



## Acknowledgement

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## About The Author

Lim Pei Ern is an undergraduate student study at INTI International University with Bachelor of Computer Science degree. The author had taken the Final Year Project as challenge to show what she had learnt from these 3 years in the university. The idea of this Final Year Project came into her mind when she was browsing on social media and saw a lot of offensive content on it and thought, why there's isn't a tool that filter all these and make the online community cleaner and better? Thus, the proposed project is the end product of the idea.

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## Chapter 1: Introduction

### 1.0 Overview

#### **Study and implementation of content analytics system on social media to discover cyberbullying intentions.**

In this era of the 20<sup>th</sup> century, people were flooded with massively distributed information. There are more and more types of social media developed and being used by public causing the enormous information being seen or shared in our daily life to the public.

The social media has done more cons than pros to the public and most of the people do not realize that they were affected. People had been spending more and more time on the social media whenever they have the free time even tiny little time between one task and another. They are obsessed with social media, they fight and debate with the community, they find new friends over the internet cable, they spend days and night checking all the news feed without realizing that they are wasting their time.

The rise of social media had caused a lot of social problem in the society, one of the most significant is cyberbully. There was no ‘cyberbully’ in the dictionary, in fact, it was the word that invented and being used ever since the existence of social media. Cyberbully happened when someone is offended or feeling hurt when another person or group of persons posted something through social media or communication platform such as a message. Due to the law of freedom of speech in social media, people are not aware the power of language, they post and comment whatever they want to express without thinking the actual consequences. This situation had to be under control and stopped these people from hurting other people by using words to bully others no matter it is intentionally or unintentionally because this might lead a lot of negative effect to the victim.

To fight with cyberbullying and prevent it, the best option is detected it before the case becomes bigger. The proposed project is a project that aimed to discover any cyber bullying or cyberbullying intentions on the social media. The proposed project will be able to extract posts data from social media, filtering them by keywords and analyze the captured data. The discovered posts data shall be stored as a record and the proposed project will send a notification to the user of the proposed project. Several API (Application Programming Interface) and Language Understanding Intelligence System (LUIS) shall be used in the proposed project.

The proposed project shall be able to detect more cyberbullying cases on the social media so that the user of proposed project will be able to help more victim of the social media and at the same time expand their help coverage to the victim.

## 1.1 Problem Statement

Social media had a very high standing today. People literally couldn't live without any social media because it is not only for entertainment anymore, it slowly enters the work, school and many more aspect. For example, in a company, any big announcement will be made to the bulletin board in the office. However, nowadays instead of printing the news out and paste it on the bulletin board, people rather post it over the social media or private group they have specifically for a company employee. Same with school, the teacher may have posted any homework or important news over the private group and student also treats the social media as a platform that interacts with the teacher. No one can doubt that the social media had made people's life easier and convenient from every aspect.

Many businesses also start to advertise their products over the social media instead of using the traditional way which is advertised through television or newspaper. The social media had invaded in every aspect of human life. One must have an account in any mainstream social media, not only they will have their news late or never, but they will also miss any important announcement or information if they do not have a social media account. The one will be left behind because they will not have any updated news and information since most of the information is now being spread over the social media only.

Since everyone is on the social media now, the interaction shall be conduct over the social media now. However, the interaction between one human and another always involve conflict. The conflict and misunderstanding may cause cyberbully – one of the most significant problem causing by the social media now. The freedom of speech not only apply to real life but it also somehow applied to the internet especially social media. A lot of people post or share not only their private life but their opinion about everything on the social media, and sometimes that can cause harm to another individual. Many typed their words without even thinking what will the words caused, they do not care about the consequences because they think this is internet, everyone is behind an account where no one knows this is true or not, so they are able to post anything they want to the public and fear no the effect that it will make.

That individual that harmed by the content posted by another individual is the victim of cyberbully. Cyberbully can lead to low self-esteem and tons of social problem to the victim. The case of cyberbully mostly occurred under the age of a teenager and young adult. The reason being this is because teenager and young adult are at the age of impulsive and immature. They took everything too important and did not learn how to cope with certain social problems and therefore they express their feelings to the social media without thinking this might hurt the other person. Young age is often doing before they think, some of them do not care about the consequences.

Cyberbully is a big problem to the society and it was affecting many teenagers and young adult. The situation must be under control and being stopped.

## **1.2 Project Objective**

1. Study on text analytics and data mining technology.
2. Identify offensive language on social media using fact-finding technique.
3. Develop a content analytics prototype to discover cyberbully intentions on social media.

## **1.3 Project Scope**

The proposed project shall be able to collect public posts from the social media site. After this, the proposed project will understand and analyze the posts content to discover the intentions beneath the posts by using the text analytics technology. The proposed project will store the identified cyberbullying intentions posts data into a database for the tracking purposes by the user of proposed project. The proposed project will send an alert to the user of the proposed project so they can take the actions afterward. The proposed project will display the record data to the user and let the user check on it.

## **1.4 Project Limitation**

The proposed project will focus only on the text-based posts on the social media and will limit to only English language for the text-based posts. The proposed project will also only focus on one social media site as a platform and limit to a certain region on the social media which is only the posts that made to the public. The proposed project will not have direct actions taken to the identified posts other than storing its data into a database and notified the user of the proposed project upon to the discovery.

## 1.5 Project Methodology

### Research Methodology

#### 1.1.1 Questionnaire

The questionnaire will be used as a research methodology because the author will be able to gather certain information from the crowds. For example, the author will prepare a set of questions regarding the issues of cyberbullying and the opinions of the public. The online questionnaire will be in the consideration of a way of conducting the questionnaire because it is more efficient and cost effective than the physical paper questionnaire since nowadays people are writing less than typing.

#### 1.1.2 Documentation Research

Documentation research will be used as another research methodology because an official document from the social media site needs to be reviewed before the author can collect any data from the site. Other than an official document, the certified journal articles and books will also need to be reviewed because previous research had been done to the similar issues and system such as the cyberbullying issues on the social media site.

#### 1.1.3 Interview

The interview will be used as another research methodology because the author needs to gather information from certain people such as psychologist or counselors to get their knowledge and opinions regarding the cyberbullying issues on the social media site. The author will also interview the potential target user of the proposed project such as the NGO (Non-Government Organization) of anti-cyberbullying to gather the knowledge and opinions of them towards the proposed project.

### Development Methodology

#### 1.1.4 Rapid Application Development (RAD)

RAD will be used as the development methodology in the proposed project. RAD is a type of methodology that involves rapid prototyping but only minimal of planning. The author will focus on obtaining the requirement through research, then iteratively run through the prototype and do the early testing. After that continue to reuse of prototype, continuous integration and thus achieve rapid delivery. The advantages of RAD is it can adapt to any changes occur in the middle of development faster and easier because the developer will work on the reusable prototype more than the planning.

The Life Cycle of RAD are shown as below in Figure 1:

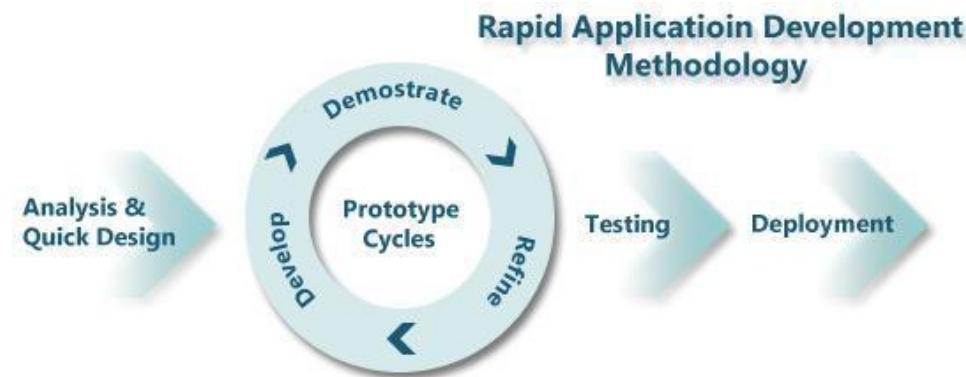


Figure 1.1 RAD Methodology (Ramsoft Consulting, 2017)

## 1.6 Target Audience

The target audience of the proposed project shall be the counselors or psychologists who want to help more victim on the cyberbullying issues. Another target audience of the proposed project will be the member of the Anti-Cyberbullying NGO (Non-Government Organization) such as ETCB (End to Cyber Bullying) to expand their help coverage to the victim of the cyberbullying. ETCB is an NGO that located in New York, USA and founded in 2011, the mission of ETCB is to raise awareness with try to provide cyberbullying information and take efforts to end the cyberbullying (End to Cyber Bullying Organization, 2011).

Other than NGO, the potential target audience can be general user too. Anyone can used the proposed project with a purpose. One of the example will be social media site itself. The social media platform could use the proposed project to filter their community and make the community cleaner and better.

These target audience will be able to review the posts and will be able to contact the victim or his/her parents or close friends after the identification of the victim to avoid further damage done to the victim.

## 1.7 Summary

The proposed project had been described clearly in this documentation by the author. The proposed project is a content analytic system that aimed to discover cyberbully intentions underneath the public text posts published on social media site. The proposed project shall help the society to discover more cyberbully cases actively and instead of waiting for victim approach for help, the counselors or NGOs can approach the victim to help them to avoid the suffer from the victim. Other than the victim, the bully shall be also discovered and been given some vital lessons to let the bully understand that the consequences of bullying other people are heavy and serious. The proposed project will also help in analyze the data of discovered cyberbully cases and present them into diagrams for easy visualization of data. This would help in terms of statistics presentation.

## Chapter 2: Literature Review

### 2.0 Overview

The literature review is the background study on more detailed to the proposed project. The proposed project will be presented as a content analytic system which will focus on discovering the cyberbully intentions underneath the social media public text posts via two parts of the process which is data extraction and sentiment analysis. These two parts will be discussed in a very detailed way in this chapter. Along with the process, the author will also discuss what is cyberbully and social media meant to the society and what is their definition in the society nowadays. Interesting to note that these two words do not exist until the existence of social media. Next, the author will discuss the community standards of the social media towards those abusive behaviors that show on their site. For example, what are their attitude and actions towards these behaviors and what are the consequences to the user.

After this, the author will be discussed about the social media site policies for the developer. It is natural that a social media would not want its data to be freely spread around the developer, so there are some rules and do's and don'ts for the developer who wish to use the social media site data for their system. The author will also discuss what are the tools that available to the developer to extract the data from the social media site. Furthermore, the author will discuss the current situation of cyberbully on the social media, this includes the society reaction towards the issue, the existing solution towards the issue and will discuss the effect of cyberbully. The following topic is the technology involved and related to the system, the author will discuss in detail for the tools used for the system, the programming language used, the theory that involved in the mechanism of the system process flow and the detail process flow.

After the explanation of the technology involved, the author will discuss the input part of the system which is the data extraction from the social media site. The operation details and process will be clearly explained in this part. Next, it will be the process part of the system which is the data analysis from the data extracted. The operation details and the tools used will explain clearly along with the detailed process. Then, the author will discuss the system mechanism in the process flow, for example, how would the system response after the cyberbully intentions content is being identified. After this, the author will discuss the output part of the process which is the presentation and visualization of the data. In this part, the author will discuss the detail operation of the visualization of data and explain how the data is going to present to the user so the user could use the visualized data for other operation or analysis. Finally, the author will discuss the comparison between the proposed project and the existing similar system, the author will focus on the functionality of both system and explain how the proposed project is different from the existing similar system.

## 2.1 Study of Definition

In this section, the author will discuss the definition of social media and cyberbully. The author will also explain their relationship with other words.

### Social Media

Social media has become a tremendously popular phenomenon in the past decade since it transformed the human communication and interaction in worldwide (Edosomwan, et al., 2011). It has already invaded into human's daily life and use due to more and more people rely on social media to do anything. For example, people can use social media to organize a party or a gathering, they can use social media to call transportation or even food ordering. They can buy things through social media, they can start their business on social media, they play games on social media and by that they met more people and they expanded their social circle through social media. They might have met their relationship goals through social media.

It is unavoidable to encountered the phrase social networking when studying about social media because both concepts are inter-related. In the dictionary, social media had been defined as "forms of electronic communication (such as websites for social networking and microblogging) through which users create online communities to share information, ideas, personal messages, and other content (such as videos)" (Merriam-Webster, 2017). The same dictionary also defined social networking as "the creation and maintenance of personal and business relationships especially online" (Merriam-Webster, 2017). Therefore, the social media are seeking as a platform for the user to build up their own social networking. In this proposed project, social media act as a source platform as the proposed project have to collect and extract the public status data that was posted by its user on social media site.



Figure 2.1 Example of Social Media Site: Twitter (Twitter, 2017)

## Cyberbully

Cyberbully had the same intentions to traditional bully which is intended to cause harm and tension to the victim due to aggression. The definition of cyberbully is defined as “the electronic posting of mean-spirited messages about a person (such as a student) often done anonymously” (Merriam-Webster, 2017). The word cyberbully originated from the word bully because of the similar intentions and similar effect caused. Dictionary defined bully as “a blustering, browbeating person; especially: one who is habitually cruel, insulting, or threatening to others who are weaker, smaller, or in some way vulnerable” (Merriam-Webster, 2017). However, the cyberbully is more aggressive in terms of the mentality of the victim because it could exist 24/7 in victim’s daily life, unlike traditional bully which only happened when face to face meeting.

Cyberbully not only affect the victim but also will affect the bully. The studies have shown that bullies often suffer from the psychological problem and therefore they bullied someone else and made them suffer too (Görzig & Ólafsson, 2013). Cyberbully had been categorized into 7 categories. The first category is Flaming, flaming indicates that the bully is sending vulgar messages to the victim directly no matter via public or private. The second category is Harassment, harassment indicates that the bully repeatedly sending offensive messages to the victim no matter via public or private. The third category is Cyberstalking, cyberstalking is one of the harassment that consist of treats and the message is highly intimidating. The fourth category is Denigration, denigration indicates that the bully is sending or posting harmful statements about the victim to other people. The fifth category is Masquerade, masquerade indicates that the bully pretends to be someone else and sending or posting any content that will make the victim feel uncomfortable or looks bad. The sixth category is Outing and Trickery, outing and trickery indicate that the bully sending or posting the content about the victim that is private, sensitive or embarrassing no matter public or privately. The last category is Exclusion, exclusion indicates that the bully had the action that intentionally isolates the victim from online groups (Li, 2012).

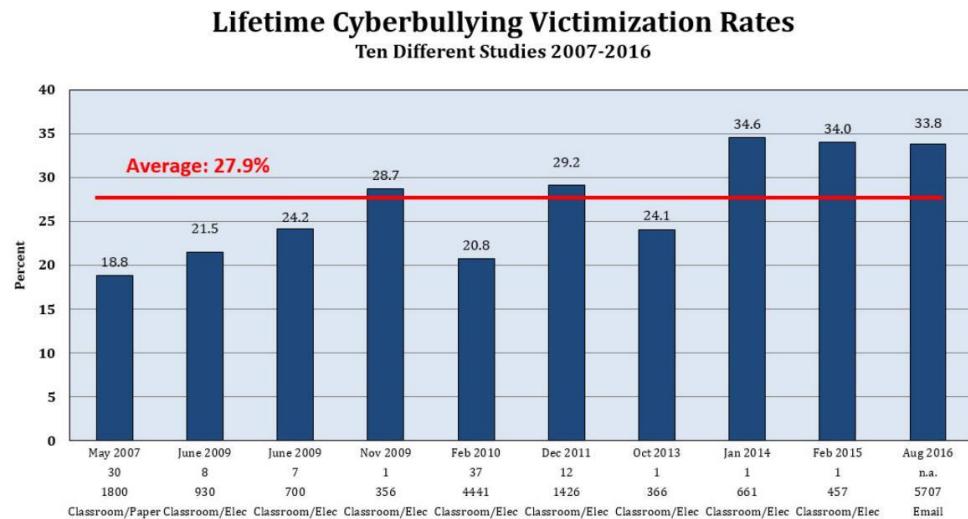


Figure 2.2 Cyberbully Victimization Rates from 2007-2016 (Centre, 2017)

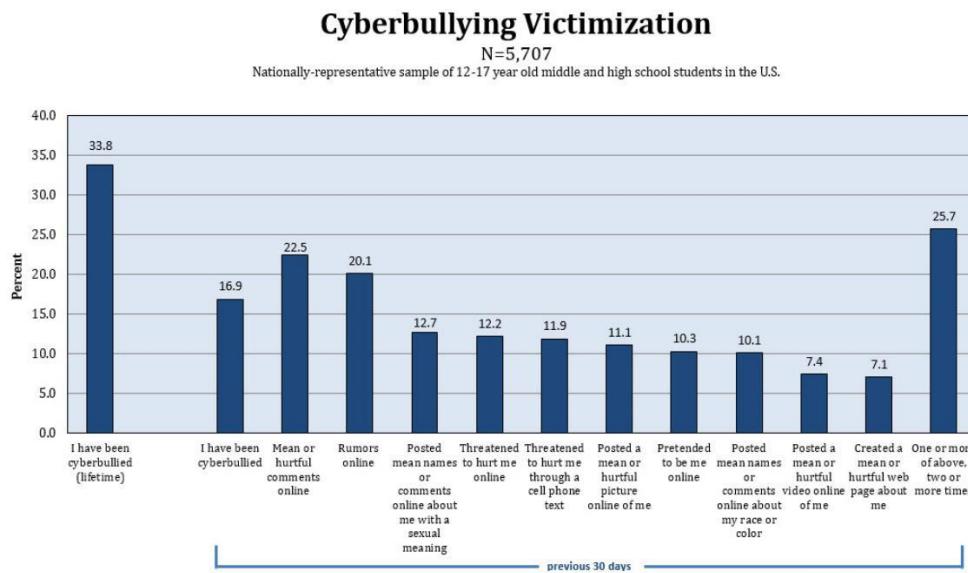


Figure 2.3 Cyberbully Victimization Rates from 2016 (Centre, 2017)

In the proposed project, cyberbully intentions is the important part because the proposed project is aimed to discover any cyberbully intentions underneath the text data.

## 2.2 Study of Social Media Community Standard

In this section, the author will explain the community standard of the social media site including rules on social media regarding the issue cyberbully and their action taken on the issues.

### Social Media Rules

Although social media support the freedom of speech, there is some behaviors or speech still being forbidden on the social media platform. These forbidden contents might be included sensitive subjects such as politics or sexuality topic. The author will focus on abusive content on the social media site, the example of social media site is Twitter.

Twitter believes that their user should be able to post anything they want to post without any barrier. However, the reality force Twitter must limit the user behaviors and type of content posted to protect the safety and experience of the user on Twitter (The Twitter Rules, 2017). The author will focus on behaviors of the user only in this section. Twitter categorized all the forbidden behaviors as abusive behaviors on its platform.

### Abusive Behaviours on Social Media

In this section, Twitter will be focused as the example of social media site. Twitter allows the freedom of speech and expression on their site, but sometimes people are afraid to speak due to mean response or threats. Therefore, Twitter forbid those content which consists of abusive behaviors to another individual in order to maintain the safety of the online community on Twitter.

Abusive had been defined as “using harsh, insulting language” (Merriam-Webster, 2017) and therefore abusive behaviors on social media site refer to user-posted content that consists of harsh and insulting language. Twitter had categorized abusive behaviors into 7 categories, they are Violent Threats, Harassment, Hateful Conduct, Multiple Account Abuse, Private Information, Impersonation and Self-Harm (The Twitter Rules, 2017).

In this section, the author will focus on only 3 categories which are Violent Threats, Harassment, and Hateful Conduct since these are the only 3 that related to cyberbully issues. Violent threats refer to the language that intends to inflict damage to another individual. Twitter forbids the creation of violent threats and promotion of violence no matter directly or indirectly. This includes threatening another user or promote terrorism on their user page. Harassment refers to annoy another individual persistently. The behaviors of harassment include repeatedly posting abusive statuses such as sexual harassment or violent threats to other users. Hateful Conduct refers to communication that involves an attack on basis of gender, race, age, disability, national origin, religion or disease. Twitter forbids any content that consists of these attacks no matter it is a public status or private message (The Twitter Rules, 2017).

## Possible Consequences

In this section, Twitter will be focused as the example of social media site. Since Twitter forbid abusive behaviors on its platform, there must be some consequences or punishment if any user of Twitter had violated the rules. Twitter had different actions taken towards the severity of the violated content and affect coverage of the violated content.

In low severe abusive behaviors content such as hateful conduct to other users, Twitter will first disable the user ability to post on Twitter and sending a request to the user to remove the offending post before they are able to post anything again. In medium severe abusive behaviors content such as harassment, Twitter will lock the account temporarily, that means the user could not log in to Twitter anymore unless the account had been unlocked. In high severe abusive behaviors content such as violent threats, Twitter will suspend the user account permanently which means the user can no longer log into the account and does anything to the account anymore. This considered as the highest punishment towards the abusive behaviors which is permanent account suspension (The Twitter Rules, 2017).

To conduct this punishment towards rules violated user, Twitter will first approach to the target user to hear his/her story after receiving user reports. The number of reports does not impact the final decision; however, it will impact the priorities of case handling (The Twitter Rules, 2017).

## 2.3 Study of Social Media Policies for Developer

In this section, the author will explain the social media policies for the developer. This includes the coverage of the developer on social media sites such as the data availability and tools available for a developer to use.

### Social Media for Developer

In this section, Twitter will be focused as the example of social media site. Twitter allows the developer to collect data of user posted status or they called it as "Tweet". The developers can use the collected data to make analysis or use the data on their own system. Eventually, the developer can create an application for Twitter or engage their application with Twitter, for example using login with Twitter to continue the experience on the application. Before the developer can use any of the kits that Twitter provided, the developer should register a Twitter account and register him/herself as a developer to get the credential key to access to the developer kits (Twitter Developer Documentation, 2017).

### Coverage Availability and Limitation

There is certain licensing from Twitter for the developer to limit the coverage of data or services that developer can implement into their own application or services. According to the license from Twitter, developer

allows using the official Twitter API to develop an application and implement into services. The developer is also allowed to cope reasonable amount of content data to display on the developed application. Furthermore, the developer only allows modifying the content that is displayed on the developed application. All the content data should display the Twitter mark to indicate the source. Twitter also allows crawlers to crawl over web pages and display content collected from Tweets or Timelines (Developer Agreement, 2017).

From the statement of Twitter documentation, it is stated that Twitter may monitor the use of Twitter API on the developed application to improve their services and examine the commercial use. The developer also suggests keeping the API key or other access credentials as private. Once the user of the developed application exceeds 1 billion, Twitter needs to be informed as there might have additional terms (Developer Agreement, 2017)

There are a few policies stated for the developer who developed using official Twitter API. First, the developer must maintain the integrity of any of the data collected, this indicates that the original content of the status shall not be modified, translated or deleted. Certain data are prohibited to collect such as geographical location of the user in Twitter. There are some data which is prohibited to collect such as geographical location of the user of Twitter. Second, respect user privacy and control on their own account, the permission needs to be granted before the developer can post any content on behalf to the user or use of published content for any reason. The use of any protected or private content will also need to request for permission, for example, private message or non-public content. Third, the purpose of the application or services needs to be clearly identified and clarified. Fourth, do not spam the register of applications or publishing content for promoting the application. Fifth, do not resell the collected data from Twitter and the use of collected data must be legal and follow the guidelines. Sixth, the developed application must not be a replication of Twitter application to avoid violating the user Twitter experience. Seventh, the advertising of the developed application must be appropriate, do not advertise over the Twitter timeline or spamming to user inbox (Developer Policy, 2017).

## Tools Availability

There are many official tools provided by Twitter for a developer to develop their application which engaged with Twitter services. The author will focus on an API tool called Streaming API as this is the tool that the author will use in the proposed project.

API stands for Application Programming Interface, it is an interface that allows developers to use the application's data and services. Streaming API is an official API provided by Twitter itself for giving the developers access to a global stream of Tweets data on Twitter in low latency. Streaming API offers 3 type of streaming which is public streaming, user streaming, and site streaming. The author will only focus on public

streaming since this is the one that is going to be implemented into the proposed project (Streaming APIs, 2017).

The public stream is the stream of data that is publicly flowing through Twitter. There are two public endpoints available for the public stream which is POST and GET. POST endpoint provided the returns of public statuses that match the filter and GET endpoint provided a random sample of all the public statuses. There is one limitation too which is one client account can only establish one connection to the public endpoints, the excessive of connection established could result in permanent banned from Twitter (Public Streams, 2017).

## 2.4 Study of Current Situation of Cyberbully

In this section, the author will study and investigate the current situation of cyberbully includes the reaction of victim and society towards this issue, the effects of cyberbully to both victims and bully and any existing solution to the issue.

### Reaction Towards Cyberbully

In this section, the author will discuss the reaction of victim towards cyberbully and society reaction towards the same issue. First, the reaction of the victim can be categorized into 4 category which is Avoidance, Revenge Taken, Active and Passive (Wong, et al., 2014). Avoidance is an action that the victim chose to tolerate the bully although they are being affected by the bully and was not happy about it. Revenge Taken is an action that the victim chose to take a revenge to anyone that is responsible for the bully. Active indicates that the victim chose to inform any social workers or teachers or adults. Passive indicates that the victim chose to delete the messages or web pages that send by the bully.

There is an investigation conducts on 2000 people, and the investigators found that most of the people chose avoidance as the reaction towards cyberbully, the least option is an active response (Wong, et al., 2014). The result was no surprise as the victim usually would not want any third person to know about the bully. This is because the victim will feel ashamed if there is a third person especially an adult acknowledged about the bully and try to help the victim. The victim will feel this represents an immature of him/herself because he/she is not capable of solving the problem alone (Dehue, et al., 2008).

The reaction of society including parents, teachers towards cyberbully are similar. Both of parties think that early education about cyberbully issues is important to the children or teenagers. They also think that it is important to let the children understand the consequences of cyberbullying, not only they will get trouble in school but it is about legal ramification. Some parents and teachers think that the peer mentor method might come in handy because, in adolescence age, peer pressure have are a huge affection to personal behaviors. However, there are also some parents and teachers think that there is no way to

prevent cyberbully as it will not even require face to face meeting and the society have not even come out a sufficient solution to traditional bully (Steinmetz, 2013).

### **Effect of Cyberbully**

Cyberbullying is an extent from traditional face to face bully as it can penetrate victim's life all time of the day and night through the internet. The case of cyber bullying could lead to social isolation, low self-esteem, and depression to the victim (Cowie, 2013). There is statistical evidence shows that cyberbullying has a higher impact on the depression, anxiety, and paranoia (Schenk & Fremouw, 2012). These emotions could lead to alcohol consumption and addiction, feeling unsafe at anywhere, insomnia and other health problems such as a headache and abdominal pains. Statistically shown on some random sample investigation on students, 42.5% of victim feel frustrated, almost 40% of them feel angry and around 27% of the victim feel sad (Vandebosch & Cleemput, 2009).

Under the long term of depression, the final may lead the victim to commit suicide. One of the news that shows the teens committed suicide after being cyberbullied is from December 2016, an 18-year-old girl from Texas, US shot herself in front of her family because of continued cyber bullying from her classmates and friends (Carma, 2016). This shows the power of cyberbullying could lead to the death of individual and could have an impact on the bully. The bully in this case, which claims to be the victim ex-boyfriend and his current girlfriend are facing charges for cyberbullying the victim now (Miller, 2017).

There are also studies shows that most of the bully are suffer from the psychological problem as well. Most of the bully are suffer from emotions such as frustrating so they bully other people to gain satisfaction. The bully could because of jealousy of victim or just do not like the victim, they could feel that they are well above the others and look down on the victim and therefore bully the victim because the bully thinks that the victim is weak and will not revolt them (Görzig & Ólafsson, 2013).

### **Existing Solution**

To be honest, there is no sufficient existing solution to the cyberbullying issue. However, most of the social workers, parents, and teacher think that make sure the adolescence understands the consequences of cyberbully is important as well as conducting early education to children (Steinmetz, 2013). These solutions have not yet given a clear and efficient result shows that these are working to solving or preventing cyberbully. The society had been tried their best to reduce the number of cyberbully on the social media.

Another solution that is frequently discussed is enforcement of laws. The enforcement of laws will be able to increase the severity of cyberbully punishment and from there, people will start to look after their behaviors to avoid violated the laws. However, there is no way to confirm that

enforcement of legislation laws helpful in preventing or solving the cyberbully issues due to cyberbully can be occurred at 24/7 in anywhere anytime, this will require a lot of monitoring to conduct the analysis (Coburn, et al., 2015).

## 2.5 Study of Technology

In this section, the author will discuss the technology used in the proposed project including tools used, theory covered and programming language used in the proposed project.

### Visual Studio 2017 Community

Visual Studio 2017 Community is the latest free IDE tool developed by Microsoft for a developer to build the application. IDE is known as Interactive Development Environment which is a creative launching pad that allows the developer to view and edit codes (Visual Studio IDE Feature Tour, 2017). Visual Studio 2017 Community provides the ability for a developer to view and edit code, debug, build and publish an application for different platforms such as Windows, Android, iOS, and The Web. In a nutshell, Visual Studio 2017 Community allows the developer to manage codes, build a cross-platform application, connect the application to cloud services such as Microsoft Azure and build a web application with asp.net (Welcome to Visual Studio 2017!, 2017). The proposed project will be developed based on Visual Studio 2017 Community with the use of Windows platform.



Figure 2.4 Visual Studio 2017 (Visual Studio, 2017)

### API (Application Programming Interface)

API (Application Programming Interface) is basically a contract. It is a contract that provides a hook for a developer to access available data and services of another application or services to build their own application (Jacobson, et al., 2012). For example, Twitter and Facebook have their own official API so that developers are free to use these API to build their own application by using Twitter or Facebook data and

services. There are 3 types of API which are API that open to any developers, API that only open to official partners of the application and API that used internally to help improve the application or services (Jacobson, et al., 2012). The proposed project will have to use the official API of the social media site in order to collect and extract the data from the social media site and conduct the analysis.

## **LUIS (Language Understanding Intelligence Service)**

LUIS (Language Understanding Intelligence Service) is a service that allows the developer to build a smart application that understands human language and able to respond accordingly to the user requests in human language. It uses the technology of Machine Learning to extract the meaning from human language. Basically, LUIS receives user utterance as input, then extract the intents and entities from the input that corresponds to the activities in applications logic. After that, its output is a web service with HTTP endpoint that developer can refer from their application to add the natural language understanding (Hanna & Mak, 2017).

The key concept of LUIS is made up of utterance, intents, and entities. The utterance is the basic text input receives from the user, which is the original input that the developed application need to interpret. For example, the input can be like “I want to book a train to KL”. Due to many forms of the input, the developer has to train LUIS to understand all forms of input since not all the input are well formed as a sentence.

Intents are the one that LUIS extract from the utterance, it is a verb in the sentence. Intent represents the actions that user request to perform, which means this is the purpose of the input. For example, in the previous example of utterance, the intent will be “BookTrainTicket”. The intent is defined by the developer in the application, the defined intent must be corresponding to the possible actions that user wants to perform in the application. For example, a bank application will have defined intent called “CheckBalance” so that LUIS can extract from the utterance like “I want to check money left in my account”.

Entities is another one that LUIS extract from the utterance, it is a noun in a sentence. An entity represents the instance of a class of an object that corresponds to the intent in the utterance. For example, from the previous example, the entity extracted will be “KL” which is a location. Once LUIS able to identify the correct entities in the utterance, it can choose the action to fulfill the intent in the utterance. In another way to say is LUIS able to perform the correct task requested by the user if it can identify the entities and intent correctly from the utterance (Hanna & Mak, 2017).

The proposed project will use LUIS for interpreting the collected data from social media including understand the text meaning and discover the intentions underneath the text.

## Natural Language Processing

Natural Language Processing which also known as NLP is the linguistic data analysis, mostly in the form of text such as documents using the computational methods. The natural language is meant by human language specifically. The analysis in NLP includes capture the grammatical relationships between the texts and discover the meaning underneath the text. In another way to say is that NLP is a way of teaching computers to understand the human language and generate the human language. NLP is usually used to develop the applications that integrate information extracted from another source such as literature documents, for example, a Text Mining Application (Verspoor & Cohen, 2013). The proposed project is one type of text analysis application that applies NLP theory to teach the application to understand human language.

## Sentiment Analysis

Sentiment Analysis also is known as opinion mining, it is the field of study to analyze opinion, attitudes, emotions, sentiments, and evaluations given by people towards anything by using computational methods (Liu, 2012). It is often applied to business because the businessman wants to know the opinion of existing customer or the expectation of the potential customer, the potential consumer will like to know the opinion of the current user of the product as well. The proposed project will use the sentiment analysis theory to analyze the opinions of people towards another individual (Aggarwal & Zhai, 2012).

## Text Mining

The rapid advance of technology has to lead to the different type of data available on the internet. In the case of text data, the increasing amounts of the text data in different applications already create a need in the algorithm to learn the patterns from the data dynamically. Text data is typically categorized in unstructured data as they are usually from the input from the user and human language is categorized in unstructured data to the computer as it could not manage under a database system. The final goal of text mining is analyzed the text data to discover the patterns of the data. Moreover, text mining will also be able to help the user to analyze and digest the information and finally lead to decision making (Aggarwal & Zhai, 2012). The proposed project will use the text mining theory to analyze the text data collected and discover the patterns of cyberbully data by using tools like LUIS.

## SQL Database

SQL database also is known as Structured Query Language database. SQL is a programming language that used to manage the relational database and also perform operations on the data inside the database. The database is basically a collection of data which is well organized so that it is easier for the user to access, update or manage them (Conolly & Begg, 2015). The proposed project will use the SQL Database service

in Microsoft Azure. Microsoft Azure is a cloud computing platform and cloud services provided by Microsoft. In the proposed project, The database will use to store the data collected from social media and also the post data that had identified as containing cyberbully intentions content.

### **MongoDB**

MongoDB is a document oriented database that acts as a database in the development of proposed project. A document oriented database indicates that the records stored inside the database is a document instead of one line of record with pre-defined data types data. Document in the database shows a data structure with the compose of fields and value pairs which is a lot like a JSON (Java Script) object. The field in the record can contain arrays or other documents inside. By using the documents as storage type is because it is corresponding to the native data types in almost any programming language. Any complicated joins will be avoided or reduced due to the embedded arrays and documents. Also, the dynamic data schema supports the polymorphism fluently (MongoDB, 2017).

### **XAML**

XAML stands for Extensible Application Markup Language. It is a language developed by Microsoft which actually based on the XML. It is used to design the user interface of the proposed project as it is the language that stand behind the visual representation of a software, which is the user interface.

### **C#**

C# is an object-oriented language that focuses mostly on web development and networking, it is designed to build a variety of applications that run on.NET framework. It also supports rapid application development methodology. C# has simple syntax yet it is highly expressive, it also supports generic methods and types. Since it is object-oriented structured, C# will also support the concepts of inheritance, encapsulation, and polymorphism (Wagner, et al., 2017). In the proposed project, C# will be used on analysis of collected data and send a notification to the user of the proposed project.

## 2.6 Study of Data Extraction

In this section, the author will explain the meaning of data extraction, the tools that will be used in the extraction process and discussed the detailed process flow in the proposed project.

### Definition

In the dictionary, extraction has been defined as “the act or process of draw forth something” (Merriam-Webster, 2017) towards data. Data extraction is basically the process that retrieves all types of data from any unstructured data sources. Extraction of data often interacts with the sources and extract the data stored in the sources. After extracted, the data usually will be post-processed by converted into another structured format for easier understanding and future usage (Ferrara, et al., 2014).

### Detail Process Flow

The extraction of data is the first step in the proposed project flow, it is also seen as an input part of the system flow. The proposed project will first interact with the official API provided by the social media site, then send an HTTP request to the API to collect the data that filtered by keywords which show the cyberbully intentions such as ‘kys’ which indicates kill yourself, it is a very rude word on social media. The keyword shall be pre-set in the application before the interaction with the API established. After the filtered data has been collected, the data will first store inside a SQL database for storing purpose.

## 2.7 Study of Data Analysis

In this section, the author will explain the meaning of data analysis, the tools that will be used in the analysis process and discussed the detailed process flow in the proposed project.

### Definition

In the dictionary, analysis has been defined as “a detailed examination of anything complex in order to understand its nature or to determine its essential features” (Merriam-Webster, 2017). The analysis of extracted data in text form has been known as Text Mining. Text Mining is part of data mining as the text is one kind of data presentation. The text data extracted from different sources need an algorithmic design to learn their patterns in the data. This is the main goal of text mining, which is discovering the patterns of text data and analyses it for information digestion and finally leads to decision making with the used of analyzed text data (Aggarwal & Zhai, 2012).

### **Detail Process Flow**

The analysis of data is the second step in the proposed project flow, it is also seen as the process part in the proposed project flow. The proposed project will first retrieve the data stored in the SQL database, then conduct the text analysis by using LUIS to understand the text and discovered the meaning underneath the text. LUIS will focus on cyberbully intentions text or words, if the data has been identified as cyberbully intentions content, it will be stored inside another SQL database. The rest of the data shall be discarded after the analysis.

## **2.8 Study of System Mechanism**

In this section, the author will explain the meaning of system mechanism, the tools that will be used in the system process and discussed the detail process flow in the proposed project.

### **Definition**

In the dictionary, the mechanism has been defined as “mechanical operation or action” (Merriam-Webster, 2017). In the proposed project, the system mechanism indicates that the action taken after the analysis of data.

### **Detail Process Flow**

The system mechanism is the third step and the final step in the proposed project flow. It is also seen as the output part in the proposed project flow. After the identified data has been stored in the database. The proposed project will use the WNS to send a notification to the user of proposed project so that the user will be aware of the discovery of cyberbully intentions content on the social media site. In this way, the proposed project does not execute any direct action to the original post or the post owner, it only stored the post details so that the user of the proposed project will be able to track the post down and take actions from there such as contact any relevant individual in this case.

## **2.9 Study of Presentation and Visualization of Data**

In this section, the author will explain the meaning of presentation and visualization of data, the tools that will be used in the process and discussed the detail operation in the system.

### **Definition**

In the dictionary, the presentation has been defined as “the act of making something to cause or permit to be seen” and visualization has been defined as “the act or process of interpreting in visual terms or of putting into visible form” (Merriam-Webster, 2017). In the proposed project, the presentation and visualization of data indicate that the number of identified cyberbully intentions content data will be visualized into

diagram form and present to the user for an overview and easier comparison.

## **Detail Operation**

The presentation and visualization of data are an extra in the process flow. It did not involve in the input-process-output process flow of the system. Whenever demanded, the proposed project will display the stored data record to the user. In this presentation and visualization of data, the user of proposed project will be able to view the full record on every stored data. This can help them better in planning on how to help the victim more effectively and track down the bully.

## **2.10 Comparison of Existing Similar System**

In this section, the author will state the existing similar system to the proposed project and compare them with the proposed project. There are three existing similar system which has part of the similar feature to the proposed project due to there is no similar system to all the feature of proposed project. Therefore, the author only discussed the similar system which has part of the similar feature to the proposed project.

### **Awario**

Awario is an application that monitors the social media all the time and identified the posts that contain the keywords that user of the application had pay attention to (Awario, 2017). This application is to let the user know the hot topics of the social media so they can alter their business target and able to let the user know any posts that will impact their business so that they can react to them quickly. The similar part of Awario and the proposed project is that both are going to filter the posts from social media site with some keywords and only present the filtered posts data to the user.

### **BINO**

BINO is posted scraper and publisher application towards the social media sites (BINO, 2017). BINO is able to collect pages posts data from the social media and present the details in the table form, the user can publish the posts again or download and visualize the posts. The similar part of BINO and the proposed project is that both are able to collect posts data from the social media and present it to the user.

### **Lexalytics**

Lexalytics is a text analysis software which can evaluate the context from text then extract them into summaries or the important point so that user can use the data that is being processed and summarized (Lexalytics, 2017). The similar part of Lexalytics and the proposed project is that both are able to analyze the collected content in text form and able to understand what is the content meaning.

## 2.11 Summary

In this section, the author had explained the definition of social media and cyberbully and discussed their situation in modern world. The author also studied and explained the community standards set by the social media site by taking one of the popular social media site as example. The author then studied and explained on the rules and regulations the social media site set for the developer to developed applications that involved its social media site. Furthermore, the author explained the current situation of cyberbully issues such as community reaction and effects. The author also studied and discussed the technology, tools and theories that is going to apply in the proposed project. Moreover, the author has discussed and explained the basic system flow of the proposed project which is data extraction, data analysis, system mechanism and data presentation and visualization. Finally, the author had discussed the discovered existing similar system and compare them to the proposed project.

## Chapter 3: System Design & Specifications

### 3.0 Overview

In this chapter, the author will discuss about the various types of facts finding techniques that are going to use for research the information needed for the proposed project. The author will explain each of the used facts finding technique and state each of the techniques advantages and disadvantages. First, the author will use two techniques for the facts finding which is interview and questionnaire. The interviewee is going to be the counsellors from school and the professional psychologist that has some experience on the cyberbully issues. These are the potential user on the proposed project therefore the author will collect the system requirement from the interview. On the other hand, another fact-finding technique will be conducting is the questionnaire. The target audience of the questionnaire will be the potential bully and victim of the cyberbully issues which is the teenagers and young adults. The questionnaire has consists of multiple sections where the respondents could talk about their experience in cyberbully issues and their opinions for this issues. This is aim for the author to research the real experience on the cyberbully issues and investigate about the opinions of potential victim and bullies how can the system help them. The author will explain each question purpose and present the respondents responds in visual such as charts or bars. The author will get the different feedback, opinions, information and perceptions for the system from these two techniques used.

The second part in this chapter, the author will present some diagrams about the design of the system. These diagrams will show the process of the whole system flow and also the diagrams that shows the dependency and class such as activity diagram, use case diagram, rich picture diagram and other diagrams that is necessary. Through these diagrams, more understanding towards the proposed project will be established. Furthermore, the author will design the user interface for the proposed project to have an overview of how the user can interact with the system and what are the options that the user is given.

### 3.1 Fact Finding Techniques

This section is going to introduce the fact-finding techniques that the author used to collect the information and gather system requirement. After the introduction, there will be the design of the fact-finding techniques and also the result analysis of each of the techniques. The fact-finding techniques that the author used is interview and questionnaire.

#### Introduction of Interview

The interview is one of the fact-finding techniques that the author used to collect information and gather system requirement from the potential user. The interview has been defined as “a meeting at which information is obtained (as by a reporter, television commentator, or pollster) from a person” (Merriam-Webster, 2017). Interview exists in various of different forms including face to face interaction, through the internet and also over the telephone (Brinkmann, 2014). The author had used the face to face interaction to conduct the interview. Most of the questions in the interview are open ended meaning to say it is open to the interviewee to express their opinions on the discussing topics. People often gathered information from the interviewee in order to let them to conduct the research or do the analysis.

#### Advantages of Interview

There are a lot of advantages of interview compare to others facts-finding method. For example, the interviews are extremely useful and it's the only method to obtain a more detailed information such as personal opinions, perceptions and feelings towards the discussing topics. Furthermore, interview can achieve a much higher response rate compare to others because the interview is more focus on the responders and usually there is only one responder. So, the response rate will be comparably higher. More of the interview advantages is the follow-up questions are allowed to ask if the response from the responders is not providing enough information to the interviewer. Moreover, the interviewees might feel more relax when they are at a one-on-one interview rather than in a group where they might feel shy and do not give their own opinions on the discussing topics. They might get more focus and will not influenced by other interviewees easily if the interview is conducted in a one-on-one method (Evidence Base, 2006).

#### Disadvantages of Interview

The interview does exist some of the disadvantages. The most significant disadvantages will be time consuming. Interview is very time consuming because it has a lot to prepare before the interview and also a lot to do after the interview, even the interview session itself is time consuming. The interviewer might need to search for suitable interviewee regarding to whatever topics that interviewer is researching now. Then, they need to contact the interviewee and ask for permission, if all thing goes well, an appointment is made between the interviewer and interviewee. After the interview session, the interviewer still need to transcript, analyse the

response and report them. Overall it is a very time-consuming activity. Another disadvantage of interview is it can be very costly. In real world, interview an expert can never be free, from the author's research, interview an expert for 30 minutes could took up to \$50 for payment. A short interview session may take up to 1 hour, so it can be very costly compare to others facts-finding method (Evidence Base, 2006).

