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**SafetyNet**

**by**

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**Project report in part fulfilment  
of the requirements for the degree of  
Bachelor of Science with Honours  
In  
Information Systems**

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## **ABSTRACT**

Cyberbullying and other factors have contributed to the negative effects that are placed upon young people that use social media and the work aims to find a solution to minimise those issues while young people are communicating on social media. This work investigates through journals, reports, and articles to analyse existing solutions that are against the existing issue and the long-term effects with the analysis of case studies to develop countermeasures to situations where cyberbullying or the risk of online safety might take place. The results of the research led to the structuring and development of a project that gives parents control over their child's activity on social media with the idea of educating the parent to bring awareness, likewise the child to guide them from avoiding areas that are unsafe while communicating online. The results were successful because all the success criteria were met, and they all serve the purpose to act as a countermeasure to avoid situations where young people could feel unsafe when communicating on social media.

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# **CHAPTER 1**

## **INTRODUCTION**

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### **1 Introduction**

This project is called SafetyNet, and it will involve designing a web-based chat application that young people can use to communicate with each other online.

This project will analyse similar social media platforms, to assess their user-friendliness and, their benefits and drawbacks. This project aims to build a platform that creates a safer experience for young people while communicating in real-time while promoting internet safety and anti-cyberbullying.

Social Networking is defined as “the use of Internet-based social media platforms to stay connected with friends, family, or peers” (Kenton, 2021). In the society of today, social media has become very influential in the lives of teenagers because surveys show that “ninety per cent of teens ages 13-17 have used social media” and “seventy-five percent report having at least one active social media profile, and 51% report visiting a social media site at least daily.” (aacap.org, 2018) This shows how important social media has become in the lives of young people and it has had its benefits. Benefits such as providing teenagers with the opportunity to strengthen or create new relationships with people. (O’Keefe, Clarke-Pearson, & Council on Communications and Media, 2011) Developing your sexuality and a sense of identity is important during a teenager’s growth till adulthood. Therefore, social media provides them with a place to learn these newly established values. (Valkenburg & Peter, 2011)

Young people can shape their identity by choosing what part of themselves they are most comfortable with and sharing it with whom they choose. (Moreno, 2012)

Based on the feedback they receive on social media, they can change the way they appear on the internet. (Moreno, 2012, Valkenburg & Peter, 2012)

Good validation and good feedback are important for a young individual's self-esteem levels. Social media has always had a degree of anonymity and because of this, it has been easier for young people who are shy in face-to-face conversations to be able to freely communicate online.

As result, they can practise social skills in an environment where they can be comfortable. Due to the anonymity that comes with using social media, young people who are insecure about their appearance, do not have to think of people judging them because of that, and they can just focus on interacting with users. (McCarty, Prawitz, Derscheid & Montgomery, 2011)

With these benefits, it can also be argued that it has become detrimental to the lives of young people and due to it being integrated into our daily lives, it is harder to monitor or stop some of the negative sides that come with social media. Social media platforms have been studied to confirm that it has several drawbacks. According to a study, "60 percent of parents with children aged 14 to 18 reported them being bullied" (Bischoff, 2021).

Cyberbullying has been an issue and there have been many ideas implemented to combat the problem, but it has been difficult. In a lot of cases that have happened, the parents have not been aware to protect the child. After all, they might not be apprised of the situation. Their child may not tell them because they likely would feel ashamed to verbalize, that they were being bullied. It was reported that "Only around 1 in 10 young people inform a parent or trusted adult of cyberbullying". (ReachOut, 2019) This could be because they might fear

the problem might worsen, could be out of embarrassment and think it may not work.

## **1.2 Problem Statement**

- Finding ways for parents to be more aware about their child's social media activity.
- Creating countermeasures in place to decrease the risk of cyberbullying or Cyber Predators.
- Finding a way to educate parents and young people about internet safety and cyberbullying.

## **1.3 Reviews of existing platforms**

Before getting started with the development side of the project, the idea was to create a unique experience, instead of a carbon copy of an existing application. There are a lot of chat applications that currently exist and have features that improve user-friendliness and also present different needs and goals. While researching, it was realized that none of those platforms was heading in the direction of this project. This was concluded because applications like Facebook Messenger, the target audience of the application consists of users in the 25-34 age range. (Statista, no date)

Therefore, a platform like Facebook Messenger is developed to cater to those audiences, so certain features and application structures would not make sense to implement in this project because the audience of this project is between the ages of 10-and 15.

Analyzing similar applications or technologies is important because it helps to know the basic requirements when building a chat application and also helps to generate ideas on which technologies and strategies to use based on their experience. An investigation was looked into three examples of chat application software:

- Facebook Messenger – <https://www.messenger.com/>
- Slack - <https://slack.com/intl/en-gb/>
- WhatsApp - <https://www.whatsapp.com/>

## **1.4 How will SafetyNet be different from these**

### **platforms?**

Facebook and WhatsApp are both popular social media platforms used in the digital world, both providing productivity towards instant messaging. However, while analyzing these platforms, the direction was to follow the steps of WhatsApp and develop this project as a private chat messaging application. While using Facebook messenger, users can be found by searching for someone's name. This could lead to strangers finding people easily and leaving comments or even worse imitating to be someone that the user may know to potentially harass the user.

On the other hand, WhatsApp requires users to find people by having their phone number. Therefore, users are less likely to get harassed or messaged by strangers because the chances that they could have access to a user's phone number are unlikely because a phone number is something personal to the user unless they prefer to share it with someone. This will be similar to this project but instead of using phone numbers, an 8-digit alphanumerical number will be used to identify users and only when users become friends with other users, their names will be shared.

Slack was another application that was analyzed to see how this project can improve as a whole. Slack has a functionality that needs to be implemented in SafetyNet, which is the ability to create chats with different users. However, users on Slack cannot continue a chat based on a previous conversation, which is something that will be implemented in this project.

Another thing that makes this project different is the integration of the user's parents onto the platform. Since the audience of this project is towards late preadolescents to early teenagers, the idea was to create a platform where parents can monitor their children when using social media.

Young people use chat applications a lot, and they mostly have full control so when issues like cyber-bullying arise, it's harder for them to get help because they are unlikely to report to an adult, and with the different threats that exist using social media, there is no one with authority to help guide teenagers on whom to communicate with. Further down in the report, this section will be explained further in-depth to illustrate how parts of the project can reduce cyber-bullying taking place more regularly.

## **1.5 Aims and Objectives**

To fulfil the aims of the project, the intention is to build an innovative platform where different features are being implemented to prevent cyberbullying from happening regularly. Several objectives will be set in order to achieve the aims of the project which include:

- An objective is to develop SafetyNet as a fully functioning chat UI private messaging application, meaning the user will not be publicly visible to anyone on the platform by name searches and the user will only be able

to converse with people they add directly, instead of being able to communicate publicly.

This objective eliminates one side of cyber-bullying because strangers will need the user's PIN which could not be found publicly, to converse with them. These measures will be taken to avoid strangers from finding the victim's profile easily by searching for a name, for example, to leave hateful messages.

- An objective is to develop an internet safety guide within the chat application to inform users how to be safe online.

Many parents are unaware of their child being cyberbullied according to a study state that "as many as 75 per cent of teens have been bullied online, but only one in 10 have reported the problem to parents or other adults" (Parker-Pope, 2017).

This shows that many teenagers are being bullied however due to several factors, they are unwilling to report to a parent and since the parent is unaware of the situation, they will not be able to assist their child in a time of need. To tackle cyberbullying, parents must be involved heavily involved for them to aid and guiding their children on social media.

- To integrate the parents of the user into the platform by developing a heavily designed dashboard with them and the child sharing the same PIN, the parents will have more control over their child's social media presence.
- The dashboard will have a friend's system embedded into the design and the parent will be able to add a friend and approve the friend request that their child requested in their application.

- The parent will have other features such as blocking or removing friends that are connected to their child and being able to log in to their child's account to be able to monitor their social media usage. The parent also could get some information about the child's account on the platform, such as the last time their child logged in on the platform.
- 
- To develop a filtering system that will monitor the messages the user sends to check whether offensive words or profanity are included within the message.
- Education is very important in tackling cyberbullying and parents and teenagers need to be aware of the problem and how it affects millions over the world. To implement this, an objective is to develop a guide on the parent's dashboard about cyberbullying.

This report will expand more on how this project will make it a safe place for people to communicate on the platform and discuss several things concerning the project. Chapter 2 or also known as 'Context', the purpose of this chapter is to bring an in-depth literature review that details existing research and solutions about cyber-bullying to support the aims and objectives of the project. This chapter will have a review of real-life case studies relating to cyberbullying to illustrate the long terms effects that cyberbullying has on victims.

Chapter 3 or also known as 'New Ideas', this chapter will the list of requirements set out for the project and a description of how they relate to the background research. It also explains in-depth how the project achieves its project aims. This chapter will show the concept and full designs, screenshots of parts of the project and the actual user interface.

Chapter 4 or also known as 'Implementation or Investigation', this chapter will show the development of the project recorded in chronological order, with new ideas added to the project and it will demonstrate that the project has undergone appropriate analysis, design, project management, structured programming, and testing.

Chapter 5 or also known as 'Results/discussion'. This part of the report talks about the success/limitations of the project and if it supports the aim/objectives that were initially set out for the project. Lastly, Chapter 6 also known as 'Conclusions/Future Work' discusses whether the project was a success and what could have been improved on the project for future purposes. It also speaks about legal, ethical, social, and professional issues and how the project had an impact on those issues and reflections on the experience of making a project and aspirations and goals that will come after this.

# **CHAPTER 2**

## **CONTEXT**

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### **2 Introduction**

#### **Research Question – Impact of Cyberbullying on young people using social media**

The technology used in this project is not innovative because chat applications (i.e., Facebook Messenger, WhatsApp) have been part of the digital world for a long time now. Social media platforms such as Facebook and Twitter are predominantly used by a wide range of ages, more towards adults. This point illustrates that there are many users on those platforms, meaning that these social media platforms will have different goals to cater to different age groups and sometimes some social media platforms may use the technology to specialise in one area.

The focus of this project is to specialise in anti-cyberbullying and online safety. A lot of social media platforms are against cyberbullying and some platforms implement ways to tackle the issue. However, there are not enough of platforms that specialise in the issue and make it their main priority before anything else, whereas all the resources allocated in this project will be used on specialising in anti-cyberbullying.

## **2.1 A Review into an existing solution**

Messenger Kids is a messaging app released in December 2017 which was designed to cater to a younger audience that may wish to use social media. The app was developed to give parents parental control over their children. The parent is allowed to see how their child is communicating, including a variety of messages including text or video calls, and the parent can keep track of these actions. Parents are allowed to remove items that their child has received on the platform. These could be in the form of images or videos; they may be removed by the parent if it is deemed unacceptable for their child to be viewed on the internet. There is a functionality on the platform that allows the parent to view the list of reports and blocked accounts that their child has made as they are notified by the application.

The parent can monitor their child's usage by analysing the devices that their child has logged onto when using the application. Users within the platform can send different types of messages including text, photos, voice notes, images etc. Users can also play games with other users within the app, and they can communicate via video calls. The positives that can be mentioned are the parental controls that the parents are given to create a safe environment, in addition to the extra features set in place to create a fun and engaging experience for users.

Having games implemented into the app can be seen as a disadvantage because users can become addicted, and this can contribute to social issues and users can become more focused on playing games rather than communicating on the platform which ruins the essence of the application. The application makes use of a profanity filter to detect messages with profanity, however, according to Moore, several tests were made to investigate the security measures of the system, however, they were able to bypass inappropriate messages on the

platform. (Moore, 2017) The plan for this project is to strengthen the security measures of the security measures to improve the detection of offensive language through messages. A final disadvantage could be the lack of education about the problem. Parents and young people should be informed about cyberbullying and internet safety to shed more light on the problem and get more people to speak about the issue and learn new lessons in the process and this application does not provide this to users.

## **2.2 What is Cyberbullying?**

Cyberbullying is defined as "bullying that takes place over digital devices like cell phones, computers and tablets". (ASPA, 2019) Due to the increased usage of social media by young people, cyberbullying has become a major issue. There was a study by (ditchthelabel, 2014) partnered with Habbo Hotel, where 10,008 teenagers and young people aged 13-22 were surveyed and the findings were that 37% of teenagers experienced cyber-bullying. This shows how prevalent cyberbullying has been towards young people and how a lot of them have been affected by this problem. According to (Lenhart, 2015) "Nine out of ten teens age 13-17 use social media platforms". This is relevant because it emphasizes the impact of social media on young people in the world. Social networking sites are set as an enabler to cyberbullying due to the personal data sent between users around the world. Teenagers use social media for different reasons, such as communicating with friends, finding new friends with whom they share common interests or also raising their confidence when they are down. social media is more than just a tool to communicate online.

Young people have grown up around technology such as computers and mobile phones, for entertainment and to communicate with people online. The transition from teenager to adulthood is an important phase in the life of a human being and social media plays a part in shaping the personality and mental strength of teenagers. The aim of this report is to discuss the risks of cyberbullying and to explore cyberbullying involving teenagers to support the idea of creating a social media platform like SafetyNet whose focus is specialising in tackling cyberbullying.

Cyberbullying has several factors which make it different from how bullying was pre-social media. These factors were the result of SafetyNet being developed as a private chat application rather than a public platform like Facebook because cyberbullies could also be from strangers and due to their anonymity, they feel less guilty meaning they could say a lot more hurtful things to the victim. (Alim, 2016) Cyberbullies say things to the victim that they might not be able to communicate in a face-to-face encounter. (Kowalski & Limber 2007).

Some studies also show that on "20-30% of occasions, the victim did not know the identity of the cyber-bully" (Smith, Mahdavi, Carvalho, Fisher, Russell, & Tippett, 2008). This illustrates the anonymity that occurs during cyber-bullying, and this could be committed by strangers or people that the victim knows in real life. Therefore, there is a potential increase of cyberbullying that is being brought onto the victim which can be detrimental to the user's mental health.

Typically, there is a lack of emotion during cyberbullying compared to traditional bullying. Due to a lack of social activity in cyberbullying i.e., face-to-face contact (Law, Shapka, Domene, & Gagne, 2012; Ortega et al., 2012), the chance of misinterpreted communication is increased. Cyberbullies cannot see the victim's reaction, they may not know when to stop. This may be due to the victim's response to the situation, the aggressor may think their methods are not

working or are insufficient. Therefore, this could lead to the cyber-bully pushing harder to hurt the victim.

It can be argued that cyberbullying is more impactful than traditional bullying. A reason for this is because there is a larger audience (Del Rey, Elipe & Ortega-Ruiz, 2012) that can witness the cyberbullying taking place. Due to it being online, it means more than one person can get attacked at a time. This point is relevant because it illustrates the impact of cyberbullying and how it's easy for many victims to get bullied at the same time.

Cyberbullying is a massive problem in the digital world and there are various methods of cyberbullying which are illustrated in Table 1 and the real-life case studies that will be discussed in this chapter.

Table 1: Types of Cyberbullying (Willard,2007)

Type of Cyberbullying	Description
Harassment	Repeatedly sending messages that cause offence or rudeness to other people.
Sexting	Getting someone to share pictures/videos of a sexual and explicit nature with you. You then send these to other people online.
Flaming	Online fights, which consist of messages containing vulgar and angry language.
Cyber Stalking	Using online information about a person to stalk them. Sending messages that threaten to harm or intimidate the person.
Impersonation	Hacking into somebody's account in order to impersonate them and carry out bad actions e.g. making them look bad and damaging their friendships with other people.
Trickery	Tricking someone into revealing secretive information about themselves, which are then shared online.

There have been real-life cases associated with cyber-bullying which have caused detrimental effects in the past. One of these cases involved a 13-year-old named Megan Meier. She was reported to committing suicide due to harassment on MySpace. The cyberbully was later found out to be the mother of Megan's classmate at the school. The mother thought Megan had spread rumours about her daughter. Therefore, she made a fake account and took advantage that Megan was depression and took her time to harass her which led to Megan's suicide. (Tokunage, 2010)

This project will be developed by learning from these case studies which was why the parents of the user will have to approve the user's friend request, so the parent could verify the identity of the user so it could decrease the likelihood of similar cases like this happening again. Adding strangers to your social media friend list could leave someone vulnerable to cyber-bullying. Megan was depressed and lonely, and this led to her adding the stranger because she needed someone to speak to. The mother took advantage of her loneliness, and this led to Megan Meier taking her own life.

Another form of cyberbullying that takes place in the next case study and is also defined in Table 1, is known as sexting. Sexting is defined as "the sending or receiving of sexual words, pictures, or videos via technology, typically a mobile phone." (Drouin, 2018) Sexting was involved in the case regarding 15-year-old Amanda Todd. Amanda was reported to have used a video chat to connect with people. She used this type of social media to meet with people online so they could communicate by physically talking to each other.

However, a stranger encouraged her to post a picture of herself topless and later was blackmailed which led to the photo being posted for the world to see. Due to the paramount presence of social media in the world, the photo was seen by a lot of people and that led to Amanda being tormented, which further led to her leaving school. This could not solve her troubles, which led to her committing suicide in 2012. (Dean, 2017)

This case study is important because it illustrates the impact that cyberbullying can have if no adult or someone with authority is aware of the situation so it could be intervened with and controlled. These case studies highlight the impact of cyberbullying on teenagers and why it's important to educate people i.e. (Parents, victims, cyber-bullies) to prevent cases like these from repeating itself.

Cyberbullying has become a massive issue in society, so it's not a matter of doing one act and eradicating the issue, it's about giving education so similar issues can be prevented before it leads to something dangerous. Parents born in generation X (Ages 42-57) have not grown up with the technology of today. Therefore, they may not understand the detrimental effect of cyberbullying on their child's mental health. Parents need to be well informed about cyberbullying, whether it is how to identify when their child is cyberbullied and how it would affect them.

Young people and parents should both be educated on social media safety and internet safety, so they understand the problems and how to avoid circumstances involving them happen in their lives. A study by Moreno & Kota (2014) created a survey involving 356 teachers, clinicians, parents, and teenagers regarding internet safety. The findings were that parents should be educating their children from 6 to 8 years old which emphasises the impact of the digital world on the younger generation which is why they must be self-aware of it at an early age.

Therefore, in the project, The parent and the child will have two different screens when using the platform, to discuss cyberbullying and internet safety, however, it will be from the perspective of the person using the platform i.e. (Parent or Child) This will try to educate the user on how to react towards different situations and also help the parent to understand the child's perspective, and the effects of cyberbullying and what they can do to help.

However, there have been challenges that affect parents monitoring internet usage. Parents cannot always monitor what their child is doing especially when they have mobile phones. (Anti-bullying Alliance, 2012) Due to the child's control, they could change passwords, or web history, this makes it difficult for parents to fully know how to monitor their children.

Therefore, this was the reason why in SafetyNet, the parent and the child both share one pin, however, the parent creates the password for themselves and for their child, with the parent being able to access their data to monitor their social media activity, the child will also not be able to change their password to stop parents from monitoring their usage on the platform.

The findings also show that parents are willing to be taught about internet safety, however, they need confidence, and this could be acquired through training and experience. According to Taradar & Kellett (2011), most 12-13 years informed their parents, whilst most 14–15-year-olds informed their friends.

This illustrates how older the child gets, the more embarrassed they are reporting to an adult because they could believe they are grown, and they may also be afraid of how their parent might be embarrassed. Talking to parents about internet safety as well can help to improve the digital literacy of the child. (Sonck, Livingston, Kuiper & De Haan, 2011) There are a lot of factors that occur in cyber-bullying, these factors can affect the victim.

Offensive language has become a part of a lot of young people's vocabulary and this type of language can be used to hurt someone's feelings online. According to a study, "being called names, sworn at, or insulted and having nasty messages about them sent to them were the two most common online bullying behaviour types, experienced by 10% of all children aged 10 to 15 years." (Office for National Statistics, no date)

This shows how detrimental certain words can affect someone's mind and it contributes to people being cyberbullied. This type of attack can be classified as flaming.

Flaming is defined “as the use of hostile language online, including swearing, insults and offensive language” (Humphreys, 2016) Flaming can be used to create online hate and this can lead to psychological effects on the victim. It was studied that exposure to hate leads to negative outcomes, and it poses a threat to the happiness of young people. (Proctor, Linley, Maltby, 2009)

There are different ways that online hate can occur while using social media such as appearance-related targeting. This can be used as a type of harassment that takes place during flaming and it happens more frequently because teenagers value their self-presentation and they seek validation through selfies and in their use of photo-sharing platforms such as Instagram (Kim, Lee, Sung & Choi, 2016) When creating user profiles which contain the user’s real-life picture of themselves, users expose themselves as targets for bullying and hateful messages.

Sexual orientation is another source of online hate, alongside race and religion, these are sensitive topics, and some users use them to spread hate, and which leads to negative consequences for the victim. These consequences consist of sleeping disorders, increased anxiety, feelings of fear and insecurity issues. These psychological effects can lead to affecting the victim’s personal life as they may behave differently during their daily activities and the ways in which they relate to their surroundings environment (Lee & Leets, 2012)

Self-esteem is defined as "how much you appreciate and like yourself regardless of the circumstances." (Cherry, 2021) Low self-esteem leads to a lack of confidence in an individual and according to research by (Anderson et al, 2014, Cenat et al, 2014, Chang et al, 2013, Cowie, 2013; Kowalski et al, 2014), Low self-esteem is a common result for individuals after being cyber-bullied.

This is because cyberbullies could leave hurtful messages about the victim's character or appearance, which result could make the victim feel less worthy of themselves. Depression is defined as "a common and serious medical illness that negatively affects how you feel, the way you think and how you act." (www.psychiatry.org, 2021) Depression is a common psychological effect of being cyber-bullied.

This is shown from the study made by (Kowalski & Limber, 2013) (Sampasa-Kanyinga et al, 2014) This study consisted of over 931 US teenagers from the ages of 11-19 and it was found out that students that were victims of cyberbullying, experienced a form of depression.

This validates the idea that cyber-bullying leads to depression. There was a survey involving 2,999 Canadian teenagers and their cyber-bullying experiences. According to research, 10.7% of teenagers had ideas of suicide, 10.7% had planned a suicide attempt and 10.5% attempted suicide. (Sampasa-Kanyinga, Roumeliotis, Xu, 2014) Bauman also agrees with the fact that depression plays a part in the relationship between cyber-bullying and suicide. (Bauman, 2013)

Cyberbullying is difficult to stay among teenagers because cyber-bullying could lead to a fear of victimization. A study by (Randa, 2013) involving 3,500 teenagers aged 12-18 years found that there's a positive correlation between cyberbullying victimisation and the fear of victimization. This is relevant because it shows that this could affect teenagers that spot the cyber-bullying taking place.

Therefore, bystanders that notice cyber-bullying may believe they could be victimized if they try to intervene. (Australian Human Rights Commission, 2012) Overall, the use of social media has led to millions of teenagers being cyber-bullied in the world. Many people have a part to play when discussing this issue; victims, cyberbullies, peers, parents, and most importantly social media platforms.

Several long-term effects come with cyber-bullying, such as self-esteem, depression, anxiety, and other psychological effects that affect the human state of mind if not taken care of. To deal with cyberbullying in the future, there must be developments in areas like education and social media software, whose main priority is focusing on tackling the problem.

Parents must be educated because due to the technological advancement compared to their generation, they may not fully grasp how damaging cyberbullying could be to their children. Cyber-Training-4 Parents was a project that was designed and developed to provide a guide about cyber-bullying to parents.

The online guide had several sections to dissect the issue with modules including the introduction of social media, introduction to cyber-bullying, detecting, and preventing it. Understanding these areas and most importantly the perspective of teenagers regarding cyberbullying could increase the parent's confidence in dealing with these issues. Building software that could detect foul words could also be used to fight against cyber-bullying.

This literature review has illustrated the impact of cyber-bullying on teenagers on social media platforms and went into detail about the different areas of cyber-bullying. This study has provided research about how cyberbullying affects young people in society and analyses how parents can be educated about cyber-bullying and how to deal with the issue itself.

# CHAPTER 3

## NEW IDEAS

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### 3 Introduction

Requirement No	Requirement	Type of Requirement	Investigation of requirement with link to background research
1	There must be a login and registration system (parent only can register) for the parent.	Functional Requirement	<p>Validation: This requirement is technically feasible because the main technologies and tools that are associated with this requirement are:</p> <ul style="list-style-type: none"><li>- HTML</li><li>- CSS</li><li>- PHP</li><li>- JAVASCRIPT</li><li>- MySQL</li><li>- Notepad</li></ul> <p>There are no time limitations because the time spent implementing this requirement will be completed before the deadline, which is the 14<sup>th</sup> of December 2021, according to the time schedule. From these points, it's clear that this requirement is technically feasible.</p>

This requirement has the required resource feasibility because the resources that are needed for this requirement are easily accessible and available. These resources include:

- Programming Device (Laptop)
- Programming software and tools (freely available)
- Programming Individual
- Server

Risk feasibility can be discussed under different contexts.

Risk of losing source code due to technical failure:

This risk is very unacceptable; however, this is very possible to take place, and this will negatively have a huge impact on the project and to mitigate this risk, the code will be saved on Google Drive.

Risks associated with size: The login and registration form files will contain a lot of code lines which affect the project size overall. However, the file size will not exceed 3MB.

Verification: To verify this requirement, the login and registration form must be tested to see if a

			<p>parent can create an account for both themselves and their child and that the parent is able to log onto their dashboard and the child is able to log onto their Chat Application.</p> <p>Without achieving this requirement, it makes it impossible for users to have their accounts and essentially make use of the application. Therefore, it stops the project from achieving its aim.</p>
2	<p>There must be an integrated dashboard for the parent to monitor their child friend requests.</p> <ul style="list-style-type: none"> <li>- Parent must be able to check user's friends.</li> <li>- Parent must be able to remove and block friends.</li> <li>- Parent must see the last time the user logged onto the website.</li> <li>- The parent must have a cyberbullying guide to inform them more about cyberbullying.</li> <li>- The parent must be able to approve or disapprove</li> </ul>	Functional Requirement	<p>Validation: This requirement is technically feasible because the main technologies and tools that are associated with this requirement are:</p> <ul style="list-style-type: none"> <li>- HTML</li> <li>- CSS</li> <li>- PHP</li> <li>- JAVASCRIPT</li> <li>- MySQL</li> <li>- Notepad</li> </ul> <p>These technologies are freely available, and the technical skills required are manageable. There are no time limitations because the time spent implementing this requirement will be completed before the deadline, which is the 28<sup>th</sup> of January 2022, according to the time schedule. From these points, it's clear that this requirement is technically feasible.</p>

of the user's (child) friend-request.

This requirement has the required resource feasibility because the resources that are needed for this requirement are easily accessible and available. These resources include:

- Programming Device (Laptop)
- Programming software and tools (freely available)
- Programming Individual
- Server

Risk feasibility can be discussed under different contexts.

- Database data might be corrupted due to technical failure:

This risk is very unacceptable; however, this is very possible to take place, and this will negatively have a huge impact on the project and to mitigate this risk, the database files will need to be backed up every two weeks to recover any data.

- Some requirements could be changed within the features of the dashboard, this risk is acceptable in the project, and it affects the project, but not heavily and to mitigate it, the scope will have to be rescheduled.

Verification: To verify this requirement, the dashboard must be tested to see if a parent can add/remove/block accounts that is linked to their child. The dashboard must be examined visually to see whether the child's details exist i.e., child name, PIN, last time since logged in.

Without achieving this requirement, it makes it impossible for parents to monitor and have more control over their child's account which defeats the purpose and results in not achieving the project's aim which is to create a safe environment.

This requirement is related to background research because according to the literature review, there have been challenges that affect parents monitoring internet usage. With the addition of the review of an existing solution, it was decided to also develop parental controls for the parent.

