |                                    |               |        |                  |                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------|--------------------------------|------------------------------------|---------------|--------|------------------|---------------------------|
| Test Case ID                                                                                                                                                                                                                            | Test Scenario   | Test Steps                                                         | Test Data                      | Expected Result                    | Actual Result | Status | Severity Failure | Notes                     |
| TC-ADM-009                                                                                                                                                                                                                              | Add new article | 1. Click 'Add Article'<br>2. Fill title/content<br>3. Click Submit | Title: Coping with Exam Stress | Article added and visible to users | As expected   | Pass   | Low              | Weekly updates encouraged |
| TC-ADM-010                                                                                                                                                                                                                              | Edit article    | 1. Click 'Edit' on the article<br>2. Change content<br>3. Save     | Updated content                | Article updated successfully       | As expected   | Pass   | Low              |                           |
| TC-ADM-011                                                                                                                                                                                                                              | Delete article  | 1. Click 'Delete' on article<br>2. Confirm deletion                | Article ID: 3045               | Article removed from list          | As expected   | Pass   | Medium           |                           |

Table 5.15: Unit Test Case Table for Admin Manage Practitioners.

| <b>Module Name:</b> Admin Manage Practitioners<br><b>Test Case Description:</b> Add, edit, delete counsellor contact list<br><b>Testing Objective:</b> Ensure contact info is accurate and up-to-date<br><b>Remarks:</b> For emergencies and support |                      |                                                                    |                               |                               |               |        |                  |                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------|-------------------------------|-------------------------------|---------------|--------|------------------|------------------------------|
| Test Case ID                                                                                                                                                                                                                                         | Test Scenario        | Test Steps                                                         | Test Data                     | Expected Result               | Actual Result | Status | Severity Failure | Notes                        |
| TC-ADM-012                                                                                                                                                                                                                                           | Add new practitioner | 1. Click 'Add'<br>2. Enter name, phone, email, schedule<br>3. Save | Name: Dr. A,<br>Email: a@u.my | Practitioner visible to users | As expected   | Pass   | High             | Mental health support access |
| TC-ADM-013                                                                                                                                                                                                                                           | Edit practitioner    | 1. Click 'Edit'<br>2. Update phone/email<br>3. Save                | New number: 012-3456789       | Changes reflected in list     | As expected   | Pass   | Medium           |                              |
| TC-ADM-014                                                                                                                                                                                                                                           | Delete practitioner  | 1. Click 'Delete'<br>2. Confirm removal                            | Name: Dr. B                   | Practitioner no longer shown  | As expected   | Pass   | Medium           |                              |

### **5.3 Non-Functional Testing**

Non-functional testing is a type of software testing that is used to ensure that a system meets non-functional requirements like performance and usability. It covers all aspects of the system that are not covered by functional testing and determines whether the system is behaving as expected.

#### **5.3.1 Reliability Testing**

Reliability testing is a crucial aspect of non-functional testing that focuses on evaluating the system's ability to function correctly under various conditions, particularly when handling invalid data. The primary objective of reliability testing is to ensure the system can maintain its performance and stability, even when subjected to unexpected or incorrect inputs. It mainly used to ensure the system can handle invalid or unexpected data gracefully without crashing or producing incorrect results, validate that the system maintains consistent performance and behaviour under different operating conditions and identify and fix defects that could lead to system failures, thereby enhancing the system's robustness and fault tolerance. Table 5.16 – 5.19 tabulates the test case for reliability testing of the VoiceSpace to ensure that it consistently performs under expected conditions without failure, by identifying and resolving issues that may cause the app to crash or behave unexpectedly.

### 5.3.1.1 User

Table 5.16: Reliability Test Case Table Confession Submission.

| <b>Module Name:</b> Confession Submission                                                                       |                              |                                                          |                         |                                   |               |        |                  |                                    |
|-----------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------|-------------------------|-----------------------------------|---------------|--------|------------------|------------------------------------|
| <b>Test Case Description:</b> Verify that the system can consistently accept valid confessions without failure. |                              |                                                          |                         |                                   |               |        |                  |                                    |
| <b>Testing Objective:</b> To ensure the feature remains stable and performs reliably under repeated use.        |                              |                                                          |                         |                                   |               |        |                  |                                    |
| <b>Remarks:</b> Repeated 3 times with same steps under normal network conditions.                               |                              |                                                          |                         |                                   |               |        |                  |                                    |
| Test Case ID                                                                                                    | Test Scenario                | Test Steps                                               | Test Data               | Expected Result                   | Actual Result | Status | Severity Failure | Notes                              |
| RT-001                                                                                                          | Submit confession repeatedly | 1. Login<br>2. Submit a valid confession<br>3. Repeat 3x | 'Today was a hard day.' | Confession is accepted every time | As expected   | Pass   | High             | Reliable under repeated submission |

Table 5.17: Reliability Test Case Table for Article Viewing.

| <b>Module Name:</b> Article Viewing<br><b>Test Case Description:</b> Check if the article section loads consistently<br><b>Testing Objective:</b> Ensure the article module does not crash or fail intermittently<br><b>Remarks:</b> Tested over 3 consecutive attempts on different articles. |                          |                                                              |                            |                                    |               |        |                  |                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------|----------------------------|------------------------------------|---------------|--------|------------------|------------------------|
| Test Case ID                                                                                                                                                                                                                                                                                   | Test Scenario            | Test Steps                                                   | Test Data                  | Expected Result                    | Actual Result | Status | Severity Failure | Notes                  |
| RT-002                                                                                                                                                                                                                                                                                         | Repeated article viewing | 1. Go to Article Page<br>2. Click on article<br>3. Repeat 3x | 'Managing Anxiety' article | The article loads fully every time | As expected   | Pass   | Medium           | No load delay or error |

Table 5.18: Reliability Test Case Table Comment Feature.

| <b>Module Name:</b> Comment Feature<br><b>Test Case Description:</b> Assess reliability of posting comments under repeated usage<br><b>Testing Objective:</b> Ensure stability and no content duplication or delay<br><b>Remarks:</b> Tested under various times with consistent network |                        |                                                               |                       |                                          |               |        |                  |                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------------------------------------------------|-----------------------|------------------------------------------|---------------|--------|------------------|--------------------------|
| Test Case ID                                                                                                                                                                                                                                                                             | Test Scenario          | Test Steps                                                    | Test Data             | Expected Result                          | Actual Result | Status | Severity Failure | Notes                    |
| RT-004                                                                                                                                                                                                                                                                                   | Post multiple comments | 1. Click 'Show thread'<br>2. Submit a comment<br>3. Repeat 3x | 'Thanks for sharing!' | Comment is posted immediately every time | As expected   | Pass   | Medium           | No duplication or UI lag |

### 5.3.1.2 Admin

Table 5.19: Reliability Test Case Table for Admin Login.

| <b>Module Name:</b> Admin Login<br><b>Test Case Description:</b> Validate system behavior after multiple sequential logins<br><b>Testing Objective:</b> Confirm system stability with repeated admin authentication<br><b>Remarks:</b> Includes login-logout cycles |                               |                                                                |                                                                   |                                                       |               |        |                  |                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------|---------------|--------|------------------|-----------------------------|
| Test Case ID                                                                                                                                                                                                                                                        | Test Scenario                 | Test Steps                                                     | Test Data                                                         | Expected Result                                       | Actual Result | Status | Severity Failure | Notes                       |
| RT-003                                                                                                                                                                                                                                                              | Admin multiple login attempts | 1. Login with correct credentials<br>2. Logout<br>3. Repeat 3x | <b>Email:</b> admin@siswa.unimas.my<br><b>Password:</b> Admin@123 | Log in and log out functions work properly every time | As expected   | Pass   | High             | No session error or lockout |

### 5.3.2 User Acceptance Testing

User Acceptance Testing (UAT) is the final phase in the testing process where actual end-users interact with the system to validate whether it meets their needs and expectations. UAT is essential to determine if the system performs its intended functions in a real-world scenario, ensuring it aligns with user requirements and provides a satisfactory user experience. For this project, UAT was conducted with ten participants, consists of six females and four males. The majority (80%) were aged between 21–23, while 20% were aged 27 and above. The evaluation focused on key areas such as functionality, usability and interface, performance, and overall satisfaction, including feedback for potential improvements.