## **Introduction of Questionnaire**

Questionnaire also known as survey is another facts-finding technique that used by the author to gather the information and user requirement. Questionnaire has been defined as "a set of questions for obtaining statistically useful or personal information from individuals" (Merriam-Webster, 2017). Questionnaire is basically a list of questions that can be various forms like close ended, semi open and open ended. These questions are designed to let the responders done it very quickly. The target audience of questionnaire is usually a large group of people that shares similar characteristics or occupation, for example students. However, the target audience can also be completely random, for example it might be the people passing by. There are two forms of questionnaire which is the traditional paper and also the online questionnaire. The author is using the online questionnaire because it is way more efficient and also time and cost saving compare to papers.

### Advantage of Questionnaire

There is a plenty of advantages that questionnaire have. For example, the questionnaire are comparably easier to analyse because it is usually presented statistically. Furthermore, it could gather information from a large group of certain populations or random in a short time and also need only low cost compare to other fact-finding techniques. Moreover, it does not have any requirement to the target audience, anyone within the population or just random person can do the questionnaire, most of the questions in the questionnaire is going to be general and common sense. On the other hand, the responders also been given a certain time frame to answer the question and they will not be watching over by someone when they are answering the question. This can make the responders feeling relax and feel free to write what they think on the questionnaire (Evidence Base, 2006).

### Disadvantage of Questionnaire

Pros and cons always corresponding exist in the same thing. So generally questionnaire does have some disadvantages. For example, if the researchers does not design the question carefully and properly, they will have no chance to go back afterwards to redesign the question or adding or removing the question after the responders has already responded, especially when the responders are anonymous, which is usually the case of questionnaire. On the other hand, sufficient information could hard to obtain from questionnaire and the respond rate of questionnaire is relatively low compare to other fact-finding techniques. This is because people nowadays used to do thing quick, if they are doing the

questionnaire fast, they will not think much therefore not much information can be obtained from the responders. Furthermore, the questionnaire does not have follow up question, so if the researchers found that they need more information from certain answer from certain responders, they could not do anything because they will not know who is the responders if the questionnaire is remain anonymous. More importantly, some responders will ignore or skip the question if they do not know how to answer or they are lazy to answer it (Evidence Base, 2006).

### **Interview: Question Design and Process**

Since the author have decided to use the interview technique to gather the information, the preparation setup is ongoing. The interviewee is a counsellor who works at a college, however she insisted to remain anonymous in the interview process. The author first contacted the interviewee and make an appointment with her for face-to-face interview. The author also recording the conversation between interviewee and interviewer down for transcript and analysation process later. There are total 8 interview questions with various of follow-up questions in the interview and all of the questions are open-ended which requires the counsellor to answer according to their opinion and experience. The question of interview covered the interviewee's opinion to cyberbully, what are their behaviours and reason of cyberbully. There is also couple of question regarding to the system, the interviewee ought to give some opinion and suggestion as a user to the system. Overall, the interview session is going smooth and last about an hour.

### **Interview: Objective of Question**

#### Q1: Do you have any experience dealing with cyberbully cases before?

Objective: The author wants to know if the interviewee has the experience of dealing with cyberbully cases and what are the common process flow of the cases.

#### Q2: What are the usual victim response towards the cyberbully?

Objective: The author wants to know that how will the victim usually react to cyberbully when it happens to them.

#### Q3: What do you think is the reason that cyberbully cases is increasing?

Objective: The author wants to know that the main reason of cyberbully cases is increasing from interviewee's opinion.

#### Q4: What are the common words or sentence that you will think that this is cyberbully?

Objective: The author wants to know the keywords or the sentence that people usually used on cyberbully others.

#### Q5: What is the common characteristics that bullies and victims have?

Objective: The author wants to know the characteristics of bully and victim and also how to differentiate them with normal people in the cyberbully cases.

Q6: Do you think that there is any way to prevent cyberbully or how can we help the victim of cyberbully cases?

Objective: The author wants to know the existing solution to the cyberbully cases.

Q7: How do you differentiate between jokes and cyberbully?

Objective: The author wants to know the difference between bad jokes and real cyberbully intentions.

Q8: What do you expect from the system as a user?

Objective: The author wants to know the opinion of interviewee as a user to the proposed project and what will they expect the systems to do.

## **Interview: Response Data Analysis**

Q1: Do you have any experience dealing with cyberbully cases before?

From the interviewee's response, she does not have any personal experience in dealing with cyberbully issues but she did heard about some cases and she clearly saw the effect from the cases.

Q2: What are the usual victim response towards the cyberbully?

From the interviewee's response, she thinks that the victim's response was originated from the victim's personality. If the victim was a positive person, he/she will fight back to cyberbully because he/she knows that this is not okay and they do not deserve that. If the victim was a negative person, he/she might think that this is their faults so they get cyberbullied, and eventually they will not respond to the cyberbully and just let it be until they could not handle the stress and tragic happened.

Q3: What do you think is the reason that cyberbully cases is increasing?

From the interviewee's response, she thinks that the easy access to the internet is one main reason why cyberbully cases is increasing. Other than easy access to the platforms, she also thinks that jealousy is another main reason why people start to cyberbully others. Third reason is that she thinks people who have many free times and do not have anything else to do will have much more chances to cyberbully others on the internet.

Q4: What are the common words or sentence that you will think that this is cyberbully?

From the interviewee's response, she thinks that all the words or sentence that contains negative meaning is the common words for cyberbully. For example, ugly, lazy, poor these kinds of negative words.

Q5: What is the common characteristics that bullies and victims have?

From the interviewee's response, she thinks that bullies can be anyone as long as that person is not happy about another person. Bullies has no reason, it could be anything such as wealth, race, age or anything else. As for victim, she thinks that victim usually hide their reaction or do not respond to the cyberbully, so she thinks that the victim is needed to pay more attention to it from the parents side.

Q6: Do you think that there is any way to prevent cyberbully or how can we help the victim of cyberbully cases?

From interviewee's response, she thinks that there is technically no practical way to prevent it now. However, it can be prevent if the parents or teachers or even student themselves know how serious the cyberbully cases be. Meaning to say is raise the awareness to different parties so everyone can co-operate to prevent the cyberbully.

Q7: How do you differentiate between jokes and cyberbully?

From interviewee's response, she thinks that the way of differentiate jokes and cyberbully is through the target response. If the target response with another joke or some other chill words, it was a joke or inside joke between them. However, if the target does not respond to the posts or replied with some begging words or angry words, it might be a cyberbully intentions posts.

Q8: What do you expect from the system as a user?

From the interviewee's response, she thinks that other than notified her upon the discovery of cyberbully intentions posts, she hopes that the system also can identify who is the bully and who is the victim. At the same time also provide some basic information about the bully and the victim. Also, she thinks that the system could auto-report to the social media platform and let them handles the action to the bully account. She also thinks that the data presentation is important because as a user she would want to know the effectiveness of the system implemented into the platform.

\*\*The complete interview transcript is present in Appendix.

### **Questionnaire: Question Design and Process**

The questionnaire was designed in online form and it has been distributed through Facebook and it is open to anyone to do it. There is 3 sections in the questionnaire and it consist of 18 questions in total. The first section is demographic profile of the respondents, the respondents shall be anonymous. The second section is personal experience with the cyberbully issues. The third section is personal opinion on the cyberbully issues and also the proposed project. There are close-ended questions and also open-ended questions for the respondents to speak out their opinion on the discussing topics. At the end of the questionnaire, it has total of 50 respondents to the questionnaire and all of them have completed the questionnaire.

## **Questionnaire: Objective of Question**

### **Section 1: Demographic Profile**

#### Q1: What is your gender?

Objective: The author wants to investigate the relationship between gender and chances that getting cyberbullied.

#### Q2: How old are you?

Objective: The author wants to investigate the relationship between age and chances that getting cyberbullied.

#### Q3: What is your race?

Objective: The author wants to investigate the relationship between race and chances that getting cyberbullied.

### **Section 2: Personal Experience**

#### Q1: According to your understanding, what is cyberbully?

Objective: The author wants to know whether the respondents fully understand what is cyberbully.

#### Q2: Have you or your friends been cyberbully before?

Objective: The author wants to know the experience of the respondents regarding to the cyberbully issues.

#### Q3: If you or your friends have been cyberbully before, what is the main reason?

Objective: The author wants to know that the common reason that people getting cyberbullied.

#### Q4: If you or your friends have been cyberbully before, how was it happened?

Objective: The author wants to know that the method that bullies commonly used to cyberbully their victim.

#### Q5: Did you or your friends ever report or told the case to anyone?

Objective: The author wants to know the percentage of whether victim will report that they are getting bullied to any third party or not.

#### Q6: If you or your friends ever report or told the case to anyone, who was it?

Objective: The author wants to know that if the victim does report the cyberbully to anyone, who was that to makes the victim trust him/her.

#### Q7: If you or your friends did not report it, why?

Objective: The author wants to know if the victim does not report the cyberbully to anyone, what was the reason to do that.

#### Q8: If you or your friends report the case, did it stopped the cyberbully?

Objective: The author wants to know the outcome of reporting, did it stopped the cyberbully successfully or did not.

### **Section 3: Personal Opinion**

Q1: Do you think the rise of social media is the main cause of cyberbully getting more and more cases?

Objective: The author wants to know the relationship between social media and the growth of cyberbully cases.

Q2: If the cyberbully on the social media could get detected, do you think it will decrease the case of cyberbully?

Objective: The author wants to know that the potential user or beneficial of the proposed project opinions on the system aim.

Q3: What kind of keywords/sentence makes you think that this is cyberbully?

Objective: The author wants to know that from bullies/victims perspective, what kind of keywords that makes them think this is cyberbully.

Q4: In which situations, you will think this is cyberbully and not just a bad joke? \*Feel free to add any situations that you may think this is cyberbully and not jokes.

Objective: The author wants to know that from bullies/victims perspective, what are the difference between jokes and cyberbully.

Q5: Based on your opinion, what is the most effective way to help the victim?

Objective: The author wants to know the effective method that the respondents think it is the best to help the victim.

Q6: Based on your opinion, how can current technology help the cyberbully victim?

Objective: The author wants to know that what are the opinions of respondents towards current technology and how can these help on the victims of cyberbully.

Q7: Based on my system description on above, what else do you think that the system could do to help the victim of cyberbully issues?

Objective: The author wants to know that from bullies/victims perspective, what are their opinions to the mechanism of the system and what else they would expect the system to do for the victim.

## Questionnaire: Response Data Analysis

### Section 1: Demographic Profile

#### Q1: What is your gender?

- Male
- Female

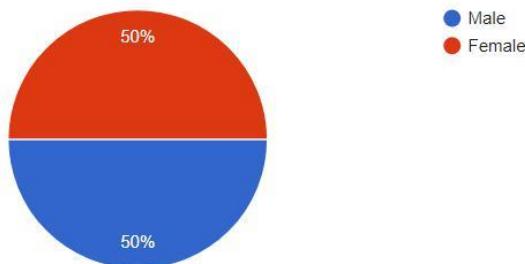


Figure 3.1: Gender of Respondents

From the charts above, 25 out of 50 respondents is male and another 25 is female, this shows a 50 to 50 proportion on the respondents genders.

#### Q2: How old are you?

- Below 13
- 13 - 20
- 21 - 30
- Above 30

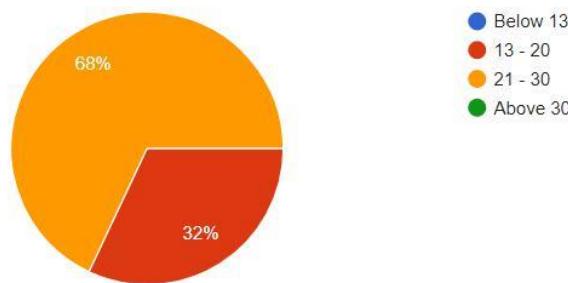


Figure 3.2: Age of Respondents

From the charts above, about 68% of respondents are aged between 21-30 which is young adult range and another 32% is between 13-20

which is between the teenager range. There is no respondents that is below 13 or above 30 year old.

Q3: What is your race?

- American Indian or Alaska Native
- Asian
- Hispanic or Latino
- Native Hawaiian or Others Pacific Islander
- White
- Others

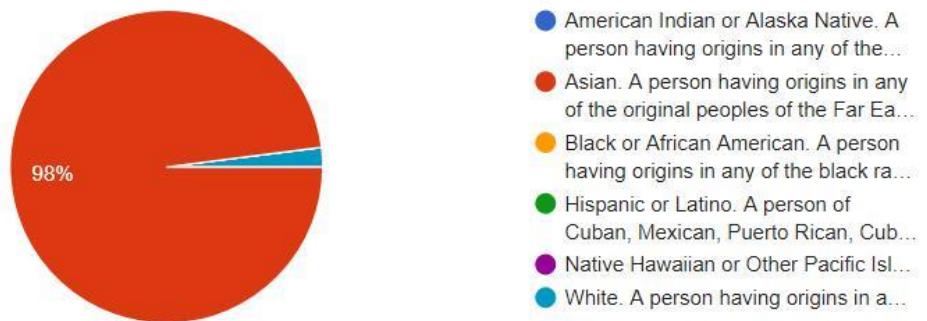


Figure 3.3: Race of Respondents

From the charts above, there are 98% of the respondents are Asian and only 2% of them are white. This is obviously significantly affected by the author's environment. There are no other races stated above between the respondents.

## Section 2: Personal Experience

### Q1. According to your understanding, what is cyberbully?

- When someone or some group of people bullies another person on the Internet.
- When someone or some group of people send mean text messages or pics to another person.
- When someone or some group of people call another person's names online.
- When someone use other's cell phone to get them into trouble.
- When someone pretend to be another person online and posted embarrassing content online.
- When someone is insulting another person online.
- When someone is intimidating another person online.
- When someone is mocking another person online.
- Others

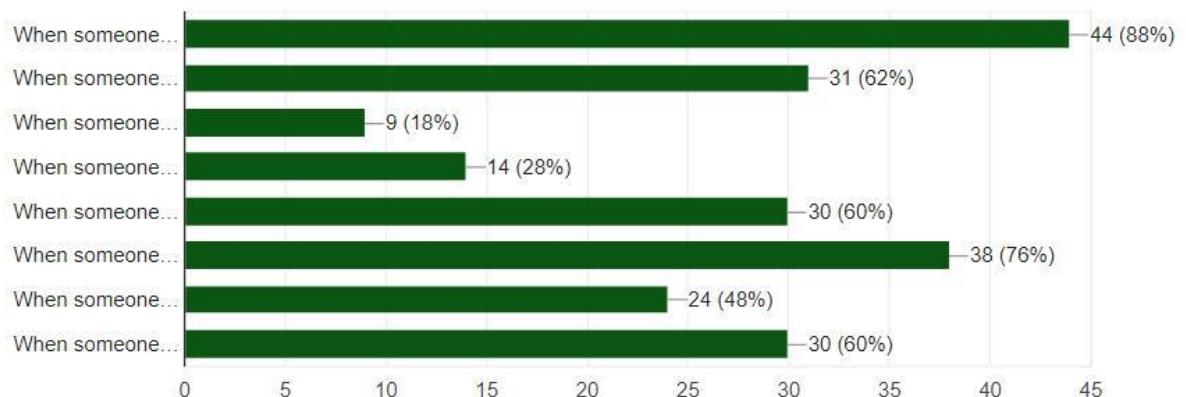


Figure 3.4: Bar Chart of Cyberbully Understanding of Respondents.

From the bar chart above, there are more people think that cyberbully is when people bullies another person online and people insults another person online, the data are 44 out of 50 and 38 out of 50 respondents respectively to these two options. There are less respondents that think sending mean messages to other person, pretend to be someone else online, use other people's cellphone and get them in trouble, mocking them online and intimidating someone online are representations of cyberbully, the data are 31 respondents, 14 respondents, 30 respondents, 24 respondents and 30 respondents chose that option respectively. There is only 9 out of 50 respondents think that cyberbully is call out another person names on the internet.

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Q2: Have you or your friends been cyberbully before?

- Yes
- No

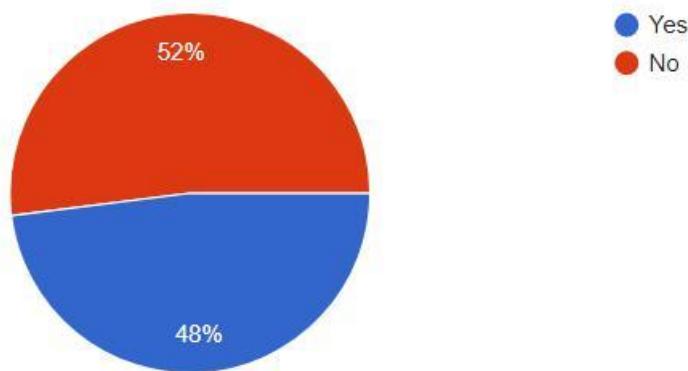


Figure 3.5: Experience of cyberbully of respondents

From the pie chart above, there are 52% of the respondents is not being cyberbullied before, another 48% tells that they have been cyberbullied before. This shows that cyberbully is an issue even it is around the author's environment.

Q3: If you or your friends have been cyberbully before, what is the main reason?

- Gender
- Race
- Behaviour
- Appearance
- Age
- Body Size
- Me and my friends have not been cyberbullied before
- Others:
  - For drawing "problematic content". Which isn't even that bad it's just fluffy BL shipping of 2 minor characters lol.
  - Relationship problem

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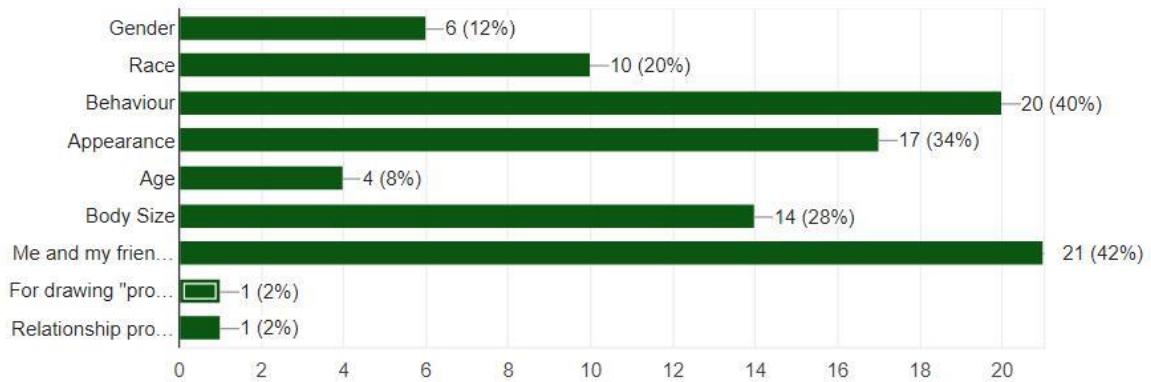


Figure 3.6: Main reason of cyberbully from respondents.

From bar charts above, there are 21 out of 50 people stated that they have not been cyberbullied before. In the other percentage, people think that behaviour and appearance are the main reason of why people started cyberbully, the precise data are 20 out of 50 respondents and 17 out of 50 respondents respectively. Another 14 respondents believe that body size does affect people getting cyberbully or not. There are also 10 respondents think that race is another reason and 6 respondents think that age does matters on the internet. There are 2 respondents who gave other options such as relationship problem and presenting problematic content online.

Q4: If you or your friends have been cyberbully before, how was it happened?

- Insult
- Mocking
- Intimidating
- Impersonate as you and posting inappropriate status on your page
- Harassment
- Me and my friends have not been cyberbullied before.
- Others

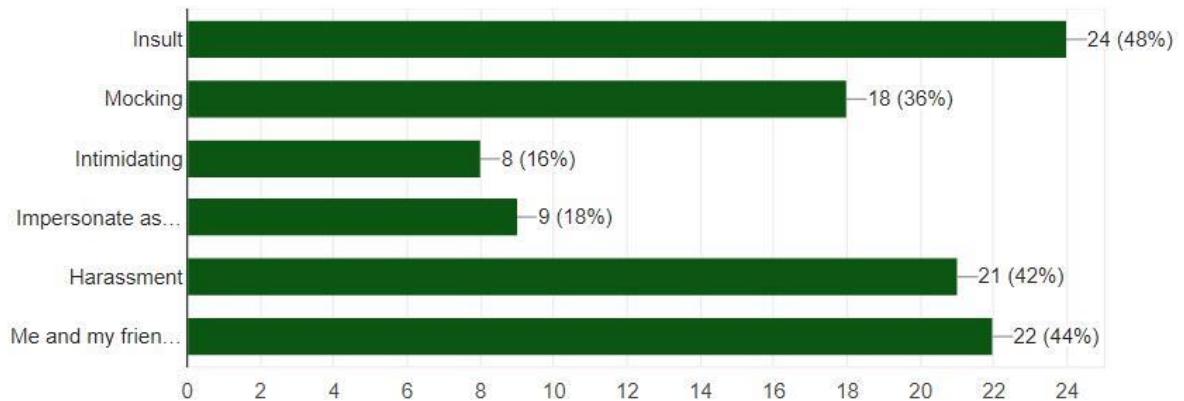


Figure 3.7: Method of cyberbully from respondents.

From the bar chart above, there are 22 out of 50 respondents state that they or their friends have not been cyberbullied before. Apart from that, the most used method on cyberbully is insult, which is chosen by 24 out of 50 respondents. There are also 18 respondents and 21 respondents has been through mocking and harassment online. There are only 8 respondents and 9 respondents have go through being intimidating and being impersonate as someone else.

Q5: Did you or your friends ever report or told the case to anyone?

- Yes
- No
- Me and my friends have not been cyberbullied before

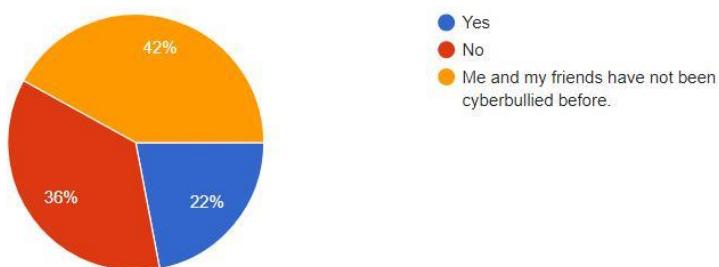


Figure 3.8: The report of the case from respondents.

From the pie chart above, there is 42% of respondents respond as they or their friends have not been cyberbullied before. Apart from that, there are 36% of the respondents do not report the cyberbully case to anyone and only another 22% of the respondents does report the case to any third party.

Q6: If you or your friends ever report or told the case to anyone, who was it?

- Teacher
- Parents
- NGO Member
- Counsellors
- Another friend
- Others:
  - Posting some PSA or clarifications on their website.
  - Police

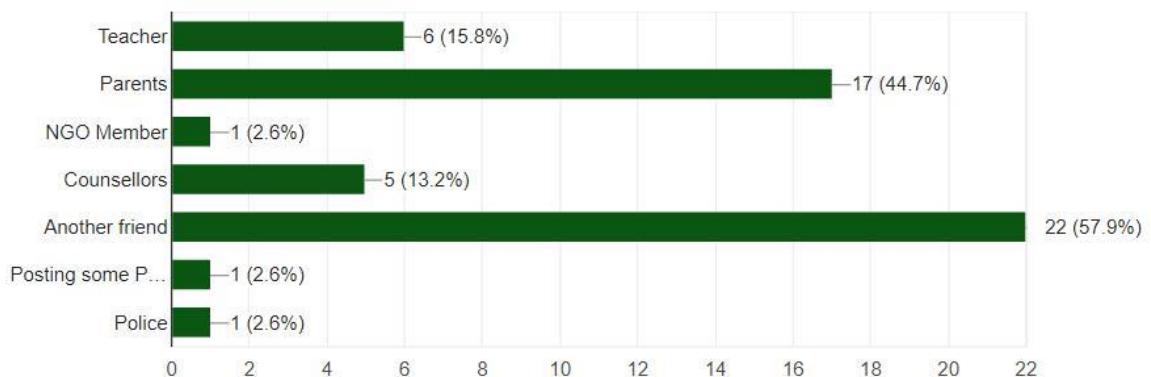


Figure 3.9: The target report from respondents

From the bar chart above, most of the respondents which is 22 choose to tell another friend of them about the cyberbully cases. There are also 17 respondents choose to tell their parents. There is only a few people willing to tell a counsellor, teachers and an NGO member which the data shows only 6 respondents, 5 respondents and 1 respondents respectively. There is also 2 people giving another party that they will told to including police and fights back to bully.

Q7: If you or your friends did not report it, why?

- Afraid will get more bullied if reported
- No one will believe or listen to
- Do not trust any third party can help
- Ashamed of getting bullied so do not want anyone else to know

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- Do not want to acknowledge anyone, thinking just bear with it and eventually it will gone.
- Others:
  - Did not pay much attention to them
  - We blocked them

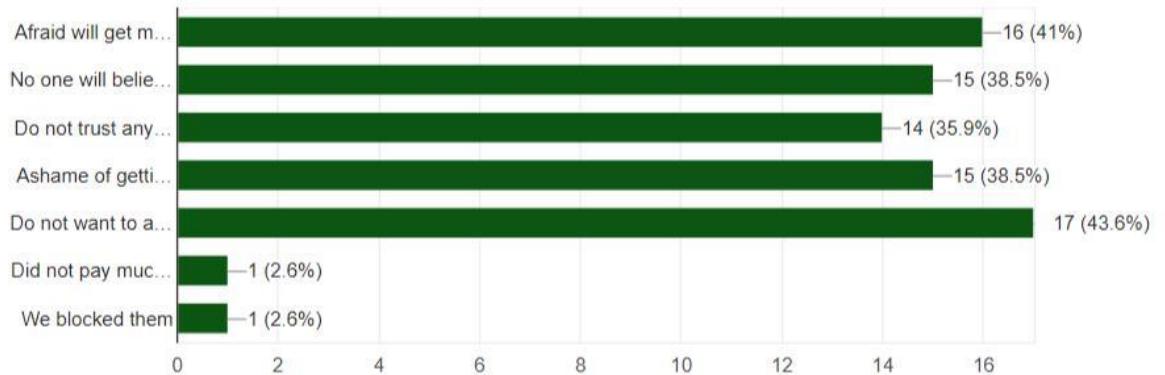


Figure 3.10: Reason of did not report the case from respondents

From the bar charts above, there are 17 respondents who did not report the cyberbully case is because do not want to acknowledge anyone. Apart from that, there are also 16 respondents that afraid they will get more bully if they report the case. 15 respondents think that they do not report the case is because they are ashamed of getting bullies and also they think that no one will believe them even if they reported the case. There is also 14 respondents that think they do not trust any third party will help them in the case. There are 2 respondents who gave out their opinions such as did not pay attention to the bully and block the bully on the internet.

**Q8: If you or your friends report the case, did it stopped the cyberbully?**

- Yes
- No
- Maybe (Some stopped but some did not)

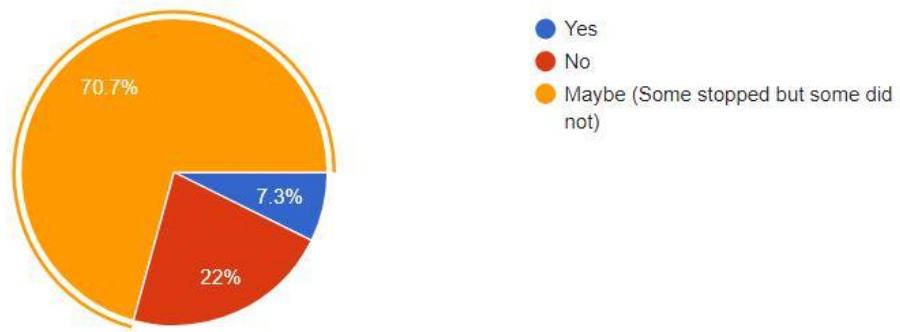


Figure 3.11: The chance of stopping cyberbully from respondent

From the pie chart above, there are 70.7% of respondents who being cyberbullied is not fully stopping by reporting the case. Some are still continuing to cyberbully them. Another 22% responds that the report did not stop the cyberbully at all. Only 7.3% of the respondents responds that the cyberbully has been completely shut down after they reported the case.

### Section 3: Personal Opinion

Q1: Do you think the rise of social media is the main cause of cyberbully getting more and more cases?

- Yes
- No
- Maybe

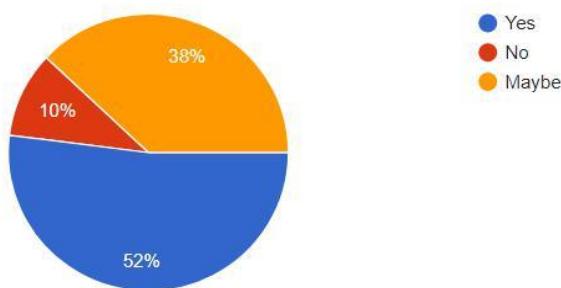


Figure 3.12: Relationship of main cause of cyberbully and social media from respondents

From the pie chart above, there are 52% of respondents think that the social media is definitely the main cause of cyberbully is growing. There are 38% of respondents do not sure and they think that maybe the social media is the main cause of cyberbully growing. There are only 10% of the respondents that do not think

the social media is the main cause of the cyberbully cases growing.

**Q2: If the cyberbully on the social media could get detected, do you think it will decrease the case of cyberbully?**

- Yes
- No
- Maybe

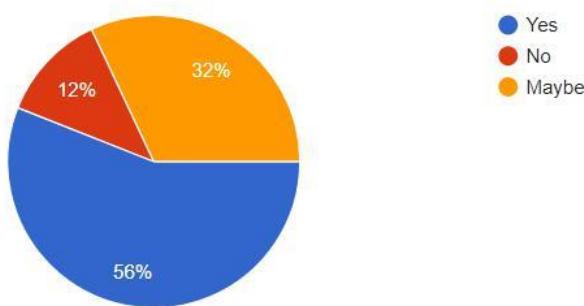


Figure 3.13: Relationship between cyberbully and detection of cyberbully from respondents

From the pie chart above, there are 56% of the respondents think that if the cyberbully is getting detected on social media, it will decrease the case. Another 32% of them do not sure that this will decrease the cyberbully case. Only 12% of the respondents think that the detection does not affect the case of cyberbully.

**Q3. What kind of keywords/sentence makes you think that this is cyberbully?**

Online harrassment (2)
stupid (2)
Give me some money or i will beat you in real life.
Stupid
Fat/Pimple faced/Skinny Bitch/Any curse words
Fat ass/fatso/slowpoke etc
Ugly
"You're the toxic of this world."

type the whole sentence with capital letters
Spreading mean information towards someone
Vulgar and insulting words
Rude vulgar words
threatening words
Insult
Curse words in a serious manner
That sensitives word can maybe person feel angry or embarrassing
race and religion
The sentence that mapping someone.
you fat shit
it depends on the individual.
He is the ugliest of all, all of his fans are stupid
stupid, idiot, fuck, shit, ugly
87
Sending mean emails, texts or instant messages.
go to die
Stupid,idiot
Noob
Anyone who threat you on the internet
Harrasment
stupid, no one ever like you
You're ugly!
Chink
ask u go die
You are idiot
" Your mom is a whore, slut , etc "
Bitch
(this is hard to answer

Insulting
Humiliation
you should go kill yourself
Your face so sucks, please XXXX off
Idiot
Humiliating words
Fuck
Fat
Hot ass
get lost
sarcastic insult.

Table 3.1: Feedback response of cyberbully keywords from respondents.

This is an open-ended question and therefore the table are represents all the response from the responders. Most of the responders did specified some of the keywords that they think it is common used in cyberbully, some respondents just categorized all the words such as insulting and humiliation. Most of these specified keywords are negatively meaning in their own definition.

Q4: In which situations, you will think this is cyberbully and not just a bad joke? \*Feel free to add any situations that you may think this is cyberbully and not jokes.

- Sally login into her friend's account and posted some embarrassing photos of her friends on FaceBook.
- Melvin received some messages from his classmates calling him "A Pig"
- Barbara received some message from strangers that called her honey for no reason
- Ken saw someone tagging him in a status that written "Why'd you still here and not gone?"
- Others:
  - Insult other via online
  - Everyone just ignored his message in group chat or when he show up the group chat will completely silent

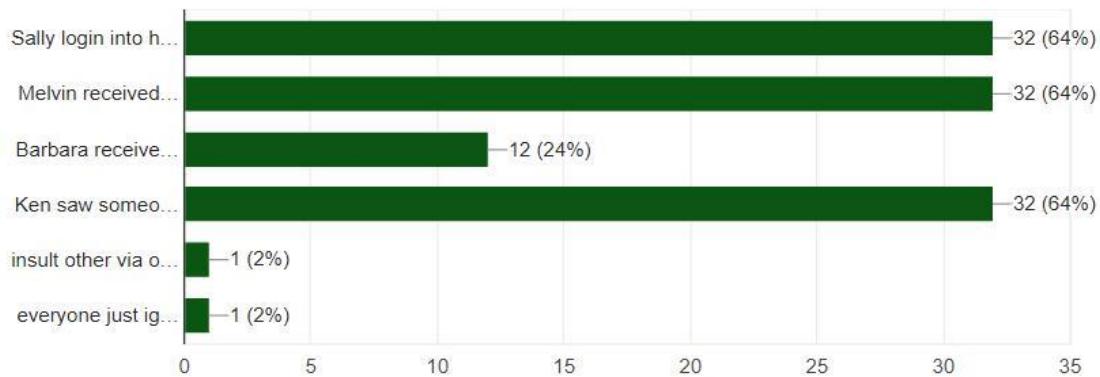


Figure 3.14: Differentiate between jokes and cyberbully from respondent

From the bar chart above, there are 32 people who thinks that impersonate as someone else to post some embarrassing things, send or post mean messages are represents cyberbully and it is not a joke to them. Only 12 people think that harassment from strangers might be a bad joke but not definitely cyberbully. There are 2 people giving another option such as insults another online and boycott someone among the groups.

Q5: Based on your opinion, what is the most effective way to help the victim?

Personal counseling (2)
Stop going to social website for a while and lay low for a while
Delete the detected messages.
Consultation; perhaps guidance on "ignorance is a bliss" or understanding of "reverse psychology" used against the cyber bully
Communicate and Open Minded
social media should stop spreading the post regarding to the bullied victim immediately
Help them report and give them moral support.
wipe out all the related content before the victim notice it

Encourage them
Talk to the victim help him or her calm down
Help them report the case.
have counselor to resolve issue, victim and bully had to agree on something
Consult them
Counselling
try to persuade cyberbully person
stop the harrasment
Ask victim block any connection with them.
counseling
ignore everyrthing, and wait them to get bored
Detect the cyberbully, make new account and choose friend, post status not public
do not fell sad but be positive and act like nothing happen, tell the people who bully you that your are still living good, the cyberbully cause nothing to you.
Report police
Discuss Internet privacy with Internet technology specialist. Follow any policies or procedures has in place for Internet communication.make them read about how they can keep an eye on their online activities without spying.
solve the case that the victim is being accuse of
Report, warning and block the person who posted the status which contains some messages which may hurt the other person.
Dun know
Save the evidence to report police
Give them some advice and spirit
made him not to care too much of the people online and focus more on real life.
Shut down or automatically delete cyberbully's account if detected bullying other after been reported
The best way is talk to the troublemaker and discuss with them.

stop comment under the post
Tell his/her to keep calm and report to his/her parents
Secure the victim account more and keep his/her privacy and respect it
Communication
Frozen the attackers' bank account and announce his/her parents, employer, etc.
Mentally support
People have to know how bad of cyberbully can affect someone's life
idk stay away from social media
Just ignore
Let them to have knowledge on what is cyber bully.
Reporting the case to related authorities
Give them knowledge.
Give counseling sessions.
Give them cyber user rules and regulations
Give counseling.
Let them know what kind of action amount to cyber bully.
Tell them how you feel when they did it or maybe just stay away from them because sometimes they did something that is very not respect to other but they think it was a joke or just fun
tell them we are on their side, we might could not stop the cyberbully but we can ignore it to minimize the damage

Table 3.2: Feedback response of effective way of helping victim from respondent

This question is an open-ended question and the above table shows all the response from the responders. Most of the responders think that the most effective way is giving counselling or comfort to the victim. Some respondents suggest to take some action against the bullies such as shut down accounts or report to someone who have the rights to punish them.

Q6: Based on your opinion, how can current technology help the cyberbully victim?

Providing procedures for them online (2)
We can use the current technology by tracking the cyberbully and ask the victim to go find him and ask for apology
Detect the messages and delete it.
Easy access and freedom of speech with allowance of the public i.e. Other people can see and view
AI features that can discover cyber bully incident and report immediately to responsible officer.
by filtering or blocking cyberbully content
It's a double edged blade to be honest because the more known the problem is the more support and harrasment you'll get. Don't really see any solution to this problem other than both parties fixing their own problems.
filtering all the cyberbully content on social media
把键盘侠们通通封锁账号 **(Translation: Suspend the account of keyboard warriors)
Block frequently used vulgar words
Add the function to report cyberbullying and attach evidence.
early prevention to avoid further escalation
I don't think current technology can help cyberbully victim
Any hotlines or live chats available for 24/7 to report cyberbully
website can report the cyberbully person
detect and remove those sensitive words
Content Analytics System
ban anyone with cyberbully record
luckily in facebook has a function name "block", juse block them to avoid any further cyberbully
Detect the cyberbully through ip and give warning for the person
detect some serious cyberbully and warn the people who bully
others. Bad
By Use encryption (e.g., PGP (Pretty Good Privacy)) for person-to-person e-mail to prevent someone from impersonating you or reading your e-mail.

stop the cyberbully by lock the bullies account according their IP address and GPS to detect they didnt register new account just for bully but they can unlock it at the administration office somewhere in malaysia and need to sign a contract promise wont bully again or else will get permanent block from internet.
Invent or create some apps that can detect the cyberbullies especially on the social media and post some articles which are titled as the effect of cyerbully.
Also dun know
Capture the photo as the evidence by screenshot it.
Always update the security of the application
detect the bullying party and block them
Can block who is bullying
Detect the sensitive or spam post and warn the troublemaker. May take severe punishment if incidents are happening again
no idea
Strengthen the security of every application either in phones or softwares
IMO , current technology cannot help the cyberbully victim unless there is a law that prohibited some user doing this cyberbully things even that might be sound ' not so freedom' but before thing can get worst, better take the hurtful action than doing nothing, cyberbully can lead a self-suicide when the victim is more depressed just like Amanda Todd
Block
Idk
No idea
Automatically delete the article
ppl need to be educated, yeah those bullies. tech is innocent
create somethings that can detect the cyberbully words and give the warning for the person, if he or she talk so many things badly it will automatic shutdown or ban the person from comment or talking.
Revert any reported post or pictures on social media.
Creating a forum or page where victims can share problems, thus supporting each other

Delete reported users' accounts.
Closely working with local police force
Look into all reported posts or pictures.
Block all reported users.
look into every reported post or picture seriously
block some sensitive word ?? but i think they will still find a way to bully those victim
stay away from technology, go out, get life

Table 3.3: Feedback response of relationship of current technology and cyberbully from respondent.

This question is an open-ended question, the table above shows the responses from the responders. Most of the responders think that blocking or deleting or filtering the content on social media might help to decrease the case of cyberbully. However, there are some responders do not think that or do not know that any of the technology could help the situation right now.

Q7: Based on my system description on above, what else do you think that the system could do to help the victim of cyberbully issues?

notify is just not enough, the system should take action to block or lock the bully account immediately if they detect it.
Perhaps , providing them contact information for counseling or etc ?
Ban the cyberbully social ID including IP address that been used
Suggest a block/softblock button
收集键盘侠的资料, 让他们再也无法登录任何网页。** (Translation: Collect those keyboard warriors information and ban them from login)
Teaches them how to avoid cyberbully and help them not to take those irritating attacks in mind too much
User that has constantly cyberbullying other should be banned and reported to authority with detailed evidence such as screen shot and post details to ensure further investigation.
Promote a lovely community. Stop cyberbully.
maybe the system can auto detect the rude word and change the rude word such as "stupid" to "clever". kek si the people who like to bully others. haha

provides suggestion or solution in how to counter/handle cyberbully
actively provide help to victim in discreet upon detection
Auto filtering cyberbully-related content feature for user(victim) to use.
The victims may also ignore those messages and just be themselves as they are in the correct ways.
By beeping/canceling the vulgar words
block the user
block the content
I think maybe they really need to instill the value that everyone is important

Table 3.4: Feedback response of suggestion on system requirement from respondent

This is an open-ended question and above table shows all the responds from the responders. Most of the responders suggest to block or ban the bullies and some suggest that raise some awareness to promote a better community.

## Conclusion

### Interview

From the interview response of the interviewee, the opinions of interviewee seem focus on the personality of the bully and victim when it comes to the reason of cyberbully apart from easy access to the platform. She believes that if the person thinks negatively, then everything will become negative and eventually it will lead to bully others because of jealousy or being bullied and heavily affected by the bully. The interviewee also thinks that there is no practical way of existing solutions that will able to decrease the cyberbully on the internet.

The interviewee thinks that it is possible to prevent cyberbully with the use of technology but she also thinks that in order to successfully prevent cyberbully needs the collaboration of different parties on the society such as parents, teachers, students and governments. The interviewee proposed some user requirement to the system and she will clearly expect more information about the cyberbully post and the bully and victim identity.

### Questionnaire

From the questionnaire response of 50 respondents, it seems like the age, gender and race does not significantly affect the chances of getting cyberbullied. From the responds, the behaviours and appearance of one person does influence and these are the main cause of the cyberbully issues. Almost half of the respondents have been cyberbullied and most

of them chose not to tell anyone or report the case because of various reasons such as they rather ignore and bear with it. Some respondents also think that there is no trustworthy third parties for them to report the cases.

Most of the respondents specified some words when comes to the keywords that they think it is cyberbully. Most of them also thinks that the most effective way of helping the victim is by blocking or banning the bullies, which indicates that avoidance is their best choice. However, most of the respondents do not think or do not know that the current technology could help the victim because they think that this is all comes from people side and not technology problem. The respondents does give some opinions on the requirement of the system from the perspective of victim such as blocking or banning the bullies from the platforms.

### **3.2 Stakeholder Requirement**

In this section, the author will describe and explain the user requirement to the proposed project. The requirements will categorized into functional and non-functional requirement.

#### **Functional Requirement**

Functional Requirement is refers to those requirement that it is compulsory to the proposed project or it can defined as the requirements that made up the system itself. There are mainly 8 functional requirements in the proposed project:

##### **1. Register**

The proposed project will open to anyone who use the system to register an account on the proposed project. Any of the cyberbully intentions discovery record will only be recorded under this account.

##### **2. Login/Logout**

The proposed project allows the registered user to login to their account and view the discovery record and when they do not use it, logout from the system.

##### **3. Keyword Filtering**

There is an option for the user to choose what they want to filter in the collection of data according to their focus. The default pre-set will be common keywords that used on cyberbully.

##### **4. Data Collection**

The proposed project should collect status data from certain social media site using the keyword filtering, the proposed project will only focus on those public status that contains certain keywords.

##### **5. Data Analyzation**

The proposed project should then analyse the collected status to check whether it has cyberbully intentions or not. It should discover any meanings underneath the words.

#### 6. Data Storage

All of the collected data should store inside a database first. After the analyzation, the detected data will be stored into another database and those who did not get detected will be discarded.

#### 7. Notification

After the cyberbully intentions content is getting discovered, the system should notified the user upon the discovery.

#### 8. Data Presentation and Visualization

The monthly report of the cyberbully intentions content discovered should be generated and present in visual to the user.

### **Non-Functional Requirement**

Non-functional requirement refers to the requirement that is more focus on the performance of the proposed project. It can be defined as how well can the proposed project run its function. There are mainly 4 non-functional requirements in the proposed project:

#### 1. Use of GUI (Graphic User Interface)

To increase the usability and learnability of the proposed project, the GUI is going to implemented into the system so that the user could use the system in a visual way.