Parents cannot always monitor their child's social media usage because the child usually creates the account. Therefore, the child is in control of their passwords, people that they speak to and because of this, cyber-bullying is more likely to take place because on social media platforms like Twitter, users can just follow anyone that they may not know in real life, and the stranger could have bad intentions when they communicate, and this could lead to cyber-bullying in the long-term.

This requirement is necessary because the parent can get a say on the friends their child can communicate with, and by having access to their account, seeing things like their messages, they can stop their child from communicating with them if there's any signs of cyberbullying in the messages.

A new idea for the project was to implement a cyberbullying guide to educate parents more about cyber-bullying and the effect it can have on their children. Parents may not understand the long-term effects of cyber-bullying, mainly because parents born in older generations, due to them not growing up with social media.

Therefore, they do not know how severe cyberbullying is to young people. According to the background research, the findings were that a lot of parents are willing to be taught about internet safety and doing so can improve the digital literacy of the child.

This requirement is important because it helps to put the parent in the child's perspective, for the parent to identify when the child is distressed or how they react as a parent when their child is being cyberbullied. The guide goes on to tell the parent about cyberbullying with a quick summary about why there's a lot of cases being reported in the world.

The guide goes on to mention the types of cyberbullying that takes place on social media and the most common ways that a child can get bullied on the internet, it states the impact of cyberbullying if a parent does not act as soon as possible and there's recommendations for how a parent can handle the situation.

Knowing when the child last logged in is important because it can assist the parent in monitoring the child's usage to see if the child uses social media too much i.e., 'Child was last seen logged in at 5am'. This could suggest to the

			parent to create limits to the child's usage of the application.
3	The application should block any type of profanity or offensive words to be sent as a message.	Non-Functional Requirement	<p>Validation: This requirement is technically feasible because the main technologies and tools that are associated with this requirement are:</p> <ul style="list-style-type: none"> <li>- JavaScript</li> <li>- Notepad++</li> </ul> <p>These technologies are freely available, and the technical skills required are manageable. The requirement fits the budget given and there are no time limitations because the time spent implementing this requirement will be completed before the deadline, which is the 23<sup>rd</sup> of February 2022, according to the time schedule.</p> <p>From these points, it's clear that this requirement is technically feasible. This requirement has the required resource feasibility because the resources that are needed for this requirement are easily accessible and available. These resources include:</p> <ul style="list-style-type: none"> <li>- Programming Device (Laptop)</li> <li>- Programming software and tools (freely available)</li> <li>- Programming Individual</li> </ul>

		<ul style="list-style-type: none"> <li>- Server</li> </ul> <p>Risk feasibility can be discussed under different contexts.</p> <ol style="list-style-type: none"> <li>1. Risk of losing source code due to technical failure:</li> </ol> <ul style="list-style-type: none"> <li>- This risk is very unacceptable; however, this is very possible to take place, and this will negatively have a huge impact on the project and to mitigate this risk, the code will be saved on Google Drive.</li> </ul> <p>Verification: To verify this requirement, it will be tested by sending messages containing offensive words to see whether the application allows it to be sent.</p> <p>This requirement is connected to the background research because it is an existing improvement of the functionality that was available in Messenger Kids because it has been improved to detect profanity/offensive language so even if the message is covered with asterisks, the application will still flag the message as unacceptable. This reduces the risk of flaming in social media because offensive language is mostly used to send nasty hateful messages during flaming, and this is a type of cyberbullying.</p>
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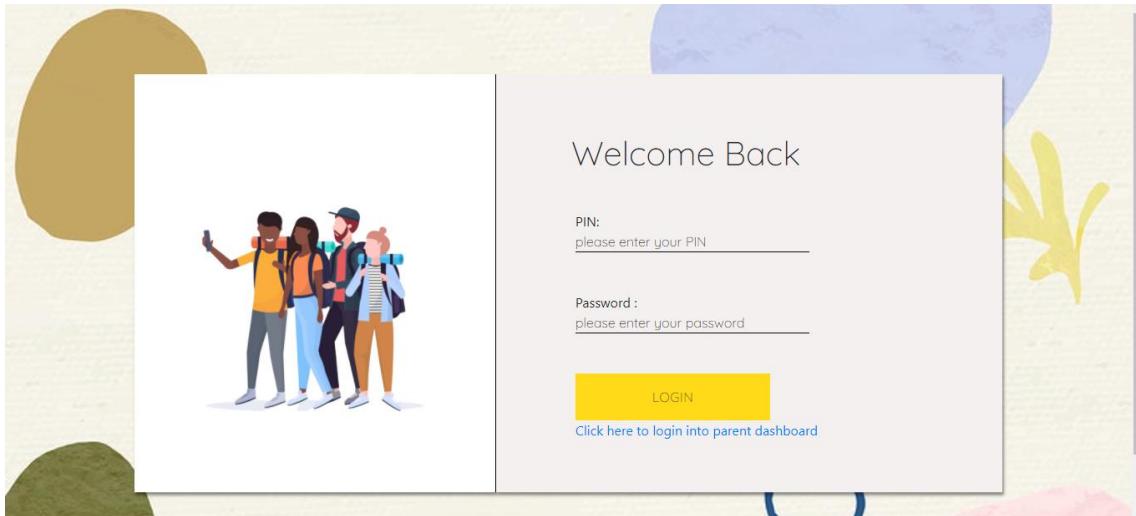
			Achieving this requirement is important in attempting to prevent online hate. In the long-term, this will make users happier and will create a safer place where users do not have to read hateful messages.
4	The chat application must have an internet safety guide for the user (child) to view.	Functional Requirement	<p>Validation: This requirement is technically feasible because the main technologies and tools that are associated with this requirement are:</p> <ul style="list-style-type: none"> <li>- JavaScript</li> <li>- Notepad++</li> <li>- HTML</li> <li>- PHP</li> <li>- CSS</li> </ul> <p>These technologies are freely available, and the technical skills required are manageable. The requirement fits the budget given and there are no time limitations because the time spent implementing this requirement will be completed before the deadline, which is the 28th of January 2022.</p> <p>From these points, it's clear that this requirement is technically feasible. This requirement has the required resource feasibility because the resources that are needed for this requirement are easily accessible and available. These resources include:</p>

		<ul style="list-style-type: none"> <li>- Programming Device (Laptop)</li> <li>- Programming software and tools (freely available)</li> <li>- Programming Individual</li> </ul> <p>Risk feasibility can be discussed under different contexts.</p> <ol style="list-style-type: none"> <li>1. Risk of losing information to technical failure:</li> </ol> <ul style="list-style-type: none"> <li>- This risk is very unacceptable; however, this is very possible to take place, and this will negatively have a huge impact on the project and to mitigate this risk, the project will be saved as a backup on Google Drive.</li> </ul> <p>Verification: To verify this requirement, this application will be examined to check whether there are topics regarding cyberbullying that the users can click on to read.</p> <p>From the background research, this requirement is a new idea that will be used to promote internet safety. The aim for the project is not for users to not only be safe while using this platform but also on other platforms. Therefore, an internet safety guide will be created that the user can click on while interacting with the application.</p>
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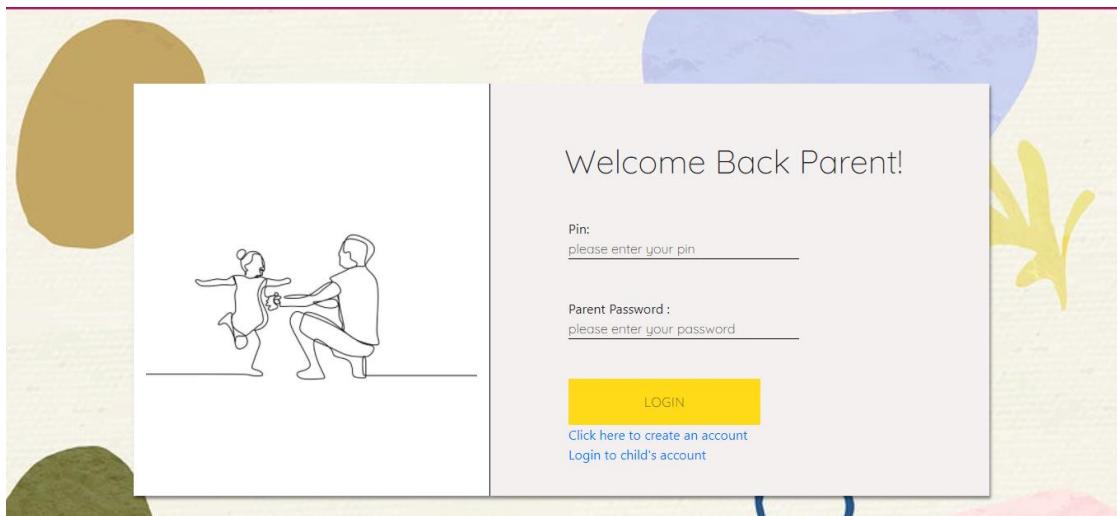
			According to the background research, promoting internet safety can improve the digital literacy of the child, this guide aims to talk about how the internet can be dangerous with predators roaming on different sites. It speaks about how predators lure their victims, with examples to help users avoid different scenarios while communication online. Lastly, it provides users with guidance to spot a cyber predator while communicating online.
5	An 8-digit alphanumerical PIN must be generated as their ID for both the parent and the child to log-in when the parent registers. This information will be sent through the parent's email.	Non-Functional Requirement	
6	Both users (child, parent) must be able to logout	Functional Requirement	
7	The application must have a friend list	Functional Requirement	
8	The user(child) must be able to send messages	Functional Requirement	

Table 2: New Ideas Table

### 3.1 Login and Registration UI



**Figure 1: Example Login UI for user (child)**

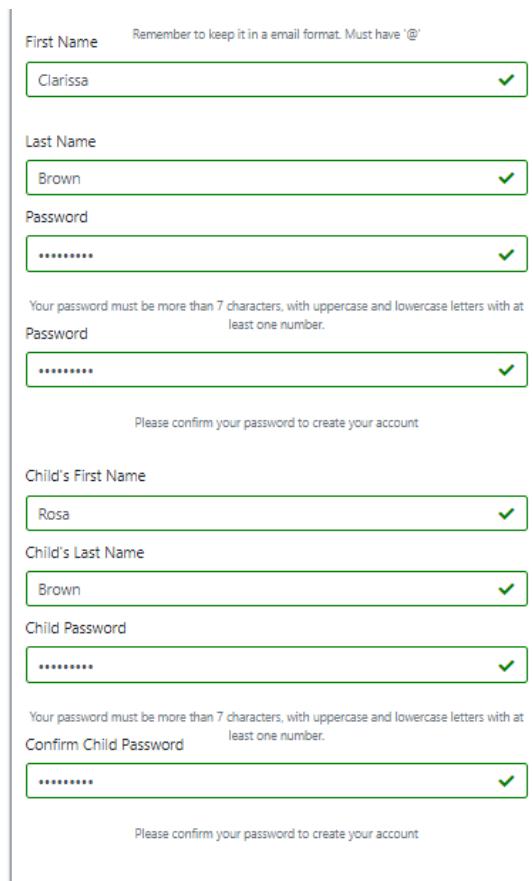


**Figure 2: Example Login UI for user (parent)**

For this project, a requirement was to create a login and registration form to allow old users and newcomers to login onto the platform and fulfil the project's purpose. As can be seen in figure 1 and figure 2, most of the screen is designed to not confuse the users (parent and child) on what login form they are on. According to Jakob Nielson, "The design should speak the users' language. Use words, phrases, and concepts familiar to the user, rather than internal jargon." (Nielsen, 1994)

This is relevant because it shows that designs should depend on your specific users. For the child's login form UI, images of teenagers were used to provide clarity to the user on what form they belong on. This was vice versa for figure 2, as there is an image of a parent hugging their child, the parent will know immediately that this is the site that they will use to log onto their dashboard.

Another way to show the difference between the users was the welcome message. The child was welcomed by the saying 'Welcome Back!', whereas the parent was welcomed by saying 'Welcome Back Parent!'. This design helps to build an experience that feels intuitive and clear.

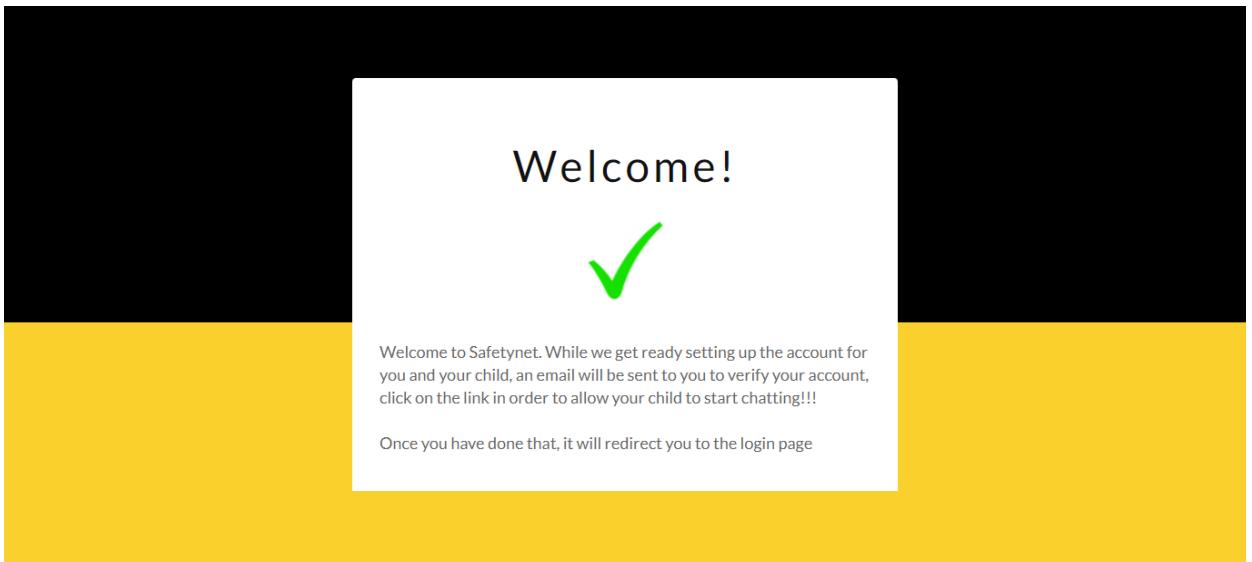


The image shows a registration form interface for a parent user. The form is divided into two columns. The left column contains fields for the parent: First Name (Clarissa), Last Name (Brown), Password (\*\*\*\*\*), and Child's First Name (Rosa). The right column contains fields for the child: Child's Last Name (Brown), Child Password (\*\*\*\*\*), and Confirm Child Password (\*\*\*\*\*). Each field has a green validation bar with a checkmark. Error messages are displayed above the password fields: 'Remember to keep it in a email format. Must have '@'' for the parent's email, and 'Your password must be more than 7 characters, with uppercase and lowercase letters with at least one number.' for both the parent and child passwords. Below each column is a note: 'Please confirm your password to create your account'.

First Name	Clarissa
Last Name	Brown
Password	*****
Child's First Name	Rosa
Child's Last Name	Brown
Child Password	*****
Confirm Child Password	*****

**Figure 3: Example Registration UI for user (parent)**

As can be seen in figure 3, newcomers can register on the website by including details for both the parent and the child. The design uses validation techniques to make it easier for the user to follow the guidelines to create an account successfully.



**Figure 4: welcome message UI**

As you can see in figure 4, when the user (parent) successfully registers their account onto the platform, to avoid identity theft, which could later lead to harassment on social media by impersonating someone else and to protect the user's privacy, an activation token is created and sent to the user's email for them to verify their account.

An activation token is a code composed of letters and numbers necessary for any solution with a security measure to be enabled or activated. This is to avoid users from using random emails to create accounts to imitate someone else.

**Account Creation** ► [Inbox x]

safetynetenquiries@gmail.com to me ▾ 21:14 (22 minutes ago) ☆ ↗ ⌂ ⌂

Hi there,

Thanks for signing up with us. From now this will be your personal email where we will send you regular updates about changes coming to safetynet, different ideas and we will be looking for your feedback to improve this chatting application for your child and the world. The next email you will be receiving will be the PIN that both you and your child will be sharing together on the platform.

Thank you from all of us from Safetynet,

Safetynet

**Account Creation** ► [Inbox x]

safetynetenquiries@gmail.com to me ▾ 21:14 (22 minutes ago) ☆ ↗ ⌂ ⌂

Hi there,

Thanks for signing up with us. From now this will be your personal email where we will send you regular updates about changes coming to safetynet, different ideas and we will be looking for your feedback to improve this chatting application for your child and the world. The next email you will be receiving will be the PIN that both you and your child will be sharing together on the platform.

Thank you from all of us from Safetynet,

Safetynet

**Figure 5: Email for creation account**

Your PIN number ► [Inbox x]

safetynetenquiries@gmail.com to me ▾ 21:36 (8 minutes ago) ☆ ↗ ⌂ ⌂

CB03V0Q7

Reply Forward

**Figure 6: Email for user's PIN**



**Figure 7: Email for verifying account**

As can be seen from figures 5,6 and 7, an email is sent to the user(parent) welcoming them to the platform, informing them what will be needed, such as the 8-digit alphanumeric PIN which the parent and child will both share and a link to verify their account is also provided. When the user clicks on the link, it redirects the user to the page so they can log onto the platform.

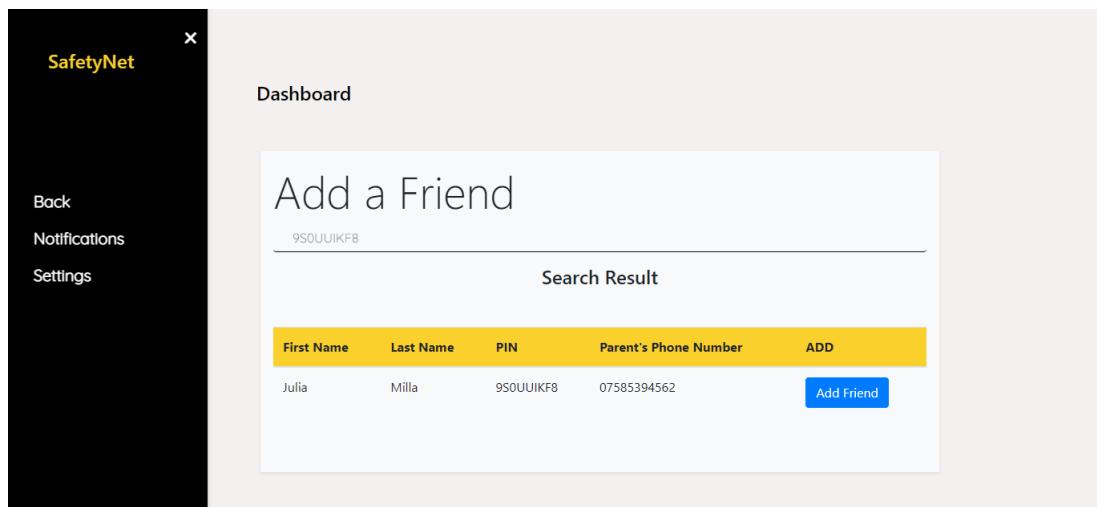
### 3.2 Dashboard Menu UI

A screenshot of the SafetyNet Parent Dashboard. On the left is a dark sidebar with white text containing links: "SafetyNet", "Notifications", "Friends", "Cyberbullying Course", "Settings", and "Logout". The main area has a light gray background. At the top, it says "Dashboard". Below that is a section titled "Your Child's Details" with the subtitle "Last Time Since your child logged in: 2022-02-22 21:36:19". A table displays child information: UserID (42), First Name (Rosa), Last Name (Brown), and PIN (CB03V0Q7).

User ID	First Name	Last Name	PIN
42	Rosa	Brown	CB03V0Q7

**Figure 8: Parent Dashboard UI**

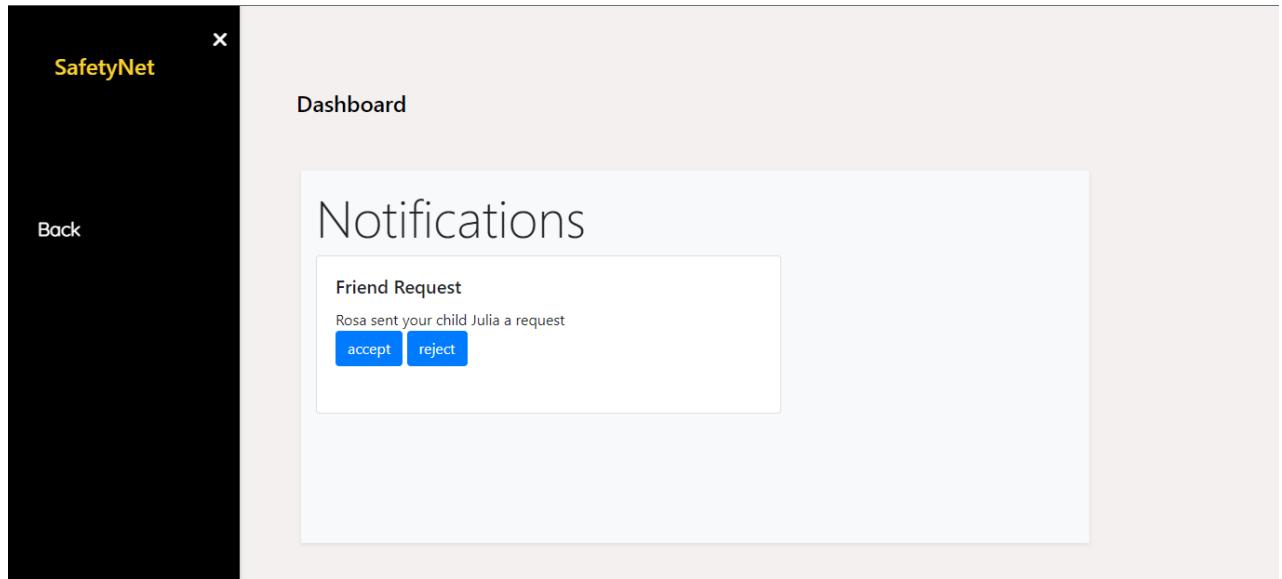
This is the dashboard that is loaded as soon as the user (Parent) logs onto the platform, the design was intended to be intuitive and easy to use and as you can see in figure 8, it shows the child's details and the last time they signed in on the platform. Figure 8 also highlights the various features that come with the dashboard to allow the parent to have extra control and assistance with monitoring their child.



**Figure 9: Adding a friend on the parent dashboard**

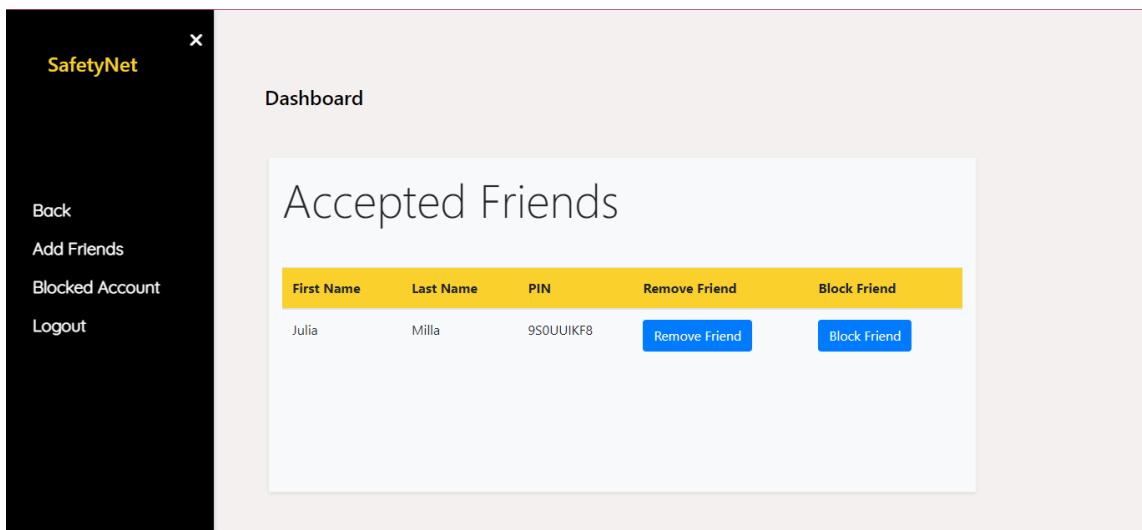
As you can see in figure 9, on the dashboard UI, a search system is integrated to allow the parent to search for a PIN that their child has given them to approve their request to add a friend to speak to. The parent has the option to add a friend, and to provide safety for the child, the parent's phone number is located on the user's details, in case the parent may want to verify the user that their child wants to communicate with. This is implemented so the chances of the child speaking with strangers or impersonators are limited and the parent also gets an opportunity to know about the person their child is speaking to.

However, the parent of the other child will have to accept this request on their notification system before communication can be allowed between the users on the platform. This notification system will be spoken about later in the report.

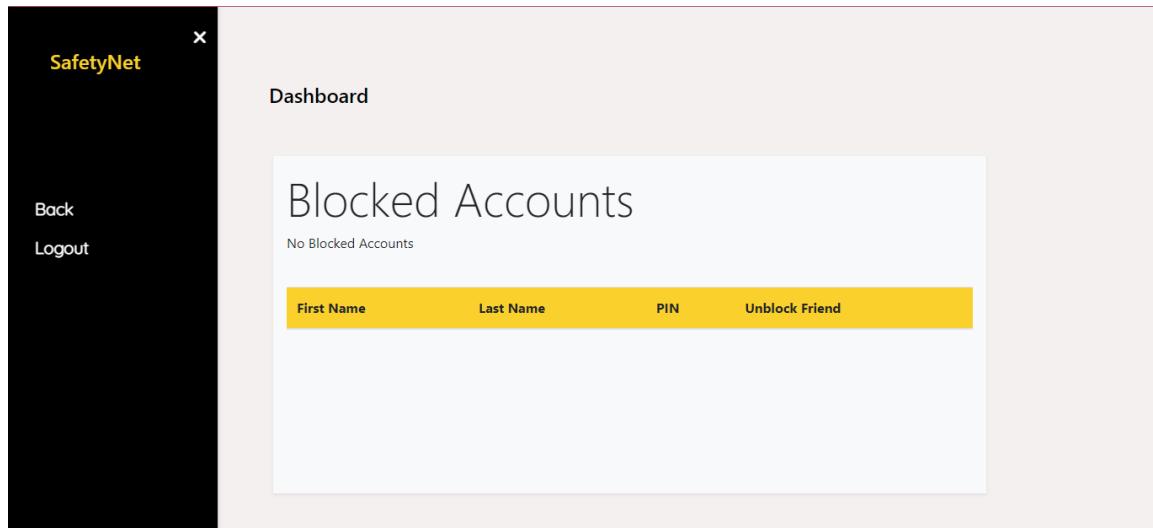


**Figure 11: Notifications UI on the parent's dashboard**

As you can see in figure 11, a notifications system is integrated onto the parent's dashboard, allowing the parent to know when a user sends a request in order to communicate with their child, the parent has the option to either accept or reject the request, and if the parent accepts the request, the friend request would have been approved and it will enable the child to communicate with their friend online.