#### 5.3.2.1 Analysis on User Acceptance Survey

##### Functionality

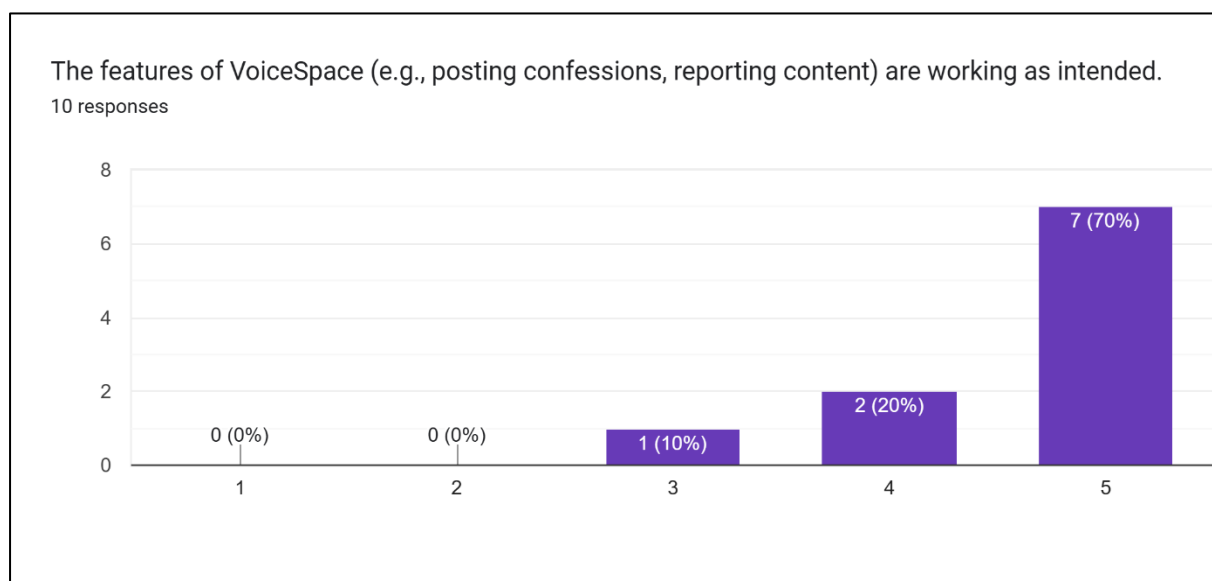


Figure 5.1: Question regarding feature functionality in VoiceSpace.

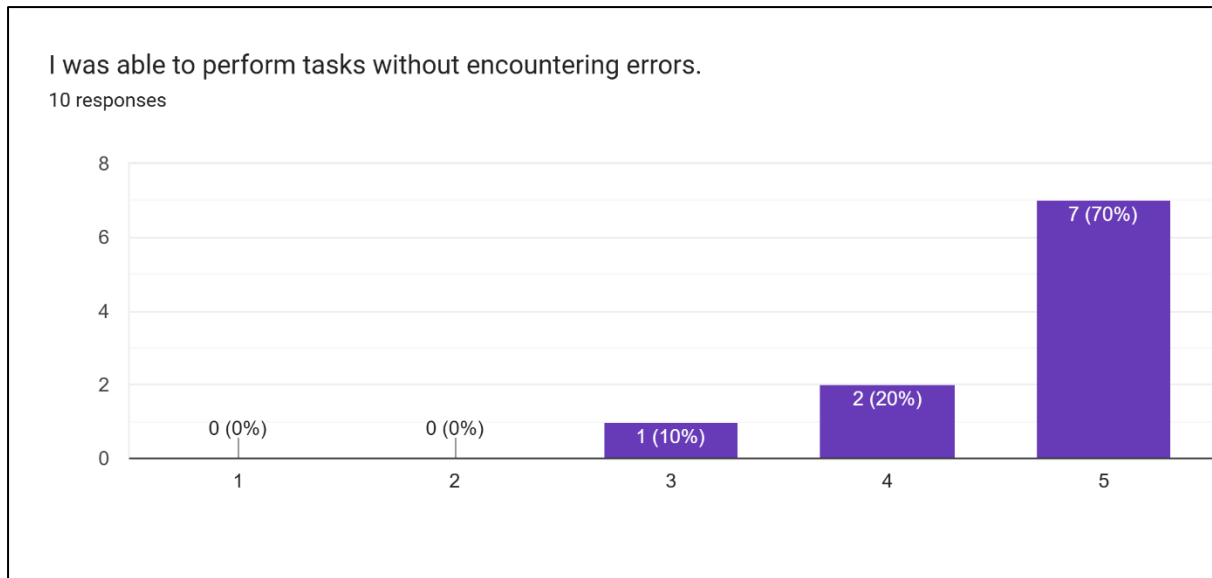


Figure 5.2: Questions regarding error-free functionality in VoiceSpace.

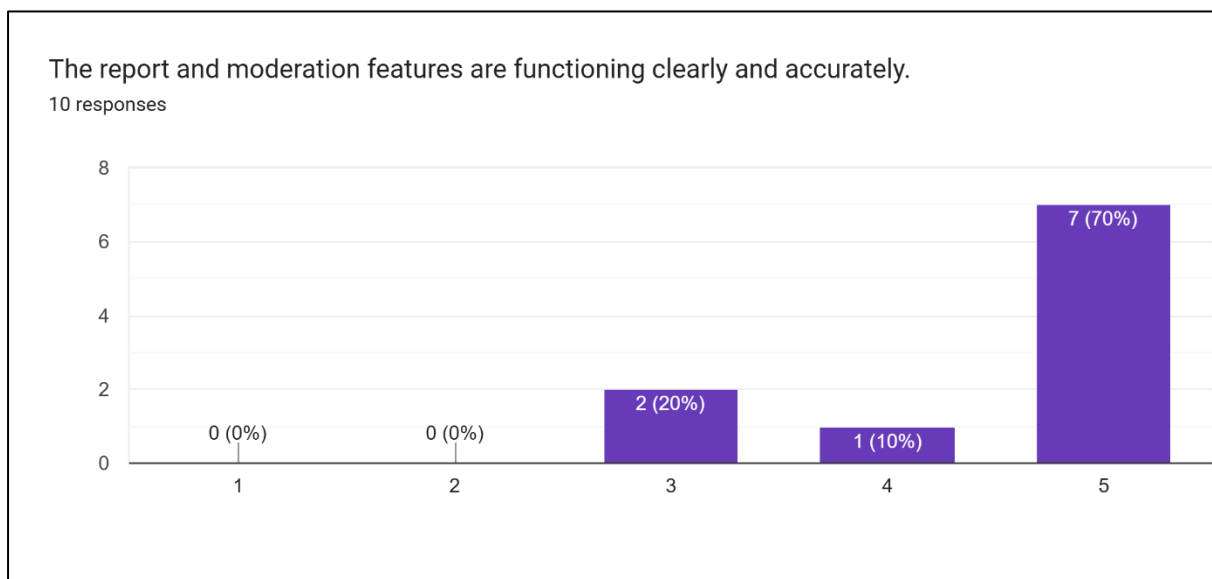


Figure 5.3: Question regarding functionality of reporting and content moderation.