#### 2. Response Rate

The proposed project should be able to respond to any request from user, for example addition of keywords into filtering process under 2 seconds and it should be able to present the data recorded to the user under 2 seconds as well.

#### 3. Accuracy

The proposed project should analyse the collected status content in high accuracy where most of the discovered contents are real cyberbully intentions content.

#### 4. Data Load

The proposed project should be able to handle the data load when it's collecting the status data from social media site. For example, it should be able to handle 100 statuses at a time.

#### 5. Fast Operation

The proposed project should be able to collect the data fast and analyse the underneath intentions fast enough to cope with the large data load on the social media site.

### 3.3 System Design

#### Rich Picture Diagram

Rich Picture Diagram is a type of diagram which define the system situation through visualized it and present it in diagram form. It basically creates a preliminary model for the system situation.

Below is the Rich Picture Diagram for the proposed project:

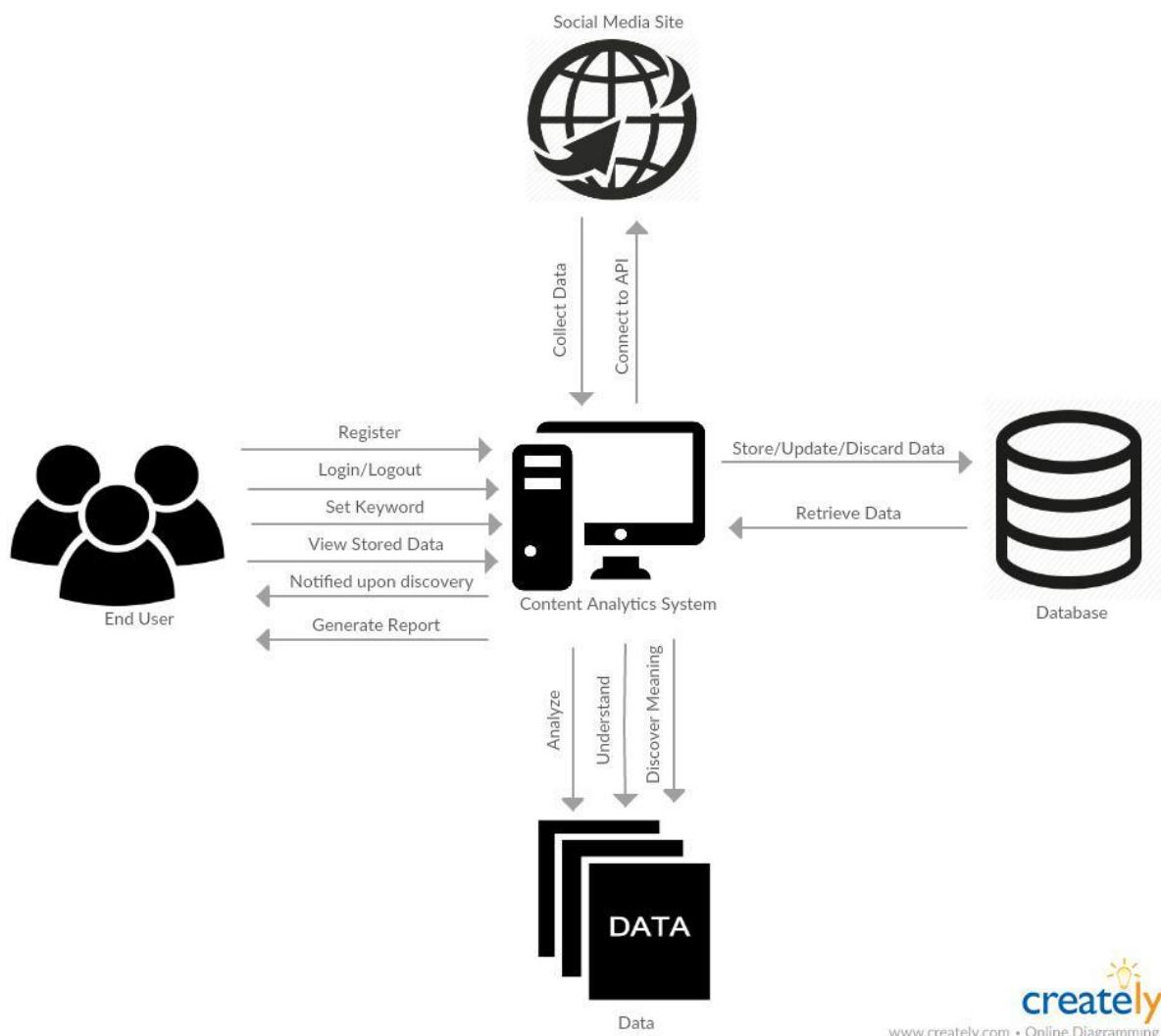


Figure 3.15: Rich Picture Diagram of Content Analytic System

There are 5 components in this Rich Picture Diagram which is the system, database, end user, social media site and data. Their interaction represents the action that is available in the proposed project between the components.

## Functional Decomposition Diagram

Functional Decomposition Diagram is a type of diagram that shows the relationship between each function and how each function behave themselves under the system.

Below are the functional decomposition diagram of proposed project, there are total of 3 subsystem diagram:

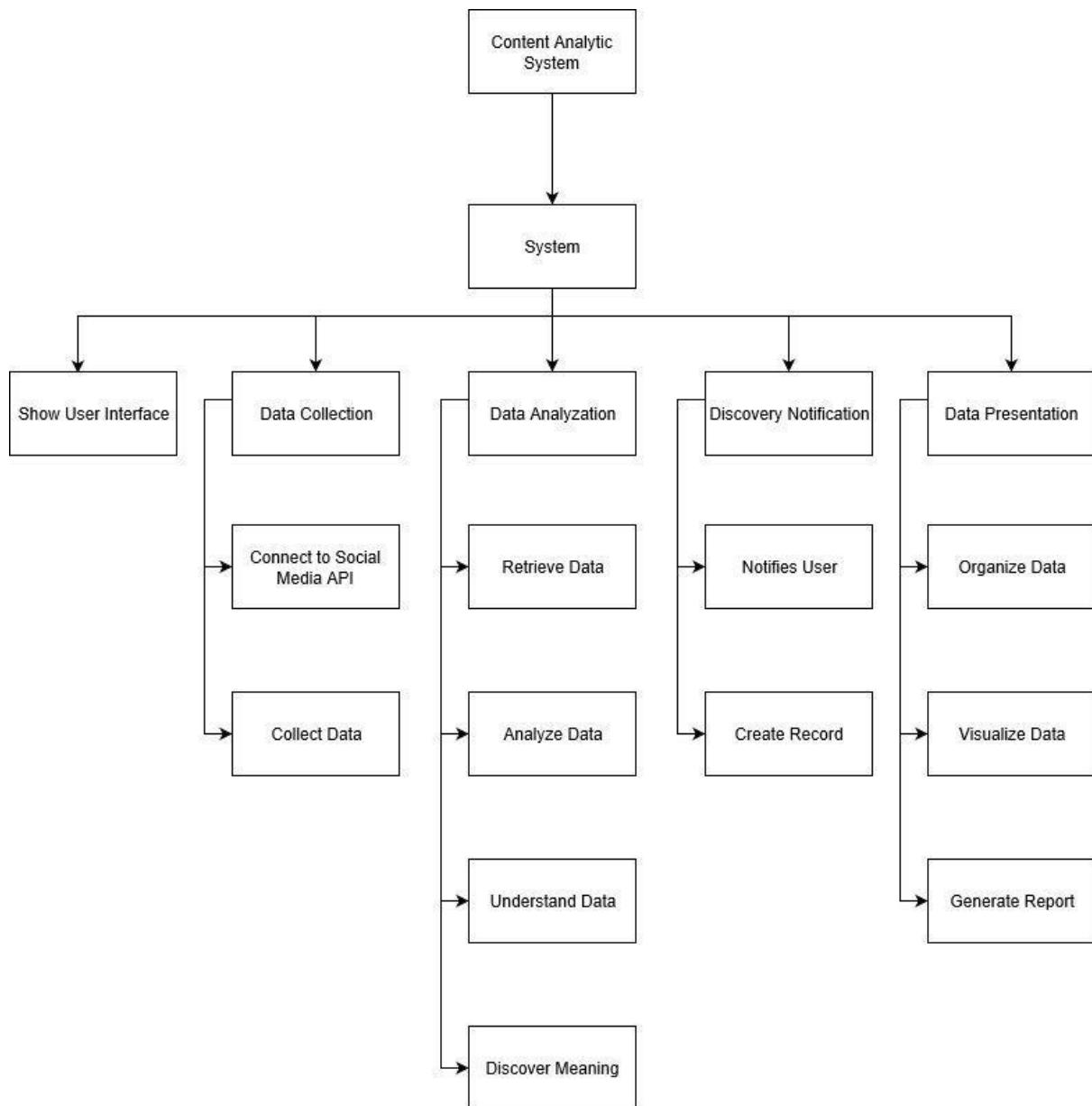


Figure 3.16: Functional Decomposition Diagram of System

This is the subsystem from the system perspective. It contains of another 5 small components which is show user interface, data collection, data analyzation, discovery notification and data presentation. Each of the small components below consists of their action on the function.

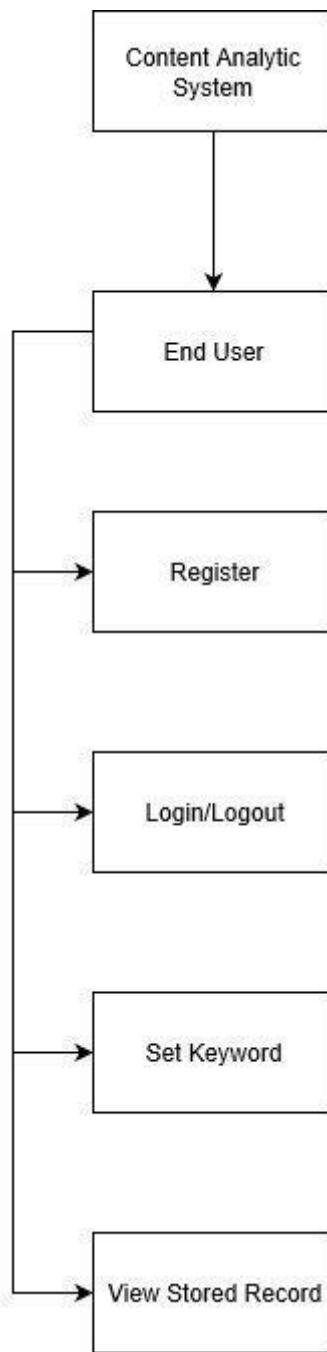


Figure 3.17: Functional Decomposition Diagram of End User

This is the subsystem from the end user perspective. There are multiple function which is established by the user which they are acts as small components under the end user tab.

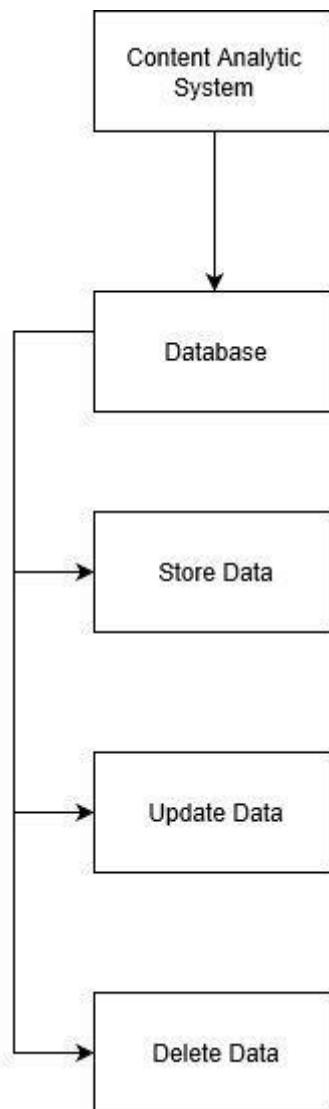


Figure 3.18: Functional Decomposition Diagram of Database

This is the database subsystem, there are multiple function which connects to the database and it is acts as a small component under the database tab.

### Use Case Table

Use Case table is a table that listed all the actors involved in the operation and the use case that they have been assigned in.

Actor	Use Case
Non-Registered User	Register
Registered User	Login
	Logout
End User	Login
	Set Keyword to Filter
	View Report
	Receive Notification
	View Stored Record
Data Collection Handle	Connect to Social Media API
	Collect Data
	Store Data
Data Analyzation Handle	Retrieve Data
	Analyze Data
	Detect cyberbully intentions content in data
	Store Detected Content Data
	Discard Undetected Content Data
Notification Handle	Send Notification to user upon discovery
Data Presentation Handle	Organize the data
	Generate Report

Table 3.5: Actor and Use Case List

Actor	Description
Non-Registered User	This is the user that have not own an account in the system and do not have access to any feature of the system.

Registered User	This is the user that own an account in the system and they have access to every feature of the system
End User	The registered user that able to access any feature of the system
Data Collection Handle	The function in the system that is responsible to collection of data operation
Data Analyzation Handle	The function in the system that is responsible to analyzation of data operation
Notification Handle	The function in the system that is responsible to notification operation
Data Presentation Handle	The function in the system that is responsible to presentation of data operation

Table 3.6: List of Actors and their description

Use Case	Description
Register	This is for the non-registered user, they have to fill in information needed in order to create an account in the system.
Login	This is for the registered user, they have to fill in their login credentials, once the system verified the credentials, they are allow to access to the system.
Logout	After the user have done with everything in the system, they can logout to prevent anyone sneak on their account data.
Set Keyword to Filter	The user will be able to set the keywords to filter the public status data from the social media site.
View Report	The user will be able to view the summary report generate by the system
Receive Notification	The user will receive a notification whenever there is a cyberbully intentions content data being discovered.
View Stored Record	The user will be able to view the stored record by the system when they

	discovered the cyberbully intentions content data.
Connect to Social Media API	The system have to connect to social media API in order to access to their function and database.
Collect Data	The system have to collect the public status data for analyzation purpose.
Store Data	The system will be able to store the data that is collected from social media
Retrieve Data	The system will be able to retrieve the data from the database and establish the next operation
Analyze Data	The system will be able to analyse the data using LUIS
Detect cyberbully intentions content in data	The system is tend to detect if any cyberbully intentions content are present in the status data collected.
Store Detected Content Data	The system should store the detected cyberbully intentions content data into another database.
Discard Undetected Content Data	The system should discard those data that did not found any cyberbully intentions content.
Send Notification to user upon discovery	The system should send notification to the user upon the discovery.
Organize the data	The system should organize the data into clear overview in certain time period.
Generate Report	The system should generate a summary report and enable user to view it as the overview of summary in certain time period.

Table 3.7: List of Use Case and Description

## Use Case Diagram

Use Case Diagram is a type of diagram that shows the interaction between each actor in an operation. Actors acts as a role in the operation and the use case is the action that they are available to do in the operation.

Below are the Use Case Diagram for the proposed project, it has been divided into 5 subsystems.

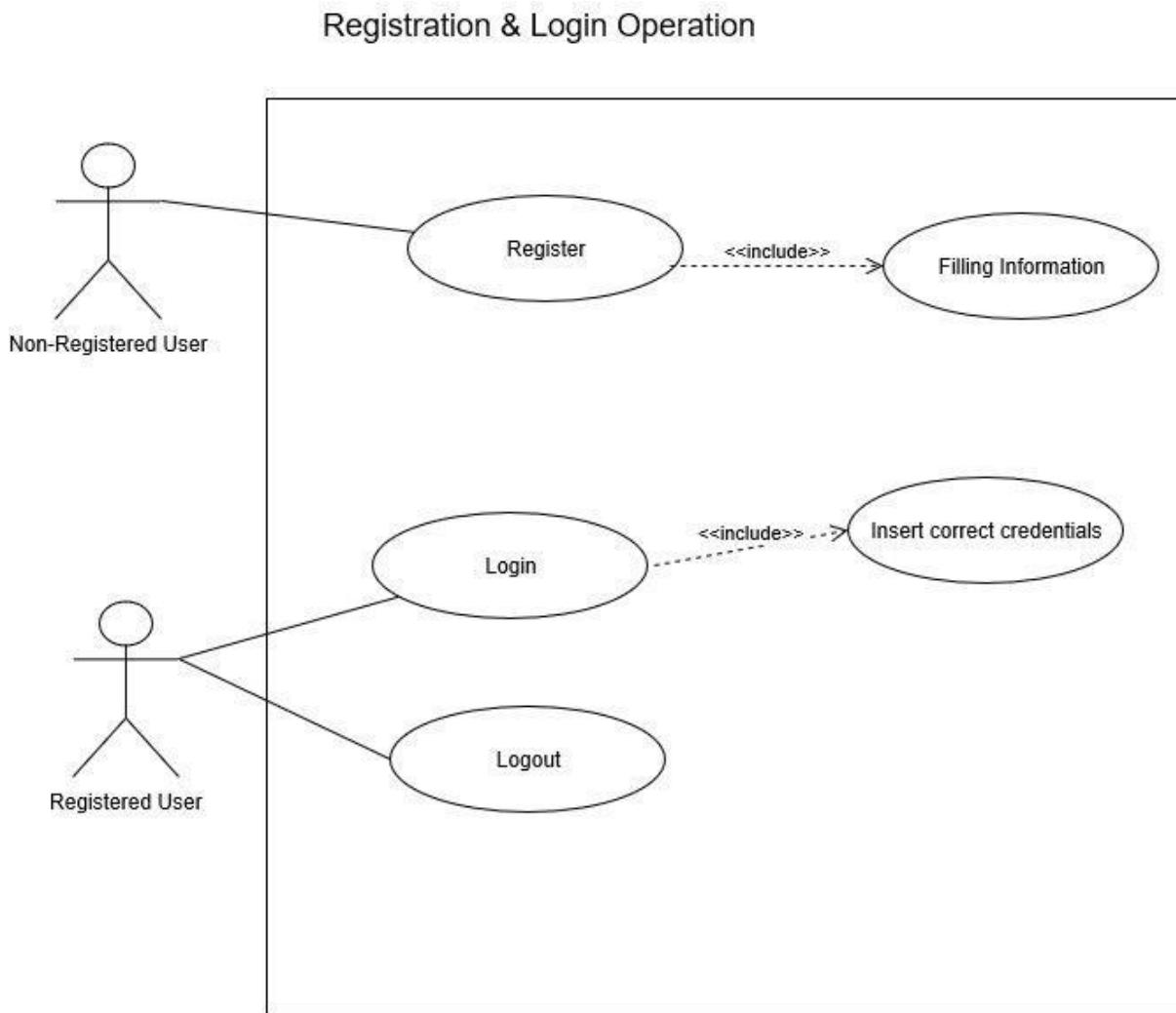


Figure 3.19: Use Case Diagram of Register and Login Operation

This diagram shows the subsystem of registration and login. The actors are non-registered user and registered user and their relatively corresponds use case.

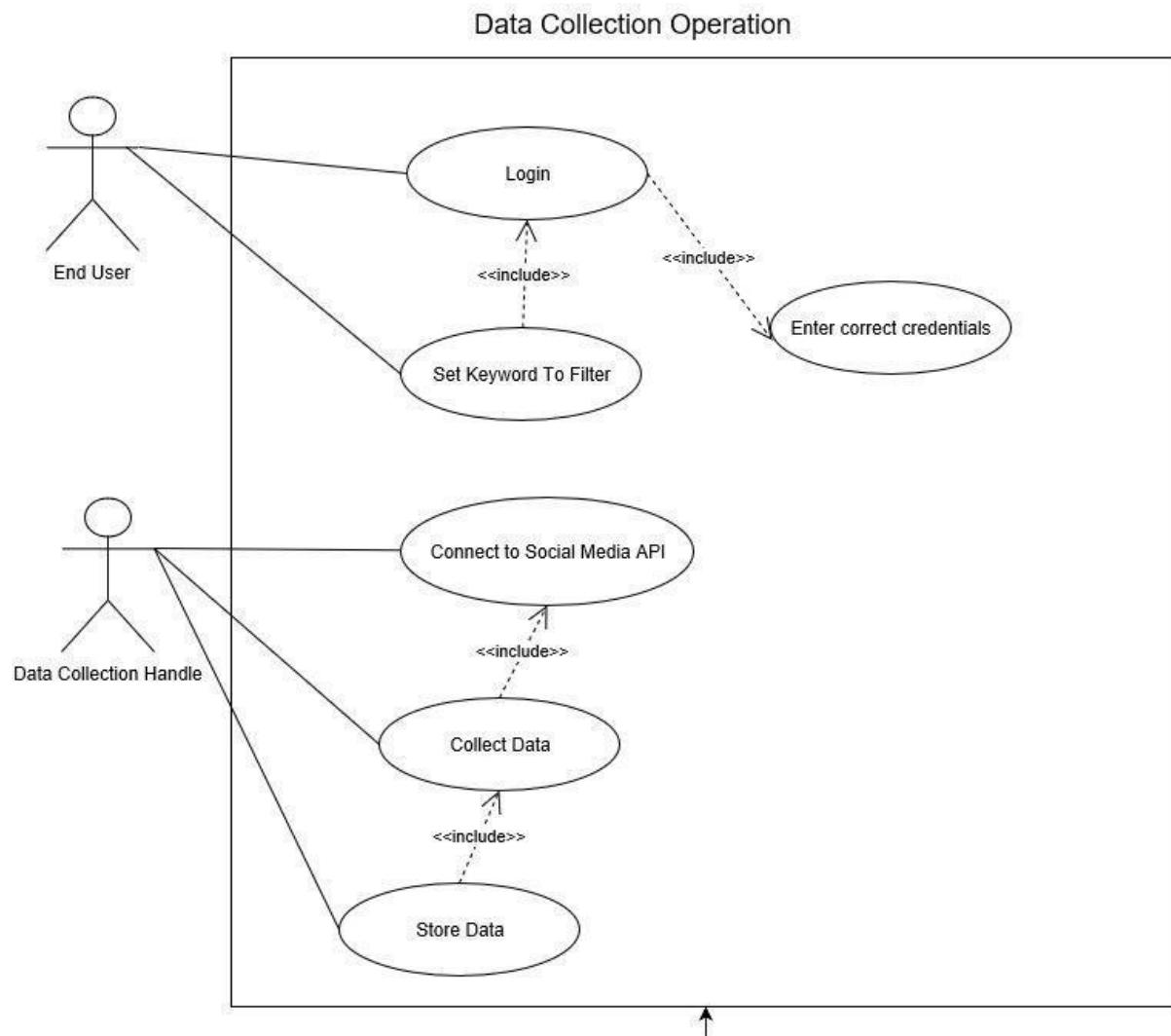


Figure 3.20: Use Case Diagram of Data Collection Operation

This diagram shows the subsystem of data collection operation. The actors is the end user and data collection handle which exist in the system and their relatively corresponds use case.

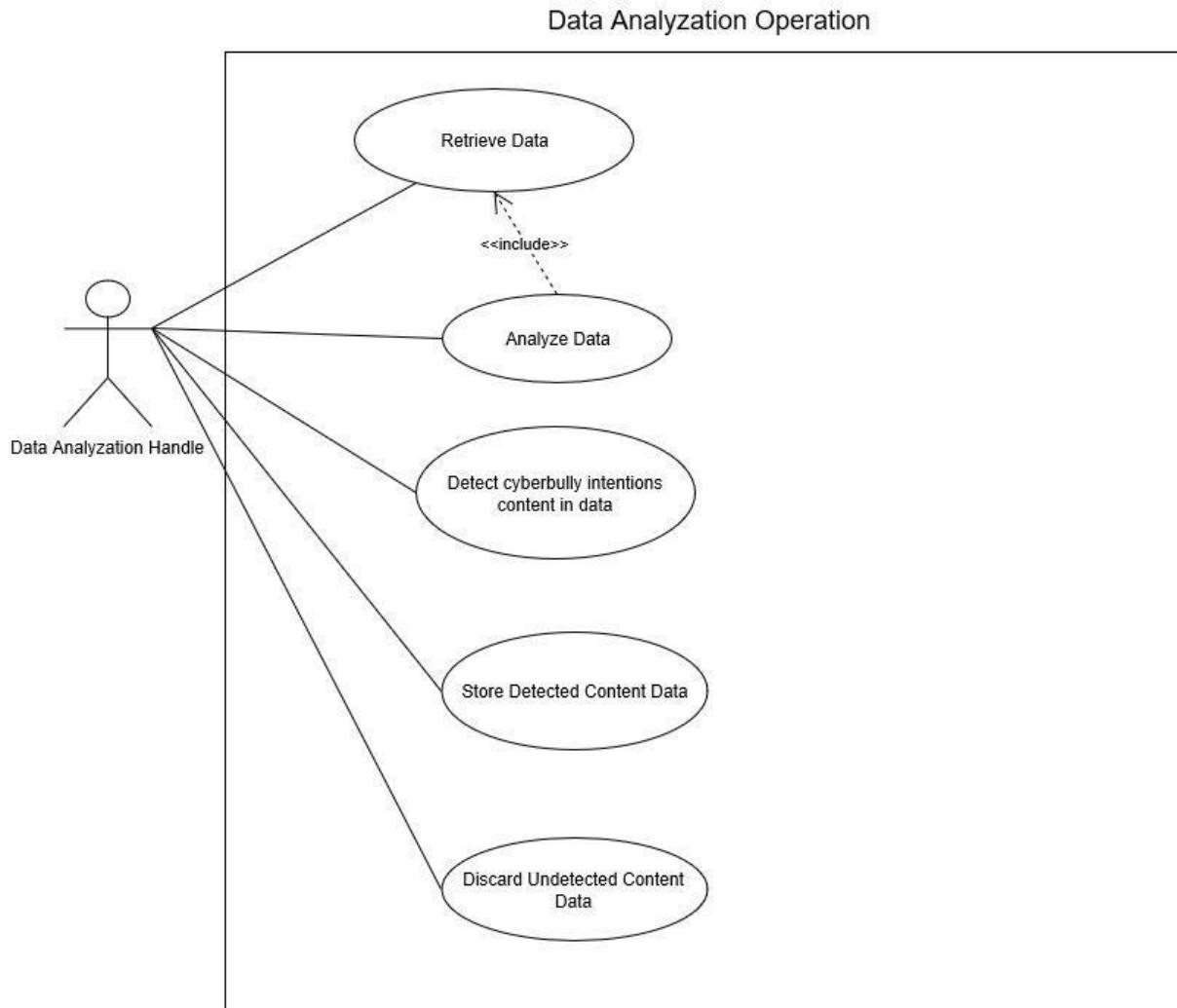


Figure 3.21: Use Case Diagram of Data Analyzation Operation

This diagram shows the subsystem of data analyzation operation. The actor is the data analyzation handle which exist inside the system and its relatively corresponds use case.

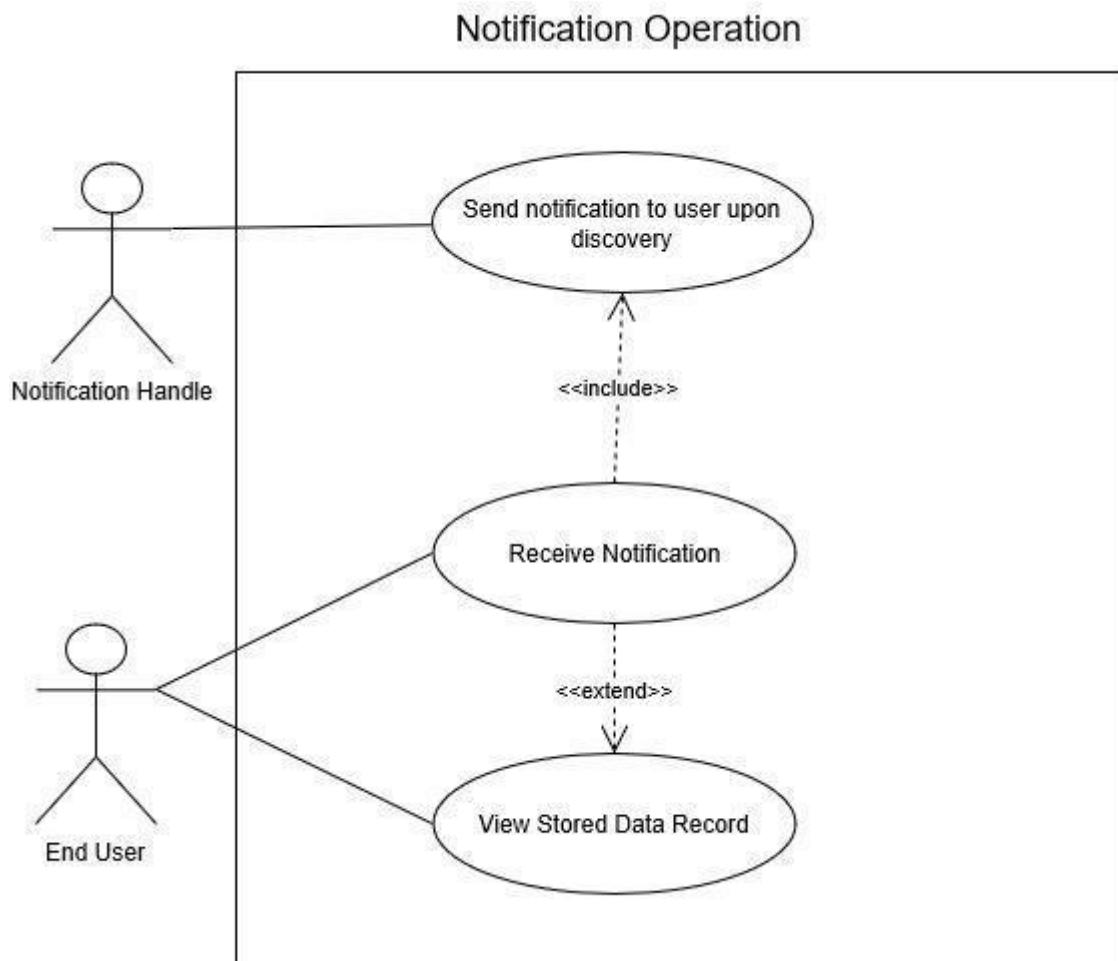


Figure 3.22: Use Case Diagram of Notification Operation

This diagram shows the subsystem of notification operation. The actors are end user and notification handle which exist inside the system and their relatively corresponds use case.

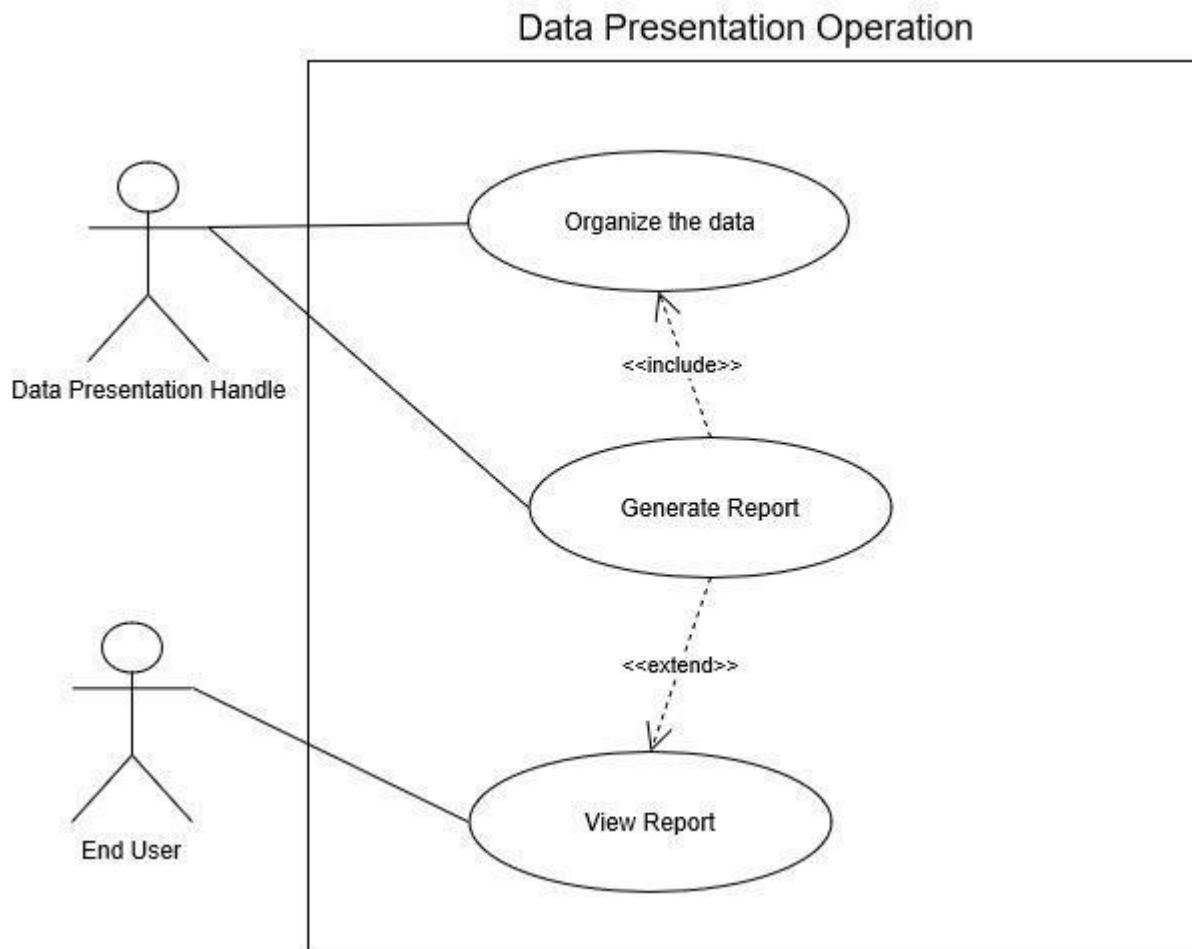


Figure 3.23: Use Case Diagram of Data Presentation Operation

This diagram shows the subsystem of data presentation operation. The actors are end user and data presentation handle which exist inside the system and their relatively corresponds use case.

### Use Case Dependency Diagram

Use Case Dependency Diagram is a type of diagram that shows the relationship between each use case in each operation in the system.

Below are the use case dependency diagram of the proposed project, the author divided them into 5 subsystem:

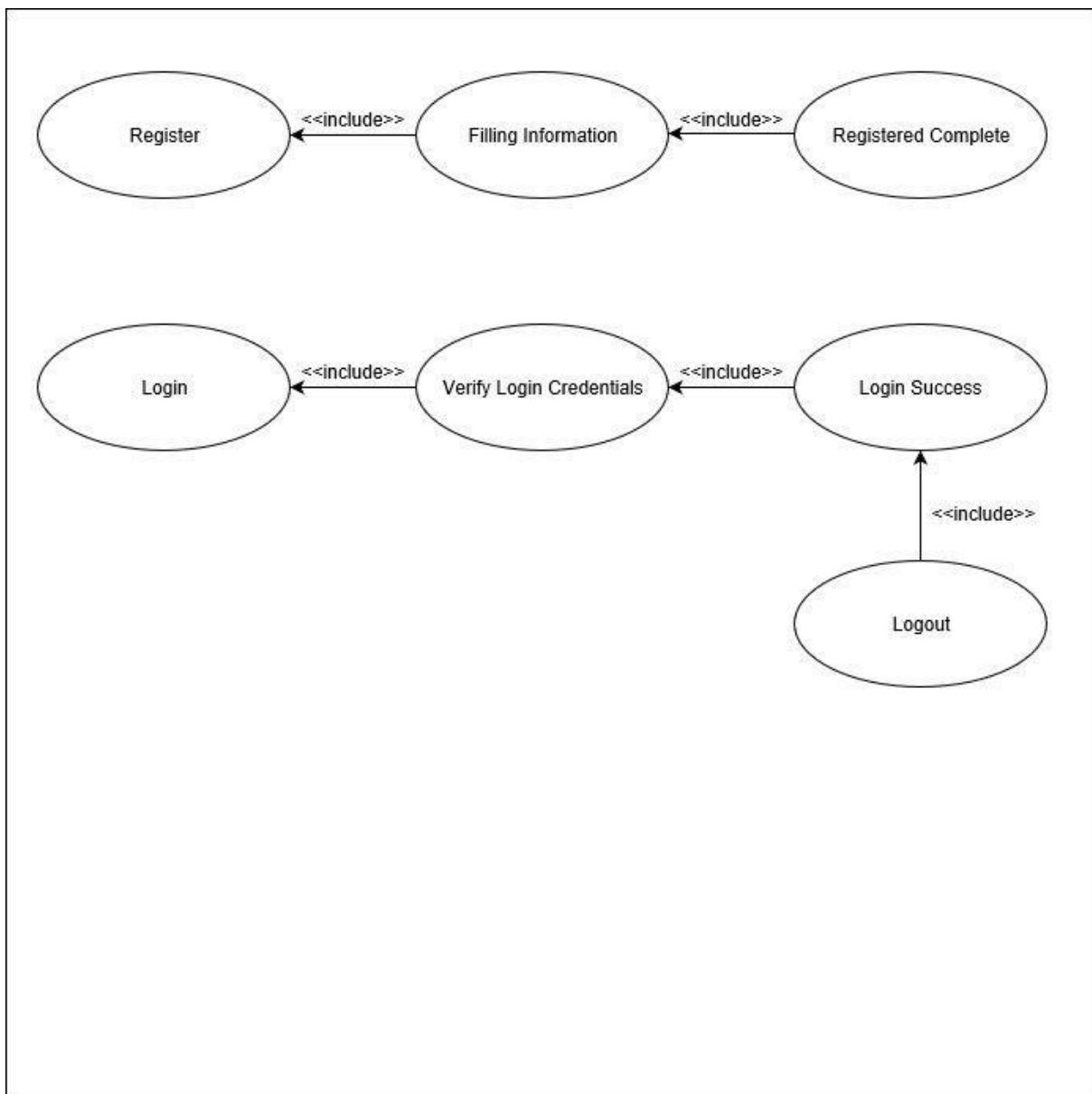


Figure 3.24: Use Case Dependency Diagram of Register and Login Operation

This diagram shows the dependency relationship between use cases that present in the registration operation and login operation.

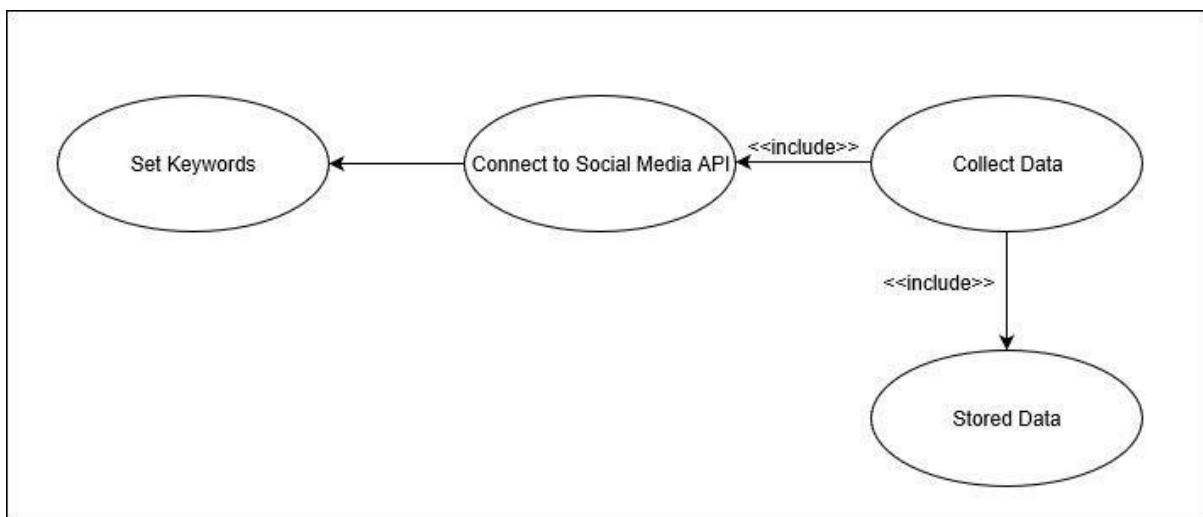


Figure 3.25: Use Case Dependency Diagram of Data Collection Operation

This diagram above shows the dependency relationship between the use case that presents in the data collection operation.

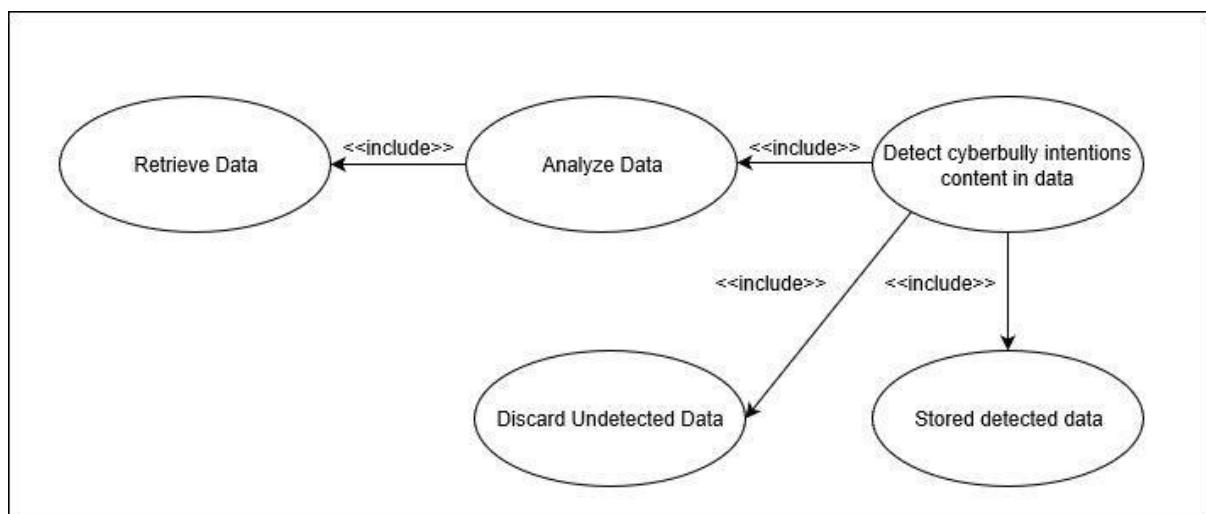


Figure 3.26: Use Case Dependency Diagram of Data Analyzation Operation

This diagram above shows the dependency relationship between the use case that represents in the data analyzation operation.

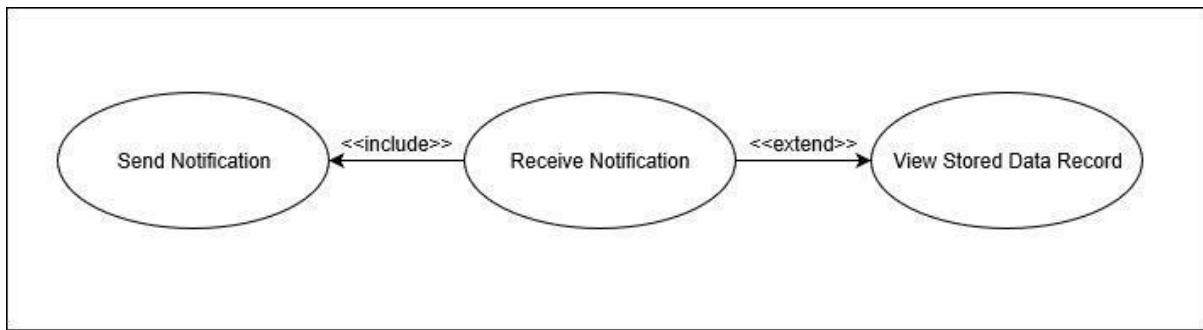


Figure 3.27: Use Case Dependency Diagram of Notification Operation

This diagram above shows the dependency relationship between the use case that presents in the notification operation..