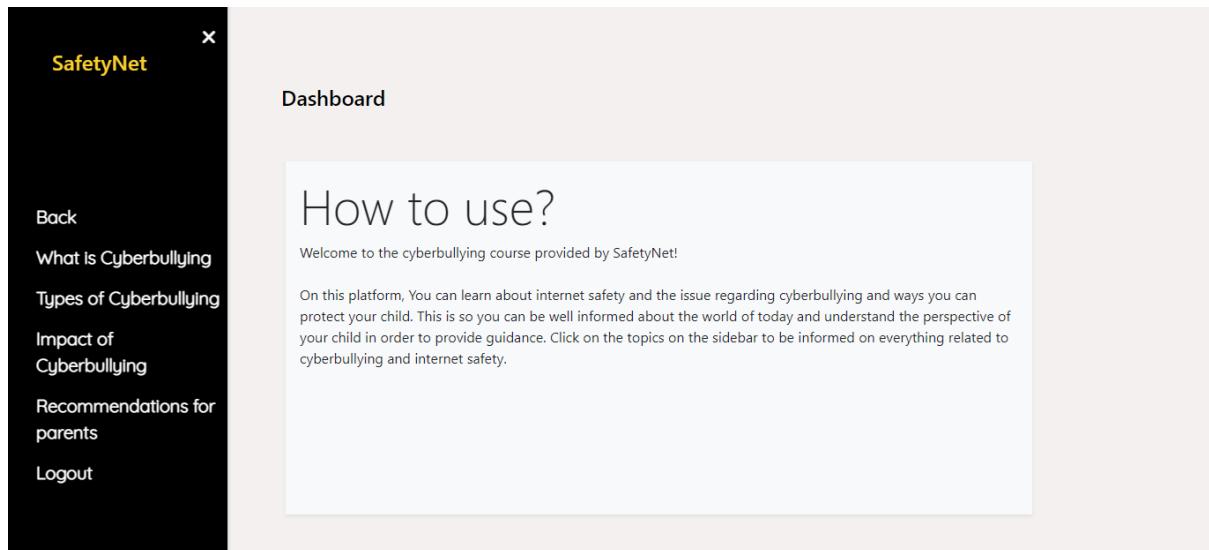


**Figure 12: Parent viewing their child's friends on dashboard UI**

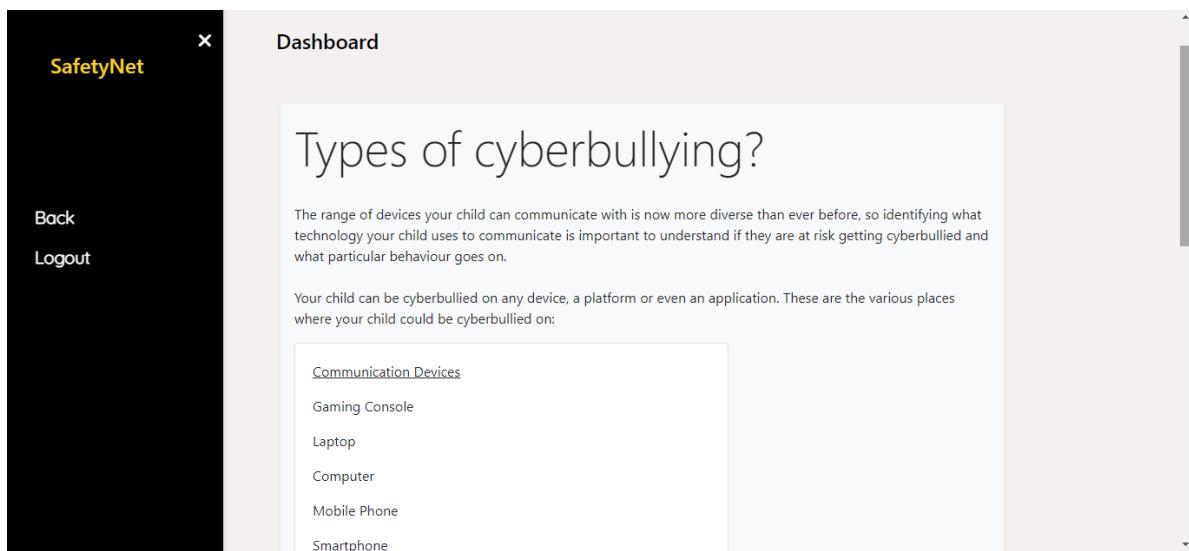


**Figure 13: Parent viewing their blocked accounts on dashboard UI**

As you can see in figures 12 and 13, the intention for this project was to give the parent control over their child social's media and this was achieved in the screenshots as it shows the parent being able to see the friends that their user has on the platform, with the ability to either remove or block them and if a mistake was made in terms of blocking them, there's also an option to unblock which was soon in figure 13.



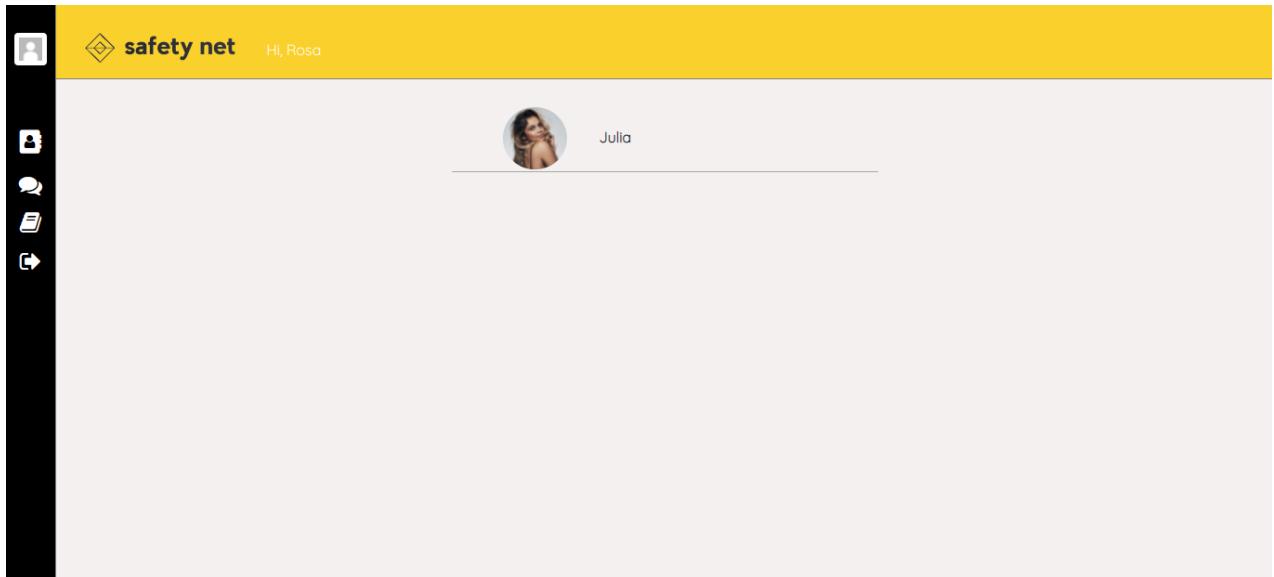
**Figure 14: introduction to SafetyNet's parent's cyberbullying guide on the Dashboard UI**



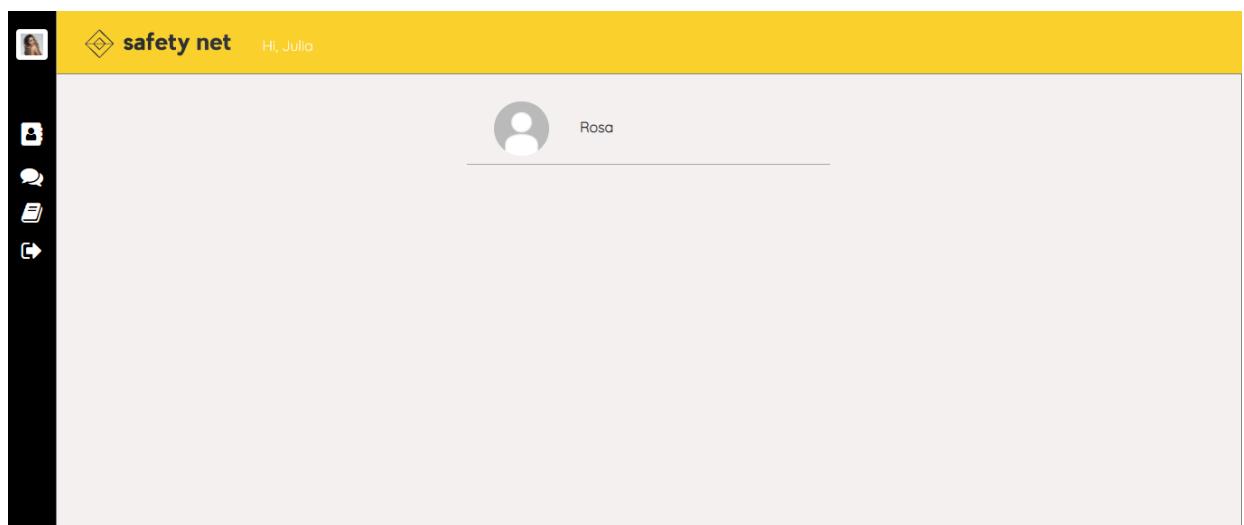
**Figure 15: an example of a section into the parent's cyberbullying guide**

For this project, one of the main objectives was to create a cyberbullying guide for parents for them to understand more about the topic and how detrimental it is to their children if it is not taken seriously. As you can see in figures 14 and 15, this was achieved because, on the dashboard UI, the parent is able to read four sections in detail about cyberbullying and its impact on the world and on their children if not taken carefully. It also goes into detail about key signs or patterns parents need to look out for to identify their child being cyberbullied, and key tips on how to respond to your child being cyberbullied as a parent.

### 3.3 Chat Application UI



**Figure 16:** Insight into the Chat Application UI from the perspective of user Rosa

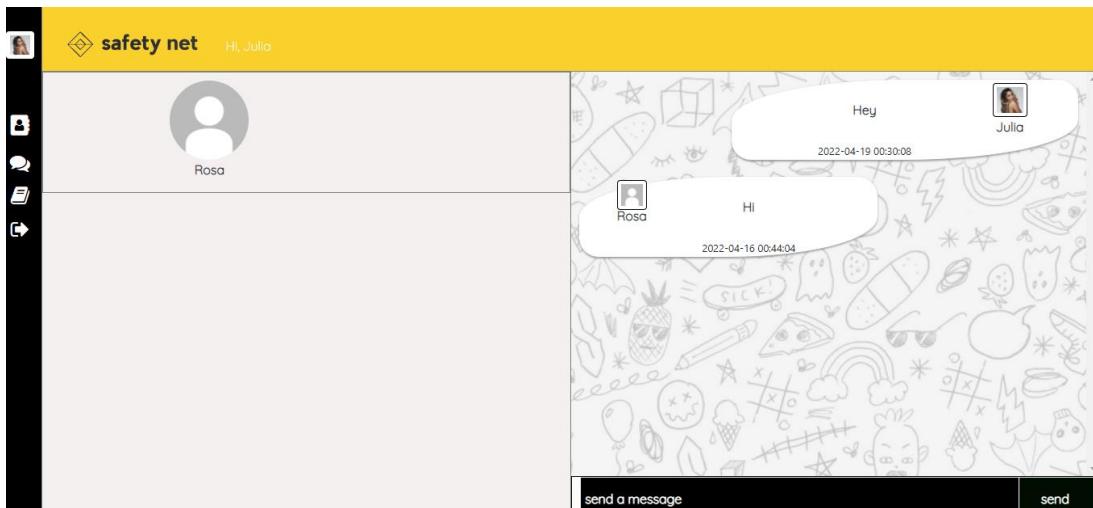


**Figure 17:** Insight into the Chat Application UI from the perspective of user Julia

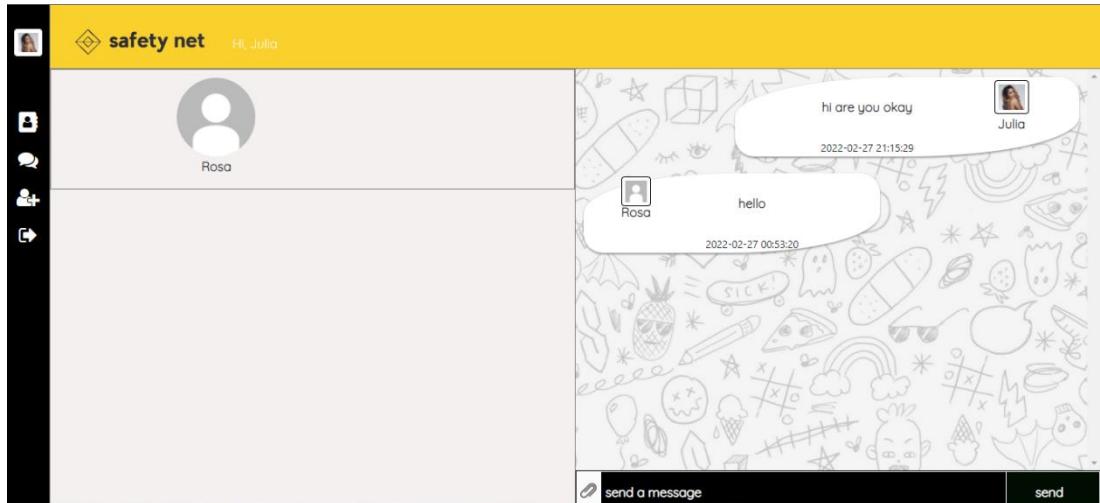
One of the main requirements of this project was to develop a chat application that will allow users to communicate in real-time. As you can see in figures 16 and 17, this is the interface of the chat application, and you can see both perspectives of the users using the platform as it shows that they have added each other due to their parent's approval and the application welcomes the user by greeting them at the top of the screen.

The sidebar located at the left side of the screen provides some functionality to the application, such as displaying the user's friend list by clicking on the contact button, viewing recent chats, and adding friends as well. According to Jakob Nielson, 'The design should speak the users' language. Use words, phrases, and concepts familiar to the user, rather than internal jargon.' (Nielson, 1994).

This was the reason why the contacts button represents a phone book, this provides clarity and as result, the user will know the functionality of the button when using the application. To begin a chat, the user must click on the friend that they wish to communicate with on their friend's list.



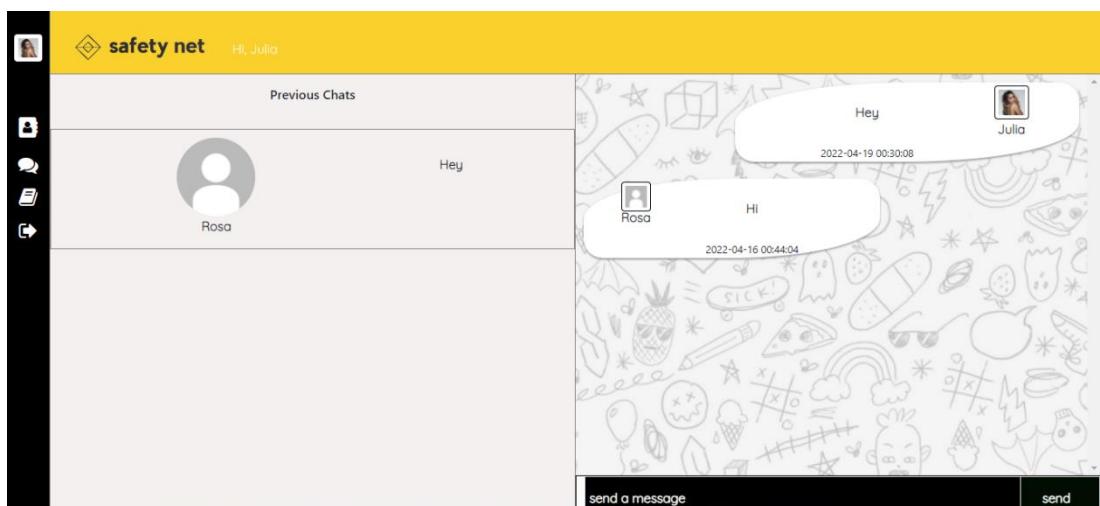
**Figure 18: Example of creating a chat from the user's perspective**



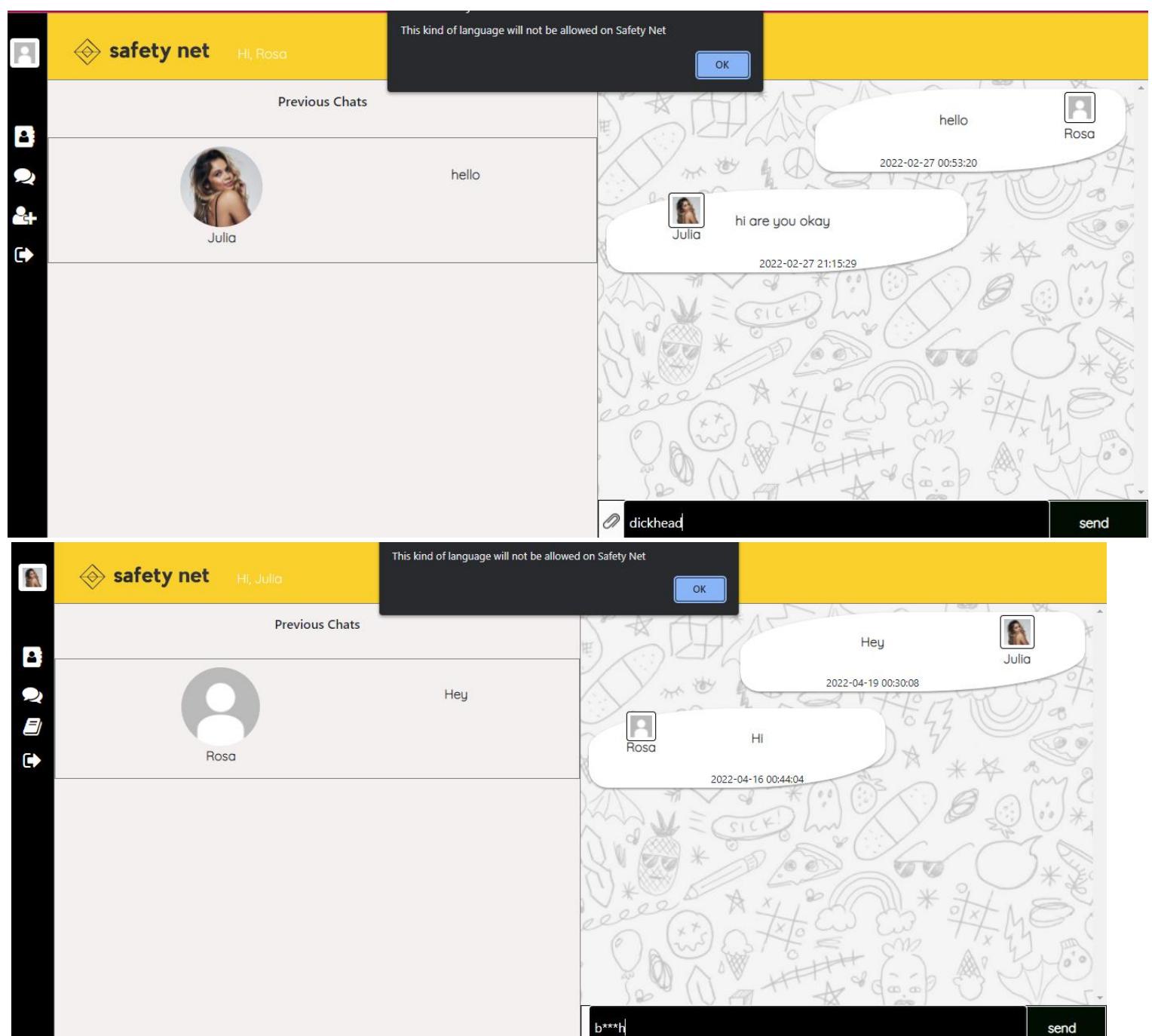
**Figure 19: viewing the chat from another user's perspective**

When the user clicks on a friend on their friends list, it creates a new window to allow the user to communicate with another user. The user can send a message by inputting a message through the textbox and pressing 'Enter' on the keyboard or by clicking using the mouse.

The chat application allows users to communicate in real-time, meaning users receive messages seamlessly as soon as they are sent. As you can see in figures 18 and 19 this is achieved because it shows the chat application from the perspective of the two users communicating, and it shows that users can see the messages from one another.



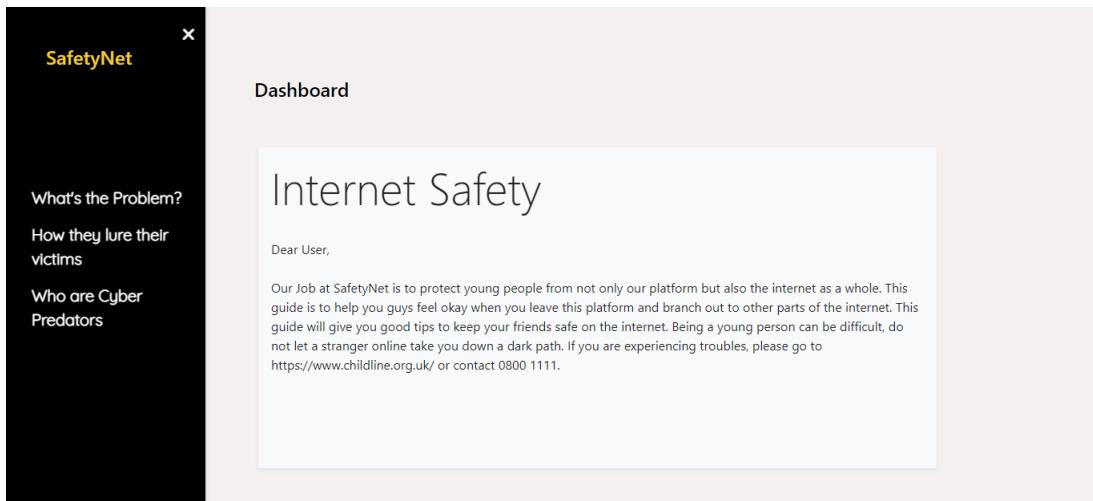
**Figure 20: Example of previous chats UI**



**Figure 21: Example of offensive language filtering system being used**

As you can see from figure 20, users on the application are allowed to view their previous chats with friends on the platform, to allow quicker access for communication. The chat application shows the different friends that the user has with the message right next to it. To access the chats the user will need to click on one of the friends on 'Previous Chats' and doing so opens the chat window to allow the user to communicate and this is shown in figure 20.

Researching on cyberbullying and its impact on teenagers led to creating a requirement that enabled to disallow any form of offensive language being sent as a message to avoid flaming on social media. This was achieved as you can see in figure 21, the user intended to send a message to a user using offensive language and a message is displayed to the user to indicate that using that type of language is not allowed to be sent as a message on this platform. The system was also improved as you can see bad language covered with asterisks will also be detected and will not be allowed to be sent as a message.



**Figure 22: Internet Safety Guide**

Lastly, when the user clicks the book icon in their chat application, it redirects them to this page when the user can learn about internet safety. To view the rest of the pages please go to [Appendix A.](#)

# CHAPTER 4

## IMPLEMENTATION

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### Analysis Phase

#### 4.1.1 Methodology

Agile methodology is a set of techniques to manage software development projects. It involves constant collaboration with stakeholders and continuous improvement at every stage. It also consists in:

- Being able to change requirements or add new ones.
- Working constantly with the client.
- Building software over comprehensive documentation.

#### 4.1.2 Users and Stakeholders

This section states the people involved in the project. The users (Parent and child) will use the chat application and dashboard respectively. The stakeholders will develop, maintain, and test the chat application.

SafetyNet Team	Responsible for developing, maintaining, and testing the application through its phases
----------------	---

Users	The users are parents and their child. The parent that registers from the website and create an account for their child in the process.
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Table 2: Users and Stakeholders

#### **4.1.3 System Requirement**

Requirement analysis is defined as “a process used to determine the needs and expectations of a new product.” (Simplilearn.com,2020). This following section presents the detailed requirement analysis of the project.

#### **4.1.4 Hardware Requirement**

- Minimum two computers with two hard drives or Laptop
- Intel processor or above
- Minimum of 256MB RAM
- Minimum of 20GB Hard Disk
- Mouse
- Keyboard
- Working Network

#### **4.1.5 Software Requirement**

##### Operating System

- Windows XP and above
- MacOS 10.4+
- Linux – Ubuntu

## **Planning Phase**

### **4.1.6 Project Planning**

A project plan is a series of documents that define the execution and phases of a project. This report states the estimated time that was planned for the project and what took place.

### **4.1.7 Estimated Time Schedule**

While considering the priorities of project, a time schedule was developed to an approximately of what can be done before the release date. It was expected that requirements will change or be added onto the phases of the project, or tasks might exist outside the project so it could delay the production of the project.