Based on Figure 5.1-5.3, the functionality section asked users about how well the system performs its intended tasks. The responses indicated a high level of satisfaction, with most users agreeing or strongly agreeing that:

- The system functions correctly
- It meets the intended purpose

- It operates without critical bugs

This suggests that the core features of the system such as confession, polling, reporting, and article modules were implemented correctly and met user expectations.

## Usability and Interface

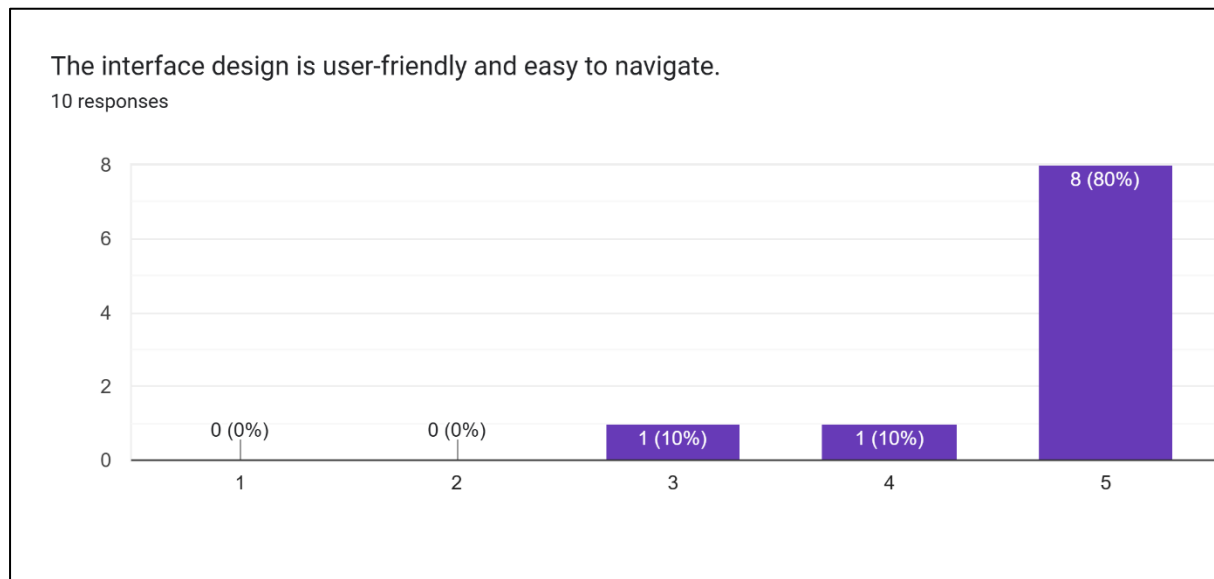


Figure 5.4: Question regarding interface usability and navigation.

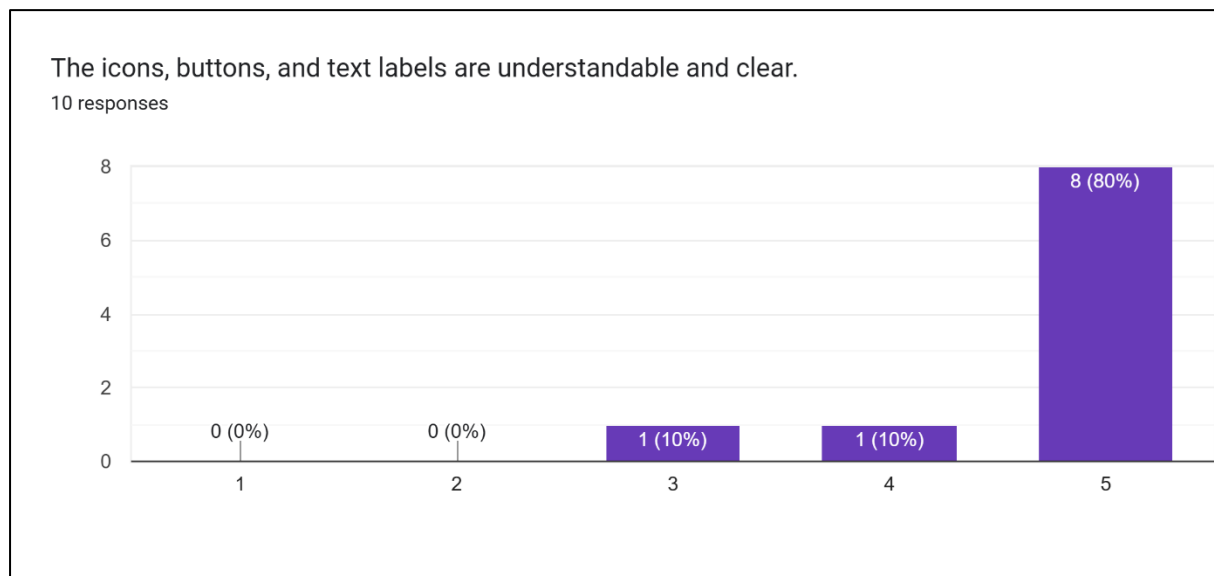


Figure 5.5: Question regarding clarity of icons, buttons, and label.