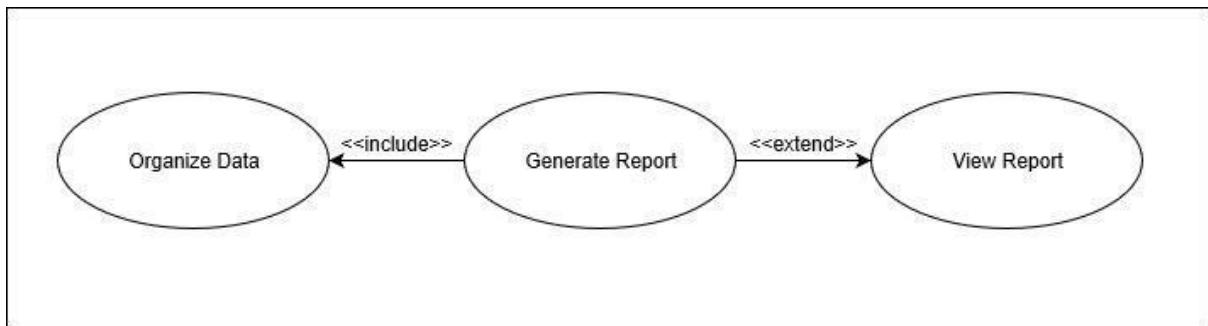


Figure 3.28: Use Case Dependency Diagram of Data Presentation Operation

This diagram above shows the dependency relationship between the use case that presents in the data presentation operation.

## Entity Relationship Diagram

Entity Relationship Diagram is a type of diagram that shows the entities and the relationship between the entities in a graphical form.

Below is the entity relationship diagram of the proposed project:

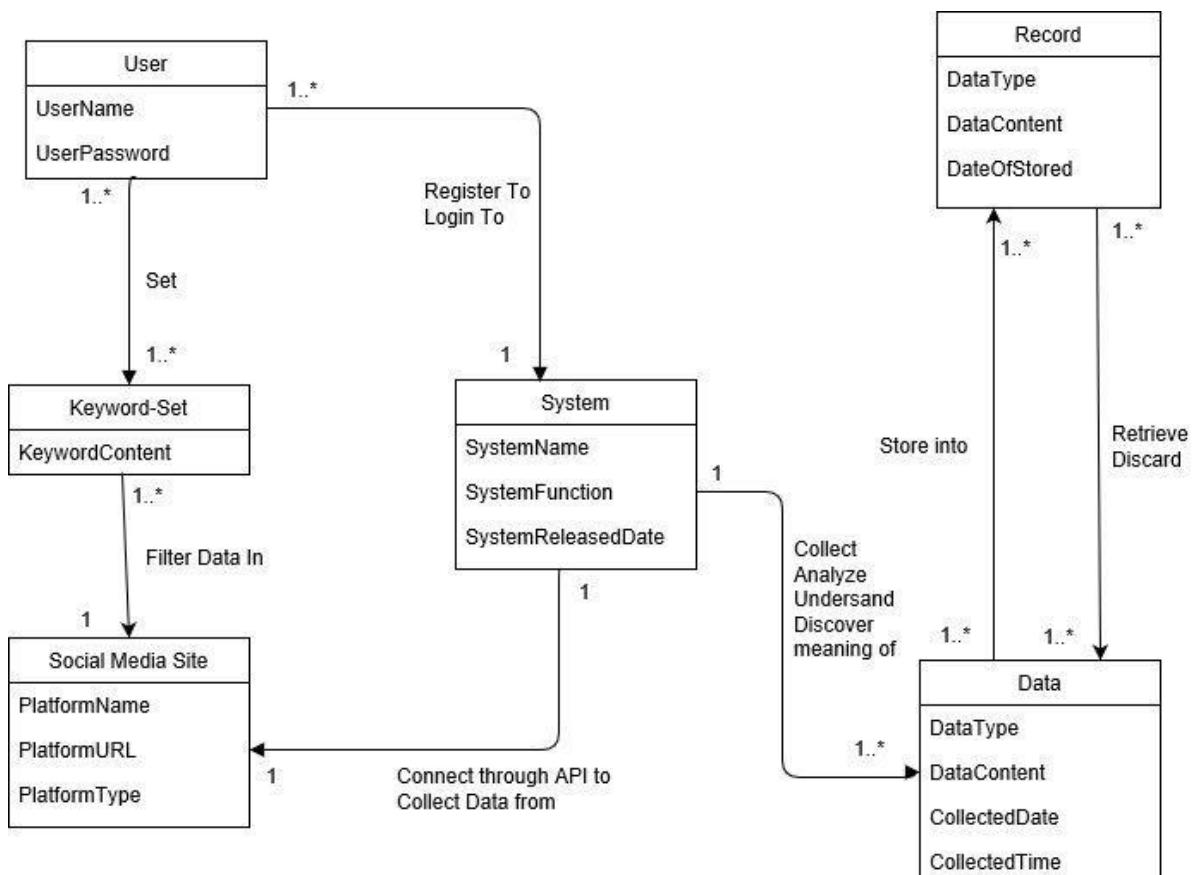


Figure 3.29: Entity-Relationship Diagram of Content Analytic System

This diagram above shows the entity relationship between each of the entities in the proposed project.

## Activity Diagram

Activity Diagram is a type of diagram that represents the process flow from one activity to another activity in the operation of the proposed project, in other words, it is like the flow chart of the operation.

Below are the activity diagrams of the proposed project, the author has divided them into 6 subsystems.

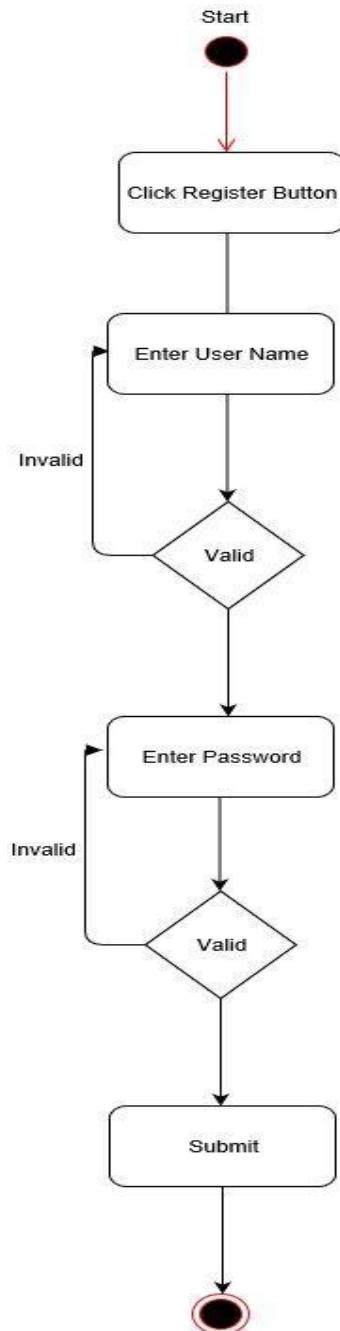


Figure 3.30: Activity Diagram of Register Operation

This diagram above shows the process flow of the registration operation.

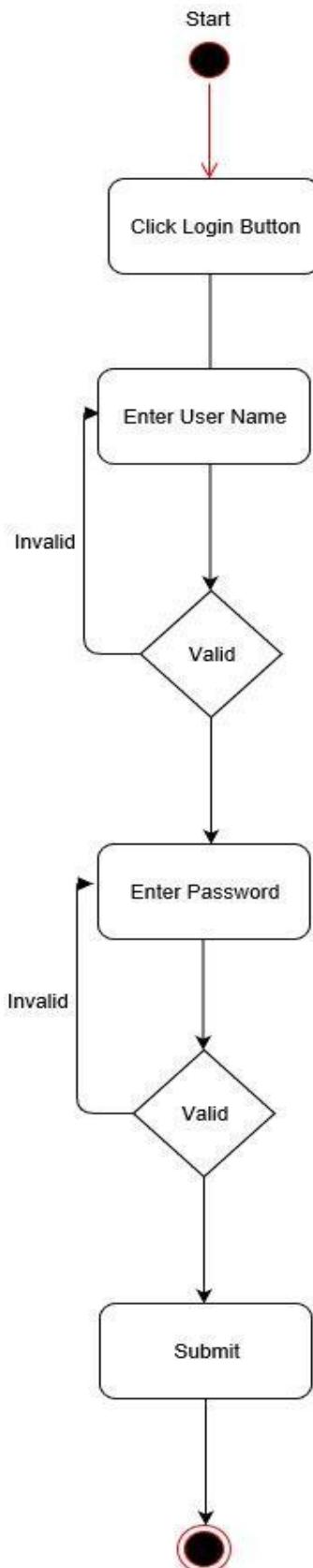


Figure 3.31: Activity Diagram of Login Operation

This diagram above shows the process flow of the login operation.

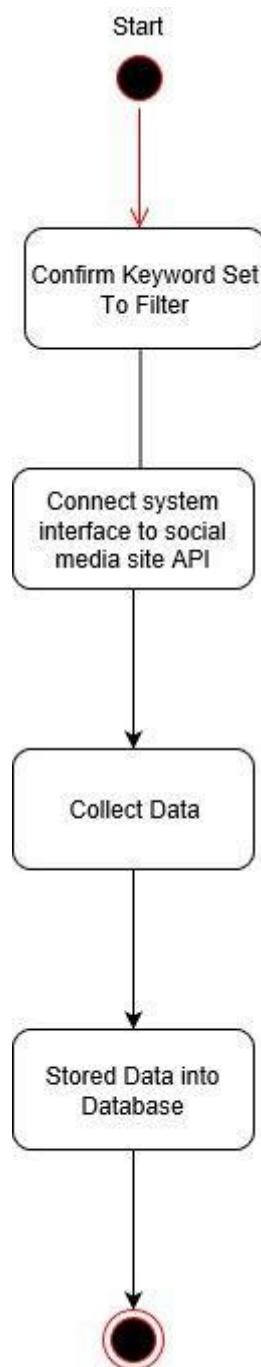


Figure 3.32: Activity Diagram of Data Collection Operation

This diagram above shows the process flow of the data collection operation.

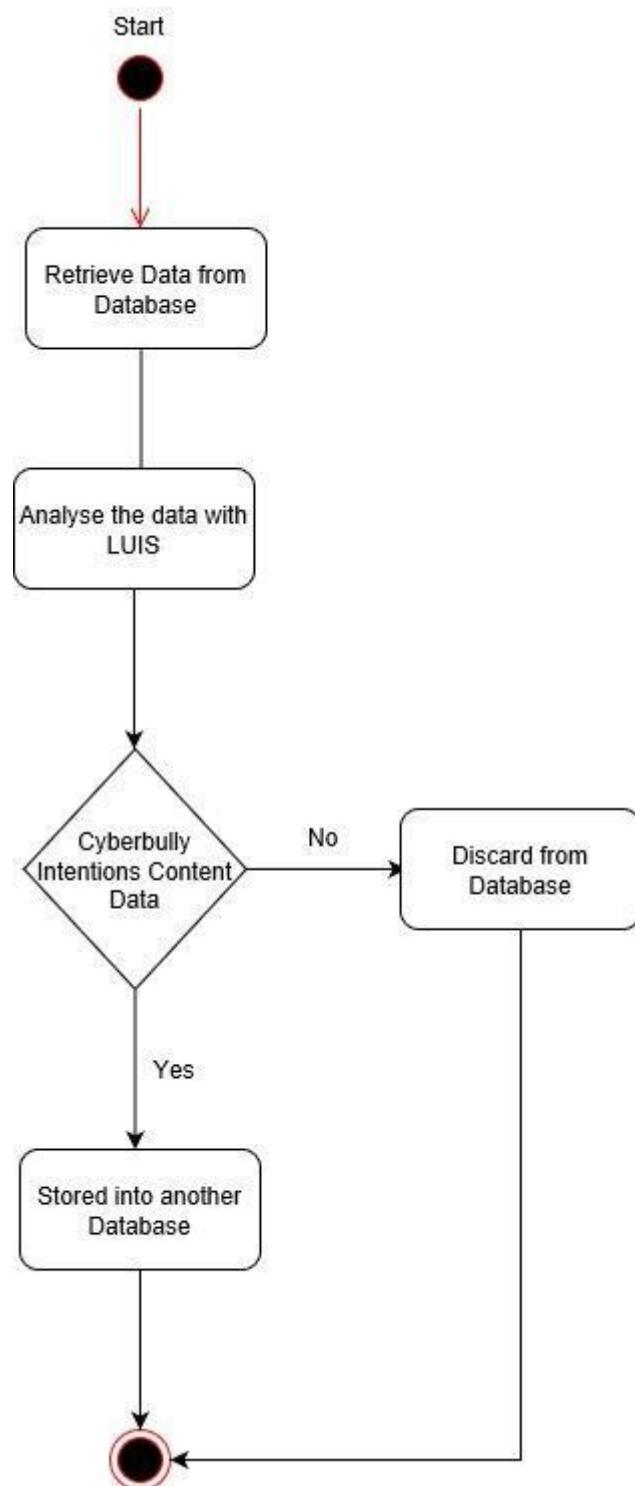


Figure 3.33: Activity Diagram of Data Analyzation Operation

This diagram above shows the process flow of the data analyzation operation.

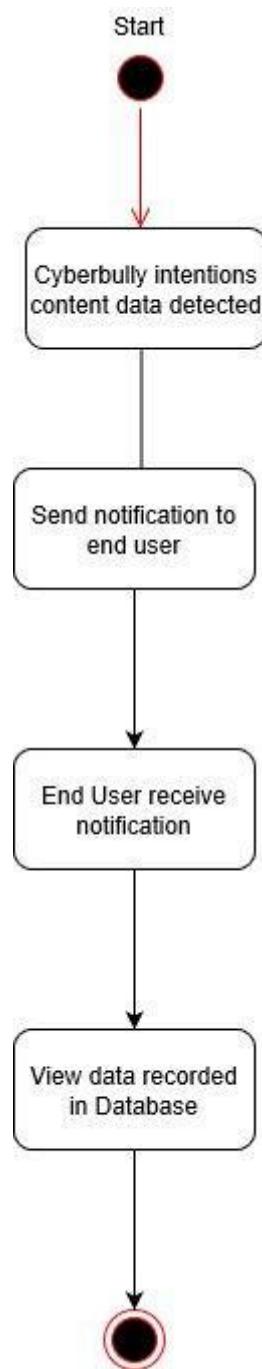


Figure 3.34: Activity Diagram of Notification Operation

This diagram above shows the process flow of the notification operation.

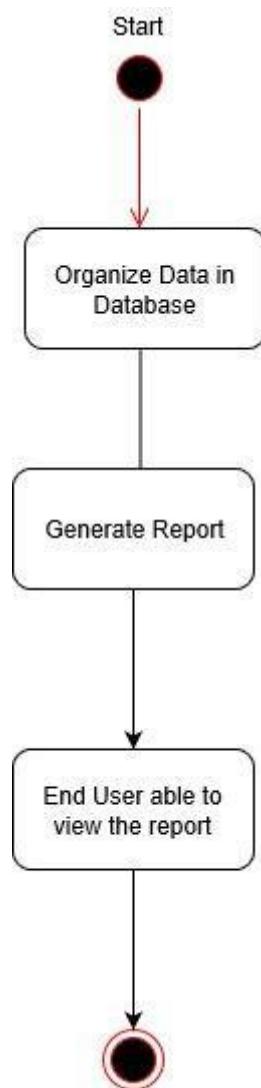


Figure 3.35: Activity Diagram of Data Presentation Operation

This diagram above shows the process flow of the data presentation operation.

## User Interface

User Interface is the interface design that supposed to show on the system to interacts with the user.

Below are the user interface design of the proposed project:



Figure 3.36: User Interface of Home Page/Login Operation

Above user interface is the home page of the proposed project. The user that owns an account in the system can directly login to the system. The unregistered user will be able to click the register account button to register an account in the system.

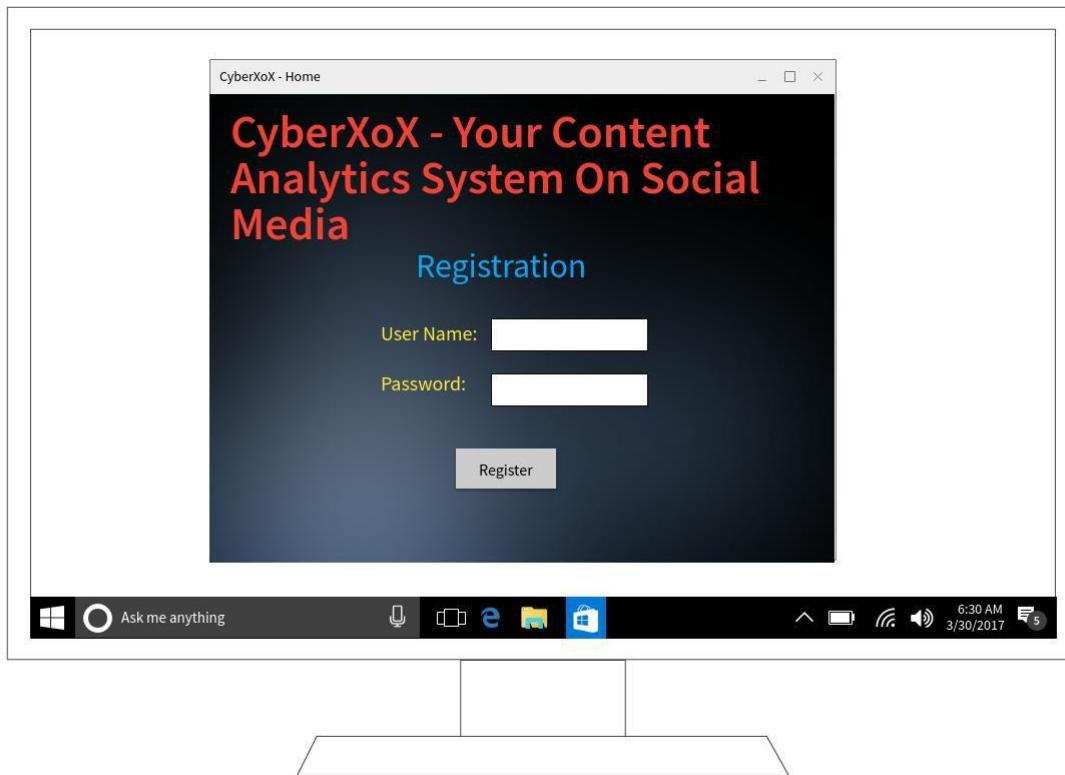


Figure 3.37: User Interface of Registration Operation

Above user interface is the registration page of the proposed project, the user that do not have an account in the system will be able to register their account in the system as long as they provide valid information filled in.

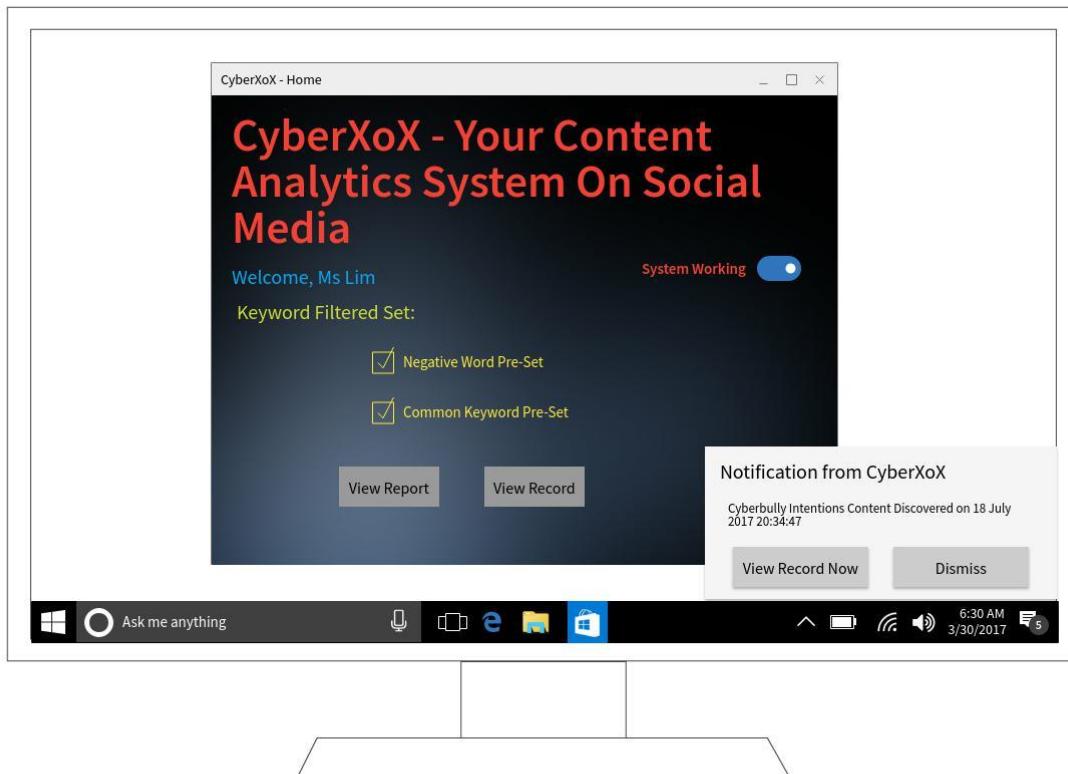


Figure 3.38: User Interface of User Account

Above interface shows the account page when the user have login to their account successfully. First that shown is the keyword filtered set where the user can choose to use the pre-set to filter the data or not. There is also a status that shows the system is working meaning that the system on the back end is actually collecting the data and also analysing the data. There are two options for the user which is view the report generated by the system to summarizes the discovered content in a month, another is view the record that is stored by the system whenever they discovered a cyberbully intentions content data. Also, the notification will pop up when there is a discovery on the cyberbully intentions data.

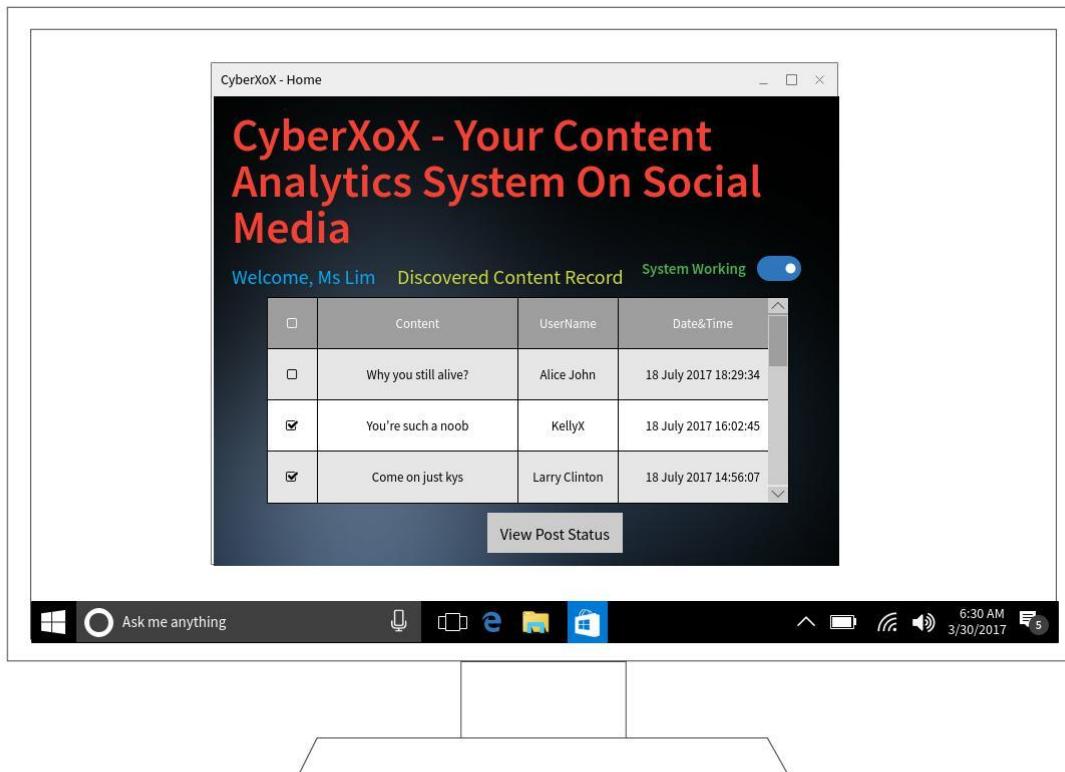


Figure 3.39: User Interface of View Record

Above interface shows the record that stored by the system whenever they discovered a cyberbully intentions content data. The user will be able to choose the status that they want to view and click view post status. The URL of the post status will lead the user to a web browser.

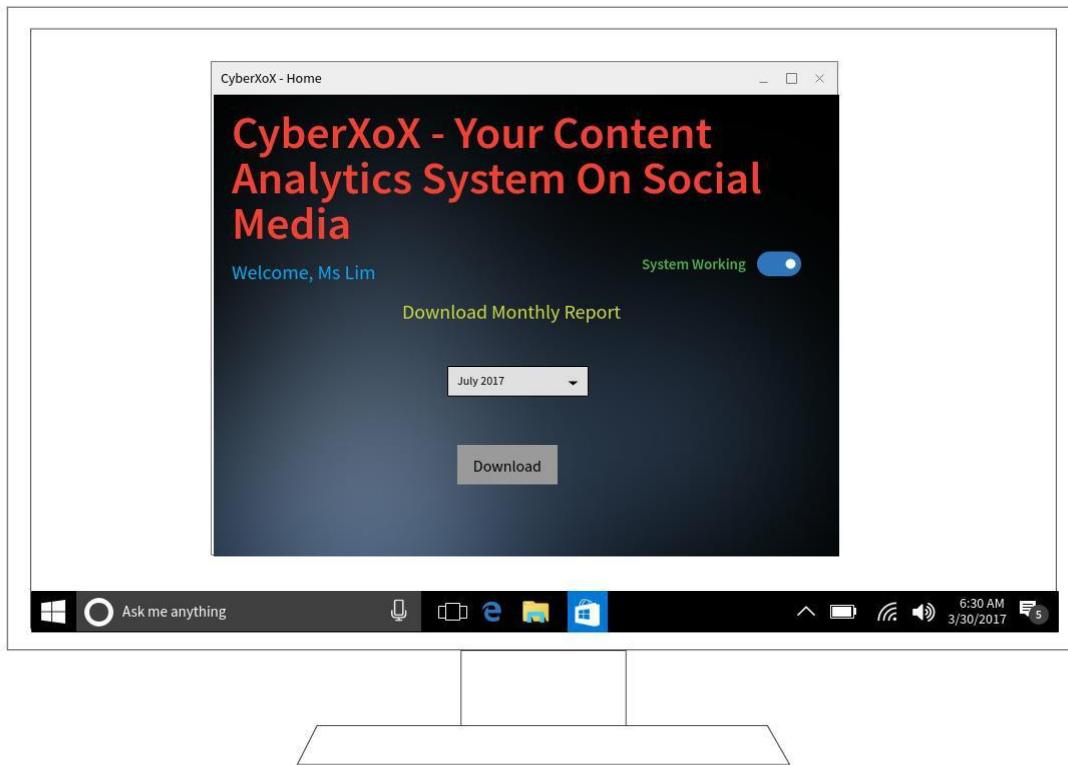


Figure 3.40: User Interface of View Report

Above interface shows the download report page of the proposed project. The user will be able to choose the month they want to download the report from. The downloaded report will be in PDF file format and it should be organized and present the summarized data.

### 3.4 Summary

In this section, the author has already done the facts-finding technique to gather the information and user requirement of the proposed project. The objective of the questions and each of the responds has already been presented and explained. The second part of this section, the author has already described the design of the system by presenting various types of UML diagram and also the proposed user interface of the proposed project. On the other hand, the transcript of the interview also included in the appendix of this section.

## Chapter 4: System Implementation

### 4.0 Overview

In this chapter, the author will discuss the development of the proposed project, which is the content analytics system prototype on the social media platform. The author will explain thoroughly regarding to the tools and technologies that the author has deployed in the development of this proposed project despite the mentioned in previous documentation. Furthermore, the author will discuss the details of the development process of the proposed project including the functions, methods and codes in the first end and back end of the prototype.

### 4.1 System Development Tools and Configuration

In this section, the author will discuss and explain the tools and technologies deployed in the process of development of the proposed project.

#### Visual Studio 2017

Visual Studio 2017 is one of the tools that the author deployed in the development of the proposed project. It acts as the Integrated Development Environment (IDE) to the proposed project because the author used the tool to write the code and develop the front-end and back-end of the proposed project.

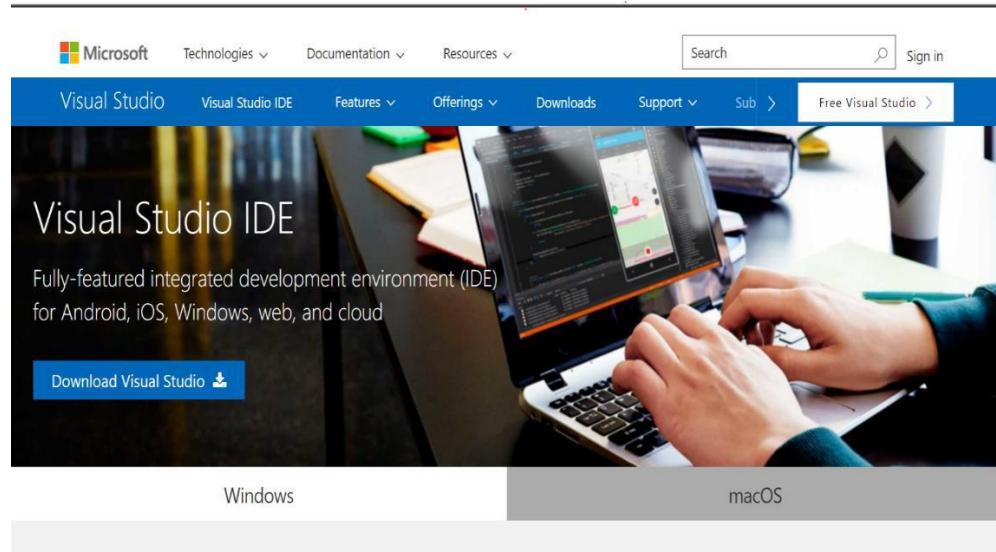


Figure 4.1 Official Website of Visual Studio IDE (Visual Studio Community, 2017)

The author was using the Visual Studio IDE Community Edition 2017, which is the latest edition that is free yet fully-feature to the community provided by Microsoft. Visual Studio IDE provided a various of feature and ease of access to the developer community.

First of all, one of the feature that Visual Studio had stand out among the other IDE is that it had great ecosystem. This indicates that the Visual Studio IDE are available to various type of extensions including NuGet packages and external extensions. The example of the external extensions is ReSharper provided by JetBrains Company. ReSharper extension allows developer to improve their code quality as well as eliminate errors and code smells by using the code editing helpers (Jetbrains, 2017). Another example of extension is NuGet packages, NuGet serves as a package manager and allows the developer to produce and consume the packages in .NET environment (NuGet, 2017). The packages are known as extension, however instead of installing the extension externally, NuGet packages allows the developer to search any package available in the NuGet gallery in the Visual Studio 2017 itself. That way, the developers are able to clean install the packages inside their program.

Another feature that makes the Visual Studio 2017 stand out is the large productivity that it can achieve and the convenience that it has provided to the developers. In Visual Studio 2017, there is debugger, designers, editors and profilers consist in the single tool so the developer saved the hassle from downloading and installing the separate parts to make an IDE works. With all the tools included at once, the author have only need to install the Visual Studio 2017 by chosen the needed components then the environment is ideal for the author to develop the proposed project.

The above two features are the main reason why the author had choose the Visual Studio 2017 as the IDE to develop the proposed project.

## Twitter Streaming API

Twitter Streaming API is the API that provided by Twitter officially. API (Application Programming Interface) is an interface that usually provided by the company in order to gives developers access to their database. In the proposed project, the author had used the Streaming API by Twitter to access into their database in order to collect the tweets data. Streaming API provided the low latency access to the global stream of Twitter's tweet data.

In Streaming API, there are several endpoints for some basic data streaming, the one that used by the author is called Public Stream. It is the endpoint where a certain percentage of public data flowing on Twitter will be streamed as a sample, often used on data mining purposes. There are also a certain rate limit for API that can streamed of, however the author had confirmed that the rate limit is sufficient for the development of proposed project (Streaming API Documentation, 2017).

In the proposed project, the collection of tweets data have to be done through the Streaming API.

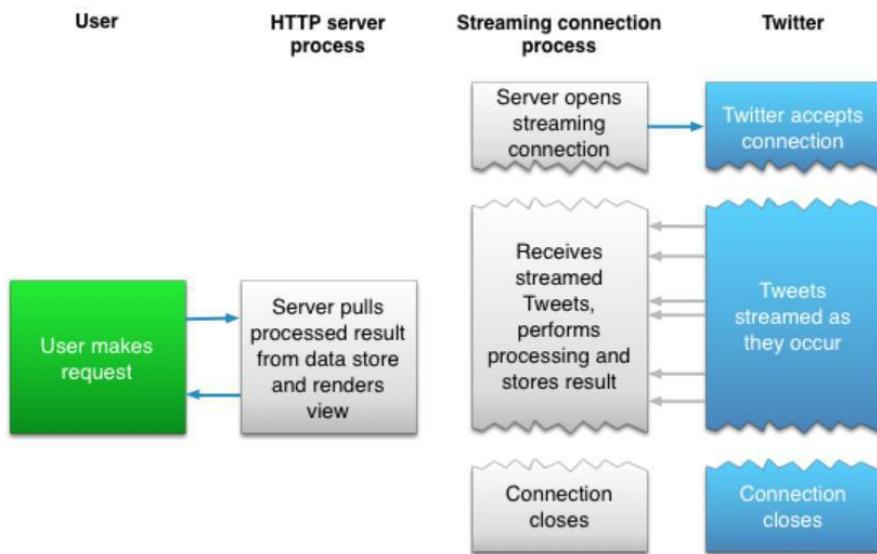


Figure 4.2 The streaming process of Streaming API (Streaming API Documentation, 2017)

### Tweetinvi Library

In the previous documentation, the author mentioned that Visual Studio 2017 have a large collection of extensions and packages to ease the developer workload. Tweetinvi is one of the extensions that is available on Visual Studio 2017. Tweetinvi is a .NET C# library that provide the reliable and easy interaction with Twitter through the Twitter official API. At its current build, Tweetinvi supports the interaction with the Twitter REST API and Streaming API, where Streaming API is one of the API that the author need to get connection on (Tweetinvi, 2017).

In the proposed project, the author used the Tweetinvi library to get connected with the Streaming API and streamed the global tweets data from it with certain condition met such as the keyword filtered, language filtered and location filtered.



Figure 4.3 Official Website of Tweetinvi (Tweetinvi, 2017)

## MongoDB

MongoDB is a document oriented database that acts as a database in the development of proposed project. A document oriented database indicates that the records stored inside the database is a document instead of one line of record with pre-defined data types data. Document in the database shows a data structure with the compose of fields and value pairs which is a lot like a JSON (Java Script) object. The field in the record can contain arrays or other documents inside. By using the documents as storage type is because it is corresponding to the native data types in almost any programming language. Any complicated joins will be avoided or reduced due to the embedded arrays and documents. Also, the dynamic data schema supports the polymorphism fluently (MongoDB, 2017).

MongoDB stands itself out among of others choice of document oriented database because of its support on rich query language on its CRUD operation as well as any data aggregation and search. Furthermore, it has high performance for data persistence due to the support the embedded data models where it can reduce I/O activity in the database system. It also have high availability because it provides data redundancy and automatic failover to increase the data availability (MongoDB, 2017).

In the development of the proposed project, the author runs the MongoDB server locally so all the data in the database are stored inside a local database.

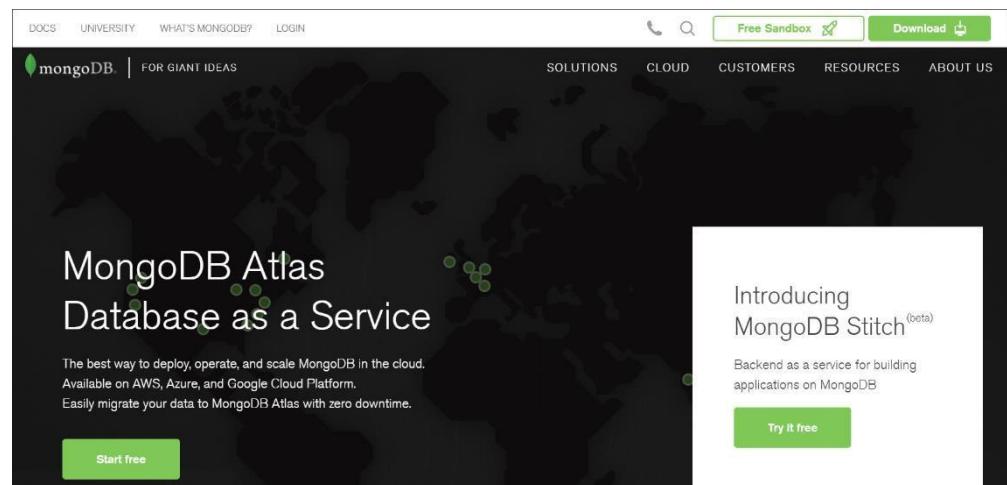


Figure 4.4 Official Website of MongoDB (MongoDB, 2017)

## MongoDB Compass

MongoDB Compass is the GUI (Graphic User Interface) for MongoDB. The author use the GUI of MongoDB to visualize the data store inside and execute the CRUD operation with it.

## Luis (Language Understanding Intelligent Service)

Luis is a service provided by Microsoft that allows the user to create a data model and implement into the user's application. From there, the user's application will be able to understand basic human language and what the user wants when they input something to the application.

Luis use the technique in Machine Learning to extract the language meaning underneath the user input. If one's application had been implemented the Luis data model, they will pass the input they received from the application user, then pass to Luis since it is on cloud, mostly will be hosted through Microsoft Azure – another cloud computing platform powered by Microsoft. Luis will return the analysis result to the application and the application will "understand" what the user means on those inputs and execute the corresponding actions.

Before implemented Luis data model into one's application, the Luis user have to build a data model either through pre-set domain or specifically train the Luis and build own data model.

There are three main things in Luis, which is utterance, intent and entity. Utterance is the input from the user, which is the natural language by human, presumably in English but Luis can train in many type of language. Intent is what the user want to do, the short from "intention", it is the target of the utterance. Entity is the key that the application need to execute the action. For example: Buy me a book. Book is the entity because the intent here would be "Buy", and the application would need that entity "Book" so that it knows what to buy when execute the action.

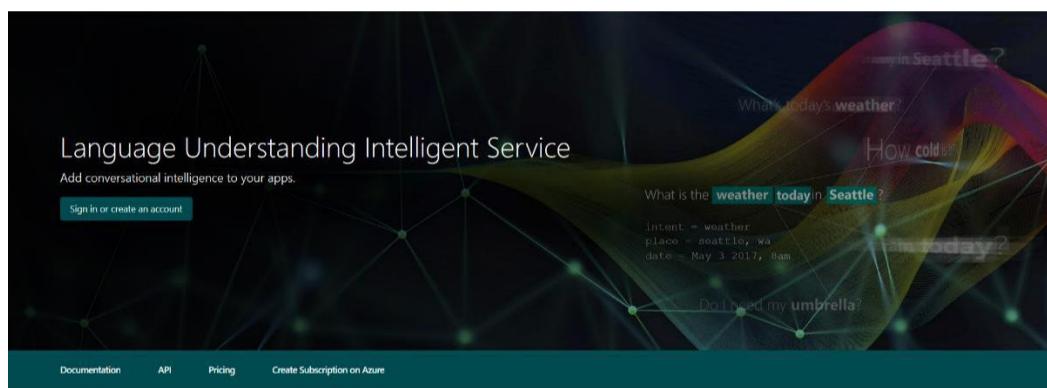


Figure 4.5 Official Website of Luis (Microsoft, 2017)

## 5.0 System Development and Program Code

In this section, the author will explain the program code in the development of the proposed project includes the front-end codes such as UI (User Interface) and the back-end codes such as operation code behind the buttons.

### Front-End Program Code

The front-end of the proposed project is coded in XAML(Extensible Application Markup Language) and the proposed project is presented in UWP (Universal Windows Platform) form.

#### A. Home Page



Figure 4.6 User Interface of Home Page

This is the home page of the proposed project. On the home page the user of the proposed project can clearly see the name of the proposed project and the slogan. The user will have a Login button for those who already have an account with the proposed project. If not, there is a Create An Account button for register a new account.

Below is the program code of this user interface:

```
x:Class="FYPFinal.MainPage"
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
xmlns:local="using:FYPFinal"
xmlns:d="http://schemas.microsoft.com/blend/2008"
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
mc:Ignorable="d">
```

#### Figure 4.7 Program Code of Home Page UI

This is the program code that determines the interface schema, class, type, size and the title name.

```
<RelativePanel x:Name="Root" Background="Black">
    <Image x:Name="BackgroundImage" Source="ms-appx:///Assets/homeback.jpg"
        RelativePanel.AlignBottomWithPanel="True"
        RelativePanel.AlignLeftWithPanel="True"
        RelativePanel.AlignRightWithPanel="True"
        RelativePanel.AlignTopWithPanel="True"
        Stretch="UniformToFill"/>
    <Button x:Name="Login" Click="ClickLogin" Content="LOGIN" HorizontalAlignment="Left"
        Height="97" VerticalAlignment="Top" Width="436" Margin="510,527,-880.667,-590.667"
        Background="#331EE4A5" FontSize="50" FontFamily="Rockwell"
        Foreground="#FF5EF546" BorderBrush="#FFF0BF515"/>
    <Button x:Name="Register" Click="ClickRegister" Content="REGISTER" HorizontalAlignment="Left"
        Height="93" VerticalAlignment="Top" Width="436" Margin="510,688,-880.667,-747.667"
        Background="#33E67044" FontSize="50" FontFamily="Rockwell" Foreground="#FFF13E22"
        Opacity="0.8" BorderBrush="#FFF94A09"/>
    <Rectangle Fill="#FF0A0A0A" HorizontalAlignment="Left" Height="340" Stroke="#FF090A09"
        VerticalAlignment="Top" Width="1134" Margin="153,111,-1287,-451"
        StrokeThickness="0" Opacity="0.5"/>
    <TextBlock HorizontalAlignment="Left" Height="202" TextWrapping="Wrap" Text="CYBER XOX"
        VerticalAlignment="Top" Width="755" Margin="346,111,-1039,-293"
        FontFamily="Javanese Text" FontSize="120" Opacity="0.8"
        Foreground="#FFBD523A" FontWeight="Bold"/>
    <Rectangle Fill="#FF0A0808" HorizontalAlignment="Left" Height="95" Stroke="#FF0CEC21"
        VerticalAlignment="Top" Width="1007" Margin="220,290,-1191.667,-385"
        Opacity="0.2" StrokeThickness="5"/>
    <TextBlock HorizontalAlignment="Left" Height="87" TextWrapping="Wrap" Text="PROTECT THE INNOCENCE"
        VerticalAlignment="Top" Width="947" Margin="251,298,-1106,-373.667"
        Foreground="#FF11B637" FontSize="70" FontFamily="Lucida Fax"/>
</RelativePanel>
```

#### Figure 4.8 Program Code of Home Page UI

This is the program code that build the whole interface. Including the background picture, the text shown on the windows and the buttons on the interface. All of them are styled with size, colours and fonts.