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Sep	Oct	Qtr 4, 2021
1		<b>Requirement Phase</b>	24 days?	Fri 10/8/21	Sat 11/6/21					
2		Research background on the effects of teenagers on social media	2 days	Fri 10/8/21	Sat 10/9/21					
3		Fill the RP1 and ethics declaration	17 days	Fri 10/8/21	Thu 10/28/21					
4		Start making the project planning document	21 days	Mon 10/11/21	Fri 11/5/21	2				
5		Plan a meeting with the supervisor to discuss the initial plans	1 day	Fri 10/22/21	Fri 10/22/21					
6		Create a project schedule	3 days	Fri 10/22/21	Mon 10/25/21					
7		<b>Design Phase</b>	69 days	Sat 11/6/21	Wed 2/2/22					
8		Look for inspirations or research on applications on a similar type	3 days	Sat 11/6/21	Tue 11/9/21					
Project: project scheduling Date: Thu 4/14/22		Task		Inactive Summary		External Tasks				
		Split		Manual Task		External Milestone				
		Milestone		Duration-only		Deadline				
		Summary		Manual Summary Rollup		Progress				
		Project Summary		Manual Summary		Manual Progress				
		Inactive Task		Start-only						
		Inactive Milestone		Finish-only						
Page 1										

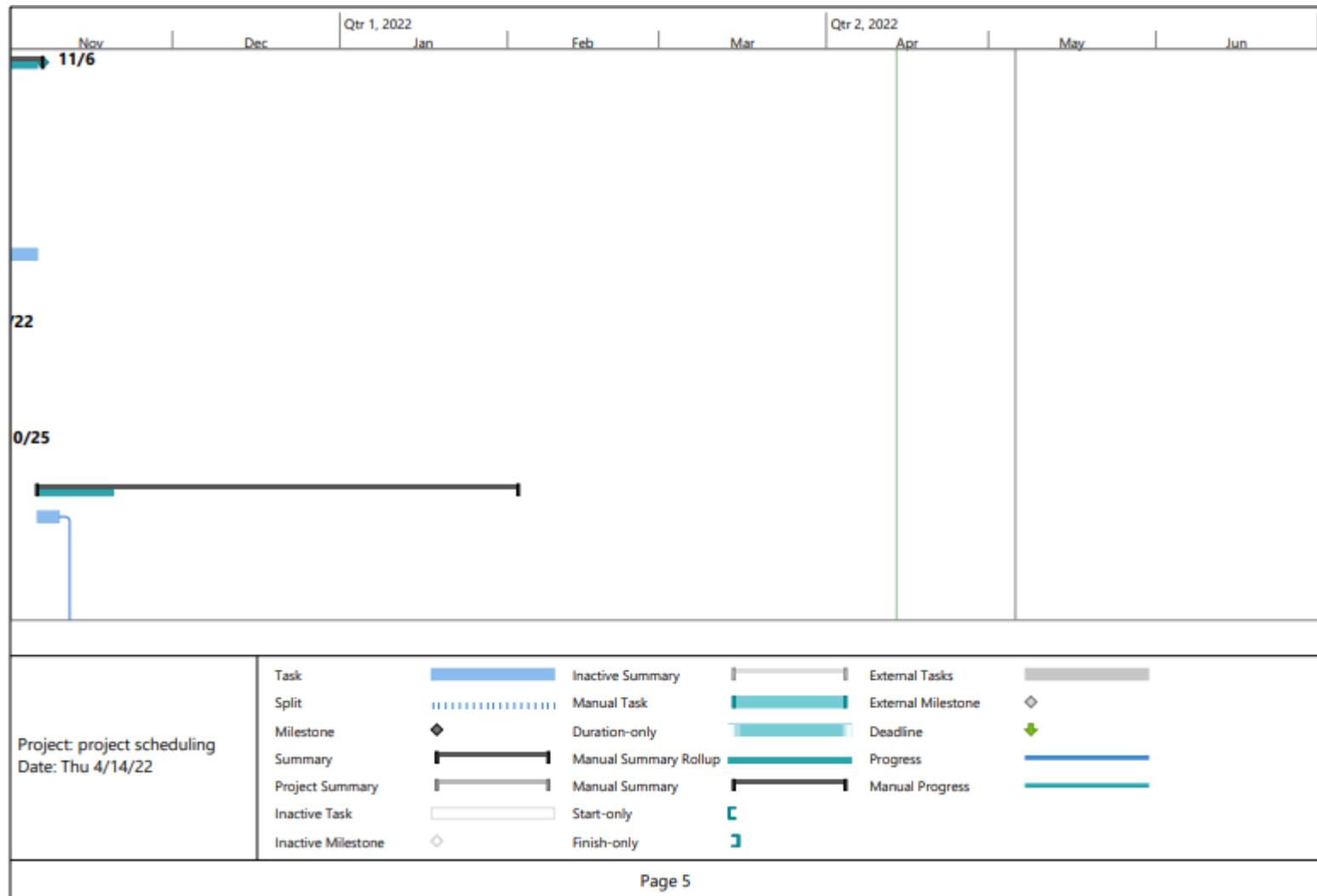
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Sep		Qtr 4, 2021	
								Sep	Oct	Nov	Dec
9		Create a mock-up design the login page and registration page using Wireframe	2 days	Fri 11/12/21	Sun 11/14/21	8					
10		Create an mySQL database for users	1 day	Mon 11/15/21	Mon 11/15/21						
11		Create a mySQL database for parents	1 day	Mon 11/15/21	Mon 11/15/21						
12		Book a meeting with your supervisor to discuss design phase	1 day	Mon 11/15/21	Mon 11/15/21						
13		Design a mockup of the chat application using wireframe.	3 days	Wed 11/17/21	Fri 11/19/21						
14		<b>Development Phase</b>	<b>53 days</b>	<b>Sat 11/20/21</b>	<b>Thu 1/27/22</b>						
15		Create an UI of the Login Page and registration page using HTML	3 days	Sat 11/20/21	Tue 11/23/21	9					

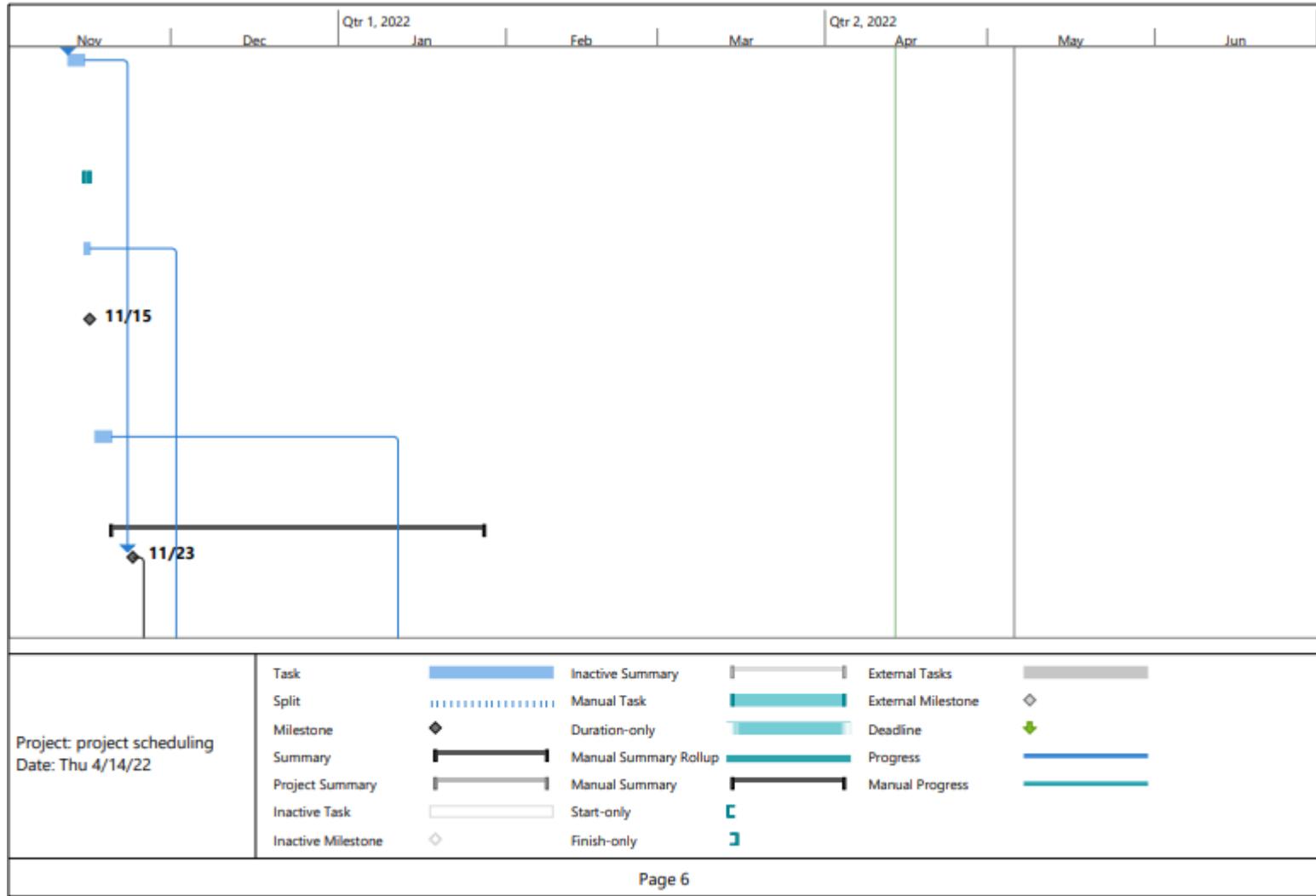
  

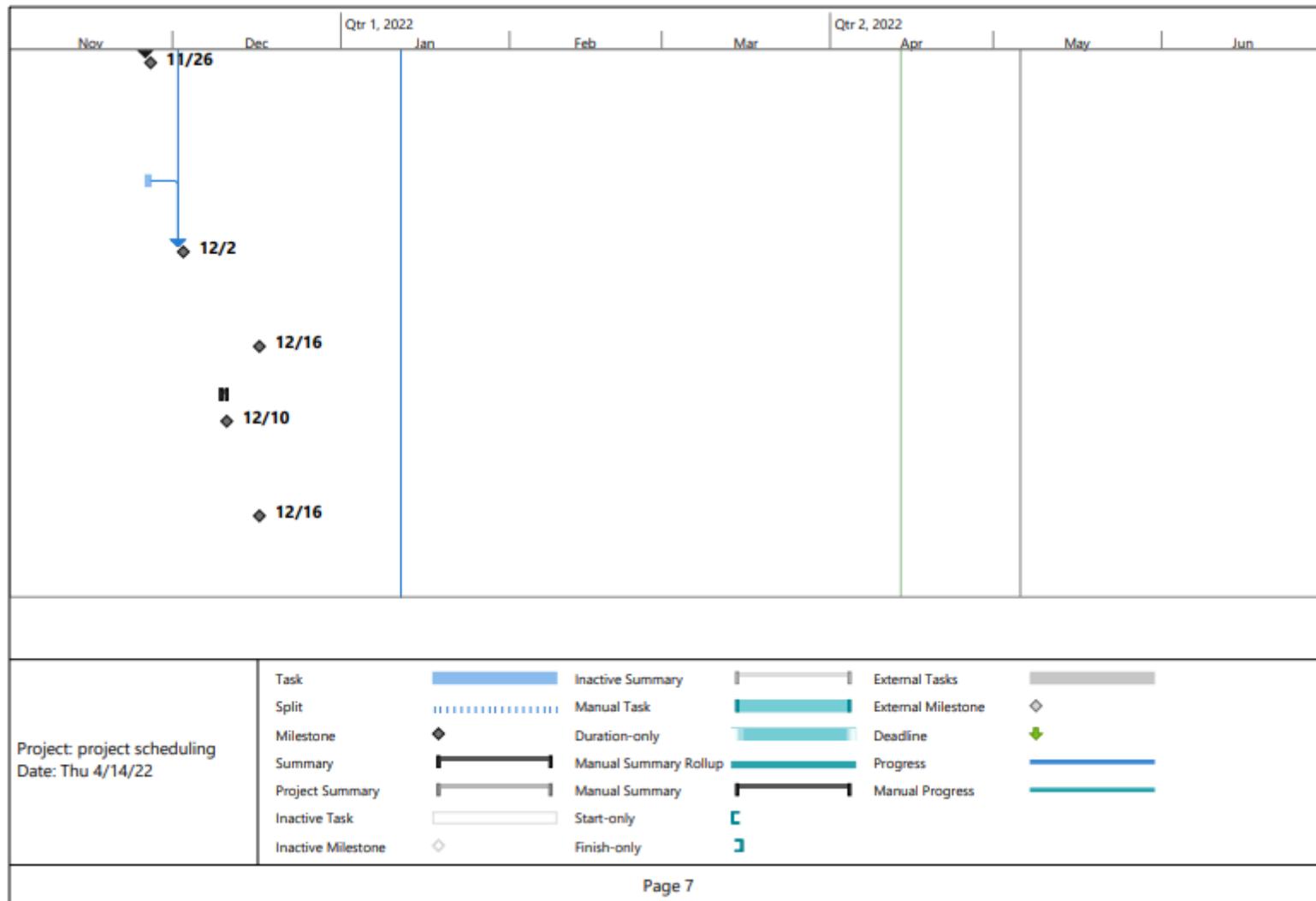
Project: project scheduling Date: Thu 4/14/22	Task		Inactive Summary		External Tasks	
	Split		Manual Task		External Milestone	
	Milestone		Duration-only		Deadline	
	Summary		Manual Summary Rollup		Progress	
	Project Summary		Manual Summary		Manual Progress	
	Inactive Task		Start-only			
	Inactive Milestone		Finish-only			

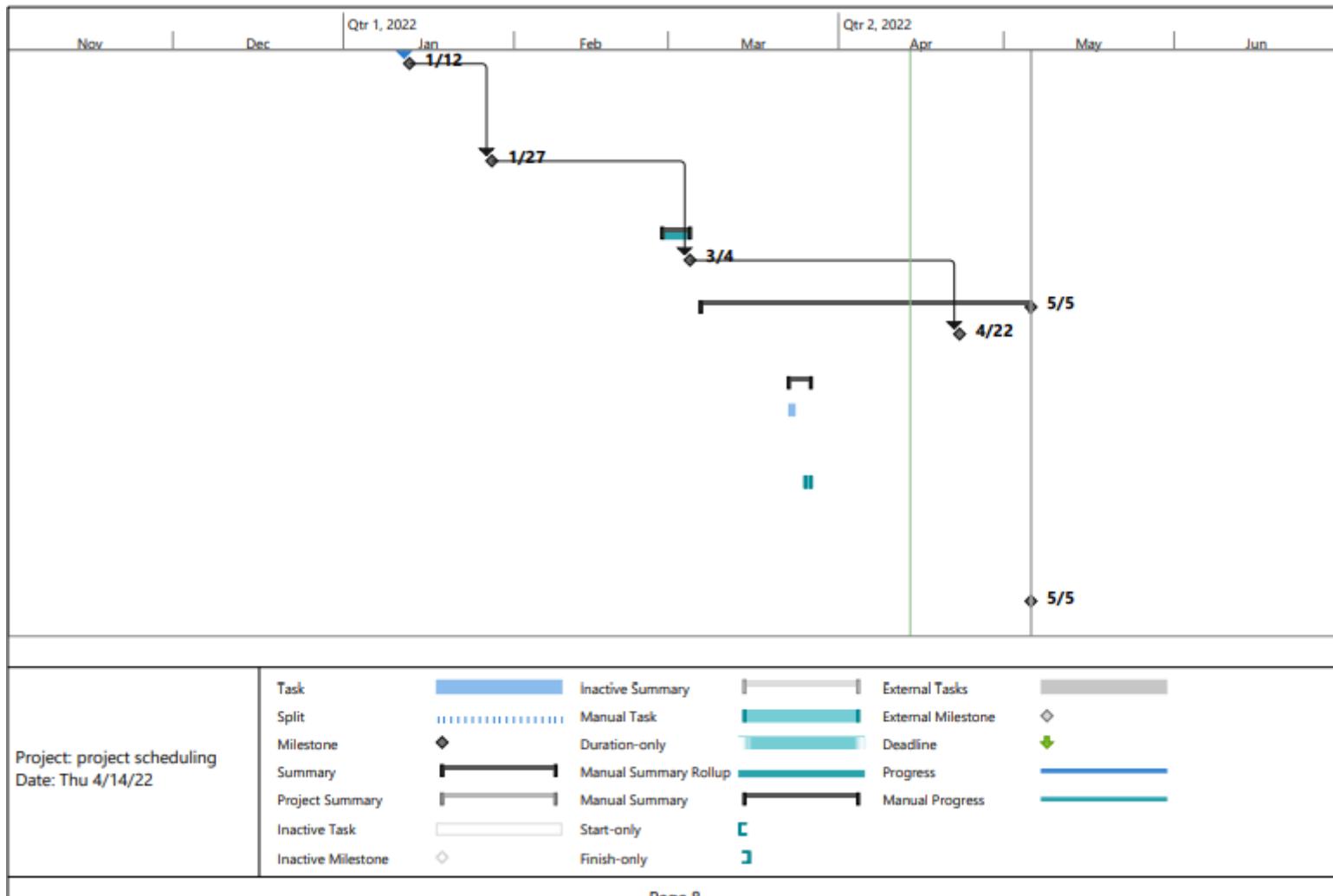
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Sep	Qtr 4, 2021	Oct
16		Improve the login and registration page by adding Validation using Javascript	3 days	Wed 11/24/21	Fri 11/26/21	15				
17		Create a MySQL database for parents	1 day	Fri 11/26/21	Fri 11/26/21					
18		Create a dashboard for parents using HTML	4 days	Mon 11/29/21	Thu 12/2/21	17,11				
19		Create a friends system using PHP	10 days	Sat 12/4/21	Thu 12/16/21					
20		Other Modules	1 day	Fri 12/10/21	Fri 12/10/21					
21		Submit Business Analysis Coursework	1 day	Fri 12/10/21	Fri 12/10/21					
22		Have meeting with supervisor to discuss the design phase	1 day	Thu 12/16/21	Thu 12/16/21					
Project: project scheduling Date: Thu 4/14/22			Task	Inactive Summary		External Tasks				
			Split	Manual Task		External Milestone				
			Milestone	Duration-only		Deadline				
			Summary	Manual Summary Rollup		Progress				
			Project Summary	Manual Summary		Manual Progress				
			Inactive Task	Start-only						
			Inactive Milestone	Finish-only						

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Sep	Qtr 4, 2021	Oct
23		Create a prototype of the chat application using HTML	15 days	Fri 12/24/21	Wed 1/12/22	13				
24		Enable connectivity between users.	10 days	Fri 1/14/22	Thu 1/27/22	23				
25		<b>Testing Phase</b>	5 days?	Mon 2/28/22	Fri 3/4/22					
26		Create a test plan of the application	5 days	Mon 2/28/22	Fri 3/4/22	24				
27		<b>Delivering Phase</b>	44 days	Mon 3/7/22	Thu 5/5/22					
28		Finish your project thesis	35 days	Mon 3/7/22	Fri 4/22/22	26				
29		<b>Other Modules</b>	3 days	Wed 3/23/22	Sat 3/26/22					
30		Submit Cyber Security Coursework	1 day	Wed 3/23/22	Wed 3/23/22					
31		Submit your Data Visualization and UX Coursework	1 day	Sat 3/26/22	Sat 3/26/22					
32		Showcase your project	1 day	Thu 5/5/22	Thu 5/5/22					
Project: project scheduling Date: Thu 4/14/22			Task		Inactive Summary		External Tasks			
			Split		Manual Task		External Milestone			
			Milestone		Duration-only		Deadline			
			Summary		Manual Summary Rollup		Progress			
			Project Summary		Manual Summary		Manual Progress			
			Inactive Task		Start-only					
			Inactive Milestone		Finish-only					









#### 4.1.8 Actual Time Schedule

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Sep	Qtr 4, 2021	Oct
1		Requirement Phase	19 days	Fri 10/8/21	Fri 10/29/21					
2		Plan a meeting with the supervisor to discuss the initial plans	1 day	Fri 10/8/21	Fri 10/8/21					
3		Research young people on the effects of teenagers on social media	5 days	Sat 10/9/21	Thu 10/14/21	2				
4		Fill the RP1 and ethics declaration	1 day	Fri 10/29/21	Fri 10/29/21					
5		Making Specifications	5 days	Wed 10/13/21	Mon 10/18/21					
6		Making Requirements	4 days	Wed 10/20/21	Sat 10/23/21					
7		Feasibility Study	4 days	Mon 10/25/21	Thu 10/28/21					
8		Planning Phase	20 days	Wed 10/13/21	Fri 11/5/21					
9		The scope of the project	3 days	Wed 10/13/21	Fri 10/15/21					
10		Risk Assessment	2 days	Sat 10/16/21	Mon 10/18/21					
11		Start making the project planning document	15 days	Tue 10/19/21	Fri 11/5/21	9,10				

Project: projectscheduling1  
Date: Wed 4/20/22

Task

- Inactive Summary
- Manual Task
- External Tasks
- External Milestone
- Duration-only
- Deadline
- Manual Summary Rollup
- Progress
- Manual Progress
- Start-only
- Finish-only

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Qtr 4, 2021	
								Sep	Oct
12		<b>Design Phase</b>	<b>15 days</b>	<b>Mon 11/8/21</b>	<b>Wed 11/24/21</b>				
13		Book a meeting with your supervisor to discuss design phase	1 day	Mon 11/8/21	Mon 11/8/21				
14		Create a design for the chat application UI	6 days	Mon 11/8/21	Sun 11/14/21				
15		Create a design of the parent dashboard UI	5 days	Mon 11/15/21	Fri 11/19/21				
16		Design of form validation within the login/registration forms	4 days	Sat 11/20/21	Wed 11/24/21				
17		<b>Other Modules</b>	<b>1 day</b>	<b>Fri 12/10/21</b>	<b>Fri 12/10/21</b>				
18		Submit Business Analysis Coursework	1 day	Fri 12/10/21	Fri 12/10/21				
19		<b>Development Phase</b>	<b>76 days?</b>	<b>Fri 11/26/21</b>	<b>Thu 3/3/22</b>				
Project: projectscheduling1 Date: Wed 4/20/22			Task		Inactive Summary		External Tasks		
			Split		Manual Task		External Milestone		
			Milestone		Duration-only		Deadline		
			Summary		Manual Summary Rollup		Progress		
			Project Summary		Manual Summary		Manual Progress		
			Inactive Task		Start-only				
			Inactive Milestone		Finish-only				

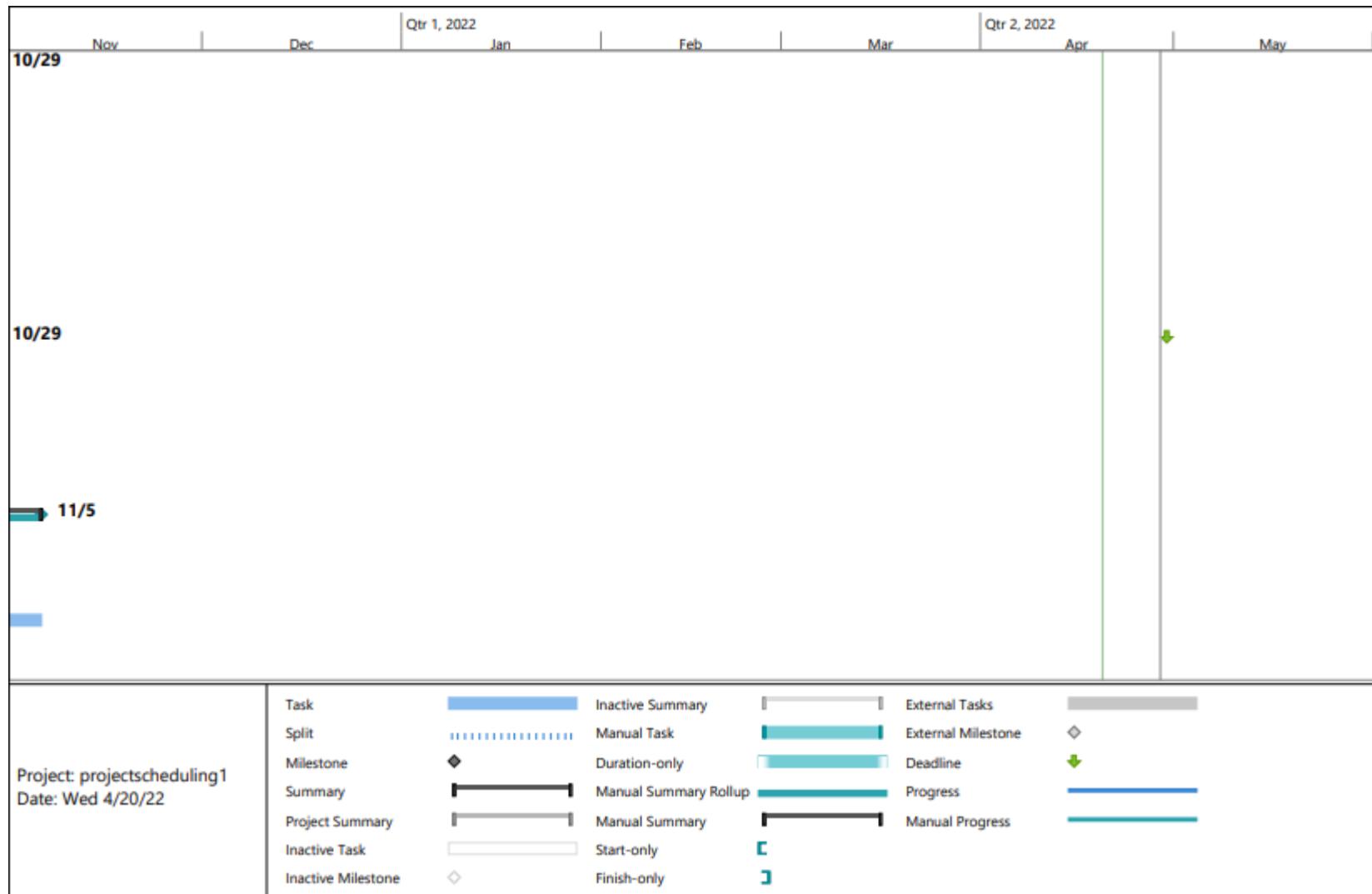
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Qtr 4, 2021	
								Sep	Oct
20	●	Create an UI of the Registration page and login page with connectivity to	14 days	Fri 11/26/21	Tue 12/14/21				
21	★	Create Parent Dashboard with all functionalities included	35 days	Thu 12/16/21	Fri 1/28/22				
22	■	Dashboard Menu UI	7 days	Thu 12/16/21	Thu 12/23/21				
23	★	Other Tasks	1 day	Sat 12/18/21	Sat 12/18/21				
24	■	Complete RP 2	1 day	Sat 12/18/21	Sat 12/18/21				
25	●	Friend Request Functionality	14 days	Fri 12/24/21	Tue 1/11/22	22			
26	●	Notifications System	3 days	Wed 1/12/22	Fri 1/14/22	25			
27	●	Cyberbullying and Internet Safety Guide	12 days	Fri 1/14/22	Fri 1/28/22				
<hr/>									
Project: projectscheduling1 Date: Wed 4/20/22		Task		Inactive Summary		External Tasks			
		Split		Manual Task		External Milestone		◇	
		Milestone	◆	Duration-only		Deadline		▼	
		Summary		Manual Summary Rollup		Progress			
		Project Summary		Manual Summary		Manual Progress			
		Inactive Task		Start-only					
		Inactive Milestone	◇	Finish-only					

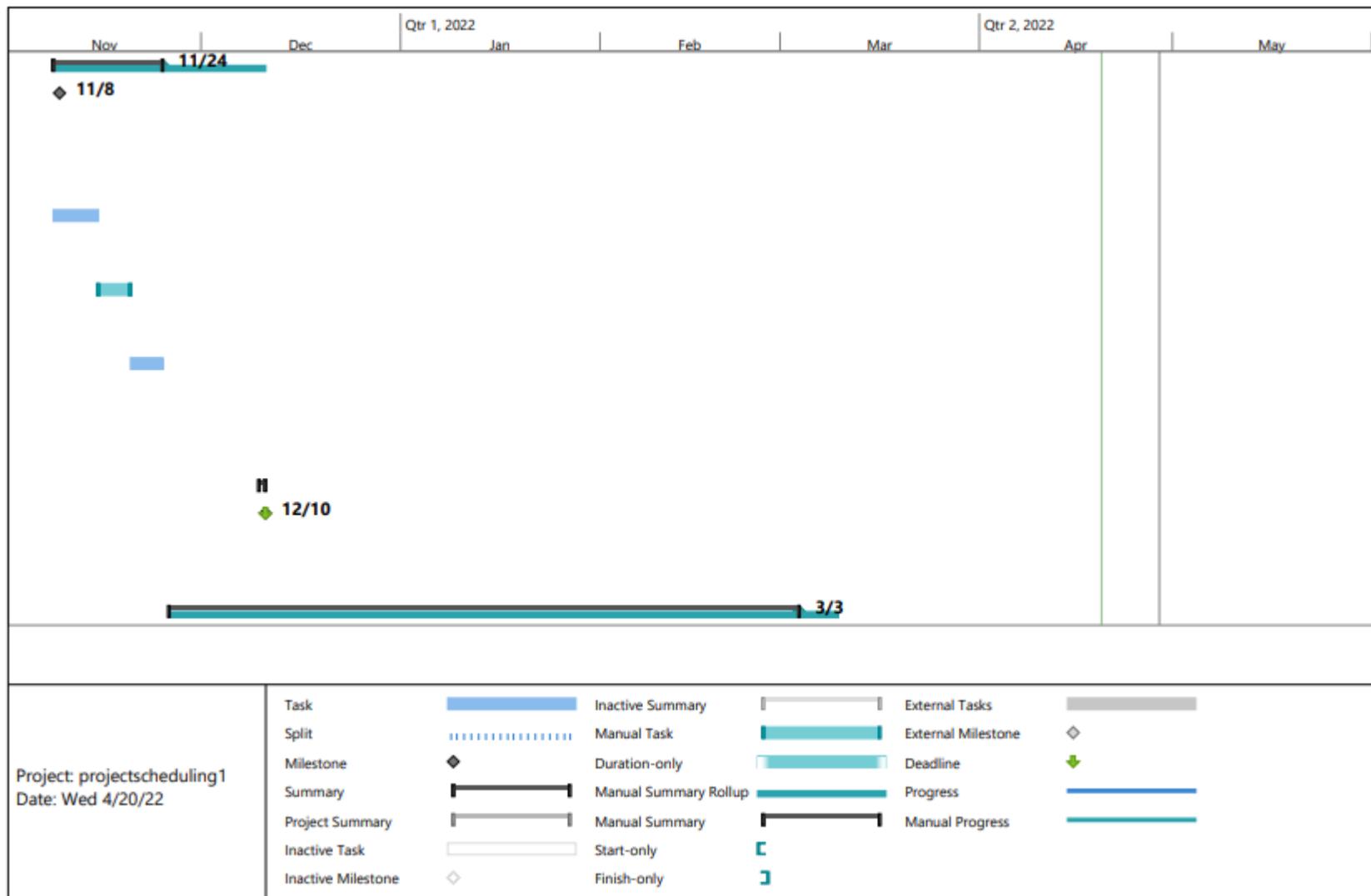
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Sep	Qtr 4, 2021	Oct
28		Create Chat Application with all functionalities included	36 days?	Tue 1/18/22	Thu 3/3/22					
29		Chat Application UI	12 days	Tue 1/18/22	Tue 2/1/22					
30		Friends List	4 days	Wed 2/2/22	Mon 2/7/22	29				
31		Other Tasks	2 days?	Fri 2/18/22	Sat 2/19/22					
32		ISM presentation	1 day?	Fri 2/18/22	Fri 2/18/22					
33		Complete RP 3 Form	1 day	Sat 2/19/22	Sat 2/19/22					
34		Starting a Chat	7 days	Tue 2/8/22	Wed 2/16/22	30				
35		Sending messages	4 days	Thu 2/17/22	Mon 2/21/22	34				
36		Offensive word filter	2 days	Tue 2/22/22	Wed 2/23/22	35				
37		Previous Chats	7 days	Thu 2/24/22	Thu 3/3/22	34,35				
38		Testing Phase	4 days?	Fri 3/4/22	Wed 3/9/22					
39		Unit Testing	4 days	Fri 3/4/22	Wed 3/9/22					
40		Delivering Phase	84 days?	Thu 1/6/22	Thu 4/28/22					
Project: projectscheduling1 Date: Wed 4/20/22		Task		Inactive Summary		External Tasks				
		Split		Manual Task		External Milestone				
		Milestone		Duration-only		Deadline				
		Summary		Manual Summary Rollup		Progress				
		Project Summary		Manual Summary		Manual Progress				
		Inactive Task		Start-only						
		Inactive Milestone		Finish-only						