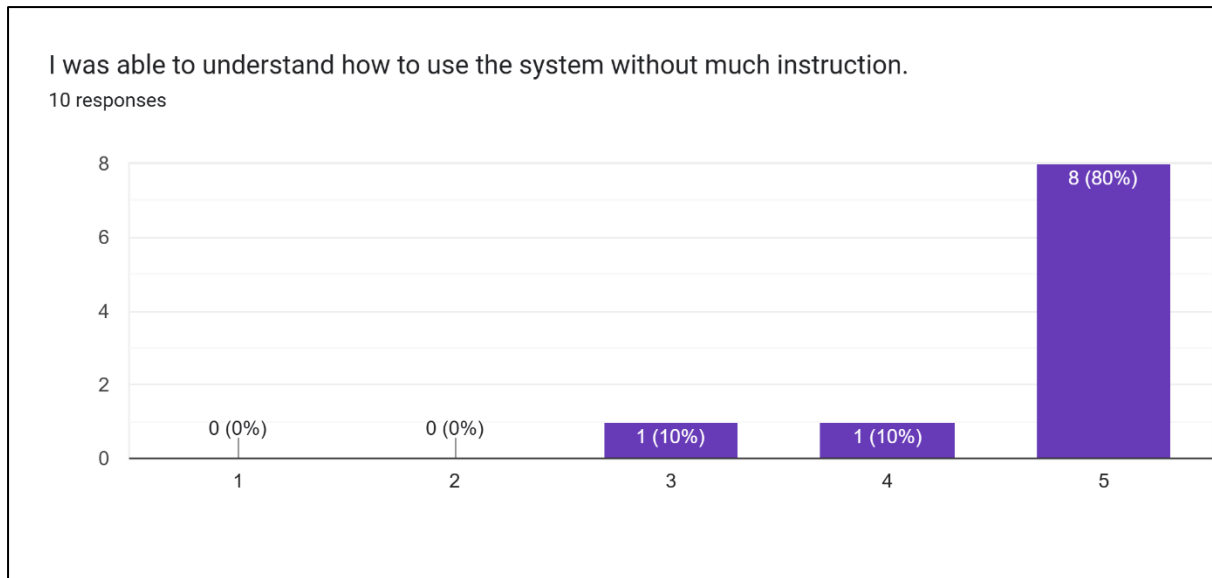


Figure 5.6: Question regarding ease of understanding without instruction.

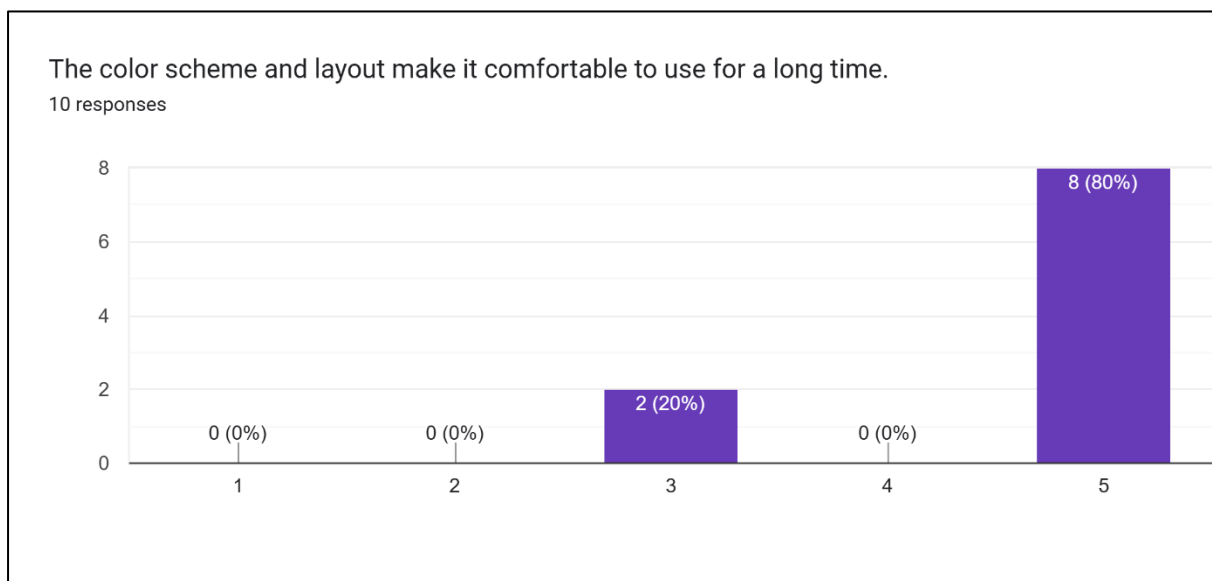
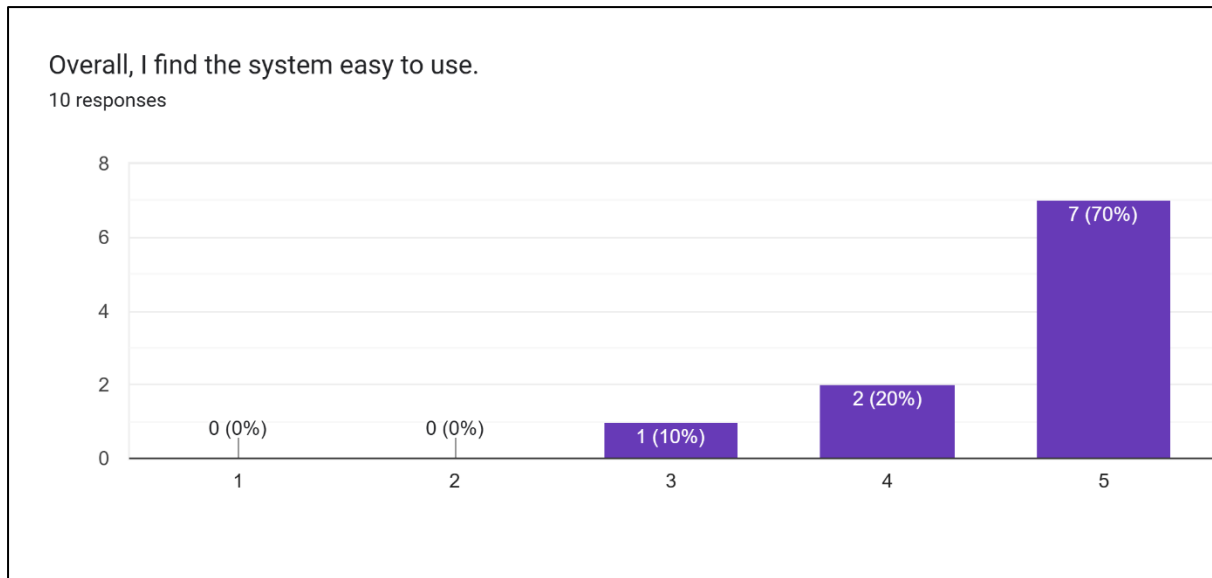


Figure 5.7: Question regarding comfort of color scheme and layout.



*Figure 5.8: Question regarding overall ease of use.*

Based on Figure 5.4 – 5.8, this part evaluated the user-friendliness of the system. Users rated aspects such as:

- Ease of navigation
- Clarity of buttons and labels
- Aesthetic and interface design

The majority of users found the system easy to use and visually appealing, showing that the interface design was intuitive. Only minor improvements may be needed in terms of visual enhancements or label clarity.