### B. Register Page

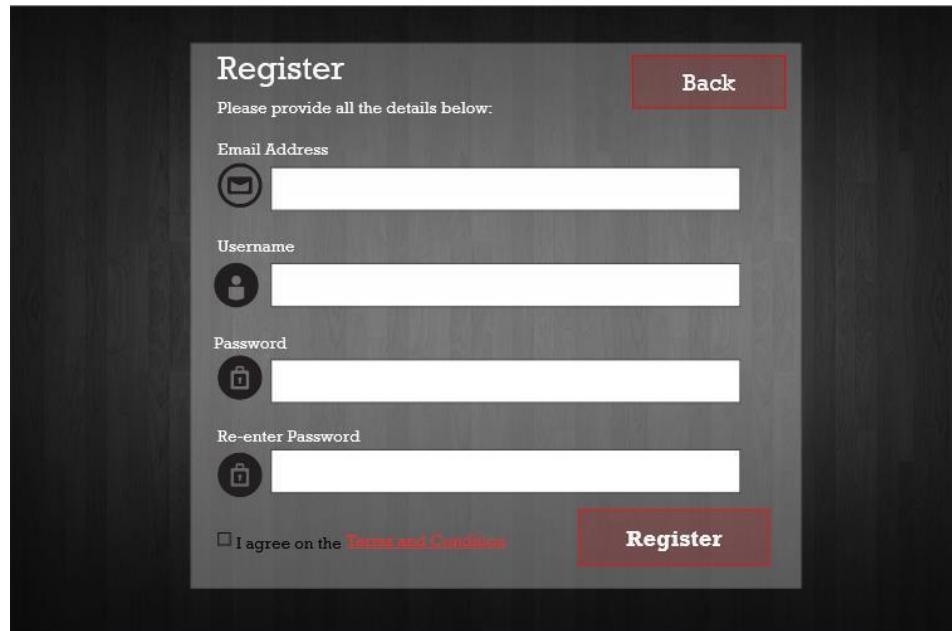


Figure 4.9 User Interface of Register Page

This is the account registration page of the proposed project. The user has to fill in their required basic information such as email address, username, password and reconfirming their password. The user must agree on terms and condition before they can proceed to create an account in the system.

Below is the program code of this user interface:

```
x:Class="FYPFinal.Register"
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
xmlns:local="using:FYPFinal"
xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
mc:Ignorable="d">
```

Figure 4.10 Program Code of Register Page UI

This is the program code that determines the interface schema, class, type, size and the title name.

```
<RelativePanel x:Name="Root" Background="Black">
    <Image x:Name="BackgroundImage" Source="ms-appx:///Assets/RegisterBack.jpg"
        RelativePanel.AlignBottomWithPanel="True"
        RelativePanel.AlignLeftWithPanel="True"
        RelativePanel.AlignRightWithPanel="True"
        RelativePanel.AlignTopWithPanel="True"
        Stretch="UniformToFill"/>
    <Rectangle HorizontalAlignment="Left" Height="827" Stroke="Black" VerticalAlignment="Top"
        Width="927" Margin="276,57,-1201.667,-884" Opacity="0.3">
        <Rectangle.Fill>
            <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
                <GradientStop Color="#FFFFFF" Offset="0"/>
                <GradientStop Color="White" Offset="1"/>
            </LinearGradientBrush>
        </Rectangle.Fill>
    </Rectangle>
    <TextBlock HorizontalAlignment="Left" Height="76" TextWrapping="Wrap" Text="Register"
        VerticalAlignment="Top" Width="255" Margin="318,65,-503.667,-99.667"
        FontSize="50" Foreground="#FFFCFCFC" FontFamily="Rockwell"/>
    <TextBlock HorizontalAlignment="Left" Height="87" TextWrapping="Wrap"
        Text="Please provide all the details below:" VerticalAlignment="Top"
        Width="649" Margin="318,141,-905,-206.667" FontSize="25" Foreground="White" FontFamily="Rockwell"/>
    <TextBlock HorizontalAlignment="Left" Height="36" TextWrapping="Wrap" Text="Email Address"
        VerticalAlignment="Top" Width="171" Margin="318,204,-427,-218.667"
        Foreground="White" FontFamily="Rockwell" FontSize="25"/>
    <TextBlock HorizontalAlignment="Left" Height="36" TextWrapping="Wrap" Text="Username"
        VerticalAlignment="Top" Width="171" Margin="318,350,-427,-364.667" Foreground="White"
        FontFamily="Rockwell" FontSize="25" RenderTransformOrigin="0.799,-2.247"/>
    <Button Content="Register" Click="Signup" HorizontalAlignment="Left" Height="85" VerticalAlignment="Top"
        Width="289" Margin="865,764,-1088.667,-815.667" FontFamily="Rockwell" FontSize="35"
        FontWeight="Bold" BorderBrush="#FF3AD421" Background="#331DE01D" Foreground="#FFF9F9F9"/>
    <TextBlock Margin="514,795,-737,-828" Foreground="#FFF04B4B" SelectionHighlightColor="#FFE25353" >
        <Hyperlink Click="termscondition" FontFamily="Rockwell" FontSize="25"
            Foreground="#FFE43434">Terms and Condition</Hyperlink></TextBlock>
    <TextBlock HorizontalAlignment="Left" Height="36" TextWrapping="Wrap" Text="Password"
        VerticalAlignment="Top" Width="171" Margin="313,495,-422,-509.667"
        Foreground="White" FontFamily="Rockwell" FontSize="25"/>
```

```

<TextBlock HorizontalAlignment="Left" Height="36" TextWrapping="Wrap" Text="Re-enter Password"
    VerticalAlignment="Top" Width="223" Margin="318,637,-479,-651.667"
    Foreground="White" FontFamily="Rockwell" FontSize="25"/>
<Image HorizontalAlignment="Left" Height="67" VerticalAlignment="Top" Width="80"
    Margin="318,240,-396.667,-305.667" Source="Assets/email.png"/>
<TextBox x:Name="EmailAddress" HorizontalAlignment="Left" Height="67" TextWrapping="Wrap"
    Text="" VerticalAlignment="Top" Width="713" Margin="398,245,-1039.667,-278.667" FontSize="25">
    <TextBox.Background>
        <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
            <GradientStop Color="#FFFDFDFD" Offset="0"/>
            <GradientStop Color="White" Offset="1"/>
        </LinearGradientBrush>
    </TextBox.Background>
</TextBox>
<Image HorizontalAlignment="Left" Height="67" VerticalAlignment="Top"
    Width="80" Margin="313,391,-391.667,-456.667" Source="Assets/user2.png"/>
<TextBox x:Name="Username" HorizontalAlignment="Left" Height="67" TextWrapping="Wrap"
    Text="" VerticalAlignment="Top" Width="713" Margin="398,391,-1039.667,-424.667" FontSize="25">
    <TextBox.Background>
        <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
            <GradientStop Color="#FFFDFDFD" Offset="0"/>
            <GradientStop Color="White" Offset="1"/>
        </LinearGradientBrush>
    </TextBox.Background>
</TextBox>
<Image HorizontalAlignment="Left" Height="67" VerticalAlignment="Top" Width="80"
    Margin="318,531,-396.667,-596.667" Source="Assets/password2.png"/>
<PasswordBox x:Name="Password" HorizontalAlignment="Left" Height="67" VerticalAlignment="Top"
    Width="713" Margin="398,536,-1039.667,-569.667" FontSize="25">
    <PasswordBox.Background>
        <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
            <GradientStop Color="White"/>
            <GradientStop Color="White" Offset="1"/>
        </LinearGradientBrush>
    </PasswordBox.Background>
</PasswordBox>

<Image HorizontalAlignment="Left" Height="67" VerticalAlignment="Top" Width="80"
    Margin="318,678,-396.667,-743.667" Source="Assets/password2.png" RenderTransformOrigin="0.581,2.872"/>
<PasswordBox x:Name="ConfirmPassword" HorizontalAlignment="Left" Height="67"
    VerticalAlignment="Top" Width="713" Margin="398,673,-1039.667,-706.667" FontSize="25">
    <PasswordBox.Background>
        <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
            <GradientStop Color="White"/>
            <GradientStop Color="White" Offset="1"/>
        </LinearGradientBrush>
    </PasswordBox.Background>
</PasswordBox>
<CheckBox x:Name="Agreement" Content="I agree on the" HorizontalAlignment="Left" Height="36"
    VerticalAlignment="Top" Width="223" Margin="318,793,-241,-796.333" FontFamily="Rockwell"
    FontSize="25" Foreground="#FFE43434">
    <CheckBox.Background>
        <ImageBrush Stretch="Fill"/>
    </CheckBox.Background>
</CheckBox>
<Button Content="Back" Click="Back" HorizontalAlignment="Left" Height="81" VerticalAlignment="Top" Width="233"
    Margin="946,76,-1114.454,-125.182" Background="#33B80E0E" FontFamily="Rockwell" FontSize="36"
    Foreground="White" BorderBrush="#FFEC0606"/>
<TextBlock x:Name="EmailError" HorizontalAlignment="Left" Height="37" Text="" TextWrapping="Wrap" VerticalAlignment="Top"
    Width="600" Margin="507,200,-1045.182,-217" Foreground="Red" FontFamily="Rockwell" FontSize="20"/>
<TextBlock x:Name="UsernameError" HorizontalAlignment="Left" Height="37" Text="" TextWrapping="Wrap" VerticalAlignment="Top"
    Width="600" Margin="504,347,-1042.182,-364" Foreground="Red" FontFamily="Rockwell" FontSize="30"/>
<TextBlock x:Name="PasswordError" HorizontalAlignment="Left" Height="37" Text="" TextWrapping="Wrap" VerticalAlignment="Top"
    Width="600" Margin="505,495,-1043.182,-512" Foreground="Red" FontFamily="Rockwell" FontSize="30"/>
<TextBlock x:Name="ConPasswordError" HorizontalAlignment="Left" Height="37" Text="" TextWrapping="Wrap" VerticalAlignment="Top"
    Width="536" Margin="565,632,-1039.182,-649" Foreground="Red" FontFamily="Rockwell" FontSize="30"/>
</RelativePanel>

```

Figure 4.11 Program Code of Register Page UI

This is the program code that build the whole interface. Including the background picture, the text shown on the windows, the checkbox with the hyperlink besides, the empty textbox and the buttons on the interface. All of them are styled with size, colours and fonts.

### C. Login Page

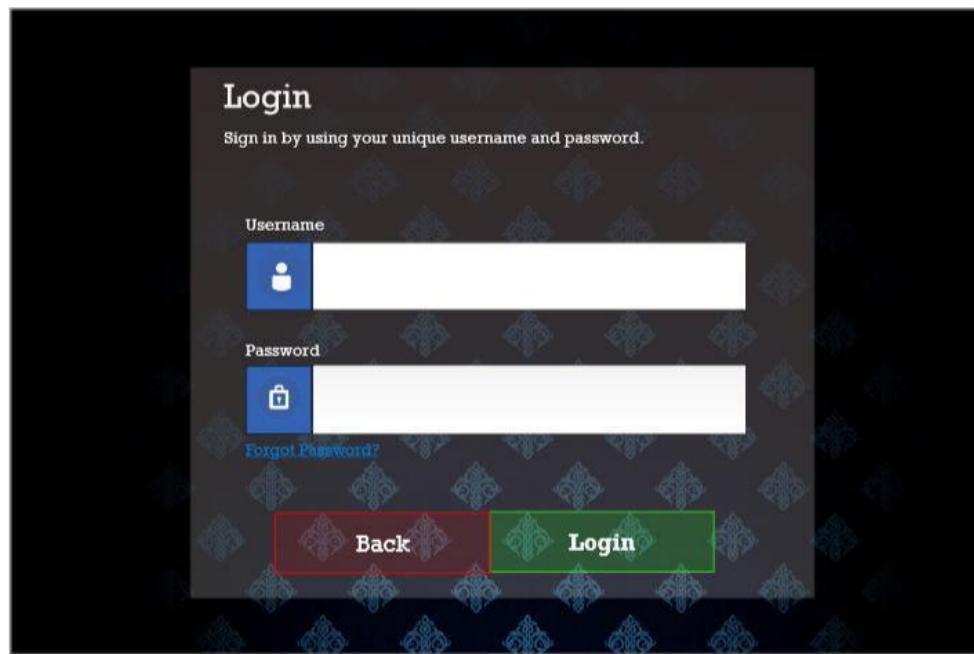


Figure 4.12 User Interface of Login Page

This is the login page of the proposed project. The user is required to enter their credentials such as the username and the password in order to login to the proposed project.

Below is the program code of this user interface:

```
x:Class="FYPFinal.Login"
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
xmlns:local="using:FYPFinal"
xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
mc:Ignorable="d">
```

Figure 4.13 Program Code of Login Page UI

This is the program code that determines the interface schema, class, type, size and the title name.

```

<RelativePanel x:Name="Root" Background="Black">
    <Image x:Name="BackgroundImage" Source="ms-appx:///Assets/logback.jpg"
        RelativePanel.AlignBottomWithPanel="True"
        RelativePanel.AlignLeftWithPanel="True"
        RelativePanel.AlignRightWithPanel="True"
        RelativePanel.AlignTopWithPanel="True"
        Stretch="UniformToFill"/>
    <Rectangle HorizontalAlignment="Left" Height="789" Stroke="Black" VerticalAlignment="Top"
        Width="927" Margin="267,87,-1192.667,-876" Opacity="0.2">
        <Rectangle.Fill>
            <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
                <GradientStop Color="#FFF7D1D1" Offset="0"/>
                <GradientStop Color="#FFFBBFBF" Offset="1"/>
            </LinearGradientBrush>
        </Rectangle.Fill>
    </Rectangle>
    <TextBlock HorizontalAlignment="Left" Height="76" TextWrapping="Wrap" Text="Login"
        VerticalAlignment="Top" Width="255" Margin="318,100,-504,-143" FontSize="50"
        Foreground="#FFF7F7F7" FontFamily="Rockwell"/>
    <TextBlock HorizontalAlignment="Left" Height="87" TextWrapping="Wrap" Text="Sign in by using your unique username and password."
        VerticalAlignment="Top" Width="649" Margin="318,176,-905,-241.667" FontSize="25"
        Foreground="#FFFDFDFD" FontFamily="Rockwell"/>
    <Rectangle HorizontalAlignment="Left" Height="103" Stroke="Black" VerticalAlignment="Top" Width="98"
        Margin="350,346,-481,-447.667" Fill="#FF3462B4"/>
    <Image HorizontalAlignment="Left" Height="103" VerticalAlignment="Top" Width="128" Margin="350,346,-452,-449"
        Source="Assets/user.png" RenderTransformOrigin="1.004,0.335"/>
    <TextBox x:Name="username" HorizontalAlignment="Left" Height="103" TextWrapping="Wrap" Text=""
        VerticalAlignment="Top" Width="645" Margin="448,346,-1021.667,-415.667" FontSize="50">
        <TextBox.Background>
            <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
                <GradientStop Color="White" Offset="0"/>
                <GradientStop Color="White" Offset="1"/>
            </LinearGradientBrush>
        </TextBox.Background>
    </TextBox>
    <TextBlock HorizontalAlignment="Left" Height="36" TextWrapping="Wrap" Text="Username" VerticalAlignment="Top" Width="171"
        Margin="350,305,-459,-319.667" Foreground="White" FontFamily="Rockwell" FontSize="25"/>
    <TextBlock HorizontalAlignment="Left" Height="36" TextWrapping="Wrap" Text="Password" VerticalAlignment="Top" Width="171"
        Margin="350,492,-459,-506.667" Foreground="White" FontFamily="Rockwell" FontSize="25"/>
    <Rectangle HorizontalAlignment="Left" Height="103" Stroke="Black" VerticalAlignment="Top" Width="98"
        Margin="350,530,-481,-447.667" Fill="#FF3462B4"/>
    <Image HorizontalAlignment="Left" Height="103" VerticalAlignment="Top" Width="128" Margin="350,530,-452,-449"
        Source="Assets/password.png" RenderTransformOrigin="1.004,0.335"/>
    <Button Content="Login" Click="Signin" HorizontalAlignment="Left" Height="91" VerticalAlignment="Top"
        Width="334" Margin="712,746,-980.546,-804.273" FontFamily="Rockwell" FontSize="35" FontWeight="Bold"
        BorderBrush="#FF3AD421" Background="#331DE01D" Foreground="#FFFBBFBF"/>
    <PasswordBox x:Name="password" HorizontalAlignment="Left" Height="105" VerticalAlignment="Top" Width="645"
        Margin="448,528,-1029,-599.667" FontSize="50">
        <PasswordBox.Background>
            <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
                <GradientStop Color="#FFF3F3F3" Offset="0"/>
                <GradientStop Color="White" Offset="1"/>
            </LinearGradientBrush>
        </PasswordBox.Background>
    </PasswordBox>
    <TextBlock Margin="350,638,-573,-671" Foreground="#FFF04B4B" SelectionHighlightColor="#FFE25353">
        <Hyperlink Click="forgotpassword" FontFamily="Rockwell" FontSize="25">Forgot Password?</Hyperlink></TextBlock>
    <Button Content="Back" Click="Back" HorizontalAlignment="Left" Height="91" VerticalAlignment="Top" Width="321"
        Margin="393,748,-649.454,-807.182" Background="#33B80E0E" FontFamily="Rockwell" FontSize="36"
        Foreground="White" BorderBrush="#FFEC0606"/>
</RelativePanel>

```

Figure 4.14 Program Code of Login Page UI

This is the program code that build the whole interface. Including the background picture, the text shown on the windows, the empty textbox and the buttons on the interface. All of them are styled with size, colours and fonts.

#### D. User Dashboard

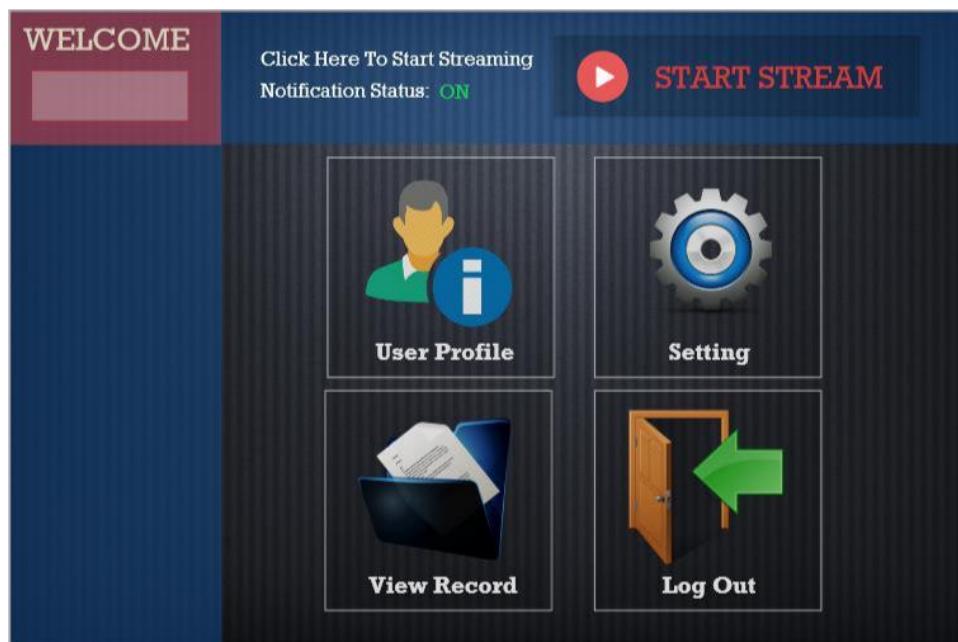


Figure 4.15 User Interface of User Dashboard

This is the User Dashboard of the proposed project. The user will be able to see their username at the top left. There are five buttons in the User Dashboard for the user to explore. When the user hover their mouse over the button, the tooltips will appear on the left panel to inform them what is this button about. There is also the notification status which shows ON/OFF of the notification now.

Below is the program code of this user interface:

```
x:Class="FYPFinal.UserDashboard"
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
xmlns:local="using:FYPFinal"
xmlns:d="http://schemas.microsoft.com/expressionblend/2008"
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
mc:Ignorable="d">
```

Figure 4.16 Program Code of User Dashboard UI

This is the program code that determines the interface schema, class, type, size and the title name.

```

<RelativePanel x:Name="Root" Background="Black">
    <Image x:Name="BackgroundImage" Source="ms-appx:///Assets/homeback.jpg"
        RelativePanel.AlignBottomWithPanel="True"
        RelativePanel.AlignLeftWithPanel="True"
        RelativePanel.AlignRightWithPanel="True"
        RelativePanel.AlignTopWithPanel="True"
        Stretch="UniformToFill"/>
    <Rectangle HorizontalAlignment="Left" Height="200" VerticalAlignment="Top" Width="1126"
        Margin="310,0,-1436,-200" Fill="#FF114C93" Opacity="0.5"/>
    <Rectangle HorizontalAlignment="Left" Height="960" VerticalAlignment="Top" Width="319"
        Margin="0,0,-317.667,-960" Fill="#FF114C93" Opacity="0.5"/>
    <Rectangle HorizontalAlignment="Left" Height="202" VerticalAlignment="Top" Width="318"
        Margin="0,0,-318,-202" Fill="#FFEA4545" Opacity="0.5"/>
    <TextBlock HorizontalAlignment="Left" Height="68" Text="WELCOME" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="271" Margin="22,13,-231,-61" FontFamily="Rockwell" FontSize="48"
        FocusVisualPrimaryBrush="#FFF5EEE" Foreground="#F8D82BC"/>
    <TextBox x:Name="username" HorizontalAlignment="Left" Height="78" Text="" VerticalAlignment="Top"
        Width="237" Margin="33,89,-200,-135" Opacity="0.7" BorderBrush="#66F11515" IsReadOnly="True"
        FontFamily="Rockwell" FontWeight="Bold" FontSize="36"/>
    <Button x:Name="stream" Click="startstream" Content="START STREAM" HorizontalAlignment="Left"
        Height="123" VerticalAlignment="Top" Width="550" Margin="818,37,-1303,-128" FontFamily="Rockwell"
        FontSize="48" Background="#33000000" Foreground="#FDC3B3B"/>
    <Image x:Name="streamimage" HorizontalAlignment="Left" Height="91" VerticalAlignment="Top" Width="106"
        Margin="845,54,-951,-145" Source="Assets/stream.png"/>
    <Image HorizontalAlignment="Left" Height="236" VerticalAlignment="Top" Width="230"
        Margin="530,250,-695,-612" Source="Assets/profile.png"/>
    <TextBlock HorizontalAlignment="Left" Height="72" Text="User Profile" TextWrapping="Wrap" VerticalAlignment="Top"
        Width="294" Margin="550,490,-736,-912" FontFamily="Rockwell" FontSize="36" Foreground="White" FontWeight="Bold"/>
    <Button x:Name="userprofile" Click="Userprofile_OnClick" PointerEntered="Userprofile_OnPointerEntered"
        PointerExited="Userprofile_OnPointerExited" Content="" HorizontalAlignment="Left" Height="332"
        VerticalAlignment="Top" Width="342" Margin="477,220,-754,-534" FontFamily="Rockwell"
        FontSize="36" Background="#33000000" Opacity="0.7">
        <Button.BorderBrush>
            <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
                <GradientStop Color="White"/>
                <GradientStop Color="White" Offset="1"/>
            </LinearGradientBrush>
        </Button.BorderBrush>
    </Button>
    <TextBlock HorizontalAlignment="Left" Height="342" Margin="878,570,-650,-642" FontFamily="Rockwell"
        FontSize="36" Background="#33000000" Opacity="0.7">
        <TextBlock.BorderBrush>
            <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
                <GradientStop Color="#FFFFDF9F9"/>
                <GradientStop Color="White" Offset="1"/>
            </LinearGradientBrush>
        </TextBlock.BorderBrush>
    </TextBlock>
    <TextBlock HorizontalAlignment="Left" Height="44" Text="Click Here To Start Streaming" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="438" Margin="377,54,-753.182,-78" FontFamily="Rockwell" FontSize="30" Foreground="White"/>
    <TextBlock x:Name="profiletext" HorizontalAlignment="Left" Height="220" Text="Review and Edit Your Own Profile Information."
        TextWrapping="Wrap" VerticalAlignment="Top" Width="255" Margin="35,235,-228,-435" FontFamily="Rockwell"
        FontSize="30" Foreground="#FFF9F9F9" Visibility="Collapsed"/>
    <TextBlock x:Name="settingtext" HorizontalAlignment="Left" Height="220" Text="Review the current application settings."
        TextWrapping="Wrap" VerticalAlignment="Top" Width="268" Margin="35,235,-241,-435" FontFamily="Rockwell"
        FontSize="30" Foreground="#FFF9F9F9" Visibility="Collapsed"/>
    <TextBlock x:Name="logouttext" HorizontalAlignment="Left" Height="220" Text="Log out from your user account."
        TextWrapping="Wrap" VerticalAlignment="Top" Width="268" Margin="35,235,-241,-435" FontFamily="Rockwell"
        FontSize="30" Foreground="#FFF9F9F9" Visibility="Collapsed"/>
    <TextBlock x:Name="recordtext" HorizontalAlignment="Left" Height="220" Text="View the record that stored into the database."
        TextWrapping="Wrap" VerticalAlignment="Top" Width="268" Margin="35,235,-241,-435" FontFamily="Rockwell" FontSize="30"
        Foreground="#FFF9F9F9" Visibility="Collapsed"/>
    <TextBlock HorizontalAlignment="Left" Height="44" Text="Notification Status:" TextWrapping="Wrap" VerticalAlignment="Top"
        Width="255" Margin="377,102,-570.182,-126" FontFamily="Rockwell" FontSize="30" Foreground="White"/>
    <TextBlock x:Name="Notification" HorizontalAlignment="Left" Height="52" Text="ON" TextWrapping="Wrap" VerticalAlignment="Top"
        Width="72" Margin="645,104,-655.182,-136" FontFamily="Rockwell" FontSize="30" Foreground="#FF1AD259"/>
</RelativePanel>

```

Figure 4.17 Program Code of User Dashboard UI

This is the program code that build the whole interface. Including the background picture, the text shown on the windows, the image and the buttons on the interface. All of them are styled with size, colours and fonts.

### E. User Profile

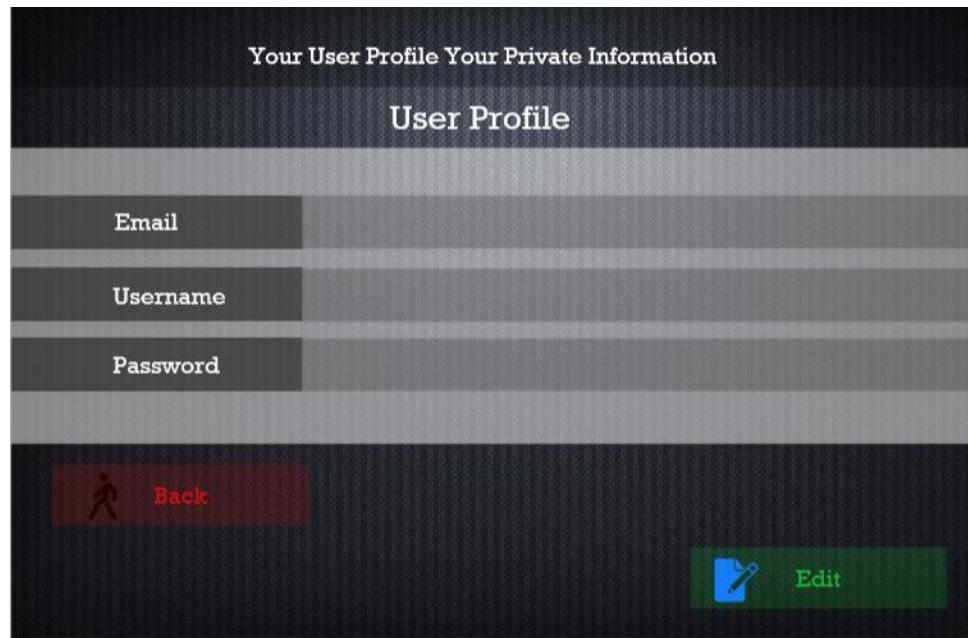


Figure 4.18 User Interface of User Profile

This is the User Profile of the proposed project. In here, the user can view their personal details when they registered an account with the software. There is an Edit option for the user if they wish to change their profile credentials.

Below is the program code of this user interface:

```
x:Class="FYPFinal.userprofile"
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
xmlns:local="using:FYPFinal"
xmlns:d="http://schemas.microsoft.com/expressionblend/2008"
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
mc:Ignorable="d">
```

Figure 4.19 Program Code of User Profile UI

This is the program code that determines the interface schema, class, type, size and the title name.

```

<RelativePanel x:Name="Root" Background="Black">
    <Image x:Name="BackgroundImage" Source="ms-appx:///Assets/homeback.jpg"
        RelativePanel.AlignBottomWithPanel="True"
        RelativePanel.AlignLeftWithPanel="True"
        RelativePanel.AlignRightWithPanel="True"
        RelativePanel.AlignTopWithPanel="True"
        Stretch="UniformToFill"/>
    <Border BorderBrush="#FF000000" BorderThickness="1,1,1,1" CornerRadius="0,0,0,0"
        Margin="-2,1,-1437,-135" Opacity="0.3" Background="Black"/>
    <TextBlock HorizontalAlignment="Left" Height="50" Text="Your User Profile Your Private Information"
        TextWrapping="Wrap" VerticalAlignment="Top" Width="698" Margin="356,66,-992,-96"
        FontFamily="Rockwell" FontSize="36" Foreground="White"/>
    <Rectangle HorizontalAlignment="Left" Height="441" VerticalAlignment="Top" Width="1440"
        Margin="-1,225,-1439,-336" Fill="White" Opacity="0.5"/>
    <Rectangle HorizontalAlignment="Left" Height="80" VerticalAlignment="Top" Width="435"
        Margin="0,508,-435,-258" Fill="Black" Opacity="0.5"/>
    <Rectangle HorizontalAlignment="Left" Height="80" VerticalAlignment="Top" Width="435"
        Margin="0,296,-435,-46" Fill="Black" Opacity="0.5"/>
    <Rectangle HorizontalAlignment="Left" Height="80" VerticalAlignment="Top" Width="435"
        Margin="0,404,-435,-154" Fill="Black" Opacity="0.5"/>
    <TextBlock HorizontalAlignment="Left" Height="66" Text="Email" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="109" Margin="156,313,-203,-359" FontFamily="Rockwell"
        FontSize="36" Foreground="#FFF9F9F9" FocusVisualPrimaryBrush="#FF062AA4"/>
    <TextBlock HorizontalAlignment="Left" Height="66" Text="Username" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="179" Margin="154,424,-271,-470" FontFamily="Rockwell"
        FontSize="36" Foreground="#FFF9F9F9" FocusVisualPrimaryBrush="#FF062AA4"/>
    <TextBlock HorizontalAlignment="Left" Height="66" Text="Password" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="168" Margin="154,526,-260,-572" FontFamily="Rockwell"
        FontSize="36" Foreground="#FFF9F9F9" FocusVisualPrimaryBrush="#FF062AA4"/>
    <TextBox x:Name="Email" IsEnabled="False" HorizontalAlignment="Left" Height="79" Text=""
        VerticalAlignment="Top" Width="1006" Margin="435,296,-1366,-341" FontFamily="Rockwell"
        FontSize="50" IsReadOnly="True">
        <TextBox.Background>
            <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
                <GradientStop Color="#FFC9C0C0"/>
                <GradientStop Color="#FFBFB5B5" Offset="1"/>
            </LinearGradientBrush>
        </TextBox.Background>
    </TextBox>
    <TextBox x:Name="Username" IsEnabled="False" HorizontalAlignment="Left" Height="79" Text=""
        VerticalAlignment="Top" Width="1006" Margin="435,405,-1368,-450" FontFamily="Rockwell"
        FontSize="50" IsReadOnly="True">
        <TextBox.Background>
            <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
                <GradientStop Color="#FFC9C0C0"/>
                <GradientStop Color="#FFBFB5B5" Offset="1"/>
            </LinearGradientBrush>
        </TextBox.Background>
    </TextBox>
    <PasswordBox x:Name="Password" IsEnabled="False" IsPasswordRevealButtonEnabled="True"
        HorizontalAlignment="Left" Height="79" VerticalAlignment="Top" Width="1006"
        Margin="435,509,-1370,-554" FontSize="50">
        <PasswordBox.Background>
            <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
                <GradientStop Color="#FFC9C0C0" Offset="0"/>
                <GradientStop Color="#FFBFB5B5" Offset="1"/>
            </LinearGradientBrush>
        </PasswordBox.Background>
    </PasswordBox>
    <Button Content="Edit" Click="Edit" HorizontalAlignment="Left" Height="91" VerticalAlignment="Top"
        Width="382" Margin="1013,821,-1330,-880" Background="#3311B236" FontFamily="Rockwell"
        FontSize="36" Foreground="#FF16B239"/>
    <Image HorizontalAlignment="Left" Height="93" VerticalAlignment="Top" Width="76"
        Margin="1042,830,-1118,-923" Source="Assets/edit.png"/>
    <TextBlock HorizontalAlignment="Left" Height="72" Text="User Profile" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="279" FontFamily="Rockwell" FontSize="50"
        Margin="565,150,-782,-202" Foreground="White"/>
    <Image HorizontalAlignment="Left" Height="70" VerticalAlignment="Top" Width="76"
        Margin="104,710,-180,-780" Source="Assets/back.png"/>
    <Button Content="Back" Click="Back" HorizontalAlignment="Left" Height="91"
        VerticalAlignment="Top"
        Width="382" Margin="64,697,-381,-756" Background="#33B80E0E" FontFamily="Rockwell"
        FontSize="36" Foreground="#FFCD1010"/>
</RelativePanel>

```

Figure 4.20 Program Code of User Profile UI

This is the program code that build the whole interface. Including the background picture, the text shown on the windows, the textbox and

the buttons on the interface. All of them are styled with size, colours and fonts.

#### F. User Edit

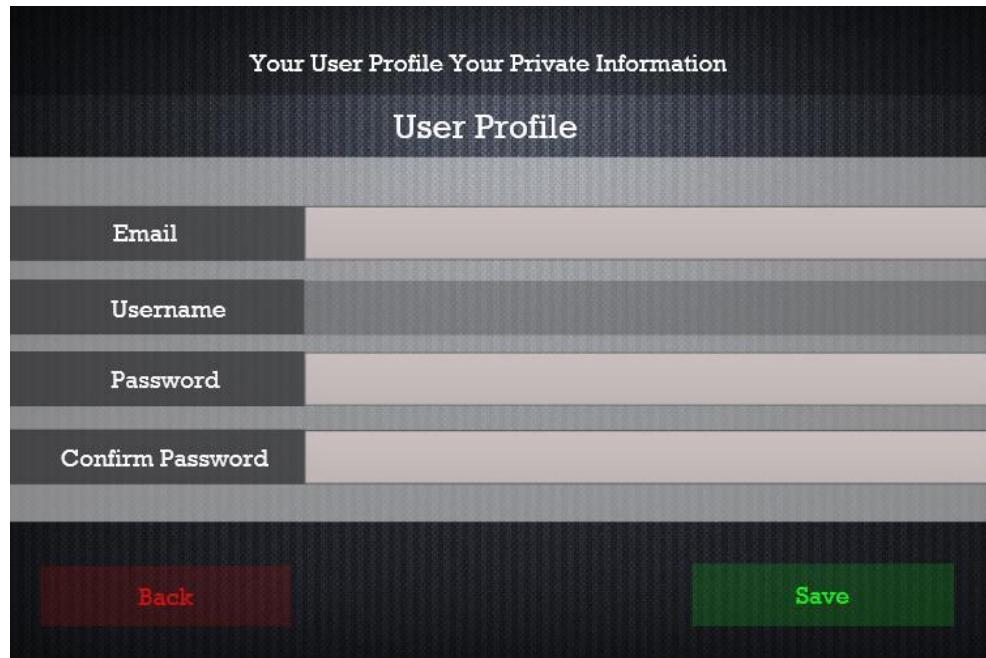


Figure 4.21 User Interface of User Edit

This is the user interface of User Edit in the proposed project. In here, the user is able to change their email and password ONLY and update their user database.

Below are the program codes of this user interface:

```
x:Class="FYPFinal.useredit"
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
xmlns:local="using:FYPFinal"
xmlns:d="http://schemas.microsoft.com/blend/2008"
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
mc:Ignorable="d">
```

Figure 4.22 Program Code of User Edit UI

This is the program code that determines the interface schema, class, type, size and the title name.

```

<RelativePanel x:Name="Root" Background="Black">
    <Image x:Name="BackgroundImage" Source="ms-appx:///Assets/homeback.jpg"
        RelativePanel.AlignBottomWithPanel="True"
        RelativePanel.AlignLeftWithPanel="True"
        RelativePanel.AlignRightWithPanel="True"
        RelativePanel.AlignTopWithPanel="True"
        Stretch="UniformToFill"/>
    <Border BorderBrush="#F00000" BorderThickness="1,1,1,1" CornerRadius="0,0,0,0"
        Margin="-2,1,-1437,-135" Opacity="0.3" Background="Black"/>
    <TextBlock HorizontalAlignment="Left" Height="50" Text="Your User Profile Your Private Information"
        TextWrapping="Wrap" VerticalAlignment="Top" Width="698" Margin="356,66,-992,-96"
        FontFamily="Rockwell" FontSize="36" Foreground="white"/>
    <Rectangle HorizontalAlignment="Left" Height="531" VerticalAlignment="Top" Width="1440"
        Margin="-1,225,-1439,-426" Fill="White" Opacity="0.5"/>
    <Rectangle HorizontalAlignment="Left" Height="80" VerticalAlignment="Top" Width="435"
        Margin="0,508,-435,-258" Fill="Black" Opacity="0.5"/>
    <Rectangle HorizontalAlignment="Left" Height="80" VerticalAlignment="Top" Width="435"
        Margin="0,296,-435,-46" Fill="Black" Opacity="0.5"/>
    <Rectangle HorizontalAlignment="Left" Height="80" VerticalAlignment="Top" Width="435"
        Margin="0,404,-435,-154" Fill="Black" Opacity="0.5"/>
    <TextBlock HorizontalAlignment="Left" Height="66" Text="Email" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="189" Margin="156,313,-203,-359" FontFamily="Rockwell"
        FontSize="36" Foreground="#FFF9F9F9" FocusVisualPrimaryBrush="#FF062AA4"/>
    <TextBlock HorizontalAlignment="Left" Height="66" Text="Username" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="179" Margin="154,424,-271,-470" FontFamily="Rockwell"
        FontSize="36" Foreground="#FFF9F9F9" FocusVisualPrimaryBrush="#FF062AA4"/>
    <TextBlock HorizontalAlignment="Left" Height="66" Text="Password" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="168" Margin="154,526,-260,-572" FontFamily="Rockwell"
        FontSize="36" Foreground="#FFF9F9F9" FocusVisualPrimaryBrush="#FF062AA4"/>
    <TextBox x:Name="Email" HorizontalAlignment="Left" Height="79" Text="" VerticalAlignment="Top"
        Width="1006" Margin="435,296,-1366,-341" FontFamily="Rockwell" FontSize="50" IsReadOnly="False">
        <TextBox.Background>
            <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
                <GradientStop Color="#FFC9C0C0"/>
                <GradientStop Color="#FFBFB5B5" Offset="1"/>
            </LinearGradientBrush>
        </TextBox.Background>
    </TextBox>
    <TextBox x:Name="Username" IsEnabled="False" HorizontalAlignment="Left" Height="79" Text="" VerticalAlignment="Top"
        Width="1006" Margin="435,405,-1368,-450" FontFamily="Rockwell" FontSize="50" IsReadOnly="True">
        <TextBox.Background>
            <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
                <GradientStop Color="#FFC9C0C0"/>
                <GradientStop Color="#FFBFB5B5" Offset="1"/>
            </LinearGradientBrush>
        </TextBox.Background>
    </TextBox>
    <PasswordBox x:Name="Password" IsPasswordRevealButtonEnabled="True" HorizontalAlignment="Left"
        Height="79" VerticalAlignment="Top" Width="1006" Margin="435,509,-1370,-554" FontSize="50">
        <PasswordBox.Background>
            <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
                <GradientStop Color="#FFC9C0C0" Offset="0"/>
                <GradientStop Color="#FFBFB5B5" Offset="1"/>
            </LinearGradientBrush>
        </PasswordBox.Background>
    </PasswordBox>
    <Button Content="Save" Click="Save" HorizontalAlignment="Left" Height="91" VerticalAlignment="Top"
        Width="382" Margin="1002,817,-1319,-876" Background="#330FD320" FontFamily="Rockwell"
        FontSize="36" Foreground="#FF14E14"/>
    <TextBlock HorizontalAlignment="Left" Height="72" Text="User Profile" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="279" FontFamily="Rockwell" FontSize="50" Margin="565,150,-782,-202" Foreground="White"/>
    <Button Content="Back" Click="Back" HorizontalAlignment="Left" Height="87" VerticalAlignment="Top"
        Width="365" Margin="51,821,-350,546,-876,182" Background="#338800E" FontFamily="Rockwell" FontSize="36" Foreground="#FFCD1010"/>
    <Rectangle HorizontalAlignment="Left" Height="80" VerticalAlignment="Top" Width="435" Margin="0,622,-435,-372" Fill="Black" Opacity="0.5"/>
    <TextBlock HorizontalAlignment="Left" Height="66" Text="Confirm Password" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="309" Margin="80,642,-327,182,-688" FontFamily="Rockwell" FontSize="36"
        Foreground="#FFF9F9F9" FocusVisualPrimaryBrush="#FF062AA4"/>
    <PasswordBox x:Name="ConPassword" IsPasswordRevealButtonEnabled="True" HorizontalAlignment="Left"
        Height="79" VerticalAlignment="Top" Width="1006" Margin="435,623,-1370.091,-668.364" FontSize="50">
        <PasswordBox.Background>
            <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
                <GradientStop Color="#FFC9C0C0" Offset="0"/>
                <GradientStop Color="#FFBFB5B5" Offset="1"/>
            </LinearGradientBrush>
        </PasswordBox.Background>
    </PasswordBox>
</RelativePanel>

```

Figure 4.23 Program Code of User Edit UI

This is the program code that build the whole interface. Including the background picture, the text shown on the windows, the textbox and the buttons on the interface. All of them are styled with size, colours and fonts.

### G. Setting

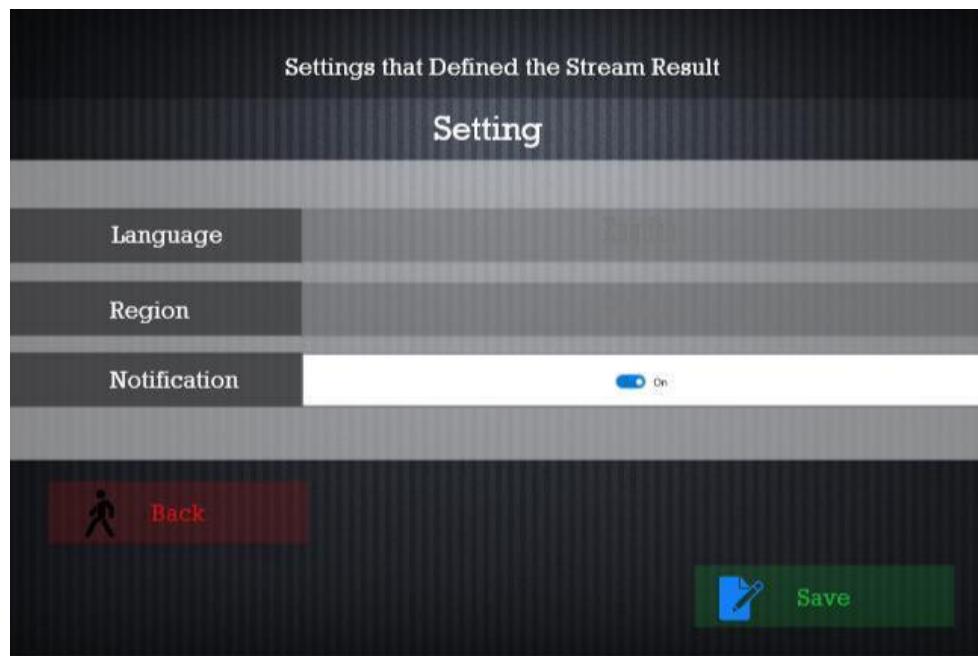


Figure 4.24 User Interface of Setting

This is the user interface of Setting of the proposed project. In here, the user can see the current setting for the stream result as in language and region. The user also will be able to toggle the notification switch to decide whether they want to receive the notification or not.