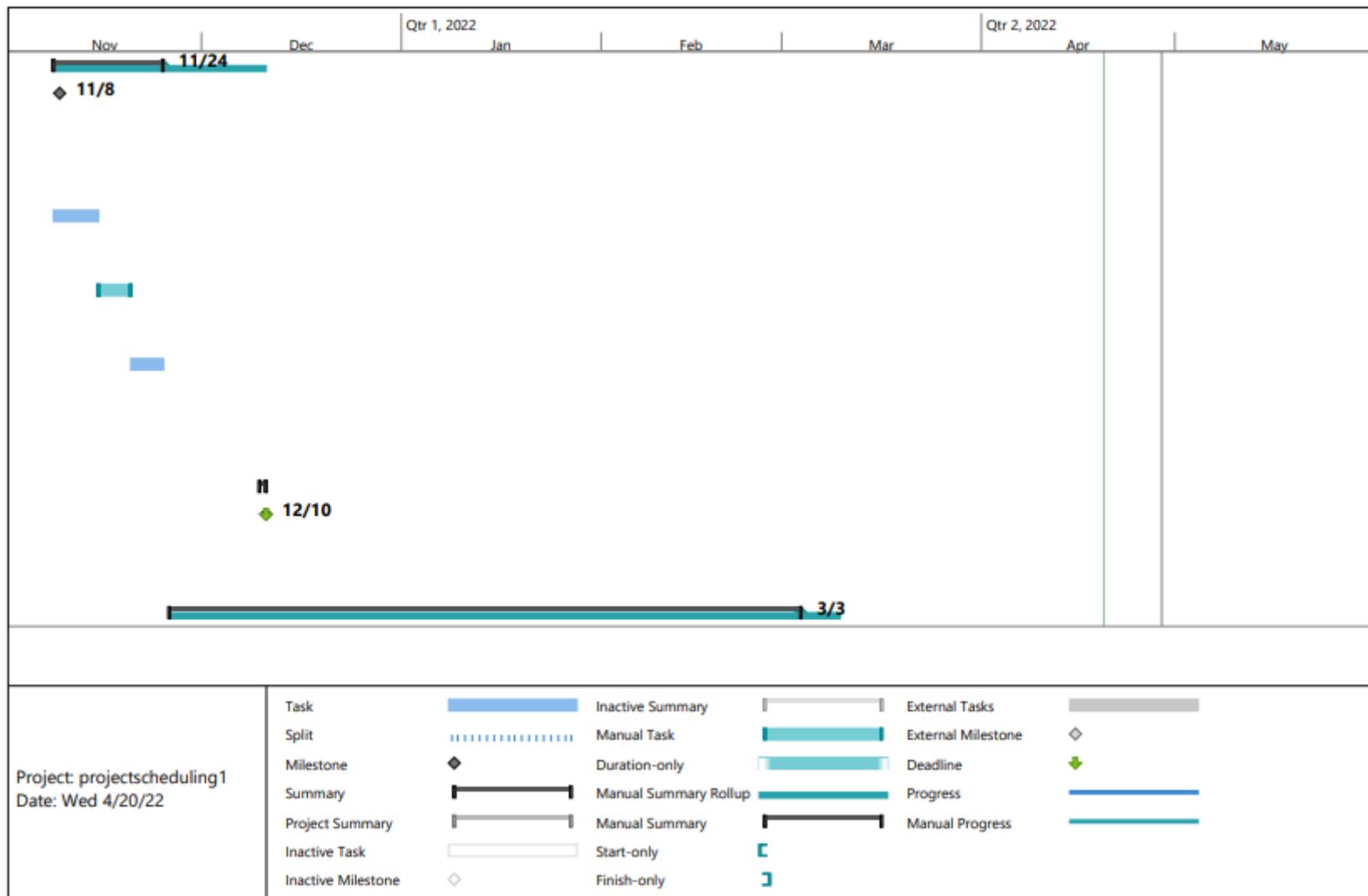
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Sep	Qtr 4, 2021	Oct
41		Finish your project thesis	68 days	Thu 1/20/22	Wed 4/20/22					
42		Submit Report, Project and Demo	1 day?	Fri 4/22/22	Fri 4/22/22					
43		Other Modules	13 days?	Wed 3/16/22	Fri 4/1/22					
44		Submit Cyber Security Coursework	1 day	Wed 3/16/22	Wed 3/16/22					
45		Submit your Data Visualization and UX Coursework	1 day	Fri 3/18/22	Fri 3/18/22					
46		ISM report	1 day?	Fri 4/1/22	Fri 4/1/22					
47		Showcase your project	1 day	Thu 4/28/22	Thu 4/28/22					

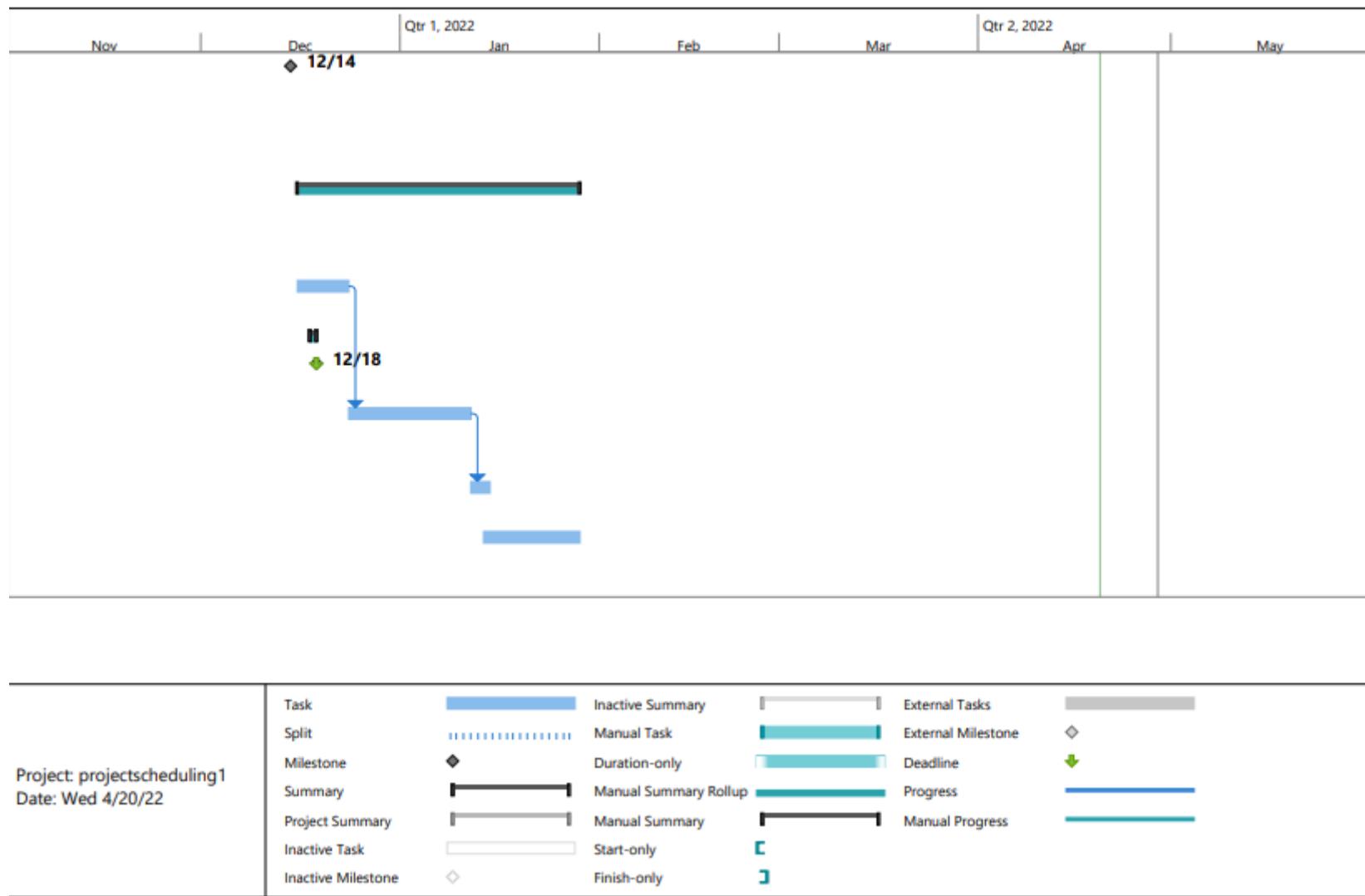
  

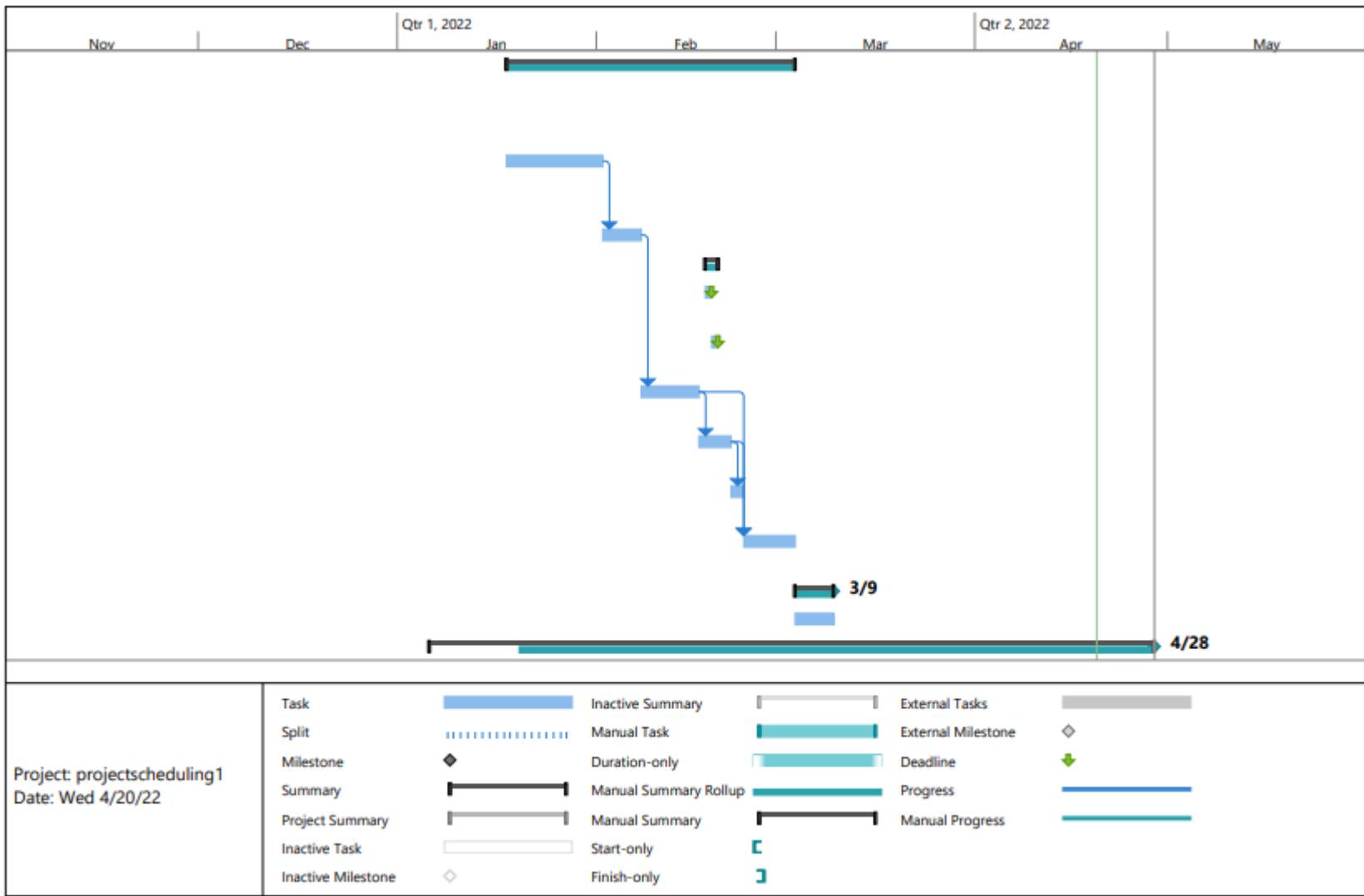
Project: projectscheduling1 Date: Wed 4/20/22	Task		Inactive Summary		External Tasks	
	Split		Manual Task		External Milestone	
	Milestone		Duration-only		Deadline	
	Summary		Manual Summary Rollup		Progress	
	Project Summary		Manual Summary		Manual Progress	
	Inactive Task		Start-only			
	Inactive Milestone		Finish-only			

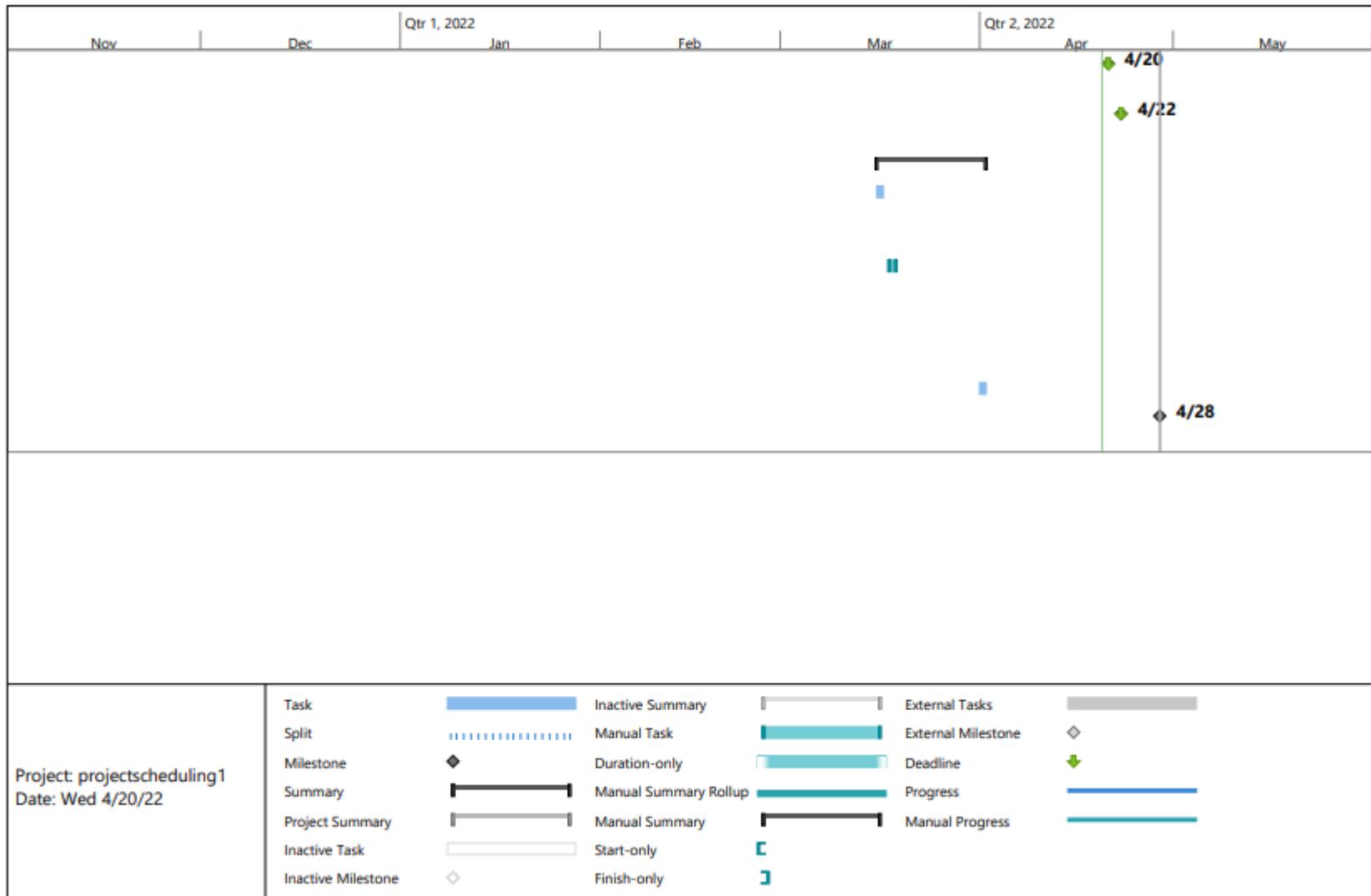












#### **4.1.9      Need of the System**

1. Efficient Communication
  - To allow reliable communication between users over real time.
  - Involvement of Parent in their child's social media life.
  
2. Intuitive Application UI
  - Usability is needed for the chat application and parent dashboard to create an easy experience for the users.

#### **4.2      Scope of the Project**

1. The parent dashboard provides the following facilities:
  - Provide login and registration through PIN and email and one child can be registered per parent.
  - Both child and parent share the same PIN but share different passwords.
  - Provides functionality to for the parent to view users that are friends with their child. They can also add, remove, and block users for the child.
  - Cyberbullying Guide that parents can view to learn more about cyberbullying
  
2. SafetyNet's Chat Application:
  - Chat system provides text transmission through real time between users.
  - System provides a filtering system that disables users from certain messages.
  - Users can start and view previous chat with users.
  - Internet Safety guide to inform users about being safe while using social media platforms.

3. Simple and interactive GUI
  - System of the chat application and dashboard facilitates simple and interactive graphical user interface for the user while using the platform.

### **4.2.1 Feasibility Study**

A feasibility study is an analysis that considers all factors to find out the chances of the project being successful.

There are three types of feasibility:

1. Operational Feasibility
2. Economic Feasibility
3. Technical Feasibility

The feasibility study was the most time consuming because it explores the likelihood of a project being completed from a technical perspective. Therefore, it puts a lot of factors into account such as the budget, timeframes, and technology used during the project's development. The project will provide a user-friendly approach meaning users will need minimal technical skills should be able to operate the application. This project is technically feasible because it was completed within the time schedule and the software and hardware required to develop the project were free and they are easily available.

Economic Feasibility was important because it analyses the financial costs while developing the project. The financial costs include hardware/software which includes the cost of purchasing computers. It also includes personnel costs, meaning the money spent on the people involved in the project and operational costs which are the expenses required for the day to day running of the system. This could relate to paying people to maintain the software.

1. Personnel Costs – Free
2. Operational Costs – Free
3. Financial Costs – Free

From these results, this project is economically feasible because these factors are free and in addition, it has benefits for developing the project which was stated earlier in the report. Therefore, since the project has benefits that obviously outweigh the costs of the project, it is economically feasible.

Operational Feasibility is defined as “a measure of how well a proposed system solves the problems and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis phase of system development.” (Osarome, 2011) The chat application and parent dashboard must be simple to use so there is no confusion while using it.

It meets the needs of the project because it follows all the specifications set at the beginning and the platform is user friendly with messages on how to use certain parts of the platform like the cyberbullying guide on the Parent’s Dashboard and there are also error messages throughout the platform if things do not go as intended to inform the user. Tutorials are not required to use the application because it is easy to use. All the points previously mentioned justifying that this project was operationally feasible.

#### **4.2.2 Technology**

The architecture of the project consists of the front-end and the back-end. The front-end refers to what the user sees when using the platform and back-end refers to the server, application and database that works together to deliver data from the database to the front-end.

### **4.2.3 Front End**

For the front-end, it was decided that combinations of technologies were going to be used. These consist of:

1. HTML - also known as Hypertext Markup Language, it provides the overall design and functionality of the application.
2. CSS – Cascading Style Sheets was implemented to create an aesthetically pleasing user interface for the platform.
3. JavaScript – This was used to provide interactivity within the application and dashboard and later in the report, communication protocols involving JavaScript will be explained further.
4. jQuery – This is a fast, small, cross-platform JavaScript library. It is designed to simplify the client-side scripting of HTML and is used for AJAX interactions in this project.

### **4.2.4 Back End**

There were different tools that were used to deliver data to the front end. This consists of:

- PHP

PHP also known as Hypertext Pre-processor is a scripting language that is used to create dynamic websites or applications, usually it brings data from the database onto the platform. There's a lot of different scripting languages however PHP was used because of the following reasons:

1. Open Source: This means that the code is designed to be easily accessible. Therefore, this means that PHP can be installed quickly and free of charge.

2. Versatility: PHP is independent, meaning it is available to many operating systems, web browsers, and web servers so it is easy to deploy on platforms like SafetyNet at a minimal cost.
3. Fast Loading Speeds: The aim of the project is to create an intuitive UI; responsiveness plays a huge part in achieving that goal. Therefore, using PHP contributes to improved responsiveness because pages load faster as compared to other back-end languages. In conclusion, this improves user satisfaction because the data retrieval is running smoothly and efficiently so users can have the best experience possible.

#### **4.2.5 Databases**

A relational database management system (RDBMS) is a database management system (DBMS) that stores data in tables and can handle multitudes of data and handle complex queries. MySQL was the relational database used for the project and this was for various reasons:

1. Open Source: It is easily accessible meaning everyone can use the software for free and it is compatible with a lot of programming languages, like PHP for instance.
2. Fast and Reliable: MySQL is very responsive in retrieving queries to display data to the user efficiently and it's very simple to learn and use.

#### **4.2.6 Communication Protocols**

Lastly, for the project, AJAX will be the method when it comes to communication protocols because it is very reliable and widely supportive. AJAX which stands for Asynchronous JavaScript and XML is a server-side script that allows web applications to handle user functionality within the application. This is useful towards the project because this reduces the need for the page to refresh and in result, users will not be able to communicate in real time.

AJAX is not a programming language, but a part of JavaScript. The interactions are initiated by JavaScript and the changes are made without a page refresh. AJAX will be used during the form entries to either log on the parent or child onto the platform, to add friends or to send messages between users on the chat application UI.

#### **4.2.7 Risk Assessment**

Risk	Severity	Likelihood	Risk Impact	Risk Control Techniques
The code might be in poor quality	Very Unacceptable	Unlikely	High	Have a test plan to make sure code is working as intended.
Loss of Source code due to a technical failure	Very unacceptable	Possible	High	Save your source code on GitHub.
The project may not be completed in time	Very Unacceptable	Possible	High	Keep track of your progress using your Gantt chart to see when key

				factors such as tasks, milestones and when to complete them.
Poor productivity due to the deadline of the project being far away	Very Unacceptable	Possible	High	Limit the number of days to complete certain tasks to generate urgency.
Losing Documentation of work due to technical failure	Very Unacceptable	Possible	High	Always keep backups of your documents on Google Drive.
A lot of requirements may be changed, and new ones may be implemented	Acceptable	Possible	Medium	Reschedule the scope
Database data might be corrupted due to technical failure	Very Unacceptable	Possible	High	Keep backups of database files on google drive.
Unrealistic Scheduling	Very Unacceptable	Possible	High	Developing and adhering to a software project plan
Supervisor may not be available	Tolerable	Possible	Medium	Communication between supervisor and student must be constantly ongoing. If there is a reason for absence, that must be discussed in the conversation and the student could seek other tutors in the meantime.

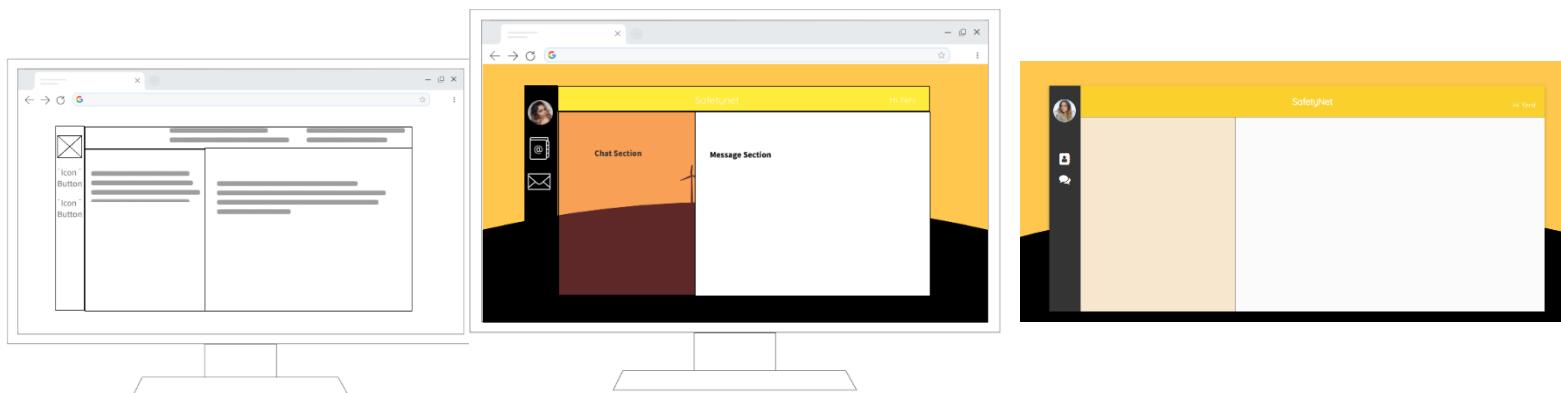
Project Design and deliverables is incomplete	Very Unacceptable	Possible	High	Define the scope in detail
---	-------------------	----------	------	----------------------------

Table 3: Risk Assessment

## **Design Phase**

### **4.2.8 Design of Chat Application UI**

As shown in Chapter 3, those images were the final user interface of the platform, from the login/registration form to the dashboard and chat application UI which took over 2 weeks to come up with a concrete and final design. However, there were a lot of thoughts that went into designing the user interface of the various functionalities, apart from the chat application, the other user interfaces were designed and developed from the ground up without any changes or new versions. The chat application previously had a design but was scrapped and a new concept was developed.