## Performance

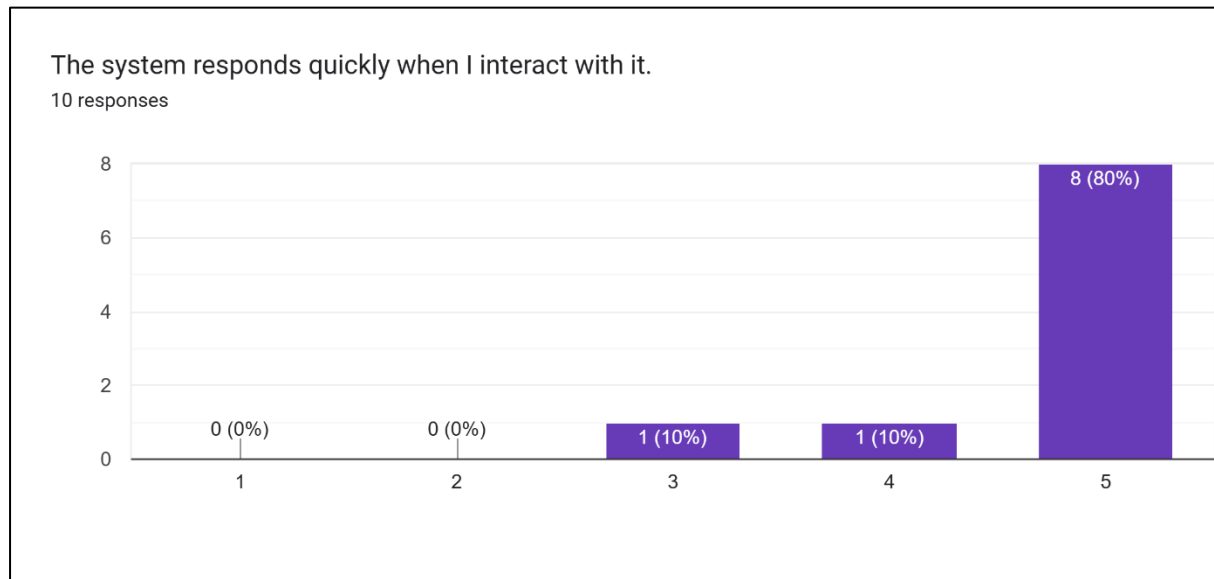


Figure 5.9: Question regarding system responsiveness during interaction.

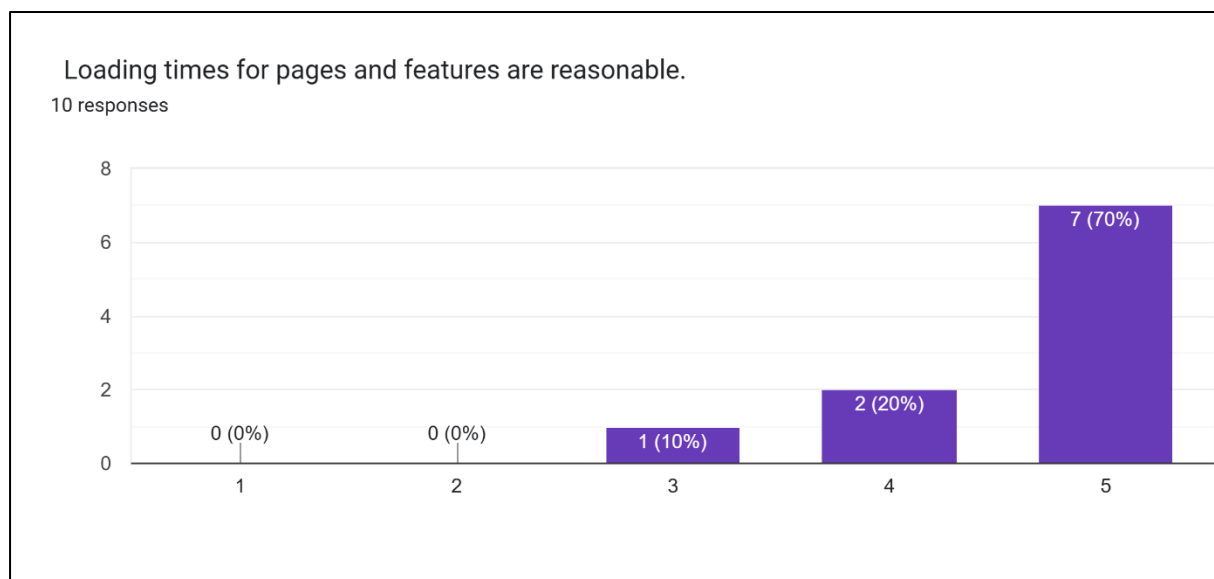


Figure 5.10: Question regarding page and feature loading times.

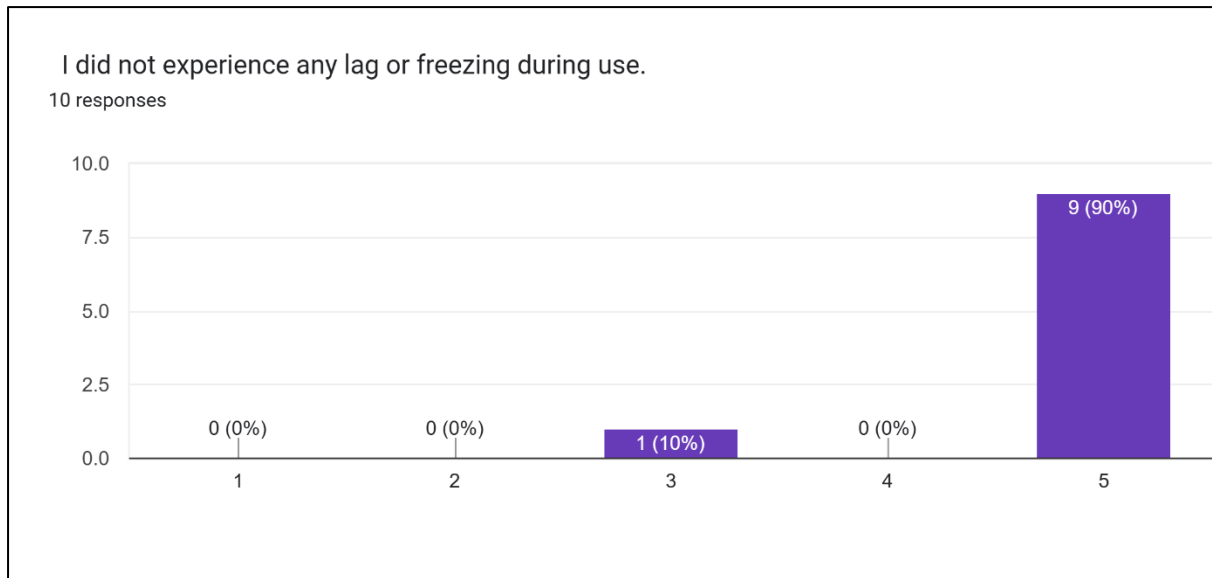


Figure 5.11: Question regarding system stability without lag or freezing.