Below are the program codes of this user interface:

```
x:Class="FYPFinal.setting"
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
xmlns:local="using:FYPFinal"
xmlns:d="http://schemas.microsoft.com/blend/2008"
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
mc:Ignorable="d">
```

Figure 4.25 Program Code of User Edit UI

This is the program code that determines the interface schema, class, type, size and the title name.

```

<RelativePanel x:Name="Root" Background="Black">
    <Image x:Name="BackgroundImage" Source="ms-appx:///Assets/homeback.jpg"
        RelativePanel.AlignBottomWithPanel="True"
        RelativePanel.AlignLeftWithPanel="True"
        RelativePanel.AlignRightWithPanel="True"
        RelativePanel.AlignTopWithPanel="True"
        Stretch="UniformToFill"/>
    <Border BorderBrush="#FF000000" BorderThickness="1,1,1,1" CornerRadius="0,0,0,0"
        Margin="-2,1,-1437,-135" Opacity="0.3" Background="Black"/>
    <TextBlock HorizontalAlignment="Left" Height="50" Text="Settings That Defined The Stream Result"
        TextWrapping="Wrap" VerticalAlignment="Top" Width="698" Margin="412,66,-1048,-96"
        FontFamily="Rockwell" FontSize="36" Foreground="White"/>
    <Rectangle HorizontalAlignment="Left" Height="441" VerticalAlignment="Top" Width="1440"
        Margin="-1,225,-1439,-336" Fill="White" Opacity="0.5"/>
    <Rectangle HorizontalAlignment="Left" Height="80" VerticalAlignment="Top" Width="435"
        Margin="0,508,-435,-258" Fill="Black" Opacity="0.5"/>
    <Rectangle HorizontalAlignment="Left" Height="80" VerticalAlignment="Top" Width="435"
        Margin="0,296,-435,-46" Fill="Black" Opacity="0.5"/>
    <Rectangle HorizontalAlignment="Left" Height="80" VerticalAlignment="Top" Width="435"
        Margin="0,404,-435,-154" Fill="Black" Opacity="0.5"/>
    <TextBlock HorizontalAlignment="Left" Height="66" Text="Language" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="187" Margin="156,313,-280.333,-359" FontFamily="Rockwell"
        FontSize="36" Foreground="#FFF9F9F9" FocusVisualPrimaryBrush="#FF062AA4"/>
    <TextBlock HorizontalAlignment="Left" Height="66" Text="Region" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="179" Margin="154,424,-271,-470" FontFamily="Rockwell"
        FontSize="36" Foreground="#FFF9F9F9" FocusVisualPrimaryBrush="#FF062AA4"/>
    <TextBlock HorizontalAlignment="Left" Height="66" Text="Notification" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="215" Margin="154,526,-307,-572" FontFamily="Rockwell"
        FontSize="36" Foreground="#FFF9F9F9" FocusVisualPrimaryBrush="#FF062AA4"/>
    <TextBox IsEnabled="False" HorizontalAlignment="Left" Height="79" Text="English"
        VerticalAlignment="Top" Width="1006" Margin="435,296,-1366,-341" FontFamily="Rockwell"
        FontSize="48" IsReadOnly="True" AcceptsReturn="True" Background="White" Foreground="Black"/>
    <TextBox IsEnabled="False" HorizontalAlignment="Left" Height="79" Text="Global"
        VerticalAlignment="Top" Width="1006" Margin="435,405,-1368,-450" FontFamily="Rockwell"
        FontSize="50" IsReadOnly="True" Background="White" Foreground="Black"/>
    <TextBox HorizontalAlignment="Left" Height="79" Text="" VerticalAlignment="Top" Width="1006"
        Margin="435,509,-1370,-554" FontFamily="Rockwell" FontSize="50" IsReadOnly="True"/>
    <TextBox.Background>
        <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
            <GradientStop Color="White"/>
            <GradientStop Color="White" Offset="1"/>
        </LinearGradientBrush>
    </TextBox.Background>
    <Button Content="Save" Click="Save" HorizontalAlignment="Left" Height="91" VerticalAlignment="Top"
        Width="382" Margin="1013,821,-1330,-880" Background="#3311B236" FontFamily="Rockwell"
        FontSize="36" Foreground="#FF16B239"/>
    <Image HorizontalAlignment="Left" Height="93" VerticalAlignment="Top" Width="76"
        Margin="1042,830,-1118,-923" Source="Assets/edit.png"/>
    <TextBlock HorizontalAlignment="Left" Height="72" Text="Setting" TextWrapping="Wrap"
        VerticalAlignment="Top" Width="279" FontFamily="Rockwell" FontSize="50"
        Margin="629,148,-845.333,-200" Foreground="White"/>
    <Button Content="Back" Click="Back" HorizontalAlignment="Left" Height="91" VerticalAlignment="Top"
        Width="382" Margin="64,697,-381,-756" Background="#33B80E0E" FontFamily="Rockwell"
        FontSize="36" Foreground="#FFCD1010"/>
    <Image HorizontalAlignment="Left" Height="70" VerticalAlignment="Top" Width="76"
        Margin="104,710,-180,-780" Source="Assets/back.png"/>
    <ToggleSwitch x:Name="NotificationSwitch" Header="" HorizontalAlignment="Left"
        VerticalAlignment="Stretch" Width="124" Margin="897,531,-21,180" IsOn="True"/>
</RelativePanel>

```

Figure 4.26 Program Code of User Edit UI

This is the program code that build the whole interface. Including the background picture, the text shown on the windows, the textbox and the buttons on the interface. All of them are styled with size, colours and fonts.

## H. View Record

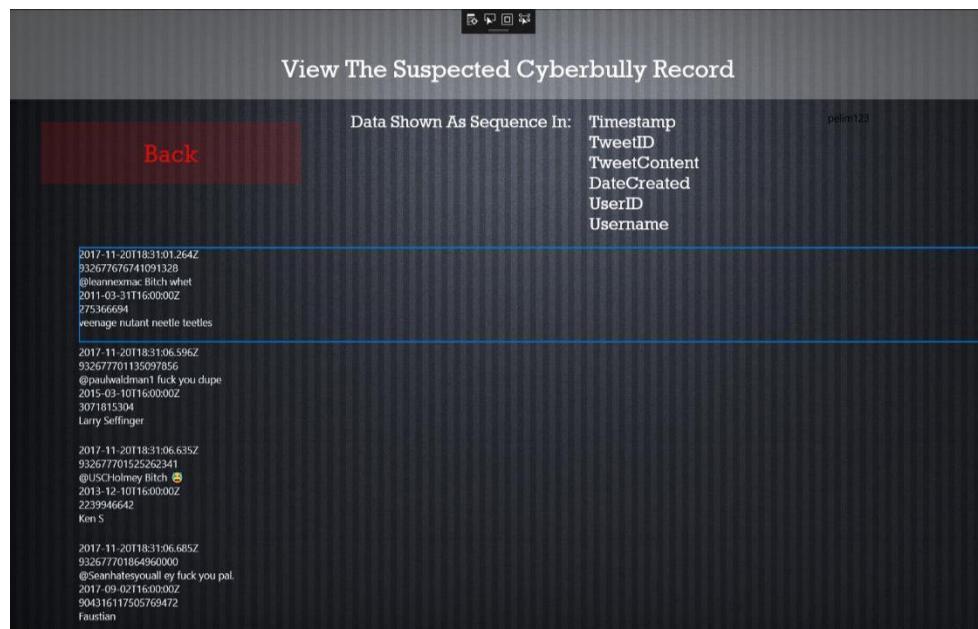


Figure 4.27 User Interface of View Record

This is the View Record user interface of the proposed project. In here, the user will be able to view any suspected detected cyberbully data in sequence.

Below are the program codes of this user interface:

```
x:Class="FYPFinal.viewrecord"
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
xmlns:local="using:FYPFinal"
xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
xmlns:data="using:FYPFinal.Model"
mc:Ignorable="d">
```

Figure 4.28 Program Code of View Record UI

This is the program code that determines the interface schema, class, type, size and the title name.

```
<Page.Resources>
<CollectionViewSource x:Name="DataSource" IsSourceGrouped="False"></CollectionViewSource>
<DataTemplate x:Name="DataSourceTemplate" x:DataType="data:Data">
    <StackPanel Orientation="Vertical" Height="Auto" Width="1400" Margin="0,0,0,20">
        <TextBlock Text="{x:Bind Timestamp}" Foreground="AliceBlue"/>
        <TextBlock Text="{x:Bind TweetID}" Foreground="AliceBlue"/>
        <TextBlock Text="{x:Bind TweetContent}" Foreground="AliceBlue" TextWrapping="Wrap"/>
        <TextBlock Text="{x:Bind DateCreated}" Foreground="AliceBlue"/>
        <TextBlock Text="{x:Bind UserID}" Foreground="AliceBlue"/>
        <TextBlock Text="{x:Bind Username}" Foreground="AliceBlue"/>
    </StackPanel>
</DataTemplate>
</Page.Resources>
```

```

<RelativePanel x:Name="Root" Background="Black">
    <Image x:Name="BackgroundImage" Source="ms-appx:///Assets/homeback.jpg"
        RelativePanel.AlignBottomWithPanel="True"
        RelativePanel.AlignLeftWithPanel="True"
        RelativePanel.AlignRightWithPanel="True"
        RelativePanel.AlignTopWithPanel="True"
        Stretch="UniformToFill" Height="993" Width="1440"/>
    <Border BorderBrush="#FF000000" BorderThickness="1,1,1,1" CornerRadius="0,0,0,0"
        Margin="-2,1,-1437,-135" Opacity="0.3" Background="White"/>
    <TextBlock HorizontalAlignment="Left" Height="50" Text="View The Suspected Cyberbully Record"
        TextWrapping="Wrap" VerticalAlignment="Top" Width="698" Margin="398,66,-1034.182,-96"
        FontFamily="Rockwell" FontSize="36" Foreground="White"/>
    <TextBlock x:Name="Username" Margin="0,0,0,0"/>
    <GridView x:Name="DataGrid"
        ItemsSource="{Binding Source={StaticResource DataSource}}"
        ItemTemplate="{StaticResource DataSourceTemplate}" Margin="101,350,-1347,-1307.364"/>
    <Button Content="Back" Click="Back" HorizontalAlignment="Left" Height="91" VerticalAlignment="Top"
        Width="382" Margin="45,166,-362.454,-225.182" Background="#33B80E0E" FontFamily="Rockwell"
        FontSize="36" Foreground="#FFCD1010"/>
    <TextBlock x:Name="username" Text="" TextWrapping="Wrap" Height="26" Width="148" Margin="1200,150,0,0"/>
    <TextBlock Text="Data Shown As Sequence In: " TextWrapping="Wrap" Height="37" Width="332"
        Margin="500,150,0,0" Foreground="#FFFFFFCF" FontFamily="Rockwell" FontSize="25"/>
    <TextBlock Text="Timestamp" TextWrapping="Wrap" Height="37" Width="143" Margin="850,150,0,0"
        Foreground="#FFFFFFCF" FontFamily="Rockwell" FontSize="25"/>
    <TextBlock Text="TweetID" TextWrapping="Wrap" Height="37" Width="143" Margin="850,180,0,0"
        Foreground="#FFFFFFCF" FontFamily="Rockwell" FontSize="25"/>
    <TextBlock Text="TweetContent" TextWrapping="Wrap" Height="37" Width="172" Margin="850,210,0,0"
        Foreground="#FFFFFFCF" FontFamily="Rockwell" FontSize="25"/>
    <TextBlock Text="DateCreated" TextWrapping="Wrap" Height="37" Width="172" Margin="850,240,0,0"
        Foreground="#FFFFFFCF" FontFamily="Rockwell" FontSize="25"/>
    <TextBlock Text="UserID" TextWrapping="Wrap" Height="37" Width="172" Margin="850,270,0,0"
        Foreground="#FFFFFFCF" FontFamily="Rockwell" FontSize="25"/>
    <TextBlock Text="Username" TextWrapping="Wrap" Height="37" Width="172" Margin="850,300,0,0"
        Foreground="#FFFFFFCF" FontFamily="Rockwell" FontSize="25"/>
</RelativePanel>

```

Figure 4.29 Program Code of View Record UI

This is the program code that build the whole interface. Including the background picture, the text shown on the windows, the buttons and the stack panel. All of them are styled with size, colours and fonts.

## Back-End Program Code

### A. Home Page

There are only navigation codes and the windows size codes on the back-end of the home page interface.

This is the codes which set the windows size:

```
public MainPage()
{
    this.InitializeComponent();
    ApplicationView.PreferredLaunchViewSize = new Size(1600,900);
    ApplicationView.PreferredLaunchWindowingMode = ApplicationViewWindowingMode.PreferredLaunchViewSize;
```

Figure 4.30 Program Code of Home Page Back-End

This piece of code will set the windows size on 1600:900 scale.

When the user clicked on the login button:

```
private void ClickLogin(object sender, RoutedEventArgs e)
{
    this.Frame.Navigate(typeof(Login));
}
```

Figure 4.30 Program Code of Home Page Back-End

This piece of code will be able to navigate to the login page to the user.

When the user clicked on the register button:

```
private void ClickRegister(object sender, RoutedEventArgs e)
{
    this.Frame.Navigate(typeof(Register));
}
```

Figure 4.31 Program Code of Home Page Back-End

This piece of code will be able to navigate to the register page to the user.

## B. Register Page

Behind the register interface, there is program code which connected to the SQL Database, various validation and navigation.

This is the code to validate the password, the password shall within 8-15 characters with a mixture of digits and upper case as well as lower case of alphabets.

```
public static bool ValidatePassword(string password)
{
    try
    {
        const int minimum = 8;
        const int maximum = 15;

        bool length = password.Length >= minimum && password.Length <= maximum;
        bool upperCase = false;
        bool lowerCase = false;
        bool digit = false;
        bool symbol = false;
        bool punctuation = false;

        if (length)
        {
            foreach (char character in password)
            {
                if (char.IsUpper(character)) upperCase = true;
                else if (char.IsLower(character)) lowerCase = true;
                else if (char.IsDigit(character)) digit = true;
                else if (char.IsSymbol(character)) symbol = true;
                else if (char.IsPunctuation(character)) punctuation = true;
            }
        }

        bool valid = length && upperCase && lowerCase && digit && !symbol && !punctuation;
        return valid;
    }
    catch
    {
        return false;
    }
}
```

Figure 4.32 Program Code of Register Page Back-End

This is the code to validate the username. The username shall not be including any punctuations or symbols.

```
public static bool ValidateUsername(string username)
{
    try
    {
        bool symbol = false;
        bool punctuation = false;

        foreach (char character in username)
        {
            if (char.IsSymbol(character)) symbol = true;
            else if (char.IsPunctuation(character)) punctuation = true;
        }

        bool valid = !symbol && !punctuation;
        return valid;
    }
    catch
    {
        return false;
    }
}
```

Figure 4.33 Program Code of Register Page Back-End

This is the code to validate the email. The email shall have an email format which is [xxx@xxx.com](mailto:xxx@xxx.com)

```
public static bool ValidateEmail(string email)
{
    try
    {
        var address = new System.Net.Mail.MailAddress(email);
        return address.Address == email;
    }
    catch
    {
        return false;
    }
}
```

Figure 4.34 Program Code of Register Page Back-End

This is the code where it sent an email to the user registered email address to notify about the registration.

```
public async Task ConfirmationEmail(Windows.ApplicationModel.Contacts.Contact recipient, string subject, string message)
{
    var EmailMessage = new Windows.ApplicationModel.Email.EmailMessage();
    EmailMessage.Body = message;

    var email = recipient Emails.FirstOrDefault<Windows.ApplicationModel.Contacts.ContactEmail>();
    if (email != null)
    {
        var emailRecipient = new Windows.ApplicationModel.Email.EmailRecipient(email.Address);
        EmailMessage.To.Add(emailRecipient);
        EmailMessage.Subject = subject;
    }

    await Windows.ApplicationModel.Email.EmailManager.ShowComposeNewEmailAsync(EmailMessage);
}
```

Figure 4.35 Program Code of Register Page Back-End

Below codes are all under the “Register” button:

When the user did not check on the checkbox:

```
if (Agreement.IsChecked == false)
{
    MessageDialog messagebox = new MessageDialog("You must agree on the Terms & Conditions.");
    await messagebox.ShowAsync();
}
```

Figure 4.36 Program Code of Register Page Back-End

There will be a message box popped up and inform that the user has to agree on the Terms & Condition only can proceed.

When the user input did not pass the validation in either email, username, password or confirm password.

```

else if (EmailAddress.Text=="" && Username.Text=="" && Password.Password=="" && ConfirmPassword.Password=="")
{
    MessageDialog messagebox = new MessageDialog("Do not leave blank on any field.");
    await messagebox.ShowAsync();
}
else if (EmailAddress.Text == "" || Username.Text == "" || Password.Password == "" || ConfirmPassword.Password == "")
{
    MessageDialog messagebox = new MessageDialog("Do not leave blank on any field.");
    await messagebox.ShowAsync();
}
else if (Password.Password != ConfirmPassword.Password)
{
    MessageDialog messagebox = new MessageDialog("The password is not a match. Your current password is " +
        +Password.Password.ToString());
    await messagebox.ShowAsync();
    ConfirmPassword.Password = "";
}
else if (ValidatePassword(Password.Password)==false)
{
    MessageDialog messagebox = new MessageDialog("The password have to be between 8-15 characters and a combination of UpperCase and " +
        "LowerCase letter as well as digit number. Your current password is " + Password.Password);
    await messagebox.ShowAsync();
    Password.Password = "";
    ConfirmPassword.Password = "";
}
else if (ValidateUsername(Username.Text) == false)
{
    MessageDialog messagebox = new MessageDialog("The username shall not contain any symbols or punctuations. " +
        "Your current username is " + Username.Text);
    await messagebox.ShowAsync();
    Username.Text = "";
}
else if (ValidateEmail(EmailAddress.Text) == false)
{
    MessageDialog messagebox = new MessageDialog("The email address is not in the correct format. " +
        "Your current email address is " + EmailAddress.Text);
    await messagebox.ShowAsync();
    EmailAddress.Text = "";
}

```

Figure 4.37 Program Code of Register Page Back-End

There will be a message box popped up and inform that the user what they have not been fulfilled on the validation.

When the user clicked on the “Register” button and pass the validation:

```

else
{
    string connetionString = null;
    SqlConnection connection;
    SqlCommand command;
    bool nameexistence;
    bool emailexistence;
    string subject = "Welcome To CyberXoX";
    string message = "Congratulations on successfully registered at CyberXoX! Please login using your " +
        "credentials in the application!" + "\n\n" +
        "Below is your registration details: " + "\nUsername: " + Username.Text + "\nPassword: " + Password.Password;

    connetionString = "Data Source=DESKTOP-2UB7OKA;Initial Catalog=RegisterLogin;Integrated Security=True;" +
        "Persist Security Info=False;Pooling=False;MultipleActiveResultSets=False;" +
        "[Connect Timeout=60;Encrypt=False;TrustServerCertificate=True";

    connection = new SqlConnection(connetionString);
    connection.Open();
    try
    {
        using (SqlCommand cmd = new SqlCommand("SELECT COUNT(*) FROM Register WHERE Username = @Username",
            connection))
        {
            cmd.Parameters.AddWithValue("UserName", Username.Text);
            nameexistence = (int) cmd.ExecuteScalar() > 0;
        }

        using (SqlCommand cmd =
            new SqlCommand("SELECT COUNT(*) FROM Register WHERE EmailAddress = @EmailAddress", connection))
        {
            cmd.Parameters.AddWithValue("EmailAddress", EmailAddress.Text);
            emailexistence = (int) cmd.ExecuteScalar() > 0;
        }

        if (nameexistence)
        {
            MessageDialog messagebox = new MessageDialog("This username has already been registered.");
            await messagebox.ShowAsync();
            Username.Text = "";
        }
        ...
    }
}

```

```

else if (emailexistence)
{
    MessageDialog messagebox = new MessageDialog("This email has already been registered.");
    await messagebox.ShowAsync();
    EmailAddress.Text = "";
}
else
{
    String query = "Insert into Register(EmailAddress,Username,Password,ConPassword) values ('" +
        EmailAddress.Text + "','" + Username.Text + "','" + Password.Password + "','" + ConfirmPassword.Password + "')";
    command = new SqlCommand();
    command.CommandText = query;
    command.Connection = connection;
    command.ExecuteNonQuery();
    try
    {
        var fromAddress = new MailAddress("peierlim@gmail.com");
        var fromPassword = "jthbqieduhvypdz";
        var toAddress = new MailAddress(EmailAddress.Text);

        SmtpClient smtp = new SmtpClient
        {
            Host = "smtp.gmail.com",
            Port = 587,
            EnableSsl = true,
            DeliveryMethod = SmtpDeliveryMethod.Network,
            UseDefaultCredentials = false,
            Credentials = new NetworkCredential(fromAddress.Address, fromPassword)
        };

        MailMessage mail = new MailMessage(fromAddress, toAddress);
        mail.Subject = subject;
        mail.Body = message;
        smtp.Send(mail);
    }
    catch (Exception ex)
    {
        MessageDialog messagebox1 = new MessageDialog("Confirmation Email Sending Error: "+ex);
        await messagebox1.ShowAsync();
    }
    MessageDialog messagebox2 = new MessageDialog("Registered Successfully." +
        " Please check your email inbox for confirmation email.");
    await messagebox2.ShowAsync();
    EmailAddress.Text = "";
    Username.Text = "";
    Password.Password = "";
    ConfirmPassword.Password = "";
    connection.Close();
    this.Frame.Navigate(typeof(MainPage));
}
catch (Exception ex)
{
    MessageDialog messagebox = new MessageDialog("Database connection error: " + ex);
    await messagebox.ShowAsync();
    this.Frame.Navigate(typeof(MainPage));
}

```

Figure 4.38 Program Code of Register Page Back-End

This is the program code that connects to the SQL database which the author has pre-created inside the SQL Server and store the user input data into the database. If the action was successful, a message box will pop up to notify the user upon the success registration as well as email sent to their registered email address. The page will be redirected back to the home page. If the action was failed, a message box will pop up.

When the user clicked on the Terms and Condition Hyperlink:

```
private async void termscondition(Hyperlink sender, HyperlinkEventArgs args)
{
    MessageDialog messagebox = new MessageDialog("Terms and Conditions. \n Last updated: November 22, 2017 \n\n" +
        "Please read these Terms and Conditions carefully before using the CyberXoX operated by CyberXoX. \n\n" +
        "Your access to and use of the Service is conditioned on your acceptance of and compliance with these Terms. \n " +
        "These Terms apply to all visitors, users and others who access or use the Service. \n " +
        "By accessing or using the Service you agree to be bound by these Terms. \n " +
        "If you disagree with any part of the terms then you may not access the Service. \n\n\n" +
        "Accounts \n\n " +
        "When you create an account with us, you must provide us information that is accurate, complete, and current at all times. " +
        "Failure to do so constitutes a breach of the Terms, which may result in immediate termination of your account on our Service. \n" +
        "You are responsible for safeguarding the username and password that you use to access the " +
        "Service and for any activities or actions under your user account. " +
        "When you create an account with us, you will agree to a third party service. \n" +
        "You agree not to disclose your password to any third party. " +
        "You must notify us immediately upon becoming aware of any breach of security or unauthorized use of your account. \n\n\n" +
        "Changes \n\n" +
        "We reserve the right, at our sole discretion, to modify or replace these Terms at any time. " +
        "If a revision is material we will try to provide at least 30 days notice prior to any new terms taking effect. " +
        "What constitutes a material change will be determined at our sole discretion. \n " +
        "By continuing to access or use our Service after those revisions become effective, you agree to be bound by the revised terms. \n" +
        "If you do not agree to the new terms, please stop using the Service. \n\n\n " +
        "Contact Us \n\n" +
        "If you have any questions about these Terms, please contact us.");
    await messagebox.ShowAsync();
}
```

Figure 4.39 Program Code of Register Page Back-End

This is the program code that will pop up a message box that state out all the terms and condition.

When the user clicked on the “Back” button:

```
private void Back(object sender, RoutedEventArgs e)
{
    this.Frame.Navigate(typeof(MainPage));
}
```

Figure 4.40 Program Code of Register Page Back-End

This is the program code that will navigate the user back to the home page.

### C. Login Page

Behind the login interface, there is program code of connects to the SQL Database and navigation.

When the user clicked on the Login button:

```
private async void Signin(object sender, RoutedEventArgs e)
{
    if (username.Text == "" || password.Password == "")
    {
        MessageDialog messagebox = new MessageDialog("Do not leave blank on any field.");
        await messagebox.ShowAsync();
    }
    else
    {
        var logincredentials = new LoginCredentials();
        try
        {
            SqlConnection connection = new SqlConnection(@"Data Source=DESKTOP-2UB7OKA;Initial Catalog=RegisterLogin;
Integrated Security=True;Persist Security Info=False;Pooling=False;MultipleActiveResultSets=False;Connect Timeout=60;Encrypt=False;TrustServerCertificate=True");
            SqlDataAdapter dataadapter = new SqlDataAdapter("SELECT COUNT(*) FROM Register" +
                " WHERE Username='" + username.Text + "' AND Password='" + password.Password + "'", connection);
            DataTable datatable = new DataTable();
            dataadapter.Fill(datatable);
            if (datatable.Rows[0][0].ToString() == "1")
            {
                logincredentials.UserName = username.Text;
                logincredentials.NotificationToggle = "True";
                MessageDialog messagebox = new MessageDialog("Login successfully.");
                await messagebox.ShowAsync();
                connection.Close();
                this.Frame.Navigate(typeof(UserDashboard), logincredentials);
            }
            else
            {
                MessageDialog messagebox = new MessageDialog("Invalid User! Please check your username and password.");
                await messagebox.ShowAsync();
                this.Frame.Navigate(typeof(Login));
            }
        }
        catch (Exception ex)
        {
            MessageDialog messagebox = new MessageDialog("Database Connection Error." + ex);
            await messagebox.ShowAsync();
            this.Frame.Navigate(typeof(Login));
        }
    }
}
```

Figure 4.41 Program Code of Login Page Back-End

This is the program code that connects to the SQL database where the user credentials data had been stored inside. The user is required to fill in their credentials data before login. If the action was successful, a message box will pop up to notify user upon success login. If the action was failed, a message box will pop up.

When the user clicked on the “Forgot Password” hyperlink:

```
private async void forgotpassword(Hyperlink sender, HyperlinkClickEventArgs args)
{
    if (username.Text == "")
    {
        MessageDialog messagebox = new MessageDialog("Please enter your username to request for password. " +
            "If you have forgot your username as well," +
            " please contact customer service via cs@cyberxox.com.");
        await messagebox.ShowAsync();
    }
    else
    {
        try
        {
            using (SqlConnection connection = new SqlConnection("Data Source=DESKTOP-2UB7OKA;Initial Catalog=RegisterLogin;" +
                "Integrated Security=True;Persist Security Info=False;Pooling=False;" +
                "MultipleActiveResultSets=False;Connect Timeout=60;" +
                "Encrypt=False;TrustServerCertificate=True"))
            {
                SqlCommand command1;
                SqlCommand command2;
                string email = null;
                string passworder = null;
                connection.Open();
                try
                {
                    using (command1 = new SqlCommand("SELECT EmailAddress FROM Register WHERE Username = @Username", connection))
                    {
                        command1.Parameters.AddWithValue("@Username", username.Text);
                        email = command1.ExecuteScalar().ToString();
                    }

                    using (command2 = new SqlCommand("SELECT Password FROM Register WHERE Username = @Username", connection))
                    {
                        command2.Parameters.AddWithValue("@Username", username.Text);
                        passworder = command2.ExecuteScalar().ToString();
                    }
                }
            }
        }
    }
}
```

```

try
{
    var fromAddress = new MailAddress("peiernlim@gmail.com");
    var fromPassword = "jthbqieduhvjypdz";
    var toAddress = new MailAddress(email);

    SmtpClient smtp = new SmtpClient
    {
        Host = "smtp.gmail.com",
        Port = 587,
        EnableSsl = true,
        DeliveryMethod = SmtpDeliveryMethod.Network,
        UseDefaultCredentials = false,
        Credentials = new NetworkCredential(fromAddress.Address, fromPassword)
    };

    MailMessage mail = new MailMessage(fromAddress, toAddress);
    mail.Subject = "CyberXoX - Password Reminder";
    mail.Body = "Dear " + username.Text + ",\n\nBelow is your requested login credentials, " +
               "please contact to customer service if you do not perform this action: " +
               "\nUsername: " + username.Text + "\nPassword: " + password + "\n\nCustomer Service: cs@cyberxox.com";
    smtp.Send(mail);
    MessageBox messagebox = new MessageBox("The login credentials has been sent to the registered email. " +
                                           "Please check your email and try to login again.");
    await messagebox.ShowAsync();
    this.Frame.Navigate(typeof(Login));
}
catch (Exception ex)
{
    MessageBox messagebox = new MessageBox("Confirmation Email Error: " + ex);
    await messagebox.ShowAsync();
}
catch (Exception ex)
{
    MessageBox messagebox = new MessageBox("The username is not existed in our database, please register your account with us.");
    await messagebox.ShowAsync();
}

```

Figure 4.42 Program Code of Login Page Back-End

This is the program code that will find the user's credentials based on the username input by the user, then it will send an email to the user registered email address for the password retrieval.

When user clicked on the “Back” button:

```

private void Back(object sender, RoutedEventArgs e)
{
    this.Frame.Navigate(typeof(MainPage));
}

```

Figure 4.43 Program Code of Login Page Back-End

This is the program code that will redirect the use back to the home page.

#### D. User Dashboard

User Dashboard consist of a lot of methods which it navigates to User Profile, Setting and View Record page and most importantly, it starts the streaming and analysing process.

```
protected override void OnNavigatedTo(NavigationEventArgs e)
{
    base.OnNavigatedTo(e);
    var logincredentials = (LoginCredentials)e.Parameter;
    username.Text = logincredentials.UserName;
    notification = logincredentials.NotificationToggle;
    if (logincredentials.NotificationToggle == "True")
    {
        Notification.Text = "ON";
        Notification.Foreground = new SolidColorBrush(Color.FromArgb(120, 0, 255, 0));
        Notify(0, cyberbully, notification);
    }
    else if (logincredentials.NotificationToggle == "False")
    {
        Notification.Text = "OFF";
        Notification.Foreground = new SolidColorBrush(Color.FromArgb(120, 255, 0, 0));
        Notify(0, cyberbully, notification);
    }
}
```

Figure 4.44 Program Code of User Dashboard Page Back-End

First, this is the override class on User Dashboard, this will pass the username from Login Page to here and display on top left. It will also detect the current notification toggle on Setting Page and change accordingly.

```
private async void startstream(object sender, RoutedEventArgs e)
{
    List<string> streamdata = new List<string>();
    List<string> keyList = new List<string>();
    try
    {
        var task1 = Task.Run(() => GetKeyword(0))
            .ContinueWith(prevTask => Connecting(1000, keyList))
            .ContinueWith(prevTask => RetrieveData(1000))
            .ContinueWith(prevTask => MakeRequest(1000, streamdata))
            .ContinueWith(prevTask => Notify(1000, cyberbully, notification));
        task1.Wait();
    }
    catch (Exception ex)
    {
        MessageDialog messagebox = new MessageDialog("Task running error:" + ex);
        await messagebox.ShowAsync();
    }
}
```

Figure 4.45 Program Code of User Dashboard Page Back-End

Second, this is the code behind the “Start Stream” button, it schedules the five tasks with sequence:

```

public static async void Connecting(int sleepTime, List<string> keyList)
{
    //Set the token that provided by Twitter to gain authorized access into Twitter database
    Auth.SetUserCredentials("YTNu0C9rrJs8g9kZ0hRweKrpp", "wXj6VS168jeFStRWHDnhG19oP1WZGeBFMNgT3KCKI6MaX46SMT",
    "892680922322960384-8ka1NuhgiuxjSLUFFQVdwmn0ibIduZa", "y92ycGrGCJS9vBJU79gq34rV6FCwNjBPFFOqhEHaTQe11");

    //Create stream with filter stream type
    var stream = Stream.CreateFilteredStream();
    int numoftweet = 0;
    //Set language filter to English only
    stream.AddTweetLanguageFilter(LanguageFilter.English);
    //Connect to database that stored the keyword
    foreach (var key in keyList)
    {
        stream.AddTrack(key);
    }
    //Let the stream match with all the conditions stated above
    stream.MatchingTweetReceived += async (sender, argument) =>
    {
        //Connect to MongoDB server and database
        var tweet = argument.Tweet;
        try
        {
            var client = new MongoClient();
            var database = client.GetDatabase("StreamData");
            var collection = database.GetCollection<BsonDocument>("StreamData");
            //Exclude any Retweeted Tweets
            if (tweet.IsRetweet) return;
            //Store the data as a BsonDocument into MongoDB database
            var tweetdata = new BsonDocument
            {
                //Store only the data that needed from a Tweet
                {"Timestamp", tweet.TweetLocalCreationDate},
                {"TweetID", tweet.IdStr},
                {"TweetContent", tweet.Text},
                {"DateCreated", tweet.CreatedBy.CreatedAt.Date},
                {"UserID", tweet.CreatedBy.IdStr},
                {"Username", tweet.CreatedBy.Name}
            };

            //Insert data into MongoDB database
            await collection.InsertOneAsync(tweetdata);
            //Every tweets streamed, add 1 into the variable
            numoftweet += 1;
            //If the number of tweets exceed 100, stopped the stream
            if (numoftweet >= 100)
            {
                stream.StopStream();
                RetrieveData(2000);
            }
        }
        //Catch if any exception/errors occurred
        catch (Exception ex)
        {
            MessageDialog messagebox = new MessageDialog("MongoDB Connection Error:" + ex);
            await messagebox.ShowAsync();
        }
    };
    //Start the stream
    stream.StartStreamMatchingAllConditions();
}

```

Figure 4.46 Program Code of User Dashboard Page Back-End

Third, this is the Connecting method, which represents the action of connect to the Twitter, and stream its data. After streamed its data, store the data into MongoDB database accordingly. In this demo, the author limit the number of streamed data into 100 to avoid long stream time during demo.

```
_id: ObjectId("59bf8aa0050bad48c8fb5e8")
Timestamp: 2017-09-18 16:58:08.520
TweetID: "909703085617905666"
TweetContent: "2 MINUTES OH MY FUCK"
DateCreated: 2017-09-18 00:00:00.000
UserID: "760732255006449664"
Username: "paige ❤ #HER"
```

Figure 4.47 Sample Data in MongoDB

This is how the data will be stored inside the MongoDB, the `_id` is generated by the MongoDB server itself, other content are all get from the tweets itself:

```
public static async void GetKeyword(int sleepTime)
{
    try
    {
        //Connect to MongoDB using localhost (The MongoDB server is run locally, so are all the data stored)
        var client1 = new MongoClient("mongodb://localhost:27017");
        var database1 = client1.GetDatabase("KeywordList");
        var collection1 = database1.GetCollection<BsonDocument>("Keyword");

        //Get the keyword
        var data = collection1.Aggregate().Project<BsonDocument>(Builders<BsonDocument>.Projection
            .Exclude(find => find["_id"]).Include(find => find["Keyword"])).ToList();

        //Create a generic list object
        List<string> keywordList = new List<string>();

        //Store each of the data inside the MongoDB Collection into the generic list
        foreach (var d in data)
        {
            keywordList.Add(d["Keyword"].AsString);
        }

        //Continue to Connecting method and pass the keyList as parameter
        Connecting(1000, keywordList);
    }
    catch (Exception ex)
    {
        MessageDialog messagebox = new MessageDialog("Retrieve Keyword Error: "+ex);
        await messagebox.ShowAsync();
    }
}
```

Figure 4.48 Program Code of User Dashboard Page Back-End

Fourth, this is the `GetKeyword` method, this method is code for getting all the keyword pre-stored inside the MongoDB database and store them into a list for easier retrieval. These are the keywords that will used to filter the tweets from Twitter when streaming.

```

public static async void RetrieveData(int sleepTime)
{
    try
    {
        //Connect to MongoDB using localhost (The MongoDB server is run locally, so are all the data stored)
        var client = new MongoClient("mongodb://localhost:27017");
        var database = client.GetDatabase("StreamData");
        var collection = database.GetCollection<BsonDocument>("StreamData");
        List<string> streamdata = new List<string>();

        //Get only the TweetContent data
        var data = collection.Aggregate().Project<BsonDocument>(Builders<BsonDocument>.Projection
            .Exclude(find => find["_id"]).Include(find => find["TweetContent"])).ToList();

        //Store each of the data inside the MongoDB Collection into the generic list
        foreach (var d in data)
        {
            streamdata.Add(d["TweetContent"].AsString);
        }

        //Continue to MakeRequest method and pass the streamdata as parameter
        MakeRequest(2000, streamdata);
    }
    catch (Exception ex)
    {
        MessageDialog messagebox = new MessageDialog("Retrieve Data Error: " + ex);
        await messagebox.ShowAsync();
    }
}

```

Figure 4.49 Program Code of User Dashboard Page Back-End

Fifth, this is the RetrieveData method, this method is code for getting all the streamed data stored inside the MongoDB after the streaming and stored them into a list for easier retrieval.

```

public static async void MakeRequest(int sleepTime, List<string> streamdata)
{
    //Create object for HttpClient to connect to HTTP endpoint
    var client = new HttpClient();
    var queryString = HttpUtility.ParseQueryString(string.Empty);

    //These AppID and subscription key is get from LUIS.AI and Azure portal
    var luisAppId = "aab50509-223f-444f-921b-d94be61b24ed";
    var subscriptionKey = "0cb92ecd4a194aa7ad5f6bb74ea79529";

    //The request header contains the subscription key from Azure portal
    client.DefaultRequestHeaders.Add("Ocp-Apim-Subscription-Key", subscriptionKey);

    //This parameter contains the utterance to send to LUIS
    foreach (var data in streamdata)
    {
        queryString["q"] = data;

        //These optional request parameters are being set followed the LUIS published settings
        queryString["timezoneOffset"] = "0";
        queryString["verbose"] = "true";
        queryString["spellCheck"] = "false";
        queryString["staging"] = "true";

        try
        {
            //Connect to the published URI of the data model set
            var uri = "https://southeastasia.api.cognitive.microsoft.com/luis/v2.0/apps/" + luisAppId + "?" + queryString;

            //Get the response from the LUIS model
            var response = await client.GetAsync(uri);

            //Read the LUIS response as string
            var responseContent = await response.Content.ReadAsStringAsync();

            //Parse the LUIS response from string to JSON format
            var jsonresponse = JObject.Parse(responseContent);

            //Assign only intent from the JSON into variable
            var intentonly = jsonresponse.SelectToken("topScoringIntent.intent").ToString();

            //Store into another database if the intent is cyberbully
            if (intentonly == "Cyberbully")
            {
                .
            }
        }
    }
}

```

```

try
{
    //Connect again to the MongoDB server
    MongoClient mclient = new MongoClient();
    var sdatabase = mclient.GetDatabase("StreamData");
    var scollection = sdatabase.GetCollection<BsonDocument>("StreamData");
    //Set the filter to filter the data that have that TweetContent
    var filter = Builders<BsonDocument>.Filter.Eq("TweetContent", data);
    //Store the whole found JSON data into a list
    var findresult = await scollection.Find(filter).ToListAsync();

    //Convert the JSON list into BsonDocument
    var arrayresult = new BsonDocument();
    foreach (var item in findresult)
    {
        arrayresult.Add(item);
    }
    var bsonresult = arrayresult;

    //Store the document into Cyberbully Database
    var cdatabase = mclient.GetDatabase("CyberbullyData");
    var ccollection = cdatabase.GetCollection<BsonDocument>("Cyberbully");
    await ccollection.InsertOneAsync(bsonresult);
    //Delete the document in StreamData database
    var deleteresult = await scollection.DeleteManyAsync(bsonresult);
    cyberbully = true;
    //Continue to Notify method and pass the cyberbully state and notification state as parameter
    Notify(2000, cyberbully, notification);
}
catch (Exception ex)
{
    MessageDialog messagebox = new MessageDialog("MongoDB Connection Error: "+ex);
    await messagebox.ShowAsync();
}

else
{
    try
    {
        //Connect to MongoDB server
        MongoClient mclient = new MongoClient();
        var mdatabase = mclient.GetDatabase("StreamData");
        var mcollection = mdatabase.GetCollection<BsonDocument>("StreamData");
        //Set the filter to filter the data that have that TweetContent
        var filter = Builders<BsonDocument>.Filter.Eq("TweetContent", data);
        //Delete the matched data
        var result = await mcollection.DeleteManyAsync(filter);
        cyberbully = false;
        //Continue to Notify method and pass the cyberbully state and notification state as parameter
        Notify(2000, cyberbully, notification);
    }
    catch (Exception ex)
    {
        MessageDialog messagebox = new MessageDialog("MongoDB Connection Error: " + ex);
        await messagebox.ShowAsync();
    }
}
catch (Exception ex)
{
    MessageDialog messagebox = new MessageDialog("LUIS Connection Error: "+ex);
    messagebox.ShowAsync();
}
}

```

Figure 4.50 Program Code of User Dashboard Page Back-End

Sixth, this is the MakeRequest method, this method is meant for connecting to the LUIS data model that is held on cloud service Microsoft Azure. After connect via the LUIS API, it will analyzed each streamed data content and return an output. The output determined the next action, if it is suspected cyberbully content, it will be stored into another MongoDB database, else it will be discarded.

```

public static async void Notify(int sleepTime, bool cyberbully, string notification)
{
    if (notification == "True")
    {
        if (cyberbully)
        {
            try
            {
                // Generate the toast notification content
                ToastContent content = GenerateToastContent();
                //Pop the toast
                ToastNotificationManager.CreateToastNotifier().Show(new ToastNotification(content.GetXml()));
            }
            catch (Exception ex)
            {
                MessageDialog messagebox = new MessageDialog("Toast Notification Error: " + ex);
                await messagebox.ShowAsync();
            }
        }
    }
}

```

Figure 4.51 Program Code of User Dashboard Page Back-End

Seventh, this is the Notify method, this method is code for pop up the toast notification if the system found the suspected cyberbully data.

```

public static ToastContent GenerateToastContent()
{
    return new ToastContent()
    {
        Launch = "action=viewEvent&eventId=1983",
        Scenario = ToastScenario.Reminder,

        //Display the text
        Visual = new ToastVisual()
        {
            BindingGeneric = new ToastBindingGeneric()
            {
                Children =
                {
                    new AdaptiveText()
                    {
                        Text = "Cyberbully Content Detected"
                    }
                }
            },
            //Display the button
            Actions = new ToastActionsCustom()
            {
                Buttons =
                {
                    new ToastButtonDismiss()
                }
            }
        };
    };
}

```

Figure 4.52 Program Code of User Dashboard Page Back-End

Eighth, this is the ToastContent method, this method is code for the content inside the toast notification.

```
private void Userprofile_OnPointerEntered(object sender, PointerRoutedEventArgs e)
{
    profilettext.Visibility = Visibility.Visible;
}

private void Userprofile_OnPointerExited(object sender, PointerRoutedEventArgs e)
{
    profilettext.Visibility = Visibility.Collapsed;
}

private void Setting_OnPointerEntered(object sender, PointerRoutedEventArgs e)
{
    settingtext.Visibility = Visibility.Visible;
}

private void Setting_OnPointerExited(object sender, PointerRoutedEventArgs e)
{
    settingtext.Visibility = Visibility.Collapsed;
}

private void Viewrecord_OnPointerEntered(object sender, PointerRoutedEventArgs e)
{
    recordtext.Visibility = Visibility.Visible;
}

private void Viewrecord_OnPointerExited(object sender, PointerRoutedEventArgs e)
{
    recordtext.Visibility = Visibility.Collapsed;
}

private void Logout_OnPointerEntered(object sender, PointerRoutedEventArgs e)
{
    logouttext.Visibility = Visibility.Visible;
}

private void Logout_OnPointerExited(object sender, PointerRoutedEventArgs e)
{
    logouttext.Visibility = Visibility.Collapsed;
}
```

Figure 4.53 Program Code of User Dashboard Page Back-End

Ninth, these are the methods that display the text on the UI left panel when the mouse is hold over the button.

```
private void Userprofile_OnClick(object sender, RoutedEventArgs e)
{
    var logincredentials = new LoginCredentials();
    logincredentials.UserName = username.Text;
    this.Frame.Navigate(typeof(userprofile), logincredentials);
}

private void Setting_OnClick(object sender, RoutedEventArgs e)
{
    var logincredentials = new LoginCredentials();
    logincredentials.UserName = username.Text;
    logincredentials.NotificationToggle = notification;
    this.Frame.Navigate(typeof(setting), logincredentials);
}

private void Viewrecord_OnClick(object sender, RoutedEventArgs e)
{
    var logincredentials = new LoginCredentials();
    logincredentials.UserName = username.Text;
    this.Frame.Navigate(typeof(viewrecord), logincredentials);
}

private void Generatereport_OnClick(object sender, RoutedEventArgs e)
{
    var logincredentials = new LoginCredentials();
    logincredentials.UserName = username.Text;
    this.Frame.Navigate(typeof(generatereport), logincredentials);
}

private void Logout_OnClick(object sender, RoutedEventArgs e)
{
    this.Frame.Navigate(typeof(MainPage));
}
```

Figure 4.54 Program Code of User Dashboard Page Back-End

Tenth, these are the method that navigates each button to wherever the page that they should go to and some pass the username to the page that need this variable.