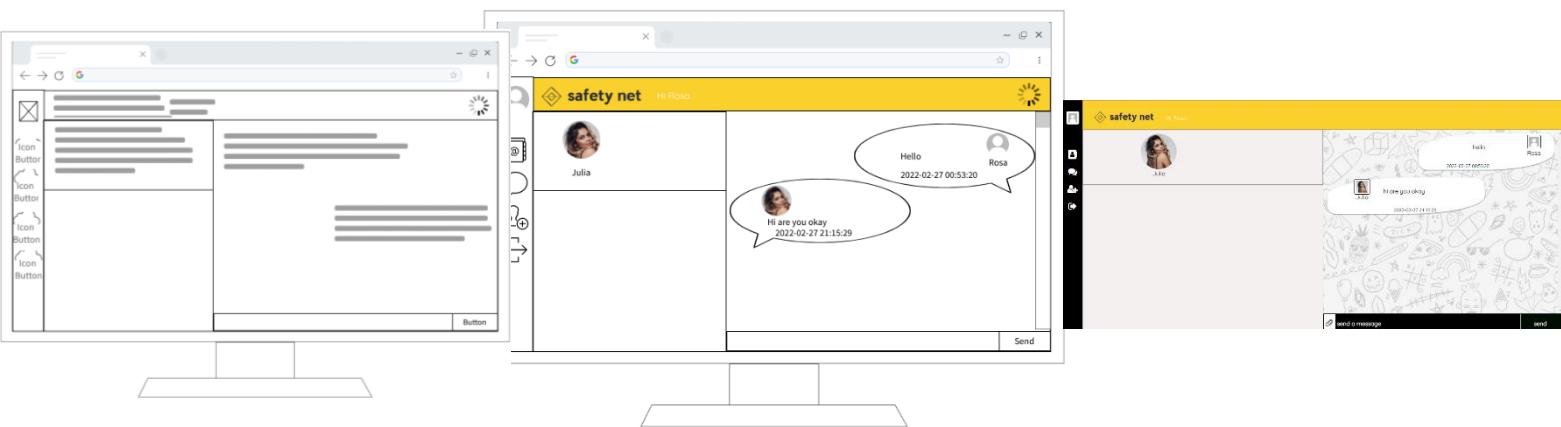


**Figure 21: Transition between the initial concept design**

The wireframe had to be created first to process any thoughts on how the design can be improved before creating a prototype of the user-interface. Wireframes are blueprints that are useful for thinking and communicating about the structure

of this platform. Initially, the plan was to have the user interface to not take up the whole size of the browser, with a background image showing from behind.

However, this design was scrapped because the user may not like the background image and the idea was to make it more like an actual application, so when the user loads it on their browser it takes up the whole page, like it would be if it was a software application downloaded from the internet. So, the design remained similar but had a few tweaks and this will be shown below.

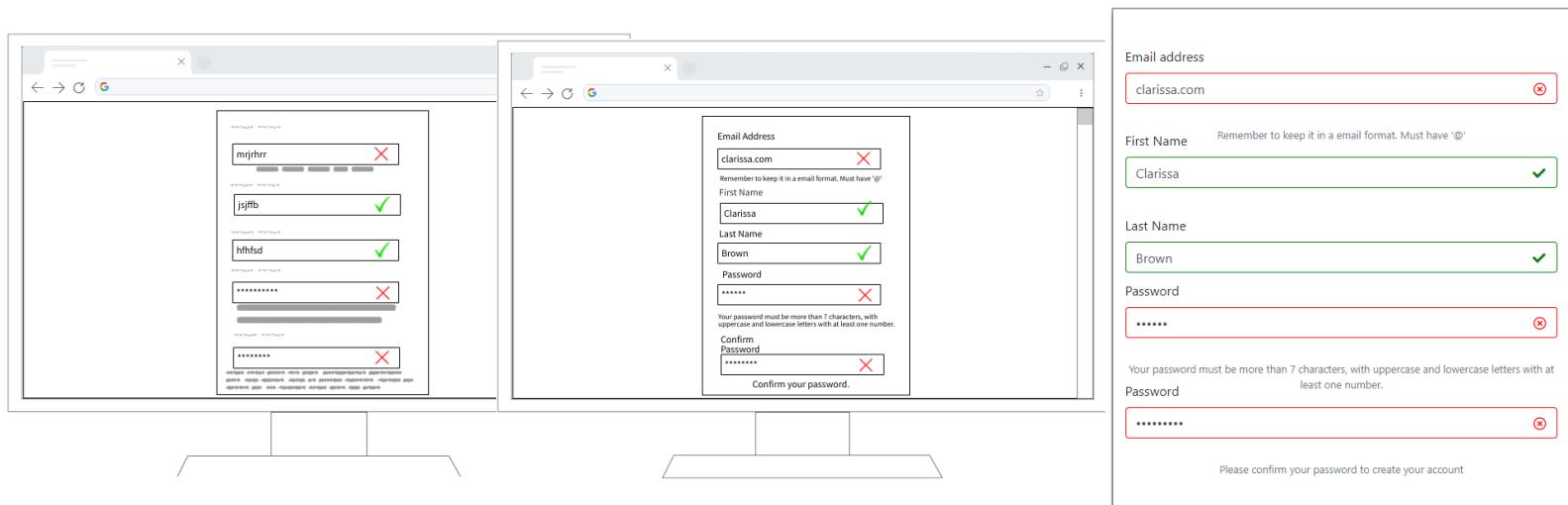


**Figure 23: Transition from the wireframe to the final design**

#### **4.2.9 Design of Form Validation within the login/registration forms**

During the creation of the login/registration UI, the next task was to focus on the form validation design that was going to be used for the forms. This took over 4 days as it was important, and the task needed some attention paid to. Form validation is defined as 'a technical process where a web-form checks if the information provided by a user is correct.' Birkett (2019) Therefore, the form will alert the user if something is wrong with their input and if everything is correct, it will allow the user to proceed into either the Parent's Dashboard or the chat

application. The idea was to make a wireframe of the layout of the form displaying some form validation techniques.



**Figure 24: Transition from the wireframe to the final form validation design**

While designing the form validation techniques, it was decided that the forms will be designed using an inline validation system. According to Treder, inline validation is “shown immediately after the user types in data to form fields.” (Treder, 2013)

In the context of this project, there is a microcopy underneath the input boxes to aid the user in understanding the formats needed for the input fields. Microcopy is small pieces of information used to improve the user experience. This ranges from error messages, tips, instructions and so on, microcopy is important to the design because it provides clarity to the user.

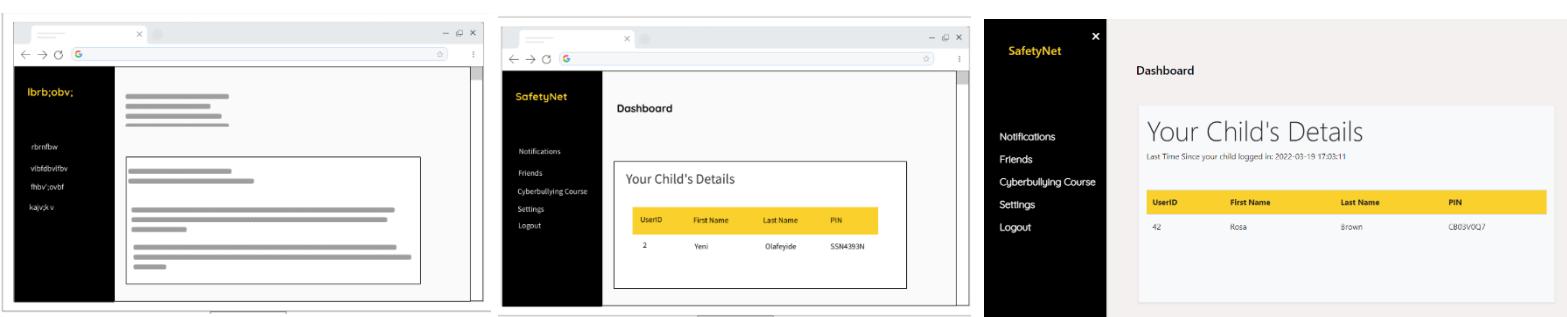
From the design, after the user enters their details, if the information is in the correct format, the input-box border will be coloured in green with an addition of a green tick to indicate that the user has correctly entered the information as soon as the user clicks off the input field. On the other hand, when the user

enters their information in the wrong format, the input-box border will be coloured in red with an addition of a red tick to indicate that the user has incorrectly entered the information when they click off the input field.

It was chosen for the forms to be designed this way because it is proven that users will make fewer mistakes when they use forms with this design. A sample about the usage of inline validation forms was taken and it was learnt that there is a 22% increase in success rate and a 22% decrease in errors made when using similar forms. (Treder, 2013) This shows that it is clearly effective and as result increases user satisfaction because the chances of users repeating the registration process repeatedly are unlikely.

### 4.3 Design of Parent Dashboard

The dashboard's design was well thought out as the task took over 5 days because the purpose of the design was to provide a solution for organizing and presenting data in a clear way, so time was needed to plan the structure. In the context of the project, the data was represented as the information regarding their child on the platform. The mission of the dashboard was to provide parents with relevant data so they can quickly interpret and analyse. A wireframe had to be created to understand the direction that was being taken with the design before creating a prototype.



**Figure 25: Transition from the wireframe to the dashboard prototype**

The initial thought process when designing the dashboard user interface was how can it suit its intended audience? The audience was already established before this question however, knowing what type of parents will be using the dashboard was not information that could be extracted. It could be parents from Gen Z, Y or even X, so the idea was to make an interface that is easy to use so parents from different generations can use it with ease.

To improve usability, the design was made to provide immediate access to relevant information. The design followed the 'five-second rule' meaning the relevant data should be accessible after the user loads up the dashboard. (Jinny, 2020) The sidebar shows the different functionalities that the user has access to, and it is displayed from the most important to the least important.

This is referred to as the inverted pyramid which is defined as "is a method for presenting information in descending order of importance." (Bradley, 2013) Therefore, in figure 8, the friend system functionality is more important than the logout functionality, hence why the friends functionality comes first. The right type of visualization had to be chosen to meet the project's aim and it was decided that using tables will suit this dashboard best because it's useful for displaying large amounts of data and it made the most sense from a logical point of view.

Overall, the design made the dashboard simple to use, with clear fonts, users should be able to read clearly, and the design uses a minimal number of colours and the dashboard follow a three colour scheme to create brand recognition and information is grouped into categories which improve the user experience.

### **4.3.1    What is UML**

UML also known as Unified Modelling Language is a modelling language with a set of diagrams used to model application structures, behaviours, and processes. These diagrams were created to visualize the project and how the system or process will work.

### **4.3.2    Use Cases**

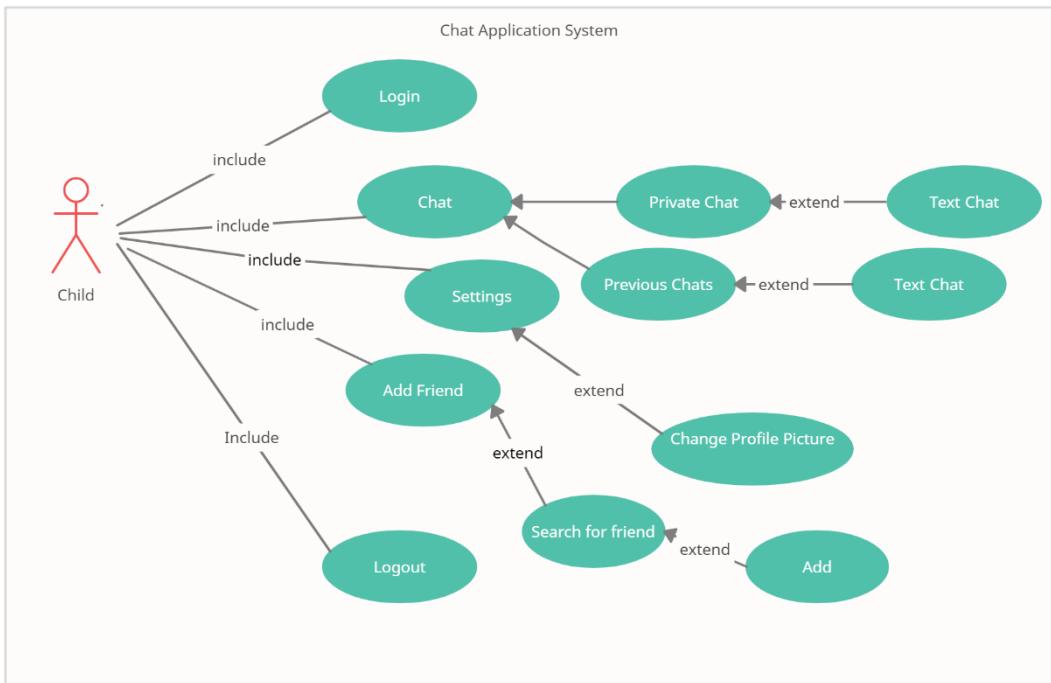
Use-Cases models the systems from the user's point of view. Using several notations and connectors, it shows the users interaction with the system and represents the following:

- The scope of your system.
- The goals that the application helps actors achieve.
- Scenarios when the user interacts with the system.

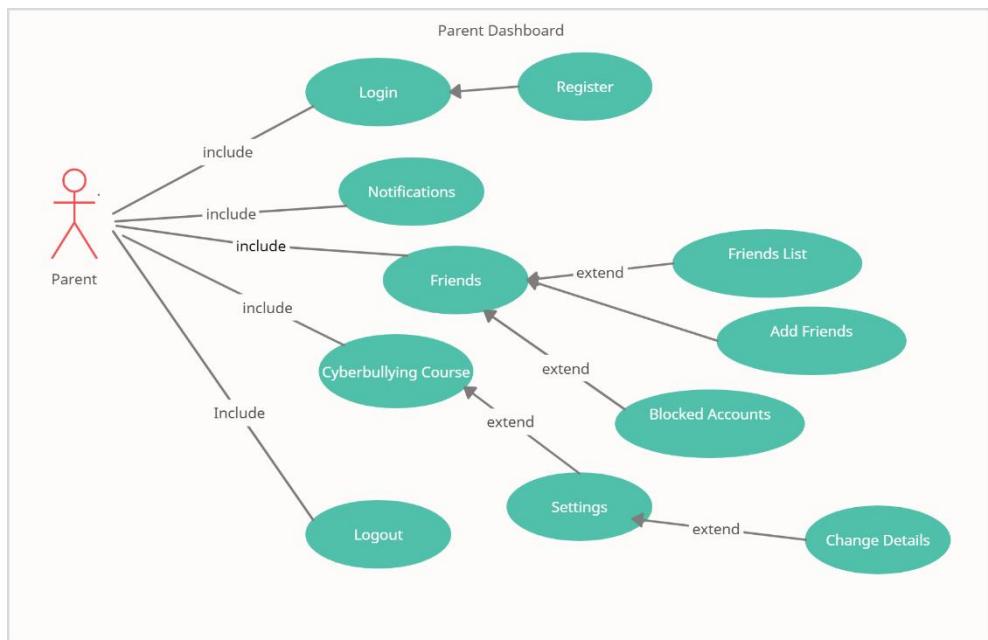
Actors: Stick figures that represents the people using the use cases.

Include: This relationship is modelled between the use cases when a use case includes the behaviour sequence of another use case.

Extend: The use case consists of one or several behaviour sequences that describes additional behaviour that can potentially come with the base use case.



**Figure 26: Use Case Diagram for Chat Application System**



**Figure 27: Use Case Diagram for Parent Dashboard System**

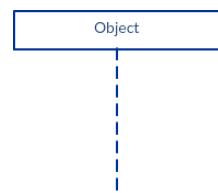
### 4.3.3 Sequence Diagrams

Sequence Diagrams are used to show how objects interact in each situation. It is organized in time, so it shows the start to finish of an interaction. Therefore, the time progress as you go down the page. The objects in this sequence diagram are listed from left to right.

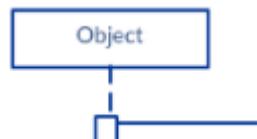
Actor - Stick figures that represents the people using the use cases.



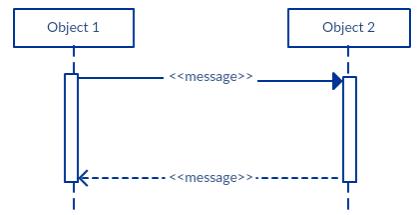
Lifelines – The Participant in the interaction.



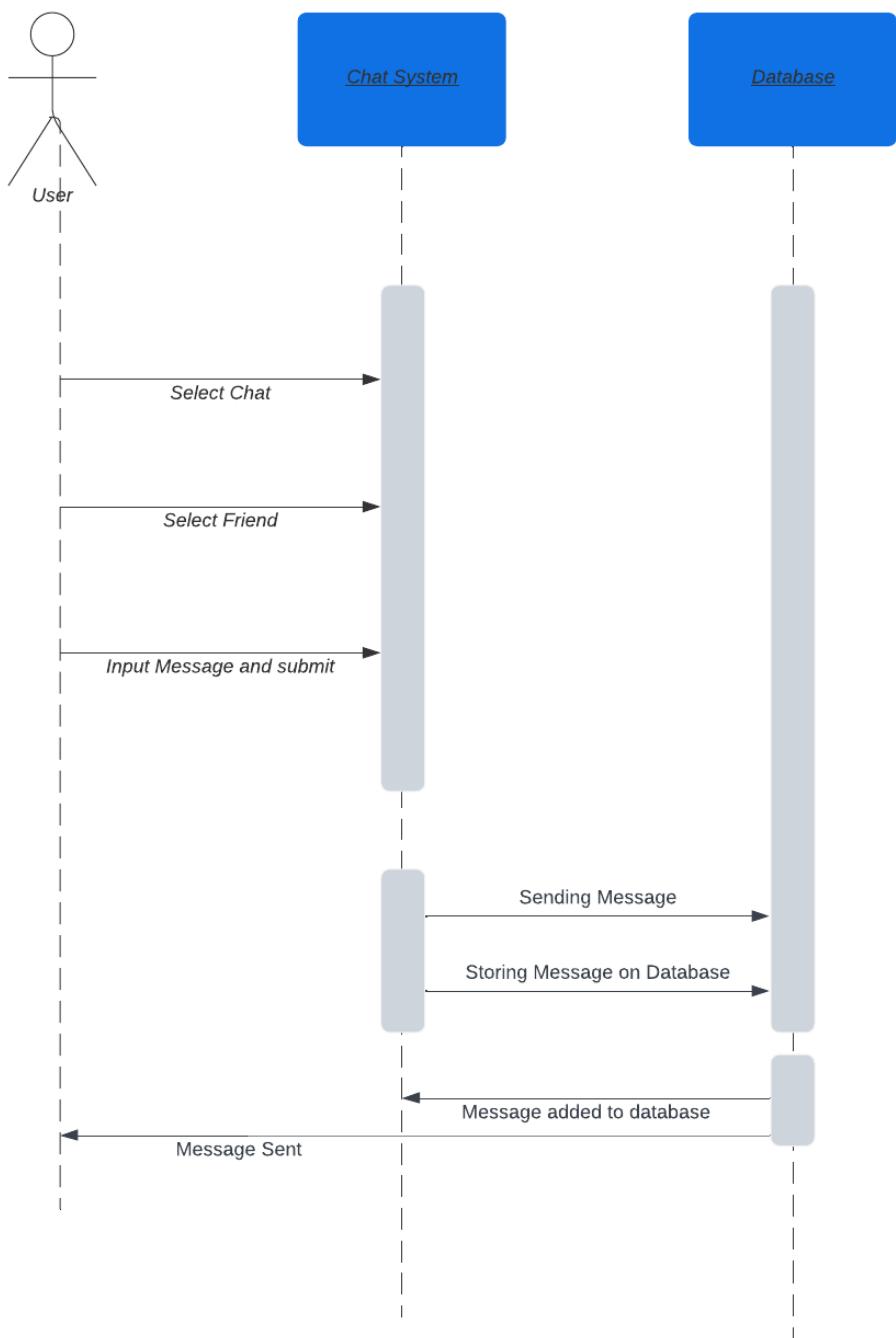
Activations – The rectangle on the lifeline represents the period during which an element is performing an operation.



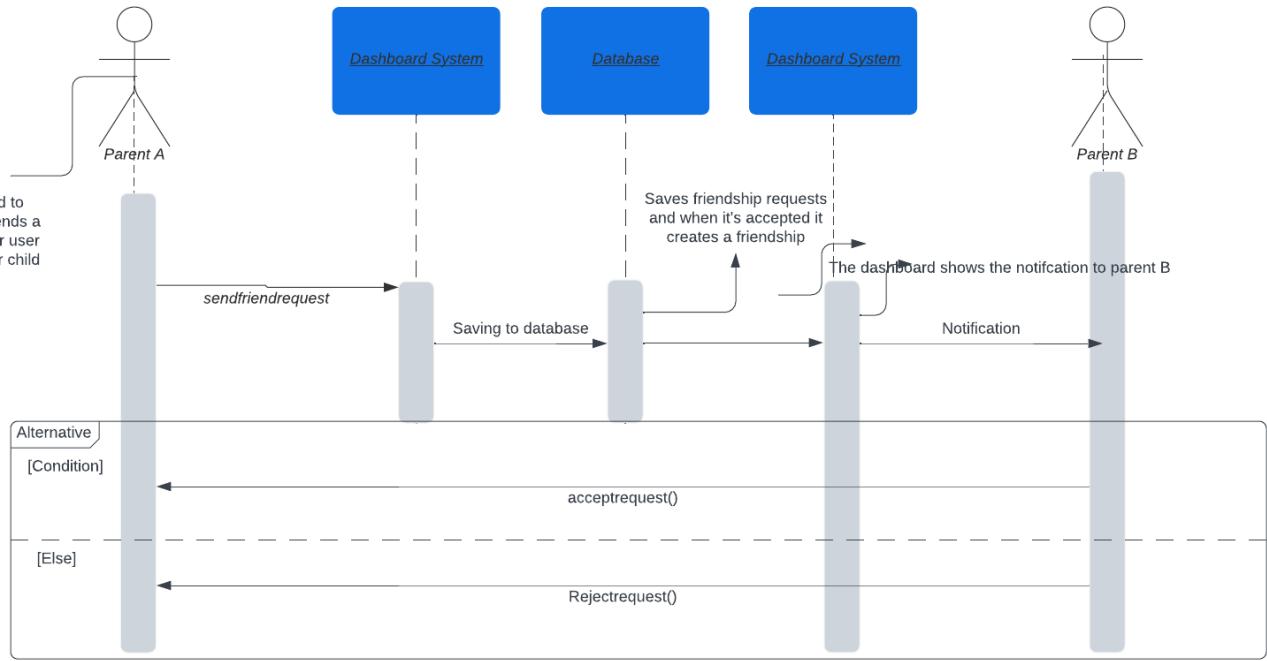
Call Message – The communication between lifelines in an interaction.



Return Message – The returned message between lifelines in an interaction.



**Figure 28: Sequence Diagram for the child sending a message**

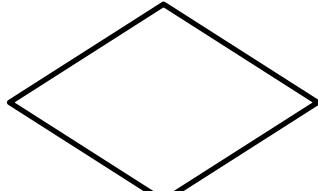


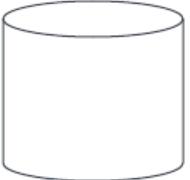
**Figure 29: Sequence Diagram for Parent A sending a friend request to Parent B**

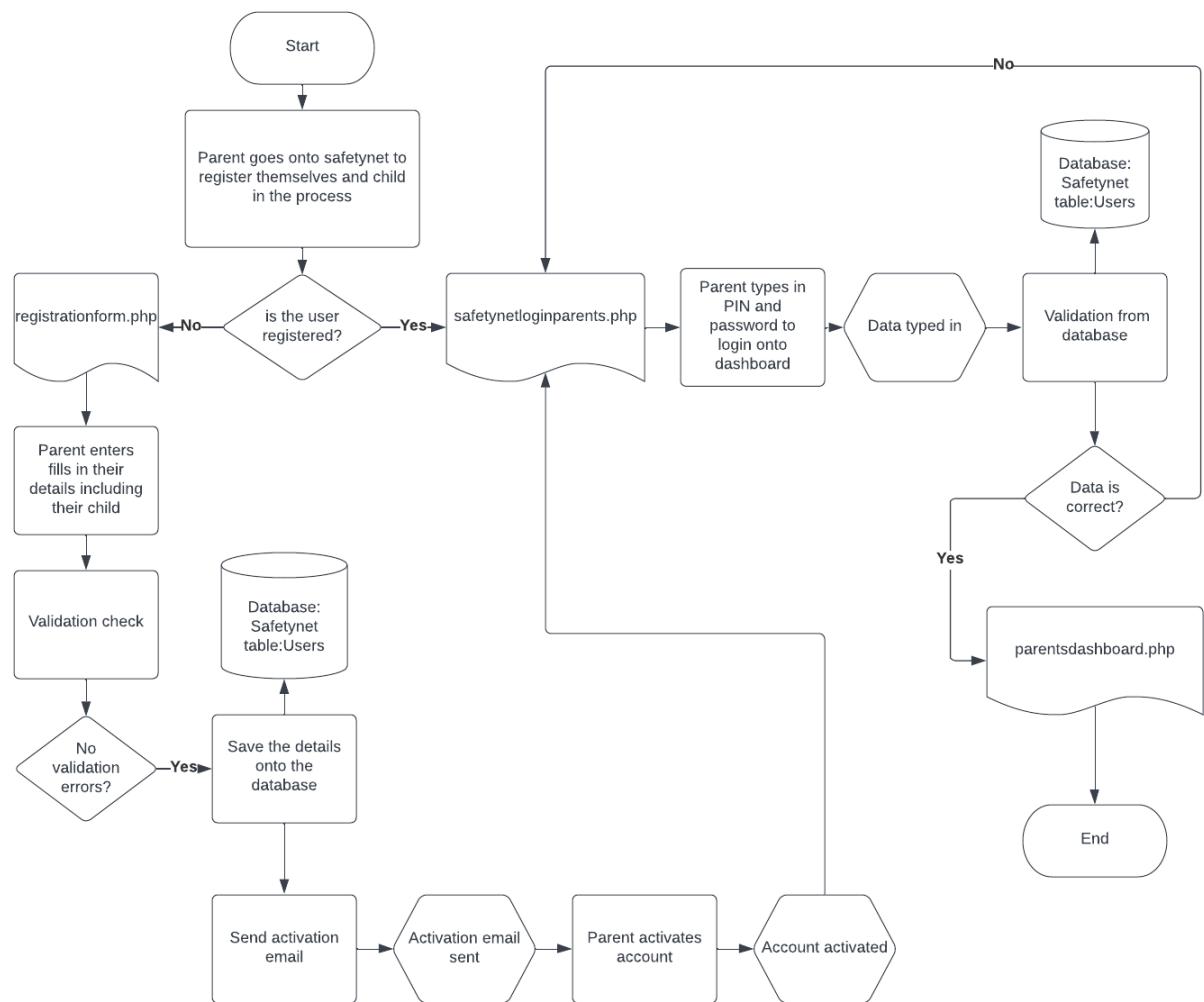
#### 4.3.4 Flowcharts

Flowcharts are not UML diagrams; however, they are diagrams that depicts a process or a computer algorithm. Flowcharts use shapes like rectangle, ovals, diamonds to show the steps, alongside arrows to show the flows and sequence. The difference between UML diagrams and flowcharts is that UML diagram represents the workflow of activities in a system while flowcharts are graphical diagrams represents the sequence of steps to solve a problem.