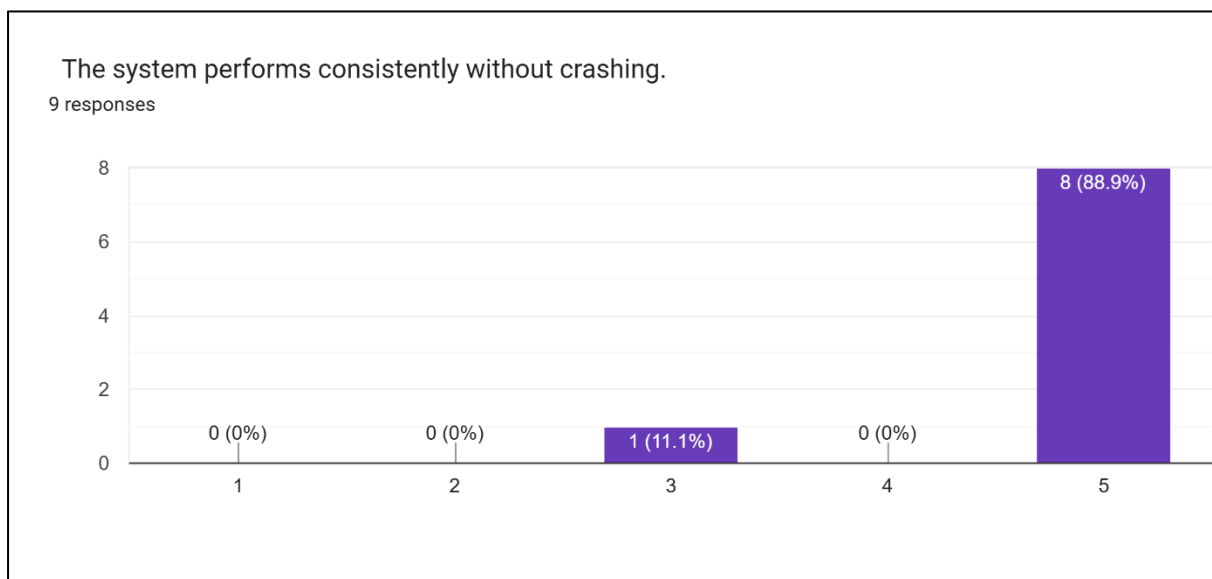


Figure 5.12: Question regarding consistent performance without crashes.

Based on Figure 5.9 - 5.12, users rated the speed, responsiveness, and reliability of the system. The results showed that:

- Most users found the system performance to be fast
- No major delays or crashes were reported

This indicates that the system is optimized for performance, which is especially important for real-time features like confessions and polling.

## Feedback and Recommendations

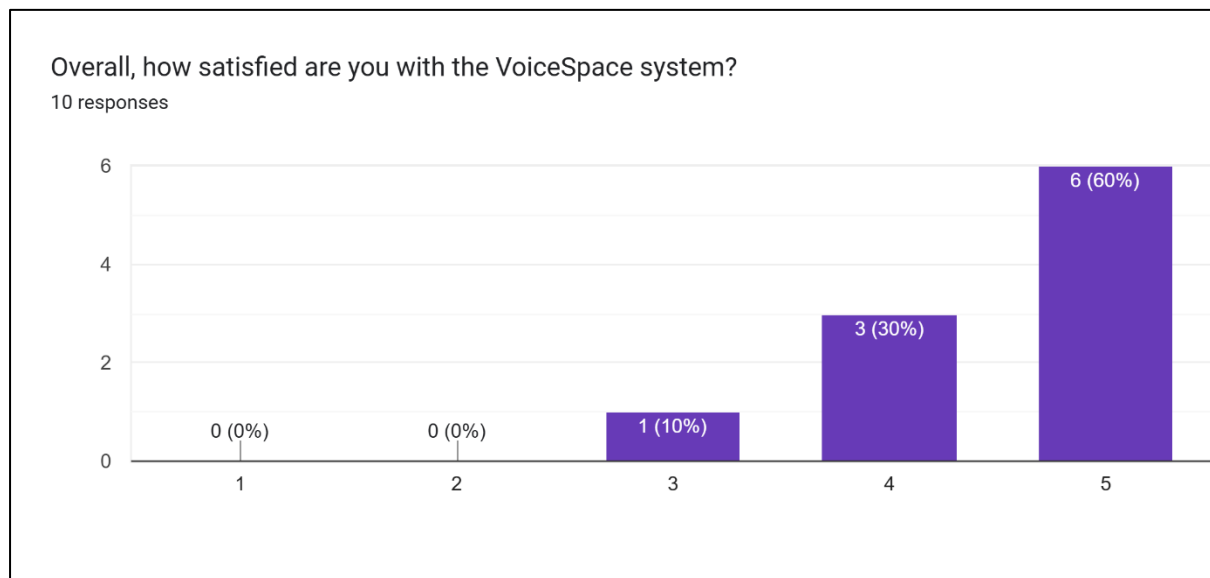


Figure 5.13: Question regarding overall user satisfaction with Voicespace.

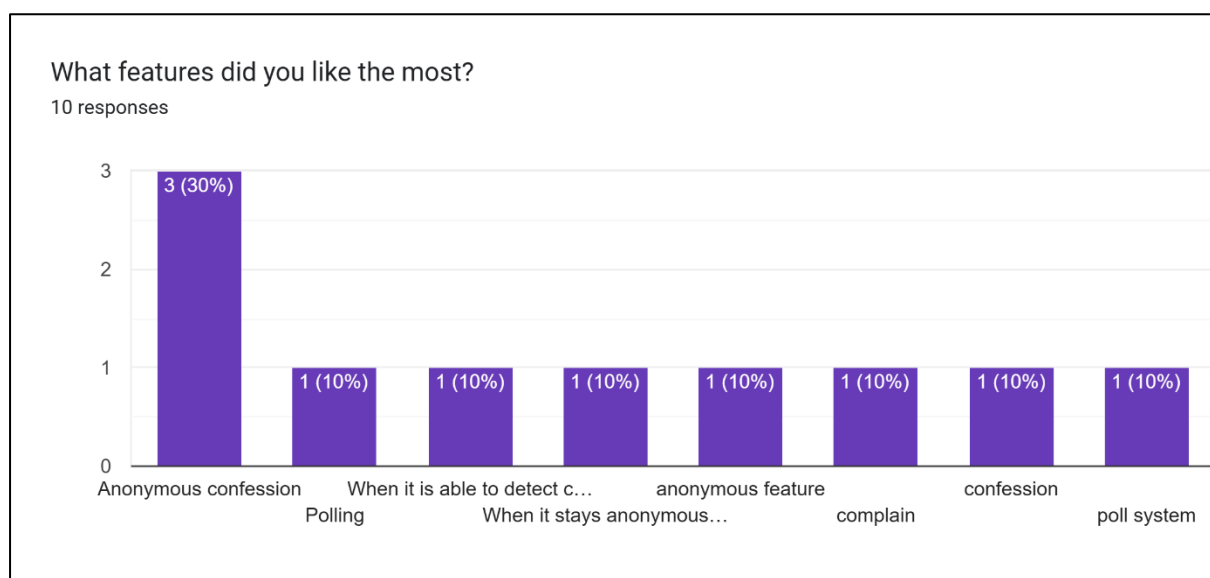


Figure 5.14: Question regarding willingness to recommend the system.

100% of users stated they would recommend the system to others, showing strong user satisfaction. From the open-ended suggestions, users provided a variety of suggestions for improvement, such as:

- Notification system for approvals and interactions
- Option to upload images/videos with confessions
- Adding article publishing features
- Expanding poll options
- AI integration for enhanced features

These suggestions show that while the core system is solid, users are interested in more interactive and dynamic features that could increase engagement.

#### **5.4 Discussion on Results**

The UAT results demonstrate that the system successfully met user expectations across all major areas. Functionality was robust, and users encountered no critical issues. Usability and interface design were well-received, indicating the system was accessible even to first-time users. Performance testing yielded positive responses regarding speed and stability. Additionally, the feedback collected points to opportunities for future enhancements, especially in terms of interactivity and user engagement features. This user-centered validation is crucial for confirming the system's readiness for deployment and for guiding future development iterations.

#### **5.5 Summary**

In conclusion, the UAT conducted with ten participants showed overwhelmingly positive responses regarding the functionality, usability, and performance of the system. All participants stated they would recommend the system, indicating high user satisfaction. Minor suggestions for improvement were noted, focusing mainly on enhanced interactivity and notification

systems. The feedback confirms that the system is effective and user-friendly, with room for growth through future feature expansions.