## E. User Profile

User Profile is one of the feature that the user is able to access to view their profile credentials that they set when they registered the account to the software.

```
protected override void OnNavigatedTo(NavigationEventArgs e)
{
    base.OnNavigatedTo(e);
    var logincredentials = (LoginCredentials)e.Parameter;
    try
    {
        using (SqlConnection connection = new SqlConnection("Data Source=DESKTOP-2UB7OKA;Initial Catalog=RegisterLogin;" +
            "Integrated Security=True;Persist Security Info=False;Pooling=False;" +
            "MultipleActiveResultSets=False;Connect Timeout=60;Encrypt=False;" +
            "TrustServerCertificate=True"))
        {
            SqlCommand command1;
            SqlCommand command2;
            string email = null;
            string passworder = null;
            connection.Open();
            try
            {
                using (command1 = new SqlCommand("SELECT EmailAddress FROM Register WHERE Username = @Username", connection))
                {
                    command1.Parameters.AddWithValue("@Username", logincredentials.UserName);
                    email = command1.ExecuteScalar().ToString();
                }

                using (command2 = new SqlCommand("SELECT Password FROM Register WHERE Username = @Username", connection))
                {
                    command2.Parameters.AddWithValue("@Username", logincredentials.UserName);
                    passworder = command2.ExecuteScalar().ToString();
                }

                Email.Text = email;
                Username.Text = logincredentials.UserName;
                Password.Password = passworder;
            }
            catch (Exception ex)
            {
                MessageDialog messagebox = new MessageDialog("Database Connection Error: " + ex);
                messagebox.ShowAsync();
            }
        }
        catch (Exception ex)
        {
            MessageDialog messagebox = new MessageDialog("Database Connection Error: " + ex);
            messagebox.ShowAsync();
        }
    }
}
```

Figure 4.55 Program Code of User Profile Page Back-End

This part is connect to the SQL database where the registered user data at, retrieve the current user data using the current username.

```
private void Edit(object sender, RoutedEventArgs e)
{
    var logincredentials = new LoginCredentials();
    logincredentials.UserName = Username.Text;
    this.Frame.Navigate(typeof(useredit), logincredentials);
}

private void Back(object sender, RoutedEventArgs e)
{
    var logincredentials = new LoginCredentials();
    logincredentials.UserName = Username.Text;
    this.Frame.Navigate(typeof(UserDashboard), logincredentials);
}
```

Figure 4.56 Program Code of User Profile Page Back-End

This part is navigation through the button to the page that it supposed to go and pass the username to the other page.

## F. User Edit

User Edit is one of the feature that the user able to access when they to edit their profile data but only email address and password. The username is unchangeable.

```
public static bool ValidatePassword(string password)
{
    try
    {
        const int minimum = 8;
        const int maximum = 15;

        bool length = password.Length >= minimum && password.Length <= maximum;
        bool upperCase = false;
        bool lowerCase = false;
        bool digit = false;
        bool symbol = false;
        bool punctuation = false;

        if (length)
        {
            foreach (char character in password)
            {
                if (char.IsUpper(character)) upperCase = true;
                else if (char.IsLower(character)) lowerCase = true;
                else if (char.IsDigit(character)) digit = true;
                else if (char.IsSymbol(character)) symbol = true;
                else if (char.IsPunctuation(character)) punctuation = true;
            }
        }

        bool valid = length && upperCase && lowerCase && digit && !symbol && !punctuation;
        return valid;
    }
    catch
    {
        return false;
    }
}
```

Figure 4.57 Program Code of User Edit Page Back-End

This part of code is meant for validation of the newly changed password. As stated, the password have to be within 8-15 characters with mixture of upper case and lower case alphabets as well as digits.

```
public static bool ValidateEmail(string email)
{
    try
    {
        var address = new System.Net.Mail.MailAddress(email);
        return address.Address == email;
    }
    catch
    {
        return false;
    }
}
```

Figure 4.58 Program Code of User Edit Page Back-End

This part of code is meant for validation of newly changed email address. The format of email address have to be [xxx@xxx.com](mailto:xxx@xxx.com)

```

base.OnNavigatedTo(e);
var logincredentials = (LoginCredentials)e.Parameter;
SqlCommand command1;
SqlCommand command2;
string email = null;
string passworder = null;
try
{
    SqlConnection connection = new SqlConnection(@"Data Source=DESKTOP-2UB7OKA;Initial Catalog=RegisterLogin;
    Integrated Security=True;Persist Security Info=False;Pooling=False;MultipleActiveResultSets=False;
    Connect Timeout=60;Encrypt=False;TrustServerCertificate=True");
    connection.Open();
    try
    {
        using (command1 = new SqlCommand("SELECT EmailAddress FROM Register WHERE Username = @Username", connection))
        {
            command1.Parameters.AddWithValue("@Username", logincredentials.UserName);
            email = command1.ExecuteScalar().ToString();
        }

        using (command2 = new SqlCommand("SELECT Password FROM Register WHERE Username = @Username", connection))
        {
            command2.Parameters.AddWithValue("@Username", logincredentials.UserName);
            passworder = command2.ExecuteScalar().ToString();
        }

        Email.Text = email;
        Username.Text = logincredentials.UserName;
        Password.Password = passworder;
    }
    catch (Exception ex)
    {
        MessageDialog messagebox = new MessageDialog("Database Connection Error: " + ex);
        messagebox.ShowAsync();
    }
}

connection.Close();

```

Figure 4.59 Program Code of User Edit Page Back-End

This part of code is meant for retrieve the current username data and show it in the UI let the user view.

```

if (Email.Text=="" || Password.Password=="") ||
{
    MessageDialog messagebox = new MessageDialog("Do not leave blank on any field.");
    await messagebox.ShowAsync();
}
else if (ValidatePassword(Password.Password) == false)
{
    MessageDialog messagebox = new MessageDialog("The password have to be between 8-15 characters and a combination " +
        "of UpperCase and LowerCase letter as well as digit number. " +
        "Your current password is " + Password.Password);
    await messagebox.ShowAsync();
    Password.Password = "";
}
else if (ValidateEmail(Email.Text) == false)
{
    MessageDialog messagebox = new MessageDialog("The email address is not in the correct format." +
        " Your current email address is " + Email.Text);
    await messagebox.ShowAsync();
    Email.Text = "";
}
else if (Password.Password != ConPassword.Password)
{
    MessageDialog messagebox = new MessageDialog("The password is not a match." +
        " Your current password is " + Password.Password);
    await messagebox.ShowAsync();
    Password.Password = "";
}

```

Figure 4.60 Program Code of User Edit Page Back-End

This part of code is under the “Save” button and for validation purpose. Any invalid input is detected, it will pop up the message box warning.

```
else
{
    string connetionString = null;
    SqlConnection connection;
    SqlCommand command;

    connetionString =
        "Data Source=DESKTOP-2UB7OKA;Initial Catalog=RegisterLogin;Integrated Security=True;" +
        "Persist Security Info=False;Pooling=False;MultipleActiveResultSets=False;" +
        "Connect Timeout=60;Encrypt=False;TrustServerCertificate=True";

    connection = new SqlConnection(connetionString);
    try
    {
        connection.Open();
        command = new SqlCommand(
            "UPDATE Register SET EmailAddress=@NEmailAddress, Password=@NPassword WHERE (Username = '" +
            Username.Text + "')", connection);
        {
            command.Parameters.AddWithValue("@NEmailAddress", Email.Text);
            command.Parameters.AddWithValue("@NPassword", Password.Password);
            command.ExecuteNonQuery();
        }
        connection.Close();
        MessageDialog messagebox = new MessageDialog("The profile has been updated successfully.");
        await messagebox.ShowAsync();
        var logincredentials = new LoginCredentials();
        logincredentials.UserName = Username.Text;
        this.Frame.Navigate(typeof(UserDashboard), logincredentials);
    }
    catch (Exception ex)
    {
        MessageDialog messagebox = new MessageDialog("Database Connection Error: " + ex);
        await messagebox.ShowAsync();
    }
}
```

Figure 4.61 Program Code of User Edit Page Back-End

This part of code is for update the newly changed profile credentials to that user data.

```
private void Back(object sender, RoutedEventArgs e)
{
    var logincredentials = new LoginCredentials();
    logincredentials.UserName = Username.Text;
    this.Frame.Navigate(typeof(userprofile), logincredentials);
}
```

Figure 4.62 Program Code of User Edit Page Back-End

This part of code is navigation back to the User Profile page along with passing the username to the page.

## G. Setting

Setting is one of the feature that the user will be able to check the current settings for the stream such as Language, Region and Notification Switch. In current demo, only the Notification Switch will be able to toggle between ON and OFF by the user.

```
protected override void OnNavigatedTo(NavigationEventArgs e)
{
    base.OnNavigatedTo(e);
    var logincredentials = (LoginCredentials)e.Parameter;
    username = logincredentials.UserName;
    if (logincredentials.NotificationToggle == "True")
    {
        NotificationSwtich.isOn = true;
    }
    else if (logincredentials.NotificationToggle == "False")
    {
        NotificationSwtich.isOn = false;
    }
}
```

Figure 4.63 Program Code of Setting Page Back-End

This part of code is detecting the notification status on the User Dashboard and set the toggle switch to corresponding status.

```
private void Save(object sender, RoutedEventArgs e)
{
    var logincredentials = new LoginCredentials();
    logincredentials.UserName = username;
    if (NotificationSwtich.isOn)
    {
        logincredentials.NotificationToggle = "True";
        this.Frame.Navigate(typeof(UserDashboard), logincredentials);
    }
    else if (!NotificationSwtich.isOn)
    {
        logincredentials.NotificationToggle = "False";
        this.Frame.Navigate(typeof(UserDashboard), logincredentials);
    }
}
```

Figure 4.64 Program Code of Setting Page Back-End

This part of code is record the state of notification toggle switch and pass it to User Dashboard page along with navigation to that page.

```
private void Back(object sender, RoutedEventArgs e)
{
    var logincredentials = new LoginCredentials();
    logincredentials.UserName = username;
    this.Frame.Navigate(typeof(UserDashboard), logincredentials);
}
```

Figure 4.65 Program Code of Setting Page Back-End

This part of code is navigation to the User Dashboard page along with passing the username variable.

## H. View Record

View Record is another feature that can access by the user, it will display the current suspected cyberbully data to the user.

```
protected override void OnNavigatedTo(NavigationEventArgs e)
{
    base.OnNavigatedTo(e);
    var logincredentials = (LoginCredentials)e.Parameter;
    username.Text = logincredentials.UserName;
    Display();
}
```

Figure 4.66 Program Code of View Record Page Back-End

This part of code is get the passed username variable and run the display method below.

```
public async void Display()
{
    try
    {
        //Connect to MongoDB server
        MongoClient client = new MongoClient("mongodb://localhost");
        var database = client.GetDatabase("CyberbullyData");
        var collection = database.GetCollection<BsonDocument>("Cyberbully");
        //Set filter to all document inside the collection
        var filter = new BsonDocument();
        IEnumerable<BsonDocument> document;
        //Search the document that fulfilled the filter
        var cursor = await collection.FindAsync(filter);
        ObservableCollection<Data> dataList = new ObservableCollection<Data>();
        //Store all the retrieved data into a collection
        while (await cursor.MoveNextAsync())
        {
            document = cursor.Current;
            foreach (var item in document)
            {
                Data data = new Data(item["Timestamp"].ToString(), item["TweetID"].ToString(),
                    item["TweetContent"].ToString(), item["DateCreated"].ToString(), item["UserID"].ToString(),
                    item["Username"].ToString());
                dataList.Add(data);
            }
        }
        //Bind the collection into the gridview data source
        DataSource.Source = dataList;
    }
    catch (Exception ex)
    {
        MessageDialog messagebox = new MessageDialog("Display Data Error: " + ex);
        await messagebox.ShowAsync();
    }
}
```

Figure 4.67 Program Code of View Record Page Back-End

This part of code is connect to the MongoDB and retrieve all the data inside the selected database collection, then stored them as a collection and bind to the grid view data source.

```
private void Back(object sender, RoutedEventArgs e)
{
    var logincredentials = new LoginCredentials();
    logincredentials.UserName = username.Text;
    this.Frame.Navigate(typeof(UserDashboard), logincredentials);
}
```

Figure 4.68 Program Code of View Record Page Back-End

This part of code is navigation to the User Dashboard page along with passing the username variable.

## Luis Data Model

In this section, the author will explain the build process of the LUIS data model and introduced the LUIS application site.

First and foremost, goes into the [www.luis.ai](http://www.luis.ai) and sign in to the site. In here, the author need to build a LUIS app and the author already did with the name CyberXoX.

The screenshot shows the 'My Apps' section of the LUIS website. A single app entry is displayed: CyberXoX. The details are as follows:

- Name: CyberXoX
- Culture: en-us
- Created date: Oct 12, 2017, 6:21:32 PM
- Endpoint hits: 7684

Below the table are several small icons for managing the app.

Figure 4.69 LUIS App Creation Page

The author had set the culture to en-us meaning to say that this app will be trained using English. Endpoint hits is the number of calls received by the LUIS app after published and implemented into the proposed project.

After created the app, enter the dashboard view.

The screenshot shows the LUIS App Dashboard for the CyberXoX app. The left sidebar includes links for Settings, Dashboard, Intents, Entities, Prebuilt domains (PREVIEW), Features, Train & Test, and Publish App. Below the sidebar is a link to 'Back to App list'.

The main dashboard area is divided into several sections:

- Overview:** Facts & statistics about the app's data and the received endpoint hits at any period of time ... [Learn more](#)
- Dashboard Suggested utterances:** App Id: aab50509-223f-444f-921b-d94be61b24ed
- App status:** Last train: Oct 14, 2017, 6:30:59 PM | Last published: Nov 19, 2017, 9:15:49 PM
- Intent Count:** 3 / 80
- Entity Count:** 0 / 30
- List Entity Count:** 0 / 50
- Labeled Utterances Count:** 321
- Endpoint Hits Per Period (PER DAY (LAST WEEK)):** A chart showing two sharp peaks of endpoint hits around Nov 17 and Nov 20.
- Total Endpoint Hits SINCE APP CREATION:** 7684
- Key Usage:** (empty section)
- Intent Breakdown ON LABELED UTTERANCES:** A pie chart showing Intent Breakdown. 48.9% is teal and 51.1% is yellow.
- Entity Breakdown ON LABELED UTTERANCES:** No entities in app

Figure 4.70 LUIS App Dashboard View

The dashboard view is quite simple. It only consisted the three main aspect in a LUIS app, which is the utterance, intent and entity. As the above figure shown, the author had 3 intents in total, 321 utterances in total and no entity. The intent is the intentions of the potential input, utterance is the input of trained data, so total of the author's trained data is 321. The reason why the author do not set any entity is the purpose of this LUIS app is to differentiate at its best on cyberbully and non-cyberbully content, there is no need the entity as the proposed project will not taking actions based on any words in the utterance.

Intent Name	Utterances
Cyberbully	164
No Cyberbully	157
None	0

Figure 4.71 Intent Page View

In the intent section, the above figure clearly shown there is three intents in total. However, the trained intent is only two which is Cyberbully and No Cyberbully. The trained data had 164 and 157 respectively. None intent is pre-set by the LUIS app itself and it is used on whenever the data model could not classify the particular input into Cyberbully or No Cyberbully.

Utterance text	Predicted Intent	Confidence Score
you just a hoe i ' m tired of it	Cyberbully	0.6
she wasn ' t talking about gang rape you idiot	Cyberbully	0.82
you sir are an idiot	Cyberbully	0.94
you ' re an idiot if you thought that penalty was anything but bs	Cyberbully	0.71
you supported an idiot who can destroy the world farage you soft bastard .	Cyberbully	0.87
lmao you are such a fucking idiot	Cyberbully	0.9
shut up you disgusting , despicable idiot	Cyberbully	0.89
you are more of an idiot than your father	Cyberbully	0.91
you white piece of trash	Cyberbully	0.75
you ' re ungrateful of what god has given to you trash	Cyberbully	0.86

Figure 4.72 Utterance trained in Cyberbully Intent Page

The above figure is the utterance the author had input inside to train the model to recognize that these utterances are considered as Cyberbully. Each of the utterance have their predicted percentage of Cyberbully intent. Similar view goes to another intent which is No Cyberbully.

#### Test your application

Use this tool to test the current and published versions of your application, to check if you are progressing on the right track ... [Learn more](#)

**Train Application** Last train: Oct 14, 2017, 6:30:59 PM | Last publish: Nov 19, 2017, 9:15:49 PM

Interactive Testing Batch Testing

The screenshot shows the 'Train and Test' section of the LUIS App. On the left, there's a text input field with placeholder text 'Type a test utterance & press Enter'. Below it, the utterance 'I've been joking around only' is entered. On the right, under 'Current version results', it shows the top scoring intent 'No Cyberbully (0.89)'. Other intents listed are 'Cyberbully (0.05)' and 'None (0)'. At the bottom right of the interface, there are buttons for 'Labels view (Ctrl+E)', 'Entities', and 'Reset console'.

Figure 4.73 Train and Test Page in LUIS App

The above figure is the train and test page in LUIS App. The “Train Application” button is used for training. After input all the utterance in Figure 4.72 pages, this button is used for the data model to train with all the utterance input inside the intent. More utterance input, more accuracy it will predict the intent next time.

Below part in this figure is the interactive testing, this is the fast testing before all the trained data had been input into the intent page. The author will be able to see how accurate the data model is now by using the words that is similar to the trained data.

#### Test your application

Use this tool to test the current and published versions of your application, to check if you are progressing on the right track ... [Learn more](#)

**Train Application** Last train: Oct 14, 2017, 6:30:59 PM | Last publish: Nov 19, 2017, 9:15:49 PM

Interactive Testing Batch Testing

The screenshot shows the 'Batch Testing' section of the LUIS App. It displays a table with one row of data. The columns are labeled 'Status', 'Name', 'Utterance Count', 'Last Test Date', 'Last Test Success', and 'Controls'. The data row shows 'Test' as Status, 'Sample' as Name, '300' as Utterance Count, 'Nov 7, 2017, 11:23:08 AM' as Last Test Date, '82%' as Last Test Success, and icons for edit and delete in the Controls column.

Figure 4.74 Batch Testing Page in LUIS App

The above figure shows the batch testing in LUIS App. Batch testing is one technique of testing the app by import a JSON file consist of all the test data, in this case the author had random stream from Twitter on 300 test data to put into the testing phase. The figure had shown that the success rate of this test is 82%, meaning to said that among the 300

data, the data model successfully predicted the same intent as in the JSON file.

```
{
    "text": "It's time to re mute this one mutual. This bitch is so annoying I swear to God.",
    "intent": "No Cyberbully",
    "entities": []
},
```

Figure 4.75 Sample JSON file for testing purpose

The above figure shows the JSON format file as a sample for testing purpose. “text” is the utterance that will received by the LUIS App to classify, “intent” is the labelled intent by the author in order to let the LUIS App verify whether the output it produced from testing is the same with the labelled intent. So in Figure 4.74, there is 82% of the test data among the 300 data had successfully produced the same output intent as in the labelled intent.

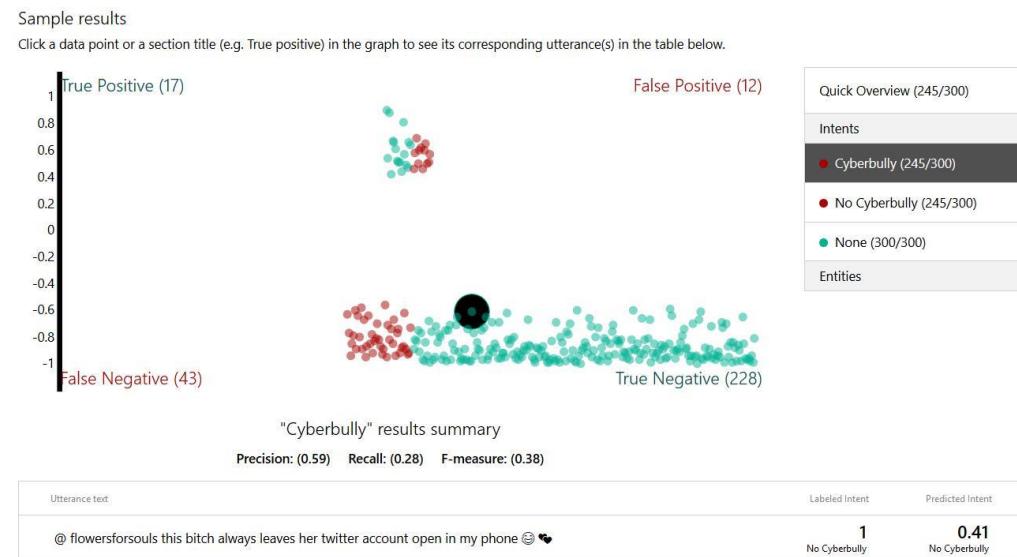


Figure 4.76 Sample results of Batch Testing

The above figure shows the results of the batch testing of this sample JSON file. From the figure shows, 245 out of 300 test data had successfully predict the same intent as the labelled intent in the sample JSON file. The results summary had shown in the bottom of the figure, the utterance text is the text in the sample JSON file. Labelled intent is the intent that the author labelled inside the sample JSON file. The predicted intent is the intent that predicted by the LUIS App.

**Publish**

Published version: 0.2  
Published date: Nov 19, 2017, 9:15:49 PM (Approximately 3 days(s) ago)

**Publish to**

Staging Timezone: (GMT) Western Europe Time, London, Lisbon, Casablanca

Enable verbose endpoint response  
 Enable Bing spell checker

**Publish to staging slot**

**Resources and Keys**

**Add Key**

US Regions  Europe Regions  Asia Regions

Resource Name	Region	Key String	Endpoint
CyberXoX	southeastasia	0cb92ecd4a194aa7ad5f6bb74ea79529, d29b9a0dddefd4588a080f70d813f918	https://southeastasia.api.cognitive.microsoft.com/luis/v2.0/apps/aab50509-223f-444f-921b-d94be61b24ed?subscription-key=0cb92ecd4a194aa7ad5f6bb74ea79529&staging=true&verbose=true&timezoneOffset=0&q=
CyberXoX	southeastasia	0cb92ecd4a194aa7ad5f6bb74ea79529, d29b9a0dddefd4588a080f70d813f918	https://southeastasia.api.cognitive.microsoft.com/luis/v2.0/apps/aab50509-223f-444f-921b-d94be61b24ed?subscription-key=0cb92ecd4a194aa7ad5f6bb74ea79529&staging=true&verbose=true&timezoneOffset=0&q=

Figure 4.77 Publish page of the LUIS App

The above figure shows the Publish page of the LUIS App, the app can be chosen to publish slot and staging slot. The author had chosen the staging slot because this is a demo app, so the staging is more suitable than publishing slot.

Before published the app to staging slot, the author need a key to publish and host on the cloud platform which is the Microsoft Azure. After obtained the key from the Microsoft Azure platform, after published to the staging slot, it will generate a endpoint url to connect to it.

**Dashboard** + New dashboard Edit dashboard Share Fullscreen Clone Delete

All resources ALL SUBSCRIPTIONS Refresh

**CyberXoX** Cognitive Services

**Quickstart tutorials**

- Windows Virtual Machines Provision Windows Server, SQL Server, SharePoint VMs
- Linux Virtual Machines Provision Ubuntu, Red Hat, CentOS, SUSE, CoreOS VMs
- App Service Create Web Apps using .NET, Java, Node.js, Python, PHP
- Functions Process events with a serverless code architecture
- SQL Database Managed relational SQL Database as a Service

**CyberXoX COGNITIVE SERVICES**

Active

Figure 4.78 Dashboard on Microsoft Azure platform

The above figure is the dashboard of Microsoft Azure platform. The author had established a cognitive service (LUIS) app on this platform.



Figure 4.79 LUIS App on Microsoft Azure platform

The above figure shows the properties details of the LUIS App on Microsoft Azure platform. There are the keys that needed for the publish LUIS App on the LUIS platform.

## 5.1 Summary

In this chapter, the author had already discussed and explained the tools used in the development of the proposed project. Furthermore, the author had explained all the front-end and back-end codes in the sequence of user interface as well as the screenshots of the codes and user interface. The outputs also had shown by the author as well as the LUIS trained data model.

In between the development, the author had encountered a lot of problem due to unfamiliar with the tools as well as the code itself. Fortunately, the author finally able to cope with the difficulties and manage to reach the expected outcome and objectives of the proposed project.

## Chapter 5: System Testing and Evaluation

### 6.0 Overview

In this chapter, the author will carry out the testing for each functionality and the user interface of the developed proposed project. Each and every function of the proposed project will be tested out using different possibilities. At the same time the author will evaluate whether the system has done what it was supposed to do in terms of both function and performance. The expected outcome will be explained and the testing result will be shown.

### 6.1 Test Plan

In this section, the author will discuss the test plan that had planned for the system. The testing that the author will be conducted is Unit Testing and Integration Testing. The techniques that the author will be used is Black-Box technique, the examples are Use Case Testing.

#### Test Traceability Matrix

The following table contains the function in the proposed project and its traceability:

Feature ID	Risk Level	Feature Description
F001	High	Register
F002	High	Login
F003	High	View
F004	Medium	Edit
F005	High	Stream

Table 5.1 Test Traceability Matrix

#### Features to be tested

The following table contains those features to be tested using both Black-Box technique and White-Box technique:

Feature ID	Feature Description
F001	Register
F002	Login
F003	View - View Profile

	<ul style="list-style-type: none"> <li>- View Setting</li> <li>- View Record</li> </ul>
F004	Edit <ul style="list-style-type: none"> <li>- Edit Profile</li> <li>- Edit Setting</li> </ul>
F005	Stream

Table 5.2 Feature Table

### Test Approach & Test Strategy

The test on the proposed project is a system level functional test that focus only on the functional part of the system. Testing will be using risk-based strategy.

This test will also be black-box testing and white-box testing where the test cases are derived using techniques such as:

- i. Use Case Testing

Testing will be executed 1 iterations. The iteration is testing functionality of all the listed tested feature.

### Test Pass/Fail Criteria

The system must satisfy the following criteria in order to pass:

- i. All test cases must be passed
- ii. All test items must fulfill its requirement

There are specific pass/fail criteria for each of the feature:

Feature ID	Feature Description	Pass/Fail Criteria
F001	Register	<ul style="list-style-type: none"> <li>1. User able to input personal data</li> <li>2. User able to store input data into database</li> <li>3. Invalid format input shall receive warning message</li> <li>4. User should receive notification email in</li> </ul>

		their registered email address.
F002	Login	<ul style="list-style-type: none"> <li>1. User able to input login credentials.</li> <li>2. User able to access to the system</li> <li>3. Invalid format login credentials shall receive warning messages.</li> <li>4. User should receive email in their registered email address if they request for password.</li> </ul>
F003	View	<ul style="list-style-type: none"> <li>1. Able to view current user data.</li> <li>2. Able to view current database data</li> </ul>
F004	Edit	<ul style="list-style-type: none"> <li>1. Able to edit current user data.</li> <li>2. Able to edit current stored data.</li> </ul>
F005	Stream	<ul style="list-style-type: none"> <li>1. Able to connect to Twitter</li> <li>2. Able to get data from Twitter real time</li> <li>3. Able to stored data into MongoDB</li> </ul>

Table 5.3 Pass/Fail Criteria Table

### Suspension Criteria and Resumption Requirement

#### Suspension Criteria

Whenever UWP, MongoDB and SQL-enabled environment is not available, all tests will be suspended.

#### Resumption Requirement

UWP, MongoDB and SQL-enabled environment is prepared.

## Environment

The following shows the software requirement for the proposed project to run for testing:

- i. Internet-enabled environment
- ii. Microsoft Visual Studio 2017
- iii. Windows 10 with Fall Creators Update & Above
- iv. Microsoft SQL Server 2014
- v. SQL Server Management Studio
- vi. MongoDB Server
- vii. Mongo Shell or Mongo Compass or Mongo Booster

## 6.2 Test Design Specification

### Unit Testing

In this section, the author will conduct the unit testing to each of the feature from F001 to F005 individually to test whether are functioning normal and produce expected outcome.

Feature ID	Feature Description	Risk Level	Testing Level
F001	Register feature.  To provide the user capability of register themselves as a user into the system and able to use the system services.	High	Unit Testing

Table 5.4 Feature Table F001

The test technique that will be applied are as follow:

1. Use Case Testing

Nature of feature as below:

F001 Register

1. Pop-Up message dialog after successfully registered.
2. Confirmation email sent to registered email address.

Black Box Testing - Use Case Testing

<b>Use Case ID</b>	UC001	
<b>Use Case</b>	F001 Register	
<b>Purpose</b>	To provide the User capability of register themselves as a user into the system and able to use the system services.	
<b>Actor</b>	User	
<b>Trigger</b>	User click the Register button	
<b>Precondition</b>	The software and database are in “On” and “Idle” state	
<b>Scenario Name</b>	<b>Step</b>	<b>Action</b>
<b>Main Flow</b>	1	User enter the main page.
	2	User click the “Register” button
	3	System display the register page
	4	User input their details in valid format
	5	User check the Terms & Condition checkbox
	6	User click the “Register” button.
	7	System verifies the input.
	8	Message Box Pops-Up shown “Register Successfully”
	9	Notification email sent to registered email address
	10	User able to login to the system.
<b>Alternate Flow – Leave blank on all details</b>	4.1.1	User leave blank on all the details field.
	4.1.2	System verifies the input.
	4.1.3	System shows message dialog with warning messages.
	4.1.4	Back to Main Flow Step 3
<b>Alternate Flow – Invalid Format of Input on details</b>	4.2.1	User input data in invalid format.
	4.2.2	System verifies the input.
	4.2.3	System shows message dialog with warning messages.
	4.2.4	Back to Main Flow Step 3

<b>Alternate Flow – Confirm Password and Password does not match</b>	4.3.1	User input different data in password field and confirm password field.
	4.3.2	System verifies the input.
	4.3.3	System shows message dialog with warning messages.
	4.3.4	Back to Main Flow Step 3
<b>Alternate Flow – User cancels during details input</b>	4.4.1	User click "Back" button.
	.4.2	Back to Main Flow Step 1.
<b>Rules</b>	i.	Invalid format input cause error message pops-up.
	ii.	Difference between password and confirm password cause error message pops-up.
	iii.	Leave all the details blank cause error message pops-up.

Table 5.5 Use Case Testing F001

#### Use Case Test Condition & Coverage

Test Condition ID	Test Condition	Test Coverage ID	Test Coverage	Test Data
TCON-01-001	Main Flow	TCOV-01-001	Main Flow	Input All Data in Valid Format:  Email Address: <a href="mailto:peierlim@gmail.com">peierlim@gmail.com</a>  Username: pelim123  Password: 072351585Pass  Confirm Password: 072351585Pass
TCON-01-002	Alternate Flow – Leave	TCOV-01-002	Alternate Flow – Leave	Do not input any data:

	blank on all details		blank on all details	Email Address: Username: Password: Confirm Password:
TCON-01-003	Alternate Flow – Invalid Format of Input on details	TCOV-01-003	Alternate Flow – Invalid Format of Input on details	Input data with invalid format:  Email Address: <a href="mailto:peiernlm">peiernlm</a> Username: pelim\$& Password: pass Confirm Password: pass
TCON-01-004	Alternate Flow – Confirm Password and Password does not match	TCOV-01-00	Alternate Flow – Confirm Password and Password does not match	Input different password and confirm password:  Email Address: <a href="mailto:peiernlm@gmail.com">peiernlm@gmail.com</a> Username: pelim123 Password: 072351585Pass Confirm Password: 072351585pass
TCON-01-005	Alternate Flow – User cancels on details input	TCOV-01-005	Alternate Flow – User cancels on details input	Press “Back”

Table 5.6 Use Case Test Condition & Coverage F001

Result & Outcome

Test Flow	Result	Remark
Main Flow	Passed	User able to login into the system with registered credentials.
Alternate Flow: Leave blank on all details	Passed	User able to see the warning message box pops-up
Alternate Flow: Invalid Format of Input on details	Passed	User able to see the warning message box pops-up
Alternate Flow: Confirm Password and Password does not match	Passed	User able to see the warning message box pops-up
Alternate Flow: User cancels during details input	Passed	User back to the main page

Table 5.7 Results & Outcome F001

Feature ID	Feature Description	Risk Level	Testing Level
F002	Login feature:  To provide the user capabilities of having access to the system service and feature.	High	Unit Testing

Table 5.8 Feature Table F002

The test technique that will be applied are as follow:

1. Use Case Testing

Nature of feature as below:

F002 Login:

1. Pop up message dialog after successfully login.

Black-Box Technique – Use Case Testing

<b>Use Case ID</b>	UC002	
<b>Use Case</b>	F002 Login	
<b>Purpose</b>	To provide the user capabilities of having access to the system service and feature.	
<b>Actor</b>	User	
<b>Trigger</b>	User click the Login button	
<b>Precondition</b>	The software and database are in “On” and “Idle” state	
<b>Scenario Name</b>	<b>Step</b>	<b>Action</b>
<b>Main Flow</b>	1	User enter the main page.
	2	User click the “Login” button
	3	System display the login page
	4	User input their valid credentials.
	5	User click the “Login” button
	6	System verifies the input
	7	Message Box Pops-Up shown “Login Successfully”
	8	User able to access system service and feature.
<b>Alternate Flow – Leave blank on all details</b>	4.1.1	User leave blank on all the details field.
	4.1.2	System verifies the input.
	4.1.3	System shows message dialog with warning messages.
	4.1.4	Back to Main Flow Step 3
<b>Alternate Flow – Invalid Input on login credentials</b>	4.2.1	User input invalid credentials.
	4.2.2	System verifies the input.
	4.2.3	System shows message dialog with warning messages.
	4.2.4	Back to Main Flow Step 3
<b>Alternate Flow – User click the forgot</b>	4.3.1	User input username only.
	4.3.2	User click the “Forgot Password” button.
	4.3.3	System verifies the input.

<b>password hyperlink with username input</b>	4.3.4	Notification email sent to registered email address.
	4.3.5	System pops-up a message box to inform that the password already sent to registered email address.
	4.3.6	Back to Main Flow Step 3
<b>Alternate Flow – User click the forgot password hyperlink without username input</b>	4.4.1	User leave blank on all the field.
	4.4.2	User click the “Forgot Password” button.
	4.4.3	System verifies the input.
	4.4.4	System shows message dialog with warning messages.
<b>Alternate Flow – User cancels during details input</b>	4.5.1	User click “Back” button.
	4.5.2	Back to Main Flow Step 1.
<b>Rules</b>	i.	Invalid credentials input cause error message pops-up.
	ii.	User click “forgot password” button will trigger system to send a notification email to registered email address.
	iii.	User click “forgot password” without any input will cause error message pops-up.
	iv.	Leave all the details blank cause error message pops-up.

Table 5.9 Use Case Testing F002

#### Use Case Test Condition & Coverage

Test Condition ID	Test Condition	Test Coverage ID	Test Coverage	Test Data
TCON-02-001	Main Flow	TCOV-02-001	Main Flow	Input Valid Credentials:

				Username: pelim123  Password: 072351585Pass
TCON-02-002	Alternate Flow – Leave blank on all details	TCOV-02-002	Alternate Flow – Leave blank on all details	Do not input any data:  Username: Password:
TCON-02-003	Alternate Flow – Invalid input on login credentials	TCOV-02-003	Alternate Flow – Invalid input on login credentials	Input invalid credentials:  Username: pelim123  Password: pass
TCON-02-004	Alternate Flow – User click the forgot password hyperlink with username input	TCOV-02-004	Alternate Flow – User click the forgot password hyperlink with username input	Input only username:  Username: pelim123  Password:
TCON-02-005	Alternate Flow – User click the forgot password hyperlink without username input	TCOV-02-005	Alternate Flow – User click the forgot password hyperlink without username input	Leave blank on all fields:  Username: Password:
TCON-02-006	Alternate Flow – User cancels during details input	TCOV-02-006	Alternate Flow – User cancels during details input	Press “Back”

Table 5.10 Use Case Test Condition & Coverage F002

Result & Outcome

Test Flow	Result	Remark
Main Flow	Passed	User able to access into system service and feature.
Alternate Flow: Leave blank on all details	Passed	User able to see the warning message box pops-up
Alternate Flow: Invalid login credentials input	Passed	User able to see the warning message box pops-up
Alternate Flow: User click the forgot password hyperlink with username input	Passed	User able to see the message box pops-up and the email is sent to registered email address.
Alternate Flow: User click the forgot password hyperlink without username input	Passed	User able to see the warning message box pops-up
Alternate Flow: User cancels during details input	Passed	User back to the main page

Table 5.11 Results & Outcome F002

Feature ID	Feature Description	Risk Level	Testing Level
F003	View feature: Able to view the profile data or record data.	High	Unit Testing

Table 5.12 Feature Table F003

The test technique that will be applied are as follow:

1. Use Case Testing

Nature of feature as below:

F003 View:

1. Correct data will be displayed.

Black-Box Technique – Use Case Testing

<b>Use Case ID</b>	UC003	
<b>Use Case</b>	F003 View	
<b>Purpose</b>	Able to view the profile data or record data.	
<b>Actor</b>	User	
<b>Trigger 1</b>	User click the User Profile button	
<b>Trigger 2</b>	User click the Setting button	
<b>Trigger 3</b>	User click the View Record button	
<b>Precondition</b>	The software and database are in “On” and “Idle” state	
<b>Scenario Name</b>	<b>Step</b>	<b>Action</b>
<b>Main Flow – Trigger 1</b>	1	User enter the main page.
	2	User click the “User Profile” button
	3	System retrieve data from database
	4	System display the profile page with the data.
	5	User view their data.
<b>Main Flow – Trigger 2</b>	1	User enter the main page.
	2	User click the “Setting” button
	3	System retrieve data from database
	4	System display the setting page with the data.
	5	User view the data.
<b>Main Flow – Trigger 3</b>	1	User enter the main page.
	2	User click the “View Record” button
	3	System retrieve data from database
	4	System display the record page with the data.
	5	User view the data.
<b>Alternate Flow –</b>	4.1.1	User click the “Back” button
	4.1.2	Back to Main Flow Step 1

User click the “Back” button		
Rules	i.	Trigger button

Table 5.13 Use Case Testing F003

#### Use Case Test Condition & Coverage

Test Condition ID	Test Condition	Test Coverage ID	Test Coverage	Test Data
TCON-03-001	Main Flow – Trigger 1	TCOV-03-001	Main Flow – Trigger 1	Click “User Profile” button
TCON-03-002	Main Flow – Trigger 2	TCOV-03-002	Main Flow – Trigger 2	Click “Setting” button
TCON-03-003	Main Flow – Trigger 3	TCOV-03-003	Main Flow – Trigger 3	Click “View Record” button
TCON-03-004	Alternate Flow – User click the “Back” button	TCOV-03-004	Alternate Flow – User click the “Back” button	Click “Back” button

Table 5.14 Use Case Test Condition & Coverage F003

#### Results & Outcome

Test Flow	Result	Remark
Main Flow: Trigger 1	Passed	User able to view their profile data.
Main Flow: Trigger 2	Passed	User able to view the setting data
Main Flow: Trigger 3	Passed	User able to view the data record
Alternate Flow: User click the “Back” button	Passed	User back to the main page

Table 5.15 Results & Outcome F003

Feature ID	Feature Description	Risk Level	Testing Level
F004	Edit feature: Able to edit the profile or setting data	High	Unit Testing

Table 5.16 Feature Table F004

The test technique that will be applied are as follow:

1. Use Case Testing

Nature of feature as below:

F004 Edit:

1. Message pops-up when updated successfully.
2. Data is updated.

Black-Box Technique – Use Case Testing

<b>Use Case ID</b>	UC004	
<b>Use Case</b>	F004 Edit	
<b>Purpose</b>	Able to edit the profile or setting data	
<b>Actor</b>	User	
<b>Trigger 1</b>	User click the Edit button	
<b>Trigger 2</b>	User click the Notification Toggle button	
<b>Precondition</b>	The software and database are in “On” and “Idle” state	
<b>Scenario Name</b>	<b>Step</b>	<b>Action</b>
<b>Main Flow – Trigger 1</b>	1	User enter the main page.
	2	User click the “User Profile” button
	3	System retrieve data from database
	4	System display the profile page with the data.
	5	User view their data.
	6	User click the “Edit” button
	7	User input new data
	8	User click the “Save” button
	9	System verifies the input
	10	Message Box Pops-Up shown “Update Successfully”
	11	Data successfully updated.
<b>Main Flow – Trigger 2</b>	1	User enter the main page.
	2	User click the “Setting” button
	3	System retrieve data from database
	4	System display the setting page with the data.
	5	User view the data.
	6	User toggle the notification switch
	7	User click the “Save” button.
	8	Message Box Pops-Up shown “Save Successfully”
	9	Status successfully updated.

<b>Alternate</b>		
<b>Flow Trigger 1 – Invalid data input by the user</b>	7.1.1	User input invalid format data
	7.1.2	User click the “Save” button
	7.1.3	System verifies the input
	7.1.4	Message Box Pops-Up with error message.
	7.1.5	Back to Main Flow Step 7
<b>Alternate</b>	7.2.1	User leave blank on fields
<b>Flow Trigger 1 – Leave blank on data fields.</b>	7.2.2	User click the “Save” button
	7.2.3	System verifies the input
	7.2.4	Message Box Pops-Up with error message.
	7.2.5	Back to Main Flow Step 7
	7.3.1	User click the “Back” button
<b>Rules</b>	i.	Invalid input cause error messages pop up
	ii.	Leave blank cause error message pop up

Table 5.17 Use Case Testing F004

#### Use Case Test Condition & Coverage

Test Condition ID	Test Condition	Test Coverage ID	Test Coverage	Test Data
TCON-04-001	Main Flow – Trigger 1	TCOV-04-001	Main Flow – Trigger 1	Click “Edit” button
TCON-04-002	Main Flow – Trigger 2	TCOV-04-002	Main Flow – Trigger 2	Click “Notification” toggle switch
TCON-04-003	Alternate Flow Trigger 1 – Invalid data input by the user	TCOV-04-003	Alternate Flow Trigger 1 – Invalid data input by the user	Input invalid format data:

				Email Address: pelim123  Password: pelim
TCON-04-004	Alternate Flow Trigger 1 – Leave blank on data fields.	TCOV-04-004	Alternate Flow Trigger 1 – Leave blank on data fields.	Leave blank on the data fields  Email Address: Password:
TCON-04-005	Alternate Flow – User click the “Back” button	TCOV-04-005	Alternate Flow – User click the “Back” button	Click “Back” button

Table 5.18 Use Case Testing & Coverage F004

#### Results & Outcome

Test Flow	Result	Remark
Main Flow: Trigger 1	Passed	User able to update their user profile data
Main Flow: Trigger 2	Passed	User able to toggle the status of notification
Alternate Flow Trigger 1: Invalid data input by the user	Passed	User able to see the warning message box pops-up
Alternate Flow Trigger 1: Leave blank on data fields.	Passed	User able to see the warning message box pops-up
Alternate Flow: User click the “Back” button	Passed	User back to the main page

Table 5.19 Results & Outcome F004

Feature ID	Feature Description	Risk Level	Testing Level
F005	Stream feature:  Stream the data from Twitter and store them into database. After this, analyze the data stored and notify if there is detected content else discard from database.	High	Unit Testing

Table 5.20 Feature Table F005

The test technique that will be applied are as follow:

1. Use Case Testing

Nature of feature as below:

F005 Stream:

1. Data is store inside database.
2. User will be notified upon the detected data.

Black-Box Technique – Use Case Testing

<b>Use Case ID</b>	UC005	
<b>Use Case</b>	F005 Stream	
<b>Purpose</b>	Stream the data from Twitter and store them into database. After this, analyze the data stored and notify if there is detected content else discard from database.	
<b>Actor</b>	User	
<b>Trigger</b>	User click the Start Stream button	
<b>Precondition</b>	The software, database and LUIS App are in “On” and “Idle” state.	
<b>Scenario Name</b>	<b>Step</b>	<b>Action</b>
<b>Main Flow – Cyberbully Data Detected With Notification Status ON</b>	1	User enter the main page.
	2	User click the “Start Stream” button
	3	System connect to Twitter using its API
	4	System stream the data
	5	System store the streamed data into database
	6	System retrieve data from database
	7	System connect to LUIS App via its API
	8	Luis App analyze the content
	9	Luis App return result as Cyberbully
	10	System receive result as Cyberbully
	11	System pop up toast notification to notify user
<b>Alternate Flow – No Cyberbully Data Detected</b>	9.1.1	Luis App return result as No Cyberbully
	9.1.2	System receive result as No Cyberbully
	9.1.3	System select the current data in database
	9.1.4	System delete the data from database
<b>Alternate Flow – Cyberbully Data Detected With</b>	11.1.1	System continue to operate

<b>Notification Status OFF</b>		
<b>Rules</b>	i.	Cyberbully data with notification status ON will pop up the toast notification
	ii.	No Cyberbully data will be discarded from database.