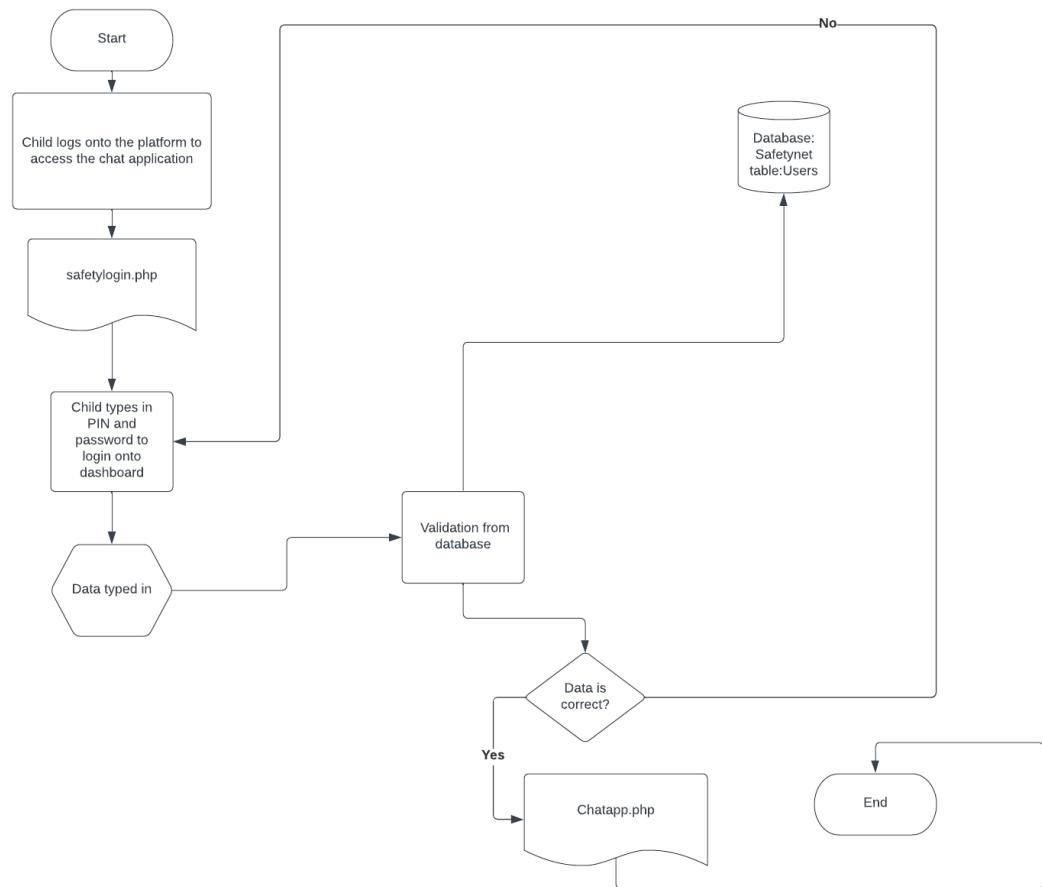
**Table 4: Flowcharts**

Symbols	Name	Explanation
	Start/End	This represents a start or end point of a flowchart.
	Arrow	A line shows relationship between symbols.
	Input/Output	A parallelogram represents input or output.
	Process	This symbol represents a process
	Decision	This symbol indicates a decision

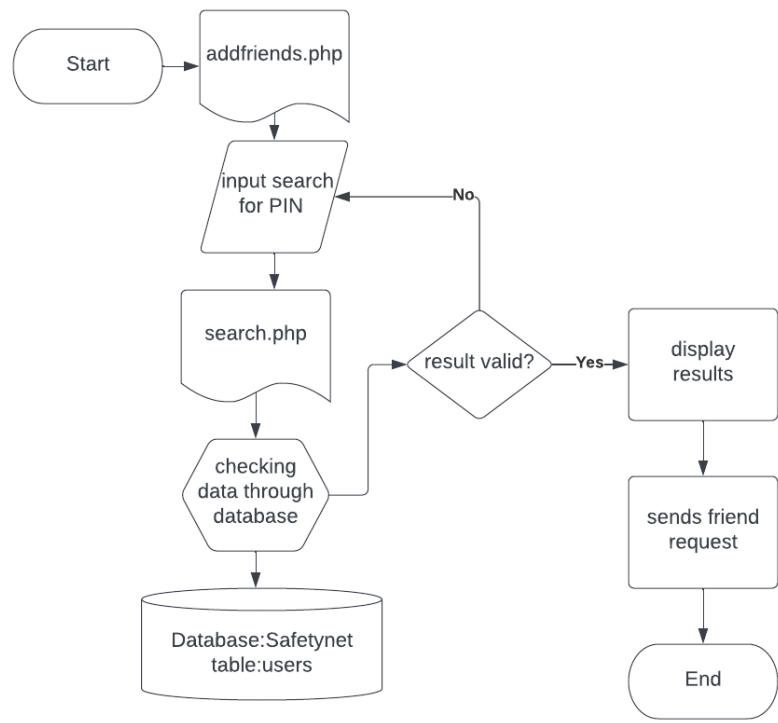
	Database	This symbol clarifies where the data your flowchart references is being stored.
---	----------	---



**Figure 30: Flowchart Diagram for the parent registering themselves and child onto the platform and logging onto the dashboard**



**Figure 31: Flowchart Diagram for the child logging onto the chat application**



**Figure 32: Flowchart Diagram for the parent searching for a child's username in order to send a friend request for their child**

## **Implementation Phase**

### **4.3.5 Create an UI of the Registration page and login page with connectivity to database**

```
21 <div class = "container">
22   <div class = "row">
23     <div class = "col-md-8 aa">
24       <!--This form will redirect to this page when the submit button is pressed-->
25       <form action = "signupform.php" method = "POST">
26         <!--the details created for the forms-->
27         <div class="form-group">
28           <p class = "errormessages"></p>
29             <label for="Email">Email address</label>
30               <input type="text" class="form-control" name = "email" id="Email" aria-describedby="emailHelp" placeholder="Enter email" onfocusout="emailValidation()"/>
31               <small id="email" class="form-text text-muted">Remember to keep it in a email format. Must have '@'</small>
32         </div>
33         <div class="form-group">
34           <label for="First Name">First Name</label>
35           <!--validation techniques are used here-->
36           <input type="text" class="form-control" name="firstname" id = "firstname" placeholder="Please enter your first name" onfocusout="firstnamechecker()"/>
37           <span class ="firstnametick" id="firstnamesuccessfultick"><i class="fa fa-check" style="color:green" "aria-hidden="true"></i></span>
38           <span class= "firstnamemax" id="firstnamefailed" ><i class="far fa-times-circle" style="color:red" ></i></span>
39           <p id = "name"><span>enter name</span></p>
40         </div>
41         <div class="form-group">
42           <label for="Last Name">Last Name</label>
43           <!--validation techniques are used here-->
44           <input type="text" class="form-control" name="LastName" id = "lastname" placeholder="Please enter your last name." onfocusout="lastnamechecker()"/>
45           <span class ="lastnametick" id="lastnamesuccessfultick"><i class="fa fa-check" style="color:green" "aria-hidden="true"></i></span>
46           <span class= "lastnamemax" id="lastnamefailed" ><i class="far fa-times-circle" style="color:red" ></i></span>
47         </div>
48         <div class="form-group">
49           <label for="Password">Password</label>
50           <!--validation techniques are used here-->
51           <input type="password" class="form-control" name="Password" id="password" placeholder="Password" onfocusout = "passwordcheck()"> <span class ="tick" id="passwordtip" class="form-text text-muted">Your password must be more than 7 characters, with uppercase and lowercase letters with at least one number</span>
52           <small id="passwordtip" class="form-text text-muted">Your password must be more than 7 characters, with uppercase and lowercase letters with at least one number</small>
53         </div>
```

**Figure 33: A Section of code for the Registration page**

Bootstrap was used in the creation of the layout of the forms used in this project. Bootstrap is a free and open-source framework to create web applications. (End, 2018) A framework is a library that makes it easier to design using the CSS language. In this project, it was used to create responsive layouts. Line 21 in figure 33, this organizes the form structure so that the form inputs are vertically in-line with one another. On line 23, this represents the grid system within bootstrap. The grid system is set up with 12 columns which is the total amount of width that a section can have.

Therefore, ‘col-md-8’ spans 8 out of 12 columns, meaning the selected section is large enough for the forms to fit properly on the screen. Using this framework requires the screen size to be defined when creating columns. For example:

- **xs** = *extra small screens* (mobile phones)
- **sm** = *small screens* (tablets)
- **md** = *medium screens* (some desktops and laptops)
- **lg** = *large screens* (remaining desktops)

Therefore, in line 24, ‘md’ refers to medium screens like laptops and desktops, these are the screen optimized for this web application. Line 25 shows the page that the form redirects to connect the page to the database. The method ‘POST’ is a superglobal variable used to collect certain data from an HTML form like email addresses, names, passwords etc.

Super global variables are variables with global scope, meaning they can be used wherever, and they do not need to be declared. The method ‘POST’ was important to use because it hides the form data and transfers it securely to the server meaning sensitive information is not easy to access during its transmission to databases.

Line 27 onwards from figure 33 shows the creation of the form itself, with input labels used to inform the user what the input field represents, to the <small> tags to represent the microcopy which was stated earlier in this report as instructions to help the user enter their details without errors. This stage is where the validation process takes place. As shown in lines 37 and 38 in figure 30, shows some of the inline validation techniques were mentioned earlier, and this consists of the green tick and red cross which will be manipulated using CSS to not be visible when the user loads up the form at the start.

```

530   .firstnamex{
531     position:relative;
532     bottom:30px;
533     left:235px;
534     visibility:hidden;
535   }
536   .lastnametick{
537     position:relative;
538     bottom:30px;
539     left:250px;
540     visibility:hidden;
541   }
542   .lastnamex{
543     position:relative;
544     bottom:30px;
545     left:235px;
546     visibility:hidden;
547   }
548   .childlastnametick{
549     position:relative;
550     bottom:30px;
551     left:250px;
552     visibility:hidden;
553   }

```

**Figure 34: CSS used to hide the green and red ticks when the user loads the form**

As shown in figure 34, this code shows how the validation images are positioned on the input fields, however it is hidden by the visibility property. Another validation technique was to change the colours of the input field border depending on the user's input after clicking away from the input box. As shown on line 37, this was done using 'onfocusout' which is a type of event handler.

Event handlers are JavaScript code that activates when an action takes place on a HTML element. For this type of event handler, a piece of JavaScript code is executed when a user clicks off an input field. The code that is executed comes from the function that is connected to the event handler. As shown in line 37 of figure 33, 'firstnamechecker()' is the function connected to the event. Therefore, the code that is written inside this function will be used whenever the user activates the event.

#### 4.3.6 Form Validation using JavaScript

```
316  function emailchecker(){  
317  
318      var successful = document.getElementById("emailsuccessfulltick");  
319      var failed = document.getElementById("emailfailed");  
320      var emailvalidation = /^[^\w+([.-]?\w+)*@\w+([.-]?\w+)*(\.\w{2,3})+$/;  
321      var emailinput= document.getElementById("Email").value;  
322      if(emailinput.match(emailvalidation)){  
323  
324          document.getElementById("emailsuccessfulltick").style.visibility = 'visible';  
325          document.getElementById("Email").style.borderColor = 'green';  
326          document.getElementById("emailfailed").style.visibility = 'hidden';  
327  
328  
329      }  
330      else{  
331          document.getElementById("emailfailed").style.visibility = 'visible';  
332          document.getElementById("Email").style.borderColor = 'red';  
333          document.getElementById("emailsuccessfulltick").style.visibility = 'hidden';  
334  
335      }  
336  };  
  
Figure 35: email inline validation using Javascript
```

As previously mentioned, functions attached to event handlers will be used in this is shown in figure 35, because the function 'emailchecker()' is linked to the event handler associated with the email input field. Figure 35, shows a section of the code on how the inline validation functions and this is how it works:

- A Variable named successful is created and equalled to the green validation tick for the email input field.
- document.getElementById – This method was used to retrieve a particular HTML element. For example, on line 30 of figure 33, the id attribute which is used by JavaScript to access and manipulate the element with the specific id is called 'email'. This means that the variable in line 318 on figure 35 is equalled to the id attribute of the green validation tick and the same process goes for the error validation cross.
- Line 320 on figure 35 shows the use of RegEx Validation. RegEx Validation is a property that helps to build input validation and a validation pattern is created to make sure the user enters all the necessary characters needed to fill the input field.

- The variable 'email input' is equalled to the value of the email input field and an if statement is created.
- As shown in line 322 onwards, if the user's input matches the validation pattern, the input field border will turn to green, whereas if the input does not match the validation pattern, the input border is turned to red, and the error validation tick will be shown.

```

252 function firstnamechecker(){
253
254     var successful = document.getElementById("firstnamesuccessfulltick");
255     var failed = document.getElementById("firstnamefailed");
256     var firstnamevalidation = /^[A-Za-z]+$/;
257     var firstnameinput= document.getElementById("firstname").value;
258     if(firstnameinput.match(firstnamevalidation)){
259
260         document.getElementById("firstnamesuccessfulltick").style.visibility = 'visible';
261         document.getElementById("firstname").style.borderColor = 'green';
262         document.getElementById("firstnamefailed").style.visibility = 'hidden';
263
264     }
265     else{
266         document.getElementById("firstnamefailed").style.visibility = 'visible';
267         document.getElementById("firstname").style.borderColor = 'red';
268         document.getElementById("firstnamesuccessfulltick").style.visibility = 'hidden';
269     }
270 }
271 };
272
273 function lastnamechecker(){
274
275     var successful = document.getElementById("lastnamesuccessfulltick");
276     var failed = document.getElementById("lastnamefailed");
277     var lastnamevalidation = /^[A-Za-z]+$/;
278     var lastnameinput= document.getElementById("lastname").value;
279     if(lastnameinput.match(lastnamevalidation)){
280
281         document.getElementById("lastnamesuccessfulltick").style.visibility = 'visible';
282         document.getElementById("lastname").style.borderColor = 'green';
283         document.getElementById("lastnamefailed").style.visibility = 'hidden';
284
285     }
286 }
```

**Figure 36: First name and Last name validation check**

When the email validation code was created, everything was quite straightforward, only that the validation images had to have different names for every input field, to avoid any errors when running the forms. For example, a case where the user enters their name in the name input field and the password input field displays a successful validation tick because the code does not differentiate the two classes as they have the same name attached to the fields. This could not be the case because it will confuse the apart. After the process, it was about be changing the validation pattern to suit every individual input field.

```

344 	function passwordcheck() {
345 	var successful = document.getElementById("successfulltick");
346 	var failed = document.getElementById("failed");
347 	var passwordvalidation = /^(?=.*\d)(?=.*[a-z])(?=.*[A-Z]).{7,}$/;
348 	var passwordinput = document.getElementById("password").value;
349 	if(passwordinput.match(passwordvalidation))
350 	{
351 	document.getElementById("successfulltick").style.visibility = 'visible';
352 	document.getElementById("password").style.borderColor = 'green';
353 	document.getElementById("failed").style.visibility = 'hidden';
354 	}
355 	else
356 	{
357 	document.getElementById("failed").style.visibility = 'visible';
358 	document.getElementById("password").style.borderColor = 'red';
359 	document.getElementById("successfulltick").style.visibility = 'hidden';
360 	}
361 	};
362 363
364 365 	function childpasswordcheck() {
366 	var successful = document.getElementById("childsuccessfulltick");
367 	var failed = document.getElementById("childfailed");
368 	var passwordvalidation = /^(?=.*\d)(?=.*[a-z])(?=.*[A-Z]).{7,}$/;
369 	var passwordinput = document.getElementById("childpassword").value;
370 	if(passwordinput.match(passwordvalidation))
371 	{
372 	document.getElementById("childsuccessfulltick").style.visibility = 'visible';
373 	document.getElementById("childpassword").style.borderColor = 'green';
374 	document.getElementById("childfailed").style.visibility = 'hidden';
375 	}

```

**Figure 37: Password input validation**

The password input validation was the last to be implemented and as mentioned earlier, the following steps for the other inputs were copied because they were all similar. However, the password validation needed a new pattern shown on lines 347 and 368 in figure 37, this pattern means that the user must enter a password that has more than 7 characters, with uppercase and lowercase letters with at least one number. Whatever the user inputs must match this pattern and the JavaScript code will display on the form afterwards.

#### 4.3.6 Code for the Login Page UI

```

42 <div class="form">
43     <div class = "container">
44         <div class="row ">
45             <div class="col-md-5">
46                 <img src = "3.jpg" class = "img-fluid" >
47
48             </div>
49         <div class="col-md-7">
50             <div class = "formrow">
51                 <div class = "intro">
52                     <h1>Welcome Back</h1>
53                 </div>
54                 <p class = "errormessages"></p>
55             </form>
56             PIN: <input type = "text" name = "email" id ="email" pattern="[A-Za-Z0-9.]{1,30}" placeholder ="please enter your PIN" ><br><br>
57             Password : <input type = "password" name = "password" id = "password" placeholder = "please enter your password" > <br><br>
58             <button type = "Submit" class = "submit">Login </button>
59             <a href = "registrationform.php">Click here to create an account </a><br>
60             <a href = "safetynetloginparents.php">Click here to login into parent dashboard</a>
61         </form>
62     </div>
63
64
65     </div>
66
67     </div>
68 </div>
69
70

```

**Figure 38: Code for the Login UI for the child**

```

42 <div class="form">
43     <div class = "container">
44         <div class="row ">
45             <!--left sided columns-->
46             <div class="col-md-5">
47                 <!--image for parent-->
48                 <img src = "4.jpg" class = "img-fluid" >
49
50             </div>
51             <!--right sided column-->
52             <div class="col-md-7">
53                 <div class = "formrow">
54                     <div class = "intro">
55                         <h1>Welcome Back Parent!</h1>
56                     </div>
57                     <!--error messages to be used in AJAX-->
58                     <p class = "errormessages"></p>
59                 </form>
60             <!--inputs-->
61             PIN: <input type = "text" name = "pin" id ="pin" pattern="[A-Za-Z0-9.]{1,30}" placeholder ="please enter your PIN" ><br><br>
62             Password : <input type = "password" name = "password" id = "password" placeholder = "please enter your password" > <br><br>
63
64
65             <button type = "Submit" class = "submit">Login </button>
66             <a href = "registrationform.php">Click here to create an account </a><br>
67             <a href = "safetynetlogin.php">Login to child's account </a>
68         </form>
69
70
71     </div>
72
73 </div>
74

```

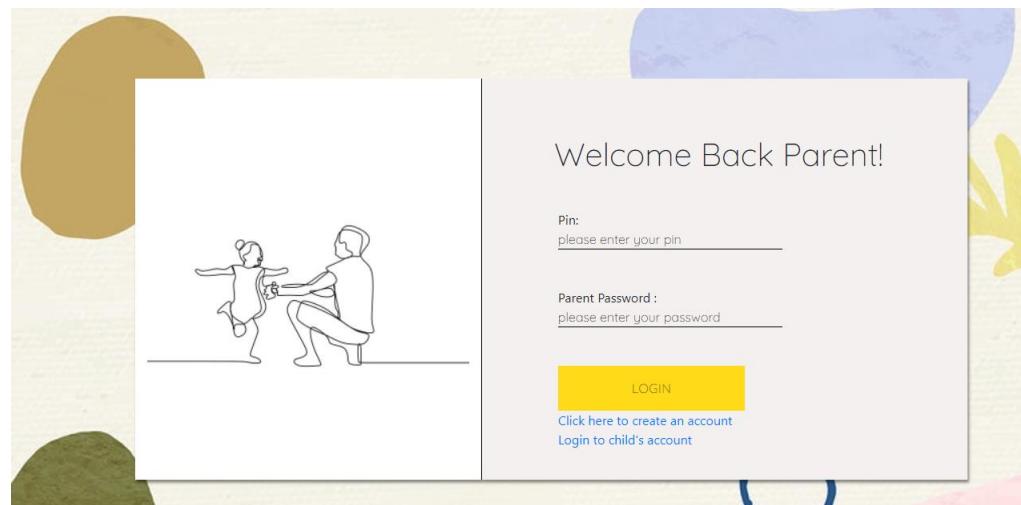
**Figure 39: Code for the Login UI for the parent**

**Figure 40: The different columns for the forms**

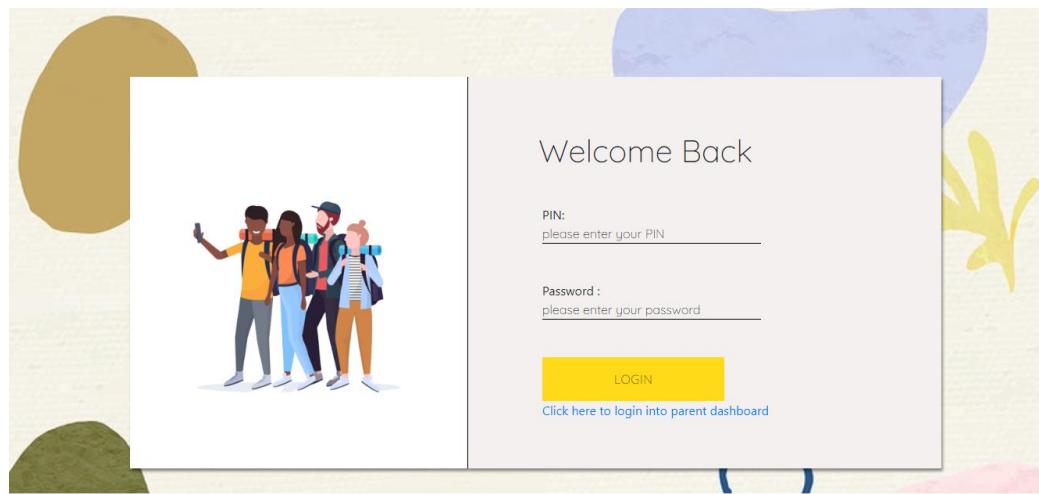
As previously mentioned, bootstrap was used to create the columns of the forms on this web application. For the login page, the idea was to have two columns instead of one column on the registration page. This was to create a differentiation between the two login forms, one for the parent and one for the child. The columns are presented in a horizontal format on the login page in comparison to the registration form, which is in vertical format. The column on the left has a picture that represents the parent or child and the right column represents the login form.

Line 45 in figure 38 defines the left column of the login form with the use of the class 'col-md-5', the section takes up 5 out of 12 columns which is almost half the width of the screen. Inside this column, as shown in line 46, displays the minimalist image of a child, to represent to whom this form belongs. Whereas on line 48 in figure 36, the code '<img src = "4.jpg" class = "img-fluid" >' displays the image of a parent so the parent knows that this will be the form to log onto the parent dashboard. In addition, to make the images responsive, the class 'img-fluid' was used. Img-fluid is a class provided by bootstrap, which provides responsiveness to the image.

Line 52 of figure 39 shows that the right column is defined by the class 'col-md-7'. This means that it covers 7 out of the 12 columns, therefore when you add the two columns together, it adds up to 12, meaning that the divisions combined take up the entire available space. The right column contains the inputs that are needed to log in and submit from lines 56-60 in figure 38. To make the divisions horizontal was done using '<div class = "row">'. On line 44, the class row is used to keep sections or divisions in a horizontal alignment, so it looks like the image below.



**Figure 41:** Screenshot of the parent login UI



**Figure 42:** Screenshot of the child login UI

```
1 html, body{  
2     overflow-x:hidden;  
3     background-image:url("6.jpg");  
4     color:black;  
5     background-size: cover;  
6 }  
  
26 .submit {  
27     background-color: #FFD700;  
28     display:block;  
29     color: black;  
30     padding: 1rem;  
31     text-transform:uppercase;  
32     margin-left: 40px;  
33  
34     border: none;  
35     cursor: pointer;  
36     width: 50%;  
37     opacity: 0.9;  
38     font-family:quicksand;  
39     letter-spacing:0.5px;  
40     position:relative;  
41     right:40px;  
42 }  
43  
44 .col-md-7{  
45     background-color:#F4F0F0;  
46     box-shadow: 1.8px 3.5px 3.5px hsl(0deg 0% 0% / 0.45);  
47 }  
48  
49 .col-md-5{  
50 }  
51 .col-md-5{  
52     background-color:white;  
53     height:500px;  
54     box-shadow: 1.8px 3.5px 3.5px hsl(0deg 0% 0% / 0.45);  
55     border-right:1px solid black;  
56  
57     padding:70px;  
58 }
```

**Figure 43: Code for visualizing the forms**

A CSS file was linked to both HTML files to visualize the web forms aesthetically.

Line 3 displays an image to the background of the form with the background-size property shown on line 5 which stretches and resizes the background image to fit the entire screen. The two columns are coded to visually show colour and the box-shadow property is used to create a shadow effect around an HTML element.

This decision was chosen to make the application visually appealing to the user.

The submit button was coded to be positionally in line with the form, with the width also being specified and the button text needed to match the font used throughout the web application, this was shown on line 38 and the text on the button was all capital letters with the use of the text-transform property. This property is used to change all text to either uppercase or lowercase.

#### **4.3.7 Connecting Forms to Database**

When the UI was created, the next step was to provide connectivity by connecting the forms to a database. The database was created using a software tool called PhpMyAdmin. PhpMyAdmin is a web application that makes it possible to manage MySQL databases. SQL is also known as structured query language is a language used to create and organize data in a database. The first table that was created was named 'Users' and it records the data of the users that register and log onto the platform.

***Table 5: Users Table***

Table Name	SQL code to create table
Users	<pre>Create Table Users (     Id int(11) auto_increment,     Pin varchar (64) NOT NULL,     Email varchar (255), NOT NULL,     childpassword varchar (255) NOT NULL,     Images varchar(255),     Lastlogintime datetime DEFAULT current_timestamp,     Parentfname varchar(16) NOT NULL,     Parentlname varchar(16) NOT NULL,     Childfname varchar(16) NOT NULL,     Childlname varchar(16) NOT NULL,     Parentspassword varchar(64)     Activeaccount tinyint(1),     Activationcode varchar(255),     Phone_number varchar(11) );</pre>

--	--

Table fields	Meaning of field
ID	Numeric column that is generated with an integer whenever a new user registers.
PIN	An 8-digit alphanumeric value that is shared between the parent and child.
email	The email that the parent uses to register to the platform.

images	The image that the child will use as their profile picture
lastlogintime	The last time the child logged in to the platform
parentfname	The parent's first name
parentlname	The parent's last name
Childfname	The child's first name
childlname	The child's last name
childpassword	The child's password
parentspassword	The parent's password
activeaccounts	This means if the account is verified, newly made accounts is set to 0, meaning it is not verified. If it's verified, it's set to 1.
activationcode	The generated code that will be sent to the user for verification.
phone_number	The parent's phone number so they can verify the child's identity before accepting request by communicating with their parents.

Table 6: Users table meaning

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	<b>id</b>	int(11)			No	None		AUTO_INCREMENT	Change  Drop  More
2	<b>pin</b>	varchar(64)	utf8mb4_general_ci		No	None			Change  Drop  More
3	<b>email</b>	varchar(255)	utf8mb4_general_ci		No	None			Change  Drop  More
4	<b>password</b>	varchar(255)	utf8mb4_general_ci		No	None			Change  Drop  More
5	<b>images</b>	varchar(255)	utf8mb4_general_ci		Yes	NULL			Change  Drop  More
6	<b>lastlogintime</b>	datetime			No	current_timestamp()			Change  Drop  More
7	<b>parentname</b>	varchar(128)	utf8mb4_general_ci		Yes	NULL			Change  Drop  More
8	<b>parentname</b>	varchar(128)	utf8mb4_general_ci		Yes	NULL			Change  Drop  More
9	<b>childname</b>	varchar(128)	utf8mb4_general_ci		Yes	NULL			Change  Drop  More
10	<b>childname</b>	varchar(128)	utf8mb4_general_ci		Yes	NULL			Change  Drop  More
11	<b>childpassword</b>	varchar(64)	utf8mb4_general_ci		No	None			Change  Drop  More
12	<b>parentspassword</b>	varchar(64)	utf8mb4_general_ci		No	None			Change  Drop  More
13	<b>activeaccounts</b>	tinyint(1)			No	0			Change  Drop  More
14	<b>activationcode</b>	varchar(255)	utf8mb4_general_ci		Yes	NULL			Change  Drop  More
15	<b>phone_number</b>	varchar(11)	utf8mb4_general_ci		No	None			Change  Drop  More

**Figure 44: Table creation on PhpMyAdmin**

As shown in figure 44, a table has been created to save the details of the parents and their child when registered to the platform, however, the forms still need connection to the database. Therefore, a file must be created to establish a connection between the database and the files.

```

1 <?php
2 $ServerName = "localhost";
3 $dbUsername = "root";
4 $dbPassword = "";
5 $dbName = "safetynet" ;
6 $conn = mysqli_connect ($ServerName,$dbUsername,$dbPassword , $dbName ) ;
7
8 if(!$conn) {
9
10 die("Connection failed: ". mysqli_connect_error());
11
12 }
13 ?>

```

**Figure 45: Code for establishing a connection for the database**

The server to the database needs to be specified with the username and password of the database being set to its default values. Line 6 makes use of the function ‘`mysqli_connect`’, this function is used to open a new connection to the server and in the parenthesis of the function contains the variables which represent the database.