## CHAPTER 6: CONCLUSION AND FUTURE WORKS

### 6.1 Introduction

This chapter evaluates and wraps up the entire project. An analysis of the developed system's result is also presented to see if it fulfils the project's objectives. This chapter also reveals the project's limitations, which may lead to future work to expand the project.

### 6.2 Objectives and Achievements

The main objective of this project was to design and develop an anonymous web-based platform, VoiceSpace, for UNIMAS students to share confessions in a secure and safe environment. The goal has been successfully achieved through the implementation of key modules including anonymous posting, secure login and registration, moderation, and user interaction features. The achievements aligned with the supporting objectives are as follows:

*Table 6.1: Objectives and Achievemets.*

| Objective                                                                                                                                         | Achievement                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| To ensure all content is free from harmful language, sexual harassment, and bullying through active moderation by administrators.                 | This was successfully achieved through a manual moderation system, where each confession and poll must be reviewed by the admin before being published. Admins can approve, reject, or flag feedback for follow-up. |
| To promote mental health awareness by providing a mental health article section and offering easy access to professional counsellors when needed. | This objective was fulfilled by integrating a mental health resource page that features weekly articles, and a practitioner page listing counsellor details such as names, emails, phone numbers, and office hours. |
| To foster user interaction through upvoting, commenting, and polling features while maintaining anonymity.                                        | These interaction features were implemented as intended. Users can upvote/downvote posts and polls, comment on confessions, and participate in real-time polls without revealing their identities.                  |

|                                                                                                                                  |                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| To safeguard user privacy with robust security measures by implementing data anonymization and secure authentication mechanisms. | This was addressed through secure one-time email verification (restricted to @siswa.unimas.my), and password requirements that meet modern security standards. No personal data is stored or exposed. |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 6.3 Project Limitations and Constraints

Although the system has met its core objectives, there are several limitations and constraints that should be noted:

- The system lacks a ‘Forgot Password’ feature, which may affect user access if credentials are lost.
- Bad words are hardcoded into the database rather than detected through an intelligent filtering system.
- Admins cannot automatically contact departments when feedback is flagged such as complaints about university facilities like Kolej Bunga Raya. Manual outreach is required.
- When viewing reported confessions or polls, admins cannot directly view the report details and must instead navigate back and forth between pages.
- Users are currently unable to upload images, videos, audio files, or any form of multimedia content.
- The system does not support emojis, stickers, or GIFs.
- There is no activity history feature where users cannot see their previous posts, likes, or comments.
- Confessions cannot be saved, reposted, or shared on social media.
- There is no notification system to inform users when their post receives a like or comment.

These constraints primarily stem from design decisions prioritizing simplicity and manual moderation, but they present opportunities for future system enhancements.

## 6.4 Future Works

To address the limitations identified in this project and enhance user experience, the following future improvements are recommended:

- Implement a 'Forgot Password' recovery mechanism.
- Replace hardcoded bad word filtering with AI/NLP-based content detection.
- Enhance the admin interface to allow direct access to reported content and to streamline the review process.
- Allow uploading of multimedia content (images, audio, video) with proper moderation tools.
- Add support for emojis, GIFs, and stickers to increase expressiveness.
- Create a user dashboard where users can view their previous posts, likes, and comments.
- Enable users to save or bookmark their favorite confessions.
- Introduce features to repost or share confessions.
- Add a notification system to alert users when someone likes or replies to their content.
- Allow integration with social media for anonymous sharing of confessions (optional and controlled).

## 6.5 Conclusion

This project successfully delivered VoiceSpace, a web-based anonymous confession system aimed at UNIMAS students. The system allows for secure, anonymous interaction through confessions and polls, while also supporting mental health awareness through articles and counsellor listings. Key features like upvoting, commenting, and admin moderation help maintain a safe and engaging environment. Although there are functional

limitations, the system lays a strong foundation for future development. With further enhancements, VoiceSpace has the potential to become a valuable digital space that supports emotional expression, feedback, and connection among the student community

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## Appendices

### Appendix A

#### Sample Questionnaire

Link of the Survey Form: <https://forms.gle/Ejsixb8J7dNSJPrz6>

#### Final Year Project Survey: VoiceSpace - Anonymous Student Confessions Platform

Dear respected respondents,

My name is Syamimi Binti Supian, and I am currently in my final year as an undergraduate student specializing in Software Engineering at Universiti Malaysia Sarawak (UNIMAS). As part of my Final Year Project, I am conducting a survey to gather valuable insights and feedback for the development of *VoiceSpace*, a platform for anonymous student confessions.

This platform aims to provide students with a safe space to express themselves anonymously, with features such as AI-powered moderation, sentiment analysis, and integration with mental health support systems. Your responses will help refine the design and functionality of this system.

Rest assured, your responses will be kept confidential and exclusively used for academic purposes. Should you have any questions, feel free to contact me at [78553@siswa.unimas.my](mailto:78553@siswa.unimas.my) or 0198530409.

Thank you for your time and cooperation!

Warm Regards,

Syamimi Binti Supian

#### Section A: Demographic Questions

Which faculty are you from? \*

- ☐ Faculty of Applied and Creative Arts (FACA)
- ☐ Faculty of Cognitive Sciences and Human Development (FCSHD)
- ☐ Faculty of Computer Science and Information Technology (FCSIT)
- ☐ Faculty of Economics and Business (FEB)
- ☐ Faculty of Engineering (FENG)
- ☐ Faculty of Medicine and Health Sciences (FMHS)
- ☐ Faculty of Resource Science and Technology (FRST)
- ☐ Faculty of Social Sciences and Humanities (FSSH)
- ☐ Faculty of Built Environment (FBE)
- ☐ Faculty of Education, Language and Communication (FELC)
- ☐ Centre For Pre-University Studies (PPPU)
- ☐ Other: \_\_\_\_\_

Age \*

- ☐ 18-20
- ☐ 21-23
- ☐ 24-26
- ☐ 27 and above

Have you used online platforms for anonymous confessions before? \*

- ☐ Yes
- ☐ No

What is your current year of study? \*

- ☐ Pre-university (Foundation/Asasi)
- ☐ Year 1
- ☐ Year 2
- ☐ Year 3
- ☐ Year 4
- ☐ Post-Graduate (Masters or PHD)

Gender \*

- ☐ Male
- ☐ Female

Are you a student at UNIMAS? \*

- ☐ Yes
- ☐ No

Section B: Feedback on features

Would you use a platform like VoiceSpace to express your thoughts anonymously?

☐ Yes
☐ No

What improvements would you like to see in an anonymous confession platform? (Select all that apply)

☐ Better AI moderation to avoid inappropriate content
☐ Faster response times for reports
☐ More interactive features (e.g., live chats, Q&A sessions)
☐ More personalized user experiences (e.g., filters, tags)
☐ Integration with mental health professionals or services
☐ Other:

What type of content would you most likely share on such a platform? (Select all that apply)

☐ Personal confessions
☐ Complaints about university-related issues
☐ Mental health-related concerns
☐ Academic or study challenges
☐ Social or relationship concerns
☐ Other:

What factors would motivate you to use VoiceSpace? (Select all that apply)

☐ Ease of use
☐ Full anonymity
☐ User-friendly design
☐ Other:

What features would make you feel safer using VoiceSpace? (Select all that apply)

☐ Stronger moderation of content
☐ Ability to block or report harmful users
☐ Visible guidelines and policies
☐ Real-time mental health support resources
☐ Anonymous but verified user accounts

How often would you use a platform like VoiceSpace?