Table 5.21 Use Case Testing F005

#### Use Case Test Condition & Coverage

<b>Test Condition ID</b>	<b>Test Condition</b>	<b>Test Coverage ID</b>	<b>Test Coverage</b>	<b>Test Data</b>
TCON-05-001	Main Flow	TCOV-05-001	Main Flow	Click "Start Stream" button with notification status ON
TCON-05-002	Alternate Flow – No Cyberbully Data Detected	TCOV-05-002	Alternate Flow – No Cyberbully Data Detected	Click "Start Stream" button
TCON-05-003	Alternate Flow – Cyberbully Data Detected With Notification Status OFF	TCOV-05-003	Alternate Flow – Cyberbully Data Detected With Notification Status OFF	Click "Start Stream" with notification status OFF

Table 5.22 Use Case Test Condition & Coverage F005

#### Results & Outcome

<b>Test Flow</b>	<b>Result</b>	<b>Remark</b>
Main Flow:	Passed	User able to see the pops-up toast notification
Alternate Flow:	Passed	User does not see anything however the

No Cyberbully Data Detected		data inside database had been discarded
Alternate Flow – Cyberbully Data Detected With Notification Status OFF	Passed	User does not see anything however the data inside database had moved from one to another.

Table 5.23 Results & Outcome F005

## Integration Testing

In this section, the author will conduct testing on integration of the module, which is to test whether these features can be co-existing and functioning well to each.

Integration Module ID	Feature ID	Test Purpose
I001	F001 Register	To test that after the user successfully registered an account in the software, the user will have login successfully access to the system service and feature as well.
	F002 Login	

Table 5.24 Integration Module I001

## Black-Box Technique – Use Case Testing

Use Case ID	UC006
Use Case	F001 Register
	F002 Login
Purpose	After the user successfully registered an account in the software, the user will have login successfully access to the system service and feature as well.
Actor	User
Trigger	User click the Register button
Trigger	User click the Login button

<b>Precondition</b>	The software and database are in “On” and “Idle” state.	
<b>Scenario Name</b>	<b>Step</b>	<b>Action</b>
<b>Main Flow</b>	1	User enter the main page.
	2	User click the “Register” button
	3	User enter valid format data
	4	System pops-up message box “Registered Successfully”
	5	User been redirect back to main page
	6	User click the “Login” button
	7	User enter correct login credentials
	8	System pops-up message box “Login Successfully”
	9	User able to access system service and feature.
<b>Rules</b>	i. User input valid format data when register ii. User input valid credentials when login	

Table 5.25 Use Case Testing I001

#### Use Case Test Condition & Coverage

Test Condition ID	Test Condition	Test Coverage ID	Test Coverage	Test Data
TCON-06-001	Main Flow	TCOV-06-001	Main Flow	Register:  Email Address: <a href="mailto:peierlim@gmail.com">peierlim@gmail.com</a> Username: pelim123 Password: 072351585Pass Confirm Password: 072351585Pass

				Login: Username: pelim123 Password: 072351585Pass
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Table 5.26 Use Case Test Condition & Coverage I001

Results & Outcome

Test Flow	Result	Remark
Main Flow:	Passed	User able to access to system service and feature

Table 5.27 Results & Outcome I001

Integration Module ID	Feature ID	Test Purpose
I002	F003 View	To test that the user able to view their profile data, after edited the data still able to see changed data.
	F004 Edit	

Table 5.28 Integration Module I002

#### Black-Box Technique – Use Case Testing

<b>Use Case ID</b>	UC007	
<b>Use Case</b>	F003 View	
	F004 Edit	
<b>Purpose</b>	User able to view their profile data, after edited the data still able to see changed data.	
<b>Actor</b>	User	
<b>Trigger 1</b>	User click the “User Profile” button	
<b>Trigger 1.1</b>	User click the “Edit” button	
<b>Trigger 2</b>	User click the “Setting” button	
<b>Trigger 2.1</b>	User click the “Save” button	
<b>Precondition</b>	The software and database are in “On” and “Idle” state.	
<b>Scenario Name</b>	<b>Step</b>	<b>Action</b>
<b>Main Flow – Trigger 1</b>	1	User enter the User Dashboard page.
	2	User click the “User Profile” button
	3	System retrieve data from database
	4	System display page and data to the user
	5	User click the “Edit” button
	6	User input valid format data
	7	User click the “Save” button
	8	System verifies the input
	9	User able to see newly changed data

<b>Main Flow –</b>	1	User enter the User Dashboard page
<b>Trigger 2</b>	2	User click the “Setting” button
	3	System retrieve data from database
	4	System display page and data to the user
	5	User toggle the notification switch
	6	User click the “Save” button
	7	User able to see newly changed status
<b>Rules</b>	i.	User input valid format data when edit

Table 5.29 Use Case Testing I002

#### Use Case Test Condition & Coverage

Test Condition ID	Test Condition	Test Coverage ID	Test Coverage	Test Data
TCON-07-001	Main Flow: Trigger 1	TCOV-07-001	Main Flow: Trigger 1	<p>View:</p> <p>User click the “User Profile” button</p> <p>Edit:</p> <p>Email Address: <a href="mailto:peiernlm@outlook.com">peiernlm@outlook.com</a></p> <p>Password: Abc123</p>
TCON-07-002	Main Flow: Trigger 2	TCOV-07-002	Main Flow: Trigger 2	<p>View:</p> <p>User click the “Setting” button</p> <p>Edit:</p>

				User toggle the notification switch
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Table 5.30 Use Case Test Condition & Coverage I002

Results & Outcome

Test Flow	Result	Remark
Main Flow: Trigger 1	Passed	User able to see edited data displayed
Main Flow: Trigger 2	Passed	User able to see edited data displayed

Table 5.31 Results & Outcome I002

Integration Module ID	Feature ID	Test Purpose
I003	F003 View	To test that after the streamed data stored into database and being analyzed and classified, the user will be able to view the record.
	F005 Stream	

Table 5.32 Integration Module I003

#### Black-Box Technique – Use Case Testing

<b>Use Case ID</b>	UC008	
<b>Use Case</b>	F003 View	
	F005 Stream	
<b>Purpose</b>	After the streamed data stored into database and being analyzed and classified, the user will be able to view the record.	
<b>Actor</b>	User	
<b>Trigger 1</b>	User click the “Start Stream” button	
<b>Trigger 1.1</b>	User click the “View Record” button	
<b>Precondition</b>	The software database and LUIS App are in “On” and “Idle” state.	
<b>Scenario Name</b>	<b>Step</b>	<b>Action</b>
<b>Main Flow</b>	1	User enter the User Dashboard page.
	2	User click the “Start Stream” button
	3	System connect to Twitter via its API
	4	System stream the data
	5	System store data into database
	6	System retrieve the data from database
	7	System connect to LUIS App via its API
	8	Luis App analyzed the content
	9	Luis App return the Cyberbully result
	10	System receive the Cyberbully result

	11	System move the data to another database
	12	System pops-up toast notification to notify the user
	13	User receive the toast notification
	14	User click "View Record" button
	15	System retrieve data from database
	16	System display the data to the user
<b>Rules</b>	i.	User click the "Start Stream" button
	ii.	User click the "View Record" button

Table 5.33 Use Case Testing I003

#### Use Case Test Condition & Coverage

Test Condition ID	Test Condition	Test Coverage ID	Test Coverage	Test Data
TCON-07-001	Main Flow	TCOV-07-001	Main Flow	<p>View:</p> <p>User click the "View Record" button</p> <p>Stream:</p> <p>User click the "Start Stream" button</p>

Table 5.34 Use Case Test Condition & Coverage I003

#### Results & Outcome

Test Flow	Result	Remark
Main Flow	Passed	User able to view the record stored in database

Table 5.35 Results & Outcome I003

### 6.3 System and User Evaluation

In this section, the author will collect the feedback and evaluation from the user about the proposed project. The evaluation will be mainly focus on two parts which is Interface Design and Functionality of the proposed project. The number of user tested is 10 and they will be given the proposed project and also a questionnaire form to fill in the evaluation.

#### Interface Design

In this section, the question and responds will only focus on interface design of the proposed project.

Question 1: Do you think the user interface is simple and easy to understand?

Objective of this question is to let the author knows that whether the user feel the user interface is user friendly and they able to understand the system from it or not.

**Do you think the user interface is simple and easy to understand?**

10 responses



Figure 5.1 UI Question 1

As the figure 5.1 shown, all of the responder user think that the system user interface is simple, user friendly and they able to understand the system from the user interface.

Question 2: Is the navigation between pages easy to understand and user friendly?

Objective of this question is to let the author know that whether the navigation between the pages is logical or not.

Is the navigation between pages easy to understand and user friendly?

10 responses



Figure 5.2 UI Question 2

As the figure 5.2 shown, 100% of the responders user think that the navigation is logical and they able to understand that.

Question 3: Can you understand how's the program work only from the user interface?

Objective of this question is to let the author know whether the user will be understand the program work flow only from the user interface or not.

Can you understand how's the program work only from the user interface?

10 responses

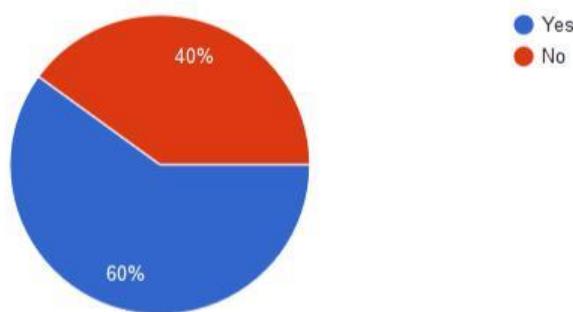


Figure 5.3 UI Question 3

As the figure 5.3 shown, only 60% of the responder user understand the work flow based on the user interface.

## Functionality

In this section, the questions and responds will only focus on the functionality of the proposed project.

Question 1: Do you find the program easy to use?

Objective of this question is to let the author know that whether the function provided able to let user understands it and feel user friendly.

**Do you find the program easy to use?**

10 responses



Figure 5.4 Function Question 1

As shown in Figure 5.4, 100% of the responder user think that the program is easy to use and able to understand it.

Question 2: Do you think the function of the program is sufficient?

Objective of this question is let the author know whether the function provided in the program is sufficient for the user to perform their task.

Do you think the function of the program is sufficient?

10 responses

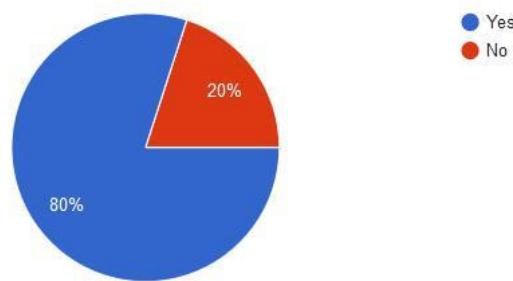


Figure 5.5 Function Question 2

As shown in figure 5.5, there is 80% of the responder user think that the function provided is sufficient enough for them to perform the tasks.

Question 3: Will this system help in preventing cyberbully?

Objective of this question is to let the author knows that whether this program is useful in tackle its problem statement and achieving objectives or not.

Will this system help in preventing cyberbully?

10 responses

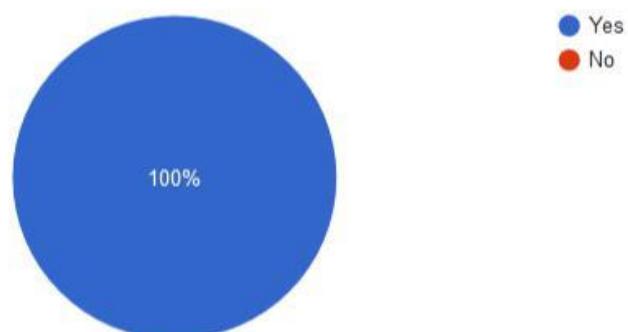


Figure 5.6 Function Question 3

As shown in figure 5.6, 100% of the responder user think that the proposed project is able to tackle its problem statement and achieving its objectives.

Question 4: How will you rate this program?

Objectives of this question is to let the author have an overall rating respond for the program based on the overall performance.

How will you rate this program?

10 responses

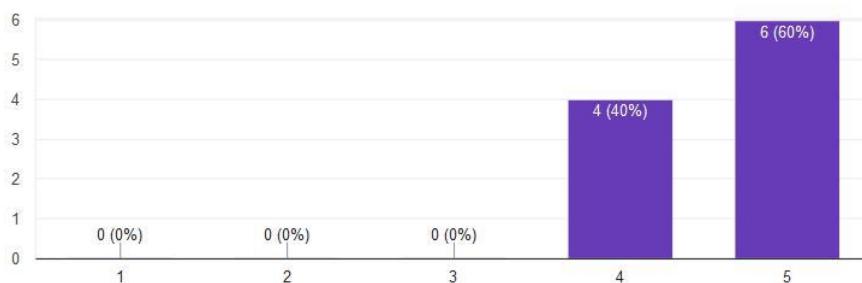


Figure 5.7 Function Question 4

As shown in figure 5.7, all of the responder user think that the proposed project is worth the rate above 4. This is considered as good rating as the user think that this is a useful project.

Based on the responds that the author received from the user, the author is able to evaluates that the user think that the user interface of the proposed project is good. However, some of the user think that the user interface could not let them understand the program work flow as some of the program work flow is actually underneath at the back-end. Other than that, the users feel the user interface is user friendly and easy to understand, the navigation also logical to them.

On the functionality part, the author evaluates that the user think that the proposed project is a useful program and the function provide mainly is sufficient for them to perform their task. The users also think that the proposed project is capable on tackle the problem statement and achieve the objectives. The overall rating for this project is pretty good as well.

Overall, the author can conclude that the user evaluation result is rather positive and both user interface and functionality satisfies the user.

## 6.4 Summary

In this chapter, the author had discussed and conduct the testing and evaluation process towards the proposed project and receive a positive result and outcome. The project is producing expected outcome and meet the user requirements and expectations. The quality of the proposed project is considered good as the result of testing had passed on all the assessments. The author also evaluates from user perspective through a questionnaire given to the user and the overall rating is positive.

## Chapter 6: Future Enhancement

### 7.0 Overview

In this chapter, the author will discuss on the system requirement and the limitations to make a clear statement on what is needed for the user in order to let the software run smoothly. Furthermore, the author will further discuss on the future enhancement that will be implemented into the project in the future but it is not currently exist in the proposed project.

#### 7.1 System Requirement and Limitation

These are the list of system requirement and software required in order to let the software run smoothly:

- a. Windows 10 with Fall Creators Update or Above

The proposed project is developed in the format of UWP application which is Universal Windows Platform application and it is enabled only on Windows 10 on Microsoft. Moreover, due to .NET 2.0 only supports on Windows 10 after the Fall Creators Update, there is needed to update the user Windows 10 to Fall Creators Update only can run the proposed project because plenty of the libraries and reference used when developed the proposed project is based on .NET 2.0 support.

- b. Internet Connections Enabled

The proposed project need to stream the data from Twitter, so the internet connection is definitely required for the proposed project to stream data from the social media. Moreover, the LUIS App is being deployed and host on the cloud platform Microsoft Azure, so the internet connection enabled environment is very important for the proposed project.

- c. SQL Server

SQL Server is needed because the data upon registration and login is stored inside a SQL database. Therefore, the SQL service and server is needed to install into user's PC and enable its service.

- d. MongoDB Server

MongoDB Server is needed because the data after streamed from Twitter will be stored inside MongoDB database. Therefore, the MongoDB service and server is needed to install into user's PC and enable its service.

Other than the system requirement, there is a few system limitations on the current prototype version of proposed project. There are as follows:

- a. Only text-based tweets available

In the current prototype version of proposed project, for the content analytics the proposed project is going to target only text-based tweets from Twitter because the tools used which is LUIS is focusing on language written in text.

- b. Only public tweets available

In the current prototype version of proposed project, the proposed project will only streamed and retrieved the data that is set as public on the Twitter. Only the public tweets will be able to captured and analyzed.

- c. Only English language available

In the current prototype version of proposed project, there is only English language tweets will be streamed and analyzed because the built LUIS data model is trained based on English and therefore the data model do not understand language other than English.

## 7.2 Future Enhancements

Since this is only the first prototype of the proposed project, there is definitely a lot can be improved in order to make this a better system. The author had concluded five points to improve on the future enhancement:

### a. Generate Report Feature

Generate Report Feature is one of the feature that the author thinks that able to add into the system. Generate report mainly focus on formatted report of the data instead of just display the data to the user. The data will be further analysed and organized into a report such as chart or graph involved into the report.

Through the addition of the generate report feature, the user will be able to see the further analysed and organized data in diagram forms, this will enable them to further understand the data and it can used on any academic research as well due to the report mostly will include data such as total number of cyberbully data detected in a certain time frame.

### b. Classification on Cyberbully Severity

Classification on cyberbully severity is one of the feature that the author thinks that able to add into the system. Classification on cyberbully severity is actually classification on the severity level of the detected cyberbully data. For example, the data could be classified and organized into three basic severity level which is low, medium and high.

Through the addition of the classification on cyberbully severity, the user will be able to know that which case is priority to handle if the severity is high. The user might need to take different actions towards the different severity of the cyberbully.

### c. Suggestion on the actions

Suggestion on the actions is one of the feature that the author thinks that able to add into the system. This is basically the system will gives out some suggestions upon the detection of cyberbully data, the suggestion might be different due to the severity classification. The suggestion will be focus on the further actions the user can do to the detected cyberbully data without violating any Twitter official rules and regulations.

Through the addition of the suggestion on the actions, the user will be able to get some ideas on how to handle the certain cyberbully case without violating the Twitter official rules and regulations.

### d. Actions Marked on Detected Data Case

Actions marked on detected data is one of the feature that the author thinks that able to add into the system. This is meant that the user will be able to choose the actions beside the record displayed on the UI to the user. For example, the user could mark a detected data case as Closed means that

the user had already handled the case. Handling means that the user is currently tracking this case. Dismiss means that the user do not want to handle the case. More actions will be given on the list.

Through the addition of actions marked on detected data, the user will be able to organized the data records better and able to see what are the current actions that the user should do on the particular case.

e. Search and Sort on Detected Data

Search and sort on detected data is one of the feature that the author thinks that able to add into the system. This means that the detected data on display record UI will be able to let the user search by using the keywords in the Tweet Content or the actions marked. The sort will also sort using the actions marked only rather than other fields.

Through the addition of search and sort feature on detected data, the user will be able to view the record data in a more sufficient and easy way. The user also will be able to find a certain record very fast rather than scroll through the whole records. The user will be able to manage the detected record data better.

### 7.3 Summary

In this chapter, the author had already discussed on the system requirement and limitations of the proposed project that as a user must know. The requirements is stated quite clear in this chapters. The author also discussed the possible future enhancement on the future prototypes and final products, these features are all possible addition into the proposed project in order to make it an even better product.

## Chapter 7: Conclusion

### 8.0 Overview

In this chapter, the author will conclude on the proposed project and discussed about personal experience on this proposed project. Furthermore, the author will discuss on the achievements done towards the objectives. The author also will acknowledge the people and internet resource that helped the author throughout the whole process.

### 8.1 Project Experience

The author had learnt massively lot from the research and development process of the proposed project. In the beginning when the author had confirmed the proposed project objectives and main focus idea, the author had literally zero knowledge on the tools and technologies used such as API, MongoDB, LUIS and Machine Learning.

After the research on the various topics, the author had a roughly idea of how are the tools working and how should the author develop the application prototype. However, theory is not enough for the author to fully have a blue print on the application. This remains a solid problem until the author went into the development process.

During the development process, the author almost is doing the learning and developing synchronously. The author had created the user interface at first, then the author code on the back end according to the sequence of user interface. At the beginning of development, it is the register and login feature as well as the user interface building. The author was managed to cope with these and finish the register and login feature as well as the initial user interface.

Next the author moved forward to other feature such as User Profile and Setting as well as their user interface. The author had completed the feature. Then, the most difficult part in the development had comes, which is the data model built and the back-end code behind the start stream button.

The author first build the connect code to the Twitter and store the data into the MongoDB database. Previously the author thought of using SQL database however it is difficult to use on unstructured data like tweets. So instead of SQL database, the author had switched to NoSQL Document Oriented Database which is MongoDB.

Then, the author start to build the data model by training the model using the stream data get from Twitter. It has a lot of confuse when training and testing the data model. However in the end the author had successfully trained the data model and get a good success rate on the testing. After deployed it on

the cloud platform Microsoft Azure, the author had wrote the code to connect to the hosted data model.

Lastly, the author had to handle the notification where it will pops up the toast notification. There is challenge there because the author had never deal with toast notification before. However the author had overcome it and successfully get the notification running.

After that, the proposed project is basically complete its first prototype and the author does spend the rest of the time try to improve it and polish it.

## 8.2 Achievement

The author is glad that the objectives of this prototype had achieved by the development of the proposed project. The author had set the 3 objectives at the beginning of the project, which is:

1. Study on text analytics and data mining technology.
2. Identify offensive language on social media using fact-finding technique.
3. Develop a content analytics prototype to discover cyberbully intentions on social media.

The author had successfully achieved all of the 3 objectives which the first one is shown on the research on documentation. The second objective is achieved on conducting interview and questionnaire on the potential target audience of the proposed project. The third objective had achieved upon the completion of development on the proposed project.

## 8.3 Summary

In this chapter, the author had discussed about the experience when completing the proposed project in either research area and development area. The author also reported that all the 3 objectives set for the proposed project had successfully achieved. Furthermore, the author also acknowledged on a few parties that helped the author go through the research and development process.

This is the final conclusion on the proposed project: Study and Implementation of content analytics system on social media to discover cyberbullying intentions.

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# APPENDIX A

## (Project Gantt Chart)

# Study and Implementation of content analytics system on social media to discover cyberbullying intentions

## Appendix B (Interview Transcript)

Interviewer: The Author

Interviewee: The Counsellor

Interview Setting: Interview was conducted in Counselling Centre at 3<sup>rd</sup> Floor Block D of INTI International University, Nilai. It was conducted at 2pm in Tuesday, 18 July 2017.

Affiliation with Interviewee: She is works at the author's university for a few years as a student counsellor.

(Start Interview)

Interviewer: Good afternoon, the interview is for my Final Year Project which developed a system which is content analytics system that will gather the data from the social media and analyse the content in the posts to discover whether it has cyberbully intentions or not.

Interviewee: Okay.

Interviewer: So, do you have any experience dealing with the cyberbully cases before?

Interviewee: Personally?

Interviewer: Yes, perhaps in your career or your previous experience.

Interviewee: No, I have not in either personally or professionally.

Interviewer: So, is that means that the cyberbully case is not common over here?

Interviewee: No I will not say it is uncommon, however it is just personally I did not encountered it before.

Interviewer: I see. If there is a cyberbully cases, what will the victim usually react to the cyberbully? What are their reaction towards this?

Interviewee: Well I have heard of the case of cyberbully before, the victim will normally will not respond to it. They will just let it be and do not have any reaction towards this. It mainly depends on the personality of the victim, but I think most of them will just remain silent like nothing happened. The victim will feel like they were being cyberbullied, then it is their own fault, so they will not respond to it.

Interviewer: I get it.

Interviewee: I will say it still mainly depends on the victim personality. If he/she are the types that fights back, they will be okay. But most of the cases that cyberbully occurs is because people getting negatively affect by it. If the victim does not feel it was affecting him/her, it will not be an issue. If the victim kept going getting negative affect by the cyberbully, they might eventually kill themselves.

Interviewer: Okay, so because recently the cyberbully cases is getting increases more and more, so what are the main cause that you think which is causing the cyberbully cases is growing?

Interviewee: The cyberbully cases is increasing a lot compare to 10 years ago, and I will say the easy access to the internet is one of the main reason. The platform of people being in the internet will grow and it will increase in the future so the cyberbully cases will just keep going to grow unless someone took some action towards it.

Interviewer: Understand, do you think that there are any other reason why the cyberbully cases is increasing, or why people actually does cyberbully others?

Interviewee: Well, easy access to the internet is definitely a big main reason. Apart from easy access, I think it still goes back to the person personality. If the person was good, he/she will not say something like an insult or mocking anyone at the first place. For example, if A is a good person, he looks at somebody's picture and maybe he feel that he/she is not pretty but he will not comment or say anything under the post like 'You're so ugly'. He will just scroll down the page. But someone will saw the picture and just type some mean comments under the picture to that person.

Interviewer: Okay, do you think that being anonymously on the internet is another reason why cyberbully cases increasing or why people does cyberbully?

Interviewee: Yes, it could be. Because being anonymous, people hide their identity and they feel like whatever they say will not affect them. For example, on Instagram people can always fake their profile and say anything they want on the internet because no one will know who are they. However, among the real life circle, the names will show on the comment section like who was commenting this, and people will know who it is if the victim know them personally. Because of this, people might think twice before they comment any mean words.

Interviewer: So, the people who cyberbully others actually do not want their behaviours to affect their real life.

Interviewee: Yes, it is like a thief. He will not stealing if he knows the place have a CCTV. He knows that his identity will be revealed. Same goes to cyberbully, if the person knows that the victim or others may know his/her identity, he will think twice before he/she want to cyberbully someone.

Interviewer: Okay, what are the common words or sentences that you think this is cyberbully?

Interviewee: I would say all of the negative words. For example ugly, not nice, poor but it goes back to the meaning of it and how you interpret it so for me any word have negative meaning means bully.

Interviewer: Understood. Move on to the next question. What are the common cause of the cyberbully?

Interviewee: Common one? People are jealous of other people. That's what I see. They don't feel happy for that person. For example, when they saw someone get straight A in SPM, they bully her instead of compliment or congrats her because they are jealous. They can't get what that girl has and they know it so they bully that girl because of jealousy. Another one is people are too free, they do not have anything better to do and have a lot of free time because busy people won't have the time to bully people.

Interviewer: I see. So, there is a significantly cases of cyberbully mostly happen in school rather than in workplace may be the reason what you have say just now?

Interviewee: Yes, because student don't have any responsibility to anything other than their own homework. They don't have to cook, don't need to clean the house, don't need to work for money so if they don't want to do their homework, they will have plenty of time go to social media and criticize people about things.

Interviewer: So, do you think one of the common cause of cyberbully is because they are too young or immature?

Interviewee: I don't think I can agree with that because even adults can be immature sometimes. I will say that they are not satisfy with what they have now because nowadays we often compete with other people not just children. Maybe it can be the cause because some student they don't know how the words can affect people, they are not aware of that cyberbully is actually a serious matter but as an adult we know that a word can affect a lot. But I think it can still be a point.

Interviewer: What do you think as a bully, why they attack the victim?

Interviewee: It can be anything, even celebrities which are rich, famous, pretty still get bully so I think the reason will be sometimes the people just envious of what they have and are not satisfy how they live so they just put that negative energy to them. They will bully too if they saw something against their sense of beauty or the differences of race and religion.

Interviewer: Okay, thank you for the answer. Moving to the next question. Do you think there is any way to prevent cyberbully?

Interviewee: I think there is a way, anything is possible but we need to really find a practical way.

Interviewer: Based on now all I can research is for example raise awareness but the main reason is the victim wouldn't want to report they're being bullied.

Interviewee: Yes, you can see from different perspective. Raise awareness is a way. Maybe the people nowadays don't really know what is cyberbully. They have heard of it but they never know what that means, how bad the situation right now so if you can raise awareness by telling them how serious cyberbully can be, they will be aware and can stand against cyberbully. Next is about the community. The victim can speak out, and because the cyberbully circle is around high school students so parents can be raise awareness and often making sure their child is okay and making sure that your child is not the bully. I think the government or internet company can do something toward cyberbully because they are in charge of the internet. They can track down the IP address of the user of the internet. People will take it serious too if the government count cyberbully as illegal.

Interviewer: Okay, I see. So just now you mention the parent should aware about their children are being bullied or is a bully. In your opinion, what are the characteristic should parents notice if they want to know their children are being bullied or they are the bully?

Interviewee: It is quite hard for parents to notice any strange behaviour because we are different people in front of different group. Sometimes children can really hide their emotion well so parents wouldn't notice. So I think it is really important that parents know really well of their children and their friends. Maybe they can invite their children friends to come over, have lunch together in order to observe what type of person their children friends is, so they will know which one of the friends can be potential bully or can give bad influence to their children. Parents can also check their children's phone. Although it is an invasion of privacy but as a parents want their children safe, that is their priority to keep their children safe.

Interviewer: Yes, I agree with you. But in your opinion, if you are the victim, how would you want other people to help you?

Interviewee: For me I will just ignore it because I am a bit older now. I will just delete the account and shut everything off, away of the bully because these bullies get me through the internet, they use internet as medium to bully people. If I remove the medium, I remove the connection from them to me so they don't get a chance to bully me anymore.

Interviewer: Okay, I see. As my project is developing a system that could possibly discover the cyberbully intention from the public post, the status, do you think it will work?

Interviewee: I think this is a very good way trying to prevent cyberbully. It is one of the efforts let third party know about the cyberbully is happening. But I am wonder how effective could this system be. For example, I say your body size is same size as a cow, there is no negative words in it but the meaning is negative, how would the system detect that? Because sometimes you say something, the meaning is different. Sometimes the literal meaning doesn't reflect what that people truly mean.

Interviewer: So, what would you expect from this system if you are the user apart from just notify you?

Interviewee: Okay, number one it should notify me about what comment from who to who. I would want to know what the bully said and who is the bully, who is the victim. Secondly, I would want to know that who is the bully actually, the identity of the bully, basic information about that person. Thirdly, because social platform like Facebook can't really do anything unless somebody report. So, I was thinking about maybe the system can highlight the bully comment to raise awareness but I think it would have side effects.

Interviewer: Thank you for your answer. Just now you were saying about analysing the words, how would you differentiate between jokes and bully?

Interviewee: Yeah! This is what I have been saying just now. It goes back to the meaning, the intention, how you say it. I think it depends on the reply from the person who is getting insult. If they reply so funny, laughing, I will think that is a joke, maybe it was an inside joke that other people wouldn't know. Because if the victim is being attack, they will just remain silence and doesn't reply anything or they will reply something like stop it, don't do it anymore so if you see the person reply like this, it will be cyberbully. So, I think the system should look at the comment as well.

Interviewer: Okay, understood. So, because my system cannot delete or block any account like Facebook, do you think notification would be enough in terms of helping the victim?

Interviewee: I think is really good enough and I would agree that the system should not delete it because is not under your right unless you have some sort of agreement. I think notify is enough to help, because Facebook is busy to handle their own stuff so for the people like you guys, your system could really help.

Interviewer: I see, one last question. Do you think that it is needed for the system to generate monthly report like show how was the growth of the cyberbully cases discovered?

Interviewee: Yes, it is needed, I could imagine user like Facebook owner, they implement the system and they would like to see the results, is the system working to the issues or not. Maybe soon they will want not only monthly report but weekly or even in hours term. But yes I think this is a very useful function to have.

Interviewer: Okay I understand. I think that's all for the interview. Thank you for your time!

Interviewee: Okay, no problem.

(End Interview)

# Appendix C

## (Supervisor Meeting Report)

## SUPERVISORY MEETING REPORT

Meeting No. : 1 Date: 31/5/2017

Start Time: 1.00pm End Time: 3.00pm

**Review of actions from the last supervisor meeting:-**

None

**Identification of any issues:-**

1. Presenting three ideas to the supervisor.
2. Pick one of the ideas and discuss about the possibility of implement the idea.
3. Discuss problem statement of the selected idea.

**Actions set for the next meeting:-**

1. Prepare first draft of the research proposals
2. Have a title for the project

Student's Name & Signature:	
Date:	
Supervisor's Name & Signature:	
Date:	

## SUPERVISORY MEETING REPORT

Meeting No. : 2 Date: 7/6/2017

Start Time: 8.00am End Time: 10.00am

### Review of actions from the last supervisor meeting:-

1. Hand in first draft of research proposals
2. Have a title for the project

### Identification of any issues:-

1. Review of the title, add the objectives/technology used into the title.
2. Review and rewrote the abstract
3. Get a better understanding on what should wrote in abstract, problem statement, research scope and limitation.

### Actions set for the next meeting:-

1. Complete the title
2. Second draft of research proposals ready.
3. Mind map for Literature Review
4. Identified co-supervisor

Student's Name & Signature:	
Date:	
Supervisor's Name & Signature:	
Date:	

## SUPERVISORY MEETING REPORT

Meeting No. : 3 Date: 12/6/2017  
Start Time: 10.00am End Time: 12.00pm

**Review of actions from the last supervisor meeting:-**

1. Complete the title
2. Hand in the second draft of proposals
3. Hand in the mind map of Literature Review
4. Identified co-supervisor

**Identification of any issues:-**

1. Review of the title - use a better word to describe the content.
2. Identified the problem that want to tackle using the proposed project.
3. Review of the research objective - each objective have different approach in the entire project.
4. Identified the research scope - what is the project coverage (Scope down the project).
5. Identified the research limitations - what project cannot do.
6. Better understanding on research methodology - only use the methodology that will collect the useful data.
7. Identified the target audience - who will be using the project and how they are going to use.

**Actions set for the next meeting:-**

1. Prepare the third draft of research proposals
2. Complete all the aspects in the proposals
3. Identified the scope and limitations of the project
4. Set the direction of the project and issues tackle by the project

Student's Name & Signature:	
Date:	
Supervisor's Name & Signature:	
Date:	

## SUPERVISORY MEETING REPORT

Meeting No. : 4 Date: 19/6/2017  
Start Time: 10.00am End Time: 12.00pm

**Review of actions from the last supervisor meeting:-**

1. Hand in the third draft of proposals.
2. Completed all aspects in the proposals.
3. Finalized scope and limitations of the project.
4. Finalized the direction of the project and issue tackle by the project.

**Identification of any issues:-**

1. Review Research Objective - Combined 3rd and 4th objective into one.
2. Review Research Description - Technology Used (Add Programming Language)
3. Further elaborate the Target Audience
4. Sort the reference to alphabetical ascending order
5. Review formatting and numbering of the documentation

**Actions set for the next meeting:-**

1. Submit the complete research proposals
2. Submit the Gantt Chart
3. Submit turnitin report

Student's Name & Signature:	
Date:	
Supervisor's Name & Signature: Date:	

## SUPERVISORY MEETING REPORT

Meeting No. : 5 Date: 4 July 2017  
Start Time: 2.00 pm End Time: 3.00 pm

**Review of actions from the last supervisor meeting:-**

Submission of Research Proposals

**Identification of any issues:-**

Reformat the Chapter 1 & Chapter 2 Documentation

Named the figure or picture in the documentation

**Actions set for the next meeting:-**

Submission of documentation to Turnitin

Submission of Chapter 1 & 2 Documentation

Student's Name & Signature:	
Date:	
Supervisor's Name & Signature:	
Date:	

## SUPERVISORY MEETING REPORT

Meeting No. : 6 Date: 08/9/17  
Start Time: 2.00pm End Time: 3.00pm

**Review of actions from the last supervisor meeting:-**

Identified items needed  
Explain project to supervisors

**Identification of any issues:-**

**Actions set for the next meeting:-**

Continue development on the project

Student's Name & Signature:	
Date:	
Supervisor's Name & Signature:	
Date:	

## SUPERVISORY MEETING REPORT

Meeting No. : 7 Date: 18/9/17  
Start Time: 11.00am End Time: 12.00pm

**Review of actions from the last supervisor meeting:-**

Inform progress of development

**Identification of any issues:-**

Discussing possible extra features on the project

**Actions set for the next meeting:-**

Continue progress of development

Student's Name & Signature:	
Date:	
Supervisor's Name & Signature:	
Date:	

## SUPERVISORY MEETING REPORT

Meeting No. : 8 Date: 13/10/17  
Start Time: 2.00pm End Time: 3.00pm

### Review of actions from the last supervisor meeting:-

Information on progress of development

### Identification of any issues:-

Continue discuss on any possible extra feature

Some of the difficulties discussion

### Actions set for the next meeting:-

Continue on progress on development

Student's Name & Signature:	
Date:	
Supervisor's Name & Signature:	

## SUPERVISORY MEETING REPORT

Meeting No. : 9 Date: 23/10/17  
Start Time: 11.00am End Time: 12.00pm

### Review of actions from the last supervisor meeting:-

Information on progress of development

### Identification of any issues:-

Continue discuss on any possible extra feature

Some of the difficulties discussion

### Actions set for the next meeting:-

Continue on progress on development

Student's Name & Signature:	
Date:	
Supervisor's Name & Signature:	
Date:	

## SUPERVISORY MEETING REPORT

**Meeting No. :** 10      **Date:** 15/11/17  
**Start Time:** 3.00pm      **End Time:** 4.00pm

### **Review of actions from the last supervisor meeting:-**

Information on progress of development

### **Identification of any issues:-**

Continue discuss on any possible extra feature  
Some of the difficulties discussion  
Final development ongoing  
Documentation preparation

### **Actions set for the next meeting:-**

Submission of project  
Submission of documentation

<b>Student's Name &amp; Signature:</b>	
<b>Date:</b>	
<b>Supervisor's Name &amp; Signature:</b>	

# Appendix D

## (Questionnaire Form 1)

# Study and Implementation of Content Analytics System on Social Media to Discover Cyberbully Intentions

Hello everyone, thanks for opening this survey! The aim of this survey is to research regarding to cyberbully issues on social media to help me continue my Final Year Project!

First, you will be requested to answer questions like age, gender and race. This is to investigate the relationship of cyberbully and the above biographic concern.

Secondly, you will be questioned by whether or not have you been experienced cyberbully issues and some follow-up questions. This is to investigate the purpose and methods of cyberbully happened in society.

Finally, you will be asking for your opinion regarding to the cyberbully issues. Please do not hesitate to write as many opinion as you want. This is to investigate how can people and proposed system help the victim of the cyberbully.

Thank you so much for reading this, let's begin the survey!

NEXT

Page 1 of 4

Never submit passwords through Google Forms.

\* Required

## Section 1: Demographic Profile

What is your gender? \*

- Male
- Female

How old are you? \*

- Below 13
- 13 - 20
- 21 - 30
- Above 30

What is your race? \*

- American Indian or Alaska Native. A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
- Asian. A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
- Black or African American. A person having origins in any of the black racial groups of Africa.
- Hispanic or Latino. A person of Cuban, Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race.
- Native Hawaiian or Other Pacific Islander. A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- White. A person having origins in any of the original peoples of Europe, the Middle East, or North Africa
- Other: \_\_\_\_\_

## Section 2: Personal Experience

According to your understanding, what is cyberbully? \*

- When someone or some group of people bullies another person on the Internet.
- When someone or some group of people send mean text messages or pics to another person.
- When someone or some group of people call another person's names online.
- When someone use other's cell phone to get them into trouble.
- When someone pretend to be another person online and posted embarrassing content online.
- When someone is insulting another person online.
- When someone is intimidating another person online.
- When someone is mocking another person online.
- Other: \_\_\_\_\_

Have you or your friends been cyberbully before? \*

- Yes
- No

If you or your friends have been cyberbully before, what is the main reason? \*

- Gender
- Race
- Behaviour
- Appearance
- Age
- Body Size
- Me and my friends have not been cyberbullied before.
- Other: \_\_\_\_\_

If you or your friends have been cyberbully before, how was it happened? \*

- Insult
- Mocking
- Intimidating
- Impersonate as you and posting inappropriate status on your page
- Harassment
- Me and my friends have not been cyberbullied before.
- Other: \_\_\_\_\_

Did you or your friends ever report or told the case to anyone? \*

- Yes
- No
- Me and my friends have not been cyberbullied before.

If you or your friends ever report or told the case to anyone, who was it?

- Teacher
- Parents
- NGO Member
- Counsellors
- Another friend
- Other: \_\_\_\_\_

If you or your friends did not report it, why?

- Afraid will get more bullied if reported
- No one will believe or listen to
- Do not trust any third party can help
- Ashame of getting bullied so do not want anyone else to know
- Do not want to acknowledge anyone, thinking just bear with it and eventually it will gone

If you or your friends report the case, did it stopped the cyberbully?

- Yes
- No
- Maybe (Some stopped but some did not)

### Section 3: Personal Opinion

Do you think the rise of social media is the main cause of cyberbully getting more and more cases? \*

- Yes
- No
- Maybe
- Other: \_\_\_\_\_

If the cyberbully on the social media could get detected, do you think it will decrease the case of cyberbully? \*

- Yes
- No
- Maybe
- Other: \_\_\_\_\_

What kind of keywords/sentence makes you think that this is cyberbully? \*

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

In which situations, you will think this is cyberbully and not just a bad jokes? \*Feel free to add any situations that you may think this is cyberbully and not jokes. \*

- Sally login into her friend's account and posted some embarrassing photos of her friends on FaceBook.
- Melvin received some messages from his classmates calling him "A Pig"
- Barbara received some message from strangers that called her honey for no reason
- Ken saw someone tagging him in a status that written "Why'd you still here and not gone?"
- Other: \_\_\_\_\_

Based on your opinion, what is the most effective way to help the victim? \*

Your answer

---

Based on your opinion, how can current technology help the cyberbully victim? \*

Your answer

---

Based on my system description on above, what else do you think that the system could do to help the victim of cyberbully issues? \*

Your answer

---

# Appendix E

## (Questionnaire Form 2)

## System and User Evaluation FYP

\* Required

### Interface Design

Do you think the user interface is simple and easy to understand? \*

- Yes
- No

Is the navigation between pages easy to understand and user friendly? \*

- Yes
- No

Can you understand how's the program work only from the user interface? \*

- Yes
- No

## Functionality

Do you find the program easy to use? \*

- Yes
- No

Do you think the function of the program is sufficient? \*

- Yes
- No

Will this system help in preventing cyberbully? \*

- Yes
- No

How will you rate this program? \*



# Appendix F

## (Turnitin Report)

# Appendix G

## (Poster)

## Faculty of IT and Sciences



### Problem Statement

Followed by recent technology trend, the social media community is getting larger. Cyberbully is getting more cases due to people used to speak whatever they want on the internet. This has to be controlled because cyberbully can lead to victim commit suicide or other psychological condition.

### System Feature

- > Register & Login to user account
- > Stream real time data from Twitter
- > Analyzed streamed data to discover cyberbully intentions
- > Stored detected data into NoSQL database
- > Review the stored data

### PROJECT TITLE

#### Study and Implementation of Content Analytic System on Social Media to Discover Cyberbully Intentions

### Screenshot



### Acknowledge

I would like to thank my lead supervisor Ms Jeyarani and my co supervisor Ms Lai to provide guidance and assist me to complete this project. I would like to thank all my friends who assist me on the development of this project.

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