☐ Daily
☐ A few times a week
☐ A few times a month
☐ Rarely
☐ Never

Do you believe a platform like VoiceSpace could positively impact student well-being?

☐ Yes
☐ No
☐ Maybe

What concerns, if any, do you have about using an anonymous platform? (Select all that apply)

☐ Privacy and data security
☐ Risk of harmful content
☐ Lack of meaningful discussions
☐ Potential for misuse by users
☐ Other:

How important is privacy and data security in a platform like VoiceSpace?

12345

Not important at all
☐
☐
☐
☐
☐
Extremely important

Which features of an anonymous confession platform do you find important? (Select all that apply)

☐ Anonymous posting
☐ AI-powered moderation for harmful content
☐ Sentiment analysis for emotional well-being
☐ Upvote/downvote system
☐ Comment threads for discussions
☐ Mental health support integration
☐ Polling and voting
☐ Community guidelines and reporting system

How would you rate the importance of community guidelines on the platform?

12345

Not important at all
☐
☐
☐
☐
☐
Very important

### Section C: Usability and Design Preferences

Would you prefer the platform to include tutorials or guidelines for first-time users? \*

☐ Yes
 ☐ No

What is the ideal response time for moderation on anonymous platforms like VoiceSpace? \*

☐ Within 5 minutes  
☐ Within 30 minutes  
☐ Within 1 hour  
☐ Same day  
☐ Response time is not a concern

How likely are you to recommend VoiceSpace to others? \*

1      2      3      4      5  
 Extremely unlikely    ☐    ☐    ☐    ☐    ☐    Extremely likely

How important is real-time feedback on your posts or confessions? \*

1      2      3      4      5  
 Not important at all    ☐    ☐    ☐    ☐    ☐    Extremely important

What type of notifications would you find useful on this platform? (Select all that apply) \*

☐ Alerts for new comments on your confession  
☐ Trending confessions  
☐ Notifications about reported content  
☐ Announcements from the university  
☐ Other: \_\_\_\_\_

What features do you think would improve the usability of VoiceSpace? (Select all that apply) \*

☐ Advanced filters for confessions (e.g., by category or topic)  
☐ Dark mode for better readability  
☐ Personalized recommendations based on user activity  
☐ Quick access to mental health support resources  
☐ Clear and accessible reporting guidelines  
☐ Other: \_\_\_\_\_

Would you prefer customizable profiles (e.g., avatars, themes) while remaining anonymous? \*

☐ Yes  
☐ No

Do you think integrating gamification elements, such as badges or rewards for participation, would enhance the platform's appeal? \*

☐ Yes  
☐ No  
☐ Maybe

What type of user interface do you prefer for such a platform? \*

☐ Simple and minimalist  
☐ Interactive and colorful  
☐ Professional and formal

How frequently would you use the platform to post or engage with confessions? \*

☐ Daily  
☐ A few times a week  
☐ Weekly  
☐ Occasionally  
☐ Rarely

### Section D: Additional feedback

Do you have any suggestions to improve the platform's features? \*

Your answer \_\_\_\_\_

Do you believe integrating mental health resources into this platform is useful? \*  
Why or why not?

Your answer \_\_\_\_\_

What concern would you have about using such a platform? \*

Your answer \_\_\_\_\_

## Appendix B

### Sample Questionnaire

Link of the Survey Form: <https://forms.gle/2A9JbQR5jJ1cvu4j9>

## Final Year Project Evaluation on Usability Testing for VoiceSpace

**B** *I* U ↺ ✕

Dear respected respondents,

My name is Syamimi Binti Supian and I am currently in my final year as an undergraduate student specializing in Software Engineering at Universiti Malaysia Sarawak (UNIMAS). As part of my Final Year Project, I am conducting a survey to gather valuable insights and feedback for the development of VoiceSpace, a platform for anonymous student confessions.

This platform aims to provide students with a safe space to express themselves anonymously, with features such as AI-powered moderation, sentiment analysis, and integration with mental health support systems. Your responses will help refine the design and functionality of this system.

Rest assured, your responses will be kept confidential and exclusively used for academic purposes. Should you have any questions, feel free to contact me at 78553@siswa.unimas.my or 0198530409.

Thank you for your time and cooperation!

Warm Regards,  
Syamimi Binti Supian

### User Demographics

Age \*

- ☐ 18-20
- ☐ 21-23
- ☐ 24-26
- ☐ 27 and above

Gender \*

- ☐ Male
- ☐ Female

### Functionality

The features of VoiceSpace (e.g., posting confessions, reporting content) are working as intended. \*

- |                   |                       |                       |                       |                       |                       |                |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
|                   | 1                     | 2                     | 3                     | 4                     | 5                     |                |
| Strongly Disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly Agree |

I was able to perform tasks without encountering errors. \*

- |                   |                       |                       |                       |                       |                       |                |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
|                   | 1                     | 2                     | 3                     | 4                     | 5                     |                |
| Strongly Disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly Agree |

The report and moderation features are functioning clearly and accurately. \*

- |                   |                       |                       |                       |                       |                       |                |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
|                   | 1                     | 2                     | 3                     | 4                     | 5                     |                |
| Strongly Disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly Agree |

#### Usability and Interface

The interface design is user-friendly and easy to navigate. \*

|                   | 1                     | 2                     | 3                     | 4                     | 5                     |                |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly Disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly Agree |

The icons, buttons, and text labels are understandable and clear. \*

|                   | 1                     | 2                     | 3                     | 4                     | 5                     |                |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly Disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly Agree |

I was able to understand how to use the system without much instruction. \*

|                   | 1                     | 2                     | 3                     | 4                     | 5                     |                |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly Disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly Agree |

The color scheme and layout make it comfortable to use for a long time. \*

|                   | 1                     | 2                     | 3                     | 4                     | 5                     |                |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly Disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly Agree |

Overall, I find the system easy to use. \*

|                   | 1                     | 2                     | 3                     | 4                     | 5                     |                |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly Disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly Agree |

#### Performance

The system responds quickly when I interact with it. \*

|                   | 1                     | 2                     | 3                     | 4                     | 5                     |                |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly Disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly Agree |

Loading times for pages and features are reasonable. \*

|                   | 1                     | 2                     | 3                     | 4                     | 5                     |                |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly Disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly Agree |

I did not experience any lag or freezing during use. \*

|                   | 1                     | 2                     | 3                     | 4                     | 5                     |                |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly Disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly Agree |

The system performs consistently without crashing.

|                   | 1                     | 2                     | 3                     | 4                     | 5                     |                |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly Disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly Agree |

Feedback and Recommendations

Overall, how satisfied are you with the VoiceSpace system? \*

12345

Very DissatisfiedVery Satisfied

Would you recommend this system to others? \*

☐ Yes

☐ No

☐ Maybe

What features did you like the most? \*

Your answer

Do you have any suggestions for improvement? \*

Your answer