If the database has an error, the code is programmed to inform the user about a connection issue. Since a connection has been established, this code can be used on every page with a technique in PHP called ‘`required_once`’.

```

3  #represents the database file
4  require_once 'safety.php';
5
6  #these variables are empty for now however they will be declared to the user's details
7  $email = $password = $confirmPassword = $firstname = $lastname = $childName = $spin = $token = "";
8  #these are error validations, and if they are not activated they will not be declared.
9  $wrongPin = $wrongEmail = $wrongPassword = $confirm_wrongPassword = $wrongFirstname = $wrongLastname = $wrongChildfirstname = $wrongChildlastname = $wrongChild
10
11 #function to create the user generated pins
12 function generated_string($length){
13     #it picks random of numbers and uppercase letters
14     $array = array(0,1,2,3,4,5,6,7,8,9, "A", "B", "C", "D", "E", "F", "G", "H", "I", "J", "K", "L", "M", "N", "O", "P", "Q", "R", "S", "T", "U", "V", "W", "X");
15     $pinRandom = '';
16     $length = rand(9,$length);
17
18     for ($i=0; $i<=$length; $i++){
19         #for loop carries on till it reaches the length
20         $randomizedNumber = rand(0,36); #generates number between 0-36
21         $pinRandom .= $array[$randomizedNumber]; #puts into array
22
23
24     }
25
26
27
28     return $pinRandom;
29
30 }
31 #length is inserted in parenthesis
32 $pin = generated_string(9);

```

**Figure 46: Programming the user PIN**

As seen in line 4 in figure 46, using the keyword ‘`require_once`’ is a reliable technique because it’s used to embed PHP code from another file. This means that the database connection does not need to be re-establish by copying and pasting the same code over and over, this keyword brings the code over to new files. This technique makes programming much neater and easier. The variables made in lines 6 and 7 were currently equalled to nothing as they have no meaning.

However, when the parent registers, the code is programmed so that the empty variables will be equalled to the data of the parent and will be sent to the database in the process. There are also error validation variables, which have error messages if the user makes an error when registering. The plan was for the parent to decide what PIN they will be sharing with their child; however, it was decided that it removes the uniqueness that was intended so the requirement was changed.

As shown in figure 46, from lines 14 to 32, shows the programming of the PIN, a function is created with the parenthesis which represents the total length of the PIN. An array with uppercase and numbers is created and a for loop is created and picks random letters and numbers until it reaches the length's number, and the PIN will be generated. Line 32 shows that the result of the generated PIN will be assigned to a variable.

```

183     #this stops the user from not entering their first name
184     if(empty(trim($_POST["firstname"]))){
185
186         $wrongfirstname = "Please enter a First Name.";
187         echo $wrongfirstname;
188     } else{
189         // Prepare a select statement where firstname is checked in the database
190         $sql = "SELECT id FROM users WHERE parentname = ?";
191         if($result = mysqli_prepare($conn, $sql)){
192             // joins the variables together to be used as parameters
193             mysqli_stmt_bind_param($result, "s", $binded_firstname);
194
195             // Set parameters
196             $binded_firstname = trim($_POST["firstname"]);
197
198             if(mysqli_stmt_execute($result)){
199
200                 mysqli_stmt_store_result($result);
201
202
203
204                 $firstname = trim($_POST['firstname']);
205
206             } else{
207                 echo "Please try again later, there has been a connection problem";
208             }
209
210             // Close the statement
211             mysqli_stmt_close($result);
212         }
213     }

```

**Figure 47: Code for preparing the users details for the database**

As seen in figure 47, line 184 starts with making use of the error validation variables created at the start of the file, declaring them if the user submits the form without completing some of the input fields. If there are not declared, this

means the user has inputted all the input fields correctly, therefore a SQL statement is prepared. During this preparation, the statement is binded to the user's input.

For example, in line 190, 'parentfname' was the field created on the table 'Users' and the '?' represents the parameter marker which indicates where the user's data must be substituted with in the statement. 'mysqli\_prepare' is used to prepare the SQL statement and inside its parenthesis is the binding between the database and the SQL statement which has become the variable 'result'. On line 193, 'mysqli\_stmt\_bind\_param' is used to bind the variable to the parameter marker on the SQL statement.

When this process has taken place, the statement will be executed to check for any errors within the statement from a logical point of view, if there are no errors, it saves the result and the empty variable '\$firstname' is finally declared. This process is done for all the inputs on the form.

```

332 $token = bin2hex(random_bytes(50)); // generate unique token
333
334
335
336 //if the error messages variables are not set then it will make the statement
337 if(empty($wrongusername) && empty($wrongpassword) && empty($confirm_wrongpassword) && empty($wrongemail)&& empty($wrongpin) && empty ($wrongfirstname) && empty ($wronglastname))
338
339     // Prepare an insert statement and store the form data into the database
340     $sql = "INSERT INTO users (email, parentfname, parentlname, password, pin, childfname, childlname, activationcode, parentspassword) VALUES (?, ?, ?, ?, ?, ?, ?, ?, ?)";
341
342     if($result = mysqli_prepare($conn, $sql)){
343         //this will bind the variables
344         mysqli_stmt_bind_param($result, "ssssssss", $binded_Email,$binded_firstname,$binded_lastname, $binded_childpassword ,$bindedpin,$binded_childfname
345
346
347             $binded_password = $password;
348             $binded_childpassword = $childpassword;
349
350             $binded_Email = $email;
351             $binded_firstname = $firstname;
352             $binded_lastname = $lastname;
353             $bindedpin = $pin;
354             $binded_childfname = $childfname;
355             $binded_childlname = $childlname;
356             $bindedtoken = $token;
357             $verificationlink = "http://localhost/safetynet/chatapp/verifemail.php?token={$token}";
358             $body = "Hi there,
359
360 Thanks for signing up with us. From now this will be your personal email where we will send you regular updates about changes coming to safetynet, different id
361
362
363
364 Thank you from all of us from Safetynet,
365
366 ";
367 mail("$binded_Email",'Account Creation', "$body", 'From:safetynetenquiries@gmail.com');
368 mail("$binded_Email",'Your PIN number', "$bindedpin", 'From:safetynetenquiries@gmail.com');
369 mail("$binded_Email",'Verify your email', '$verificationlink', 'From:safetynetenquiries@gmail.com');

370
371     if(mysqli_stmt_execute($result)){
372         // takes user into this page
373
374             header("location: chatapp/verify.php");
375
376         } else{
377             echo "Something is wrong, please try again later.";
378         }
379
380
381
382         mysqli_stmt_close($result);
383     }
384
385
386
387
388
389
}

```

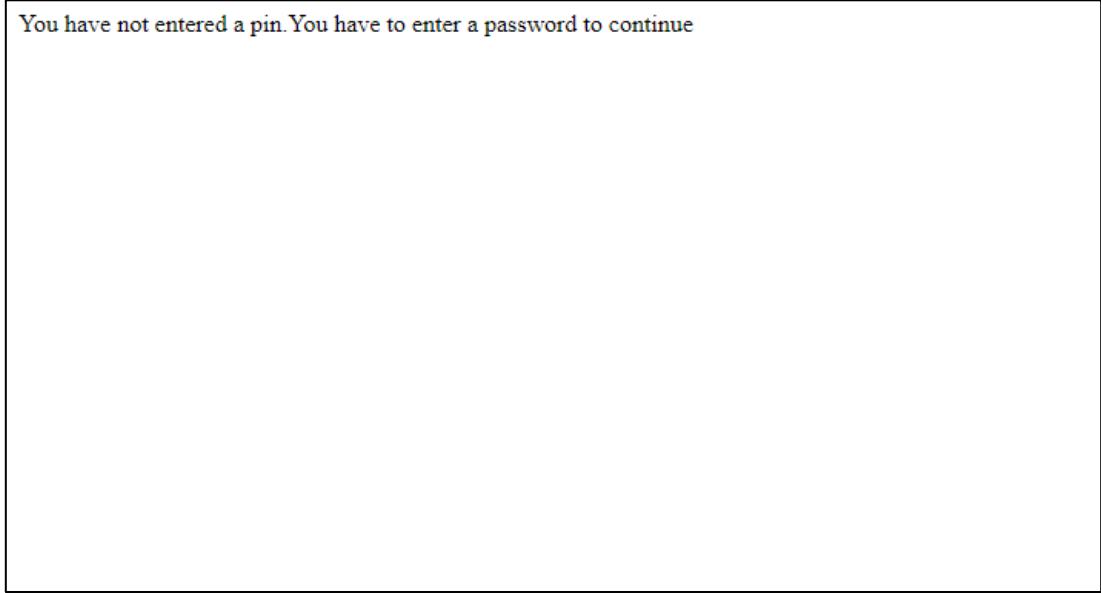
**Figure 48: Code for sending the data into the database and sending activation code to email**

As seen in figure 48, line 322 shows the creation of an activation code that will be used to verify an account. As previously stated, error validation variables were created at the beginning of this file and for the data to be transferred to the database, none of the variables should be set. From lines 340 to 344 in figure 48, an SQL statement is made that inserts the values of the user inputs into the specified fields.

From lines 348 to 357, the binded variables are equalled to the variables that store the user's data. In addition, a web link is created with a generated token that was created earlier. Lastly, an email is sent to the user welcoming them to the platform, informing them what to expect with the application, showing their

PIN that must be shared with their child and a verification link which is sent for them to activate an account. After the user clicks the link, they can now log in.

<b>id</b>	<b>pin</b>	<b>email</b>	<b>password</b>	<b>images</b>	<b>lastlogintime</b>	<b>parentname</b>	<b>parentname</b>	<b>childname</b>	<b>childname</b>
42	CB03V0Q7	yeni8200@gmail.com	Yeni12345	default.jpg	2022-03-19 17:03:11	Clarissa	Brown	Rosa	Brown
43	9S0UUIKF8	haveringyeni@gmail.com	Yeni12345	model.jpg	2022-03-19 17:03:11	Melania	Milla	Julia	Milla



You have not entered a pin. You have to enter a password to continue

**Figure 49: Initial result when user entered wrong login**

Programming using PHP is excellent because of how efficient the programming techniques are; however, it cannot be relied on for certain methods. For example, Figure 49 shows the results of the user if there's an error in the code. This was a problem because as an application, errors should be shown on the screen, rather than redirecting the user to another page. This was improved by using AJAX which will be explained further.

```

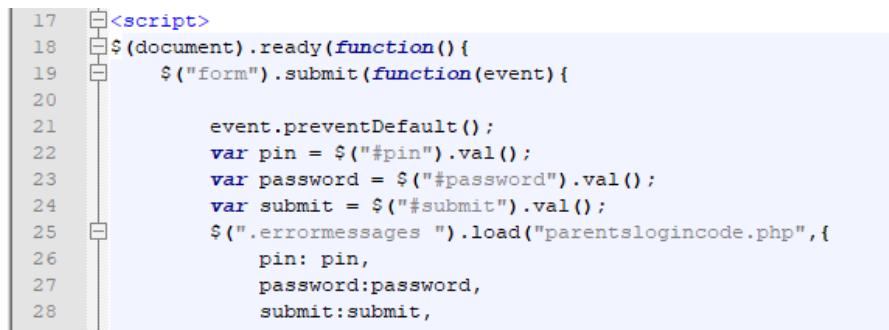
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
    mysqli_stmt_bind_result($result, $id, $pin, $password);
    if(mysqli_stmt_fetch($result)){
        $query = "SELECT * FROM users WHERE pin = '".$_POST['pin']."' and password ='".$_POST['password']."' ";
        $result = mysqli_query ($conn, $query);
        $row= mysqli_num_rows ($result);
        if ($row>0) {
            // a new session will start and the user will be taken to their account
            // Store data in session variables
            $_SESSION["loggedinaccount"] = true;
            $_SESSION["id"] = $id;
            $_SESSION["pin"] = $pin;
            $success = true;
            echo '<script>
                window.location.href = "parentsdashboard.php";
            </script>';
        } else{
            // and if it is wrong an error message will be given
            echo "<span class ='errormessages'>The password you entered was not valid.</span>";
        }
    }
}

```

**Figure 50: Code for checking if the password and pin match in the database**

However, an SQL statement is made to search for a field in the database that matches the same PIN and password and if it exists then cookies will be saved as sessions, and it loads the user to the parent dashboard. Sessions are variables that can be used repeatedly across different pages. However, the child is logging from their login page, following the same steps, it loads the user to the chat application.

However, if the field is non-existent, meaning either the user wrote the wrong pin or password or even the PIN does not exist on the database, the user will get an error on their screen which will be explained.



```
17 <script>
18 $(document).ready(function() {
19     $("form").submit(function(event) {
20
21         event.preventDefault();
22         var pin = $("#pin").val();
23         var password = $("#password").val();
24         var submit = $("#submit").val();
25         $(".errormessages").load("parentslogincode.php", {
26             pin: pin,
27             password: password,
28             submit: submit,
```

**Figure 51: AJAX used for form validation**

Mentioned at the beginning of the report, AJAX was used in this project to retrieve and display data without refreshing or redirecting the web page, like an actual web application. This process was done for the two of the login forms available on the platform, one for the parent and the child. jQuery was used in enabling AJAX, though there were other methods in implementing AJAX, jQuery was the easiest method, so it was the obvious choice.

Figure 51 shows the use of jQuery as it is placed within JavaScript, the code checks if the form is fully loaded and line 21 prevents the way that the form data is usually handled for AJAX to function. Lastly, Parameters are created to link the input fields of the form.

```

51 <div class ="formrow">
52   <div class = "intro">
53     <h1>Welcome Back Parent!</h1>
54   </div>
55   <p class = "errormessages"></p>
56   <form>
57     Pin: <input type = "text" name = "pin" id = "pin" placeholder ="please enter your pin" ><br><br>
58     Parent Password : <input type = "password" name = "password" id = "password" placeholder = "please enter your password" >
59   </form>

```

**Figure 52: error message paragraph**

Shown in Line 55, a paragraph tag is created to represent the error messages that displays when the user makes an error. Currently this error message is set to nothing, however, using AJAX, this paragraph tag will become the result of the PHP code, so when there is an error or message, the code passes through this paragraph. Therefore, the user sees the error immediately on their login form.

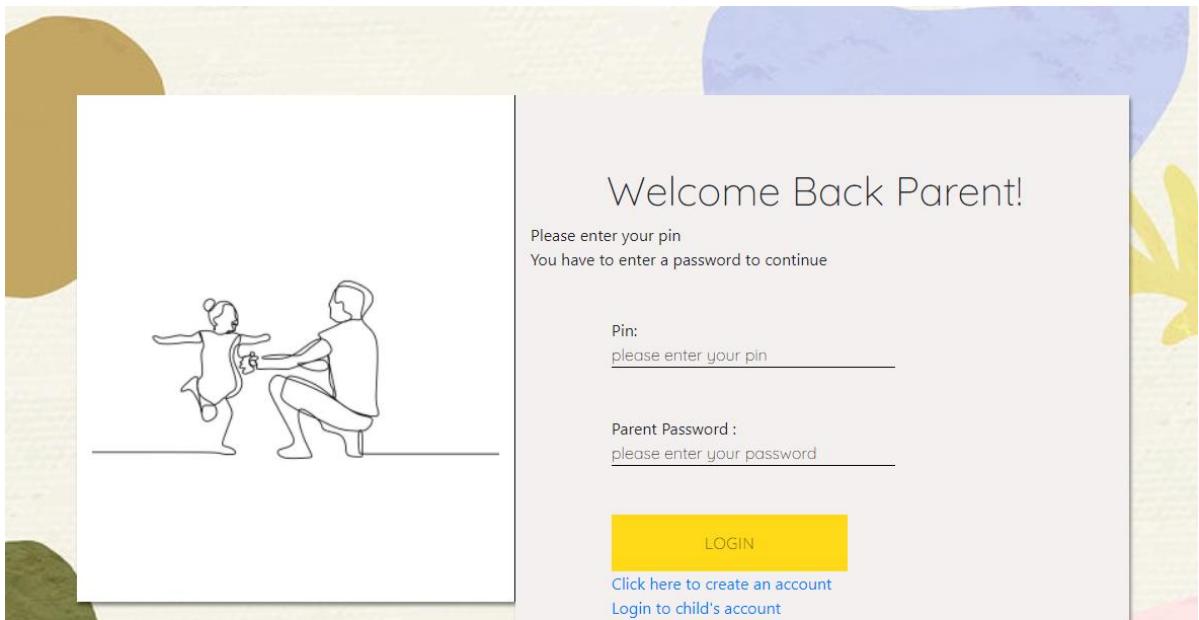
```

11 if($_SERVER["REQUEST_METHOD"] == "POST"){
12   $errorvalue = false;
13   //it will check if the user has entered the email, if so it will store the email, and if not, it will bring the error message
14   if(empty(trim($_POST["pin"]))){
15     $errorvalue = true;
16
17     echo "<span class = 'errormessages'>Please enter your pin<br></span>";
18   }
19 } else{
20   $errorvalue = false;
21   $pin = trim($_POST["pin"]);
22 }
23
24
25 //it will check if the user has entered the password, if so it will check if the password is right, and if not, it will bring the error message
26 if(empty(trim($_POST["password"]))){
27   $errorvalue = true;
28   echo "<span class = 'errormessages' > You have to enter a password to continue</span>";
29
30 } else{
31   $errorvalue = false;
32   $password = trim($_POST["password"]);
33 }

```

**Figure 53: different types of error messages**

This is shown in line 25 of figure 51 and the class attribute of the error messages is used, and it shows that the page parentslogincode.php is loaded and the results of the code will go through this paragraph. Shown in figure 53, lines 17 and 28 shows the types of error messages the user can get, and it gets passed onto the paragraph tag and this is the result:



**Figure 54: User receives an error message on the same screen**

#### 4.3.8 Create Parent Dashboard with all functionalities included

#### 4.3.9 Dashboard Menu

The next task was to create the dashboard menu that the parent can go to after they log in. Since this is a dashboard, it must consist of the features users would usually expect (sidebars, visualization etc) and this took over a week to program. An initial problem was retrieving the child's information and displaying it on the dashboard. It was later solved by using the 'start\_session()' function.

```

1  <?php
2   session_start();
3   // create the database connection
4   require_once 'safety.php';
5
6   // Select query to fetch the phone names and prices onto the chart
7   $sql = "select * from users where pin = '".$_SESSION['pin']."' ";
8   $result = $conn->query($sql);
9   $row = mysqli_fetch_assoc($result);
10  // Create the data
11  if(!isset($_SESSION['pin'])){ //if login in session is not set
12   header("location:chatapp/safetynetparentslogin.php");
13  }
14 ?>

```

**Figure 55: Retrieving child data from database to display on dashboard**

Line 2 on Figure 55 shows the use of the 'start\_session()' function.

'start\_session()' enables programmers to use variables on multiple pages.

Previously mentioned in the report, during the parent or child's login process, a session variable is created, and this is like a user accepting cookies on a web page, the difference between them is those session variables are available temporarily if the browser is not closed, unlike cookies that are always available due to it being stored on the user's computer.

This is relevant because the parent's PIN is saved as a session variable, which means that this PIN will be passed onto other pages, and this will be used to extract the child's data from the database as shown on line 7. The query is created and the function 'mysqli\_fetch\_assoc()' is used to fetch the statement in the database. Inside the parentheses of the function contains the variable '\$result' which represents the SQL statement and now data can be extracted easily. Lines 11 to 12 show that if the session variable is not declared, the web page should automatically send the user to the login page, this means the user cannot go to the page directly through the URL.

```
41 <div class = "wrapper">
42   <!--sidebar here -->
43   <nav id ="sidebar" class="sidebar">
44     <a href="javascript:void(0)" class="closemenubutton" onclick="closemenu()">
45       <div class= "sidebar-header">
46         <h4 style = "color:#FAD02C ;">SafetyNet</H4>
47       </div>
48   <div id = "links">
49     <a href="notification.php">Notifications</a>
50     <a href="acceptedfriends.php">Friends</a>
51     <a href="cyberbullying.php">Cyberbullying Course</a>
52     <a href="#">Settings</a>
53     <a href="logout.php">Logout</a>
54
55   </div>
56 </div>
57   </nav>
```

```
299 #sidebar {|
300   width:250px;
301   height:100%;
302   position:fixed;
303   background-color:black;
304   left:0;
305   border-right:1px solid #d3d3d3;
306   box-shadow: 0px 0px 5px 0px rgb(211,211,211);
307 }
308 </style>
309
310 .sidebar a {
311   padding: 8px 8px 8px 32px;
312   position:relative;
313   top:130px;
314   text-decoration: none;
315   font-size: 20px;
316   font-family:quicksand;
317   font-weight:bold;
318   color: white;
319   display: block;
320   transition: 0.4s;
321 }
322
323 #links a:hover{
324   text-decoration: none;
325   background-color:white;
326   border-left:5px solid #FAD02C;
327   color:black;
328 }
```

Figure 56: Code for sidebar navigation

The code shows the creation of the sidebar on the dashboard. <div> tags are used to create sections on the dashboard that will be styled using CSS. This includes the header which shows the application name on line 46 or the links that the parent will use to navigate as shown on lines 48 to 53. As shown on the right side of figure 56, these sections were styled using CSS. This includes links that have been positioned and visually changed using colours and fonts, with some transition that changes the colour of the links when the user hovers on them, these decisions were made to make the dashboard visually appealing for the user.

The sidebar is created to have a fixed position and its height was set to 100%. This means that the sidebar will always have the same position and it will never be scaled down. Finally, it is also visually tweaked with the background colour and box shadow. Line 44 makes use of JavaScript to create a hamburger functionality that opens and closes the sidebar

```

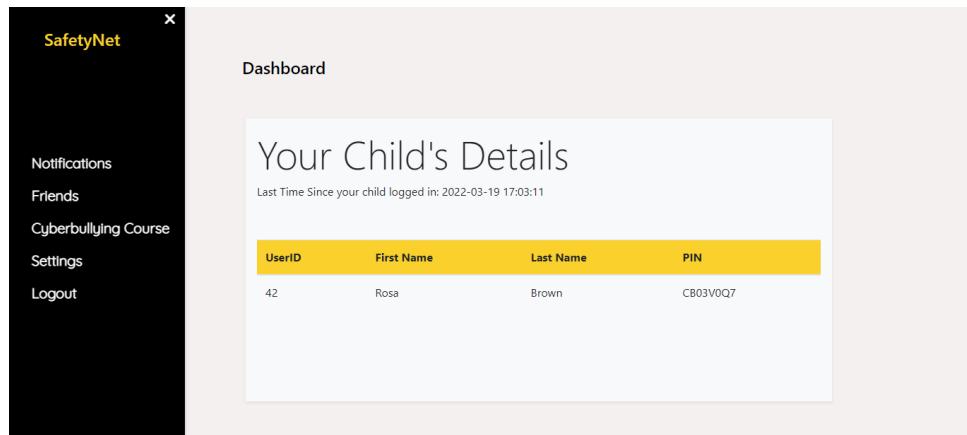
116 <script>
117     function openmenu() {
118         document.getElementById("sidebar").style.width = "250px";
119         document.getElementById("sidebar").style.visibility = "visible";
120         document.getElementById("openbutton").style.visibility = "hidden";
121         document.getElementById("dashboardcontent").style.marginLeft = "250px";
122         document.getElementsByClassName("nav").style.width = "0px";
123     }
124
125     /* Set the width of the sidebar to 0 and the left margin of the page content to 0 */
126     function closemenu() {
127         document.getElementById("openbutton").style.visibility = "visible";
128         document.getElementById("sidebar").style.width = "0";
129         document.getElementById("sidebar").style.visibility = "hidden";
130
131         document.getElementById("dashboardcontent").style.marginLeft = "0";
132     }
133
134
135
136 -</script>

```

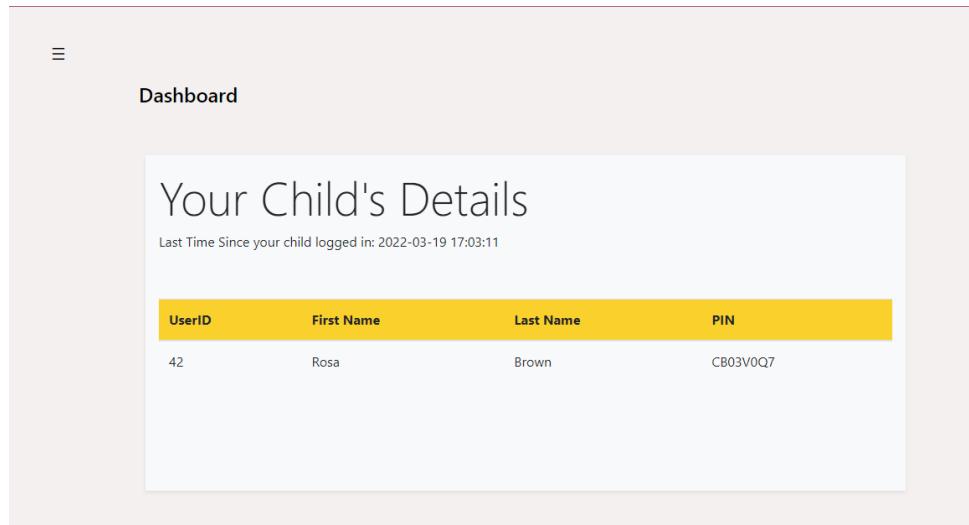
**Figure 57: Code for hamburger menu on JavaScript**

Figure 57 shows the creation of two functions which are attached to events that are called 'Onclick'. These events take place when the user clicks on the HTML element. Two buttons are attached with this event, and they are buttons that open and close the sidebar.

The function 'openmenu()' works when the user clicks the button to open the sidebar and when this happens, the sidebar reappears and is repositioned, and the open button disappears, and the close button becomes visible. 'closemenu()' is the exact same from a logical standpoint, however this closes the sidebar, and the open button is displayed again.



**Figure 58: User opens the sidebar**



**Figure 59: User closes the sidebar**

```

63         <div class="row">
64             <div class="col-md-10 shadow-sm p-3 bg-light bb" style="height:400px;" id="chartscreen">
65                 <h1 class="display-4">Your Child's Details</h1>
66                 <table class="table">
67                     <thead class="thead">
68                         <tr>
69                             <th scope="col">UserID</th>
70                             <th scope="col">First Name</th>
71                             <th scope="col">Last Name</th>
72                             <th scope="col">PIN</th>
73                         </tr>
74                     </thead>
75             <?php
76
77             // create the database connection
78             include('safety.php');
79
80             // Select query to fetch the phone names and prices onto the chart
81             $sql = "select * from users WHERE pin = '".$_SESSION['pin']."' ";
82             #the query is created
83             $data = mysqli_query($conn, $sql);
84             $count = mysqli_num_rows ($data);
85             if ($count!=0)
86             {
87                 while ($result = mysqli_fetch_assoc($data))
88                 {// this will then display it in the table
89                     echo "
90                     <tr>
91                     <td>".$result ['id']."</td>
92                     <td>".$result ['childfname']."</td>
93                     <td>".$result ['childlname']."</td>
94                     <td>".$result ['pin']."</td>
95                 </tr>
96             ";
97         }
98     }
99     else {
100         echo "no records found";
101     }
102     -?>
103
104     <p>Last Time Since your child logged in: <?php echo $row['lastlogintime']; ?></p>
105
106
107
108
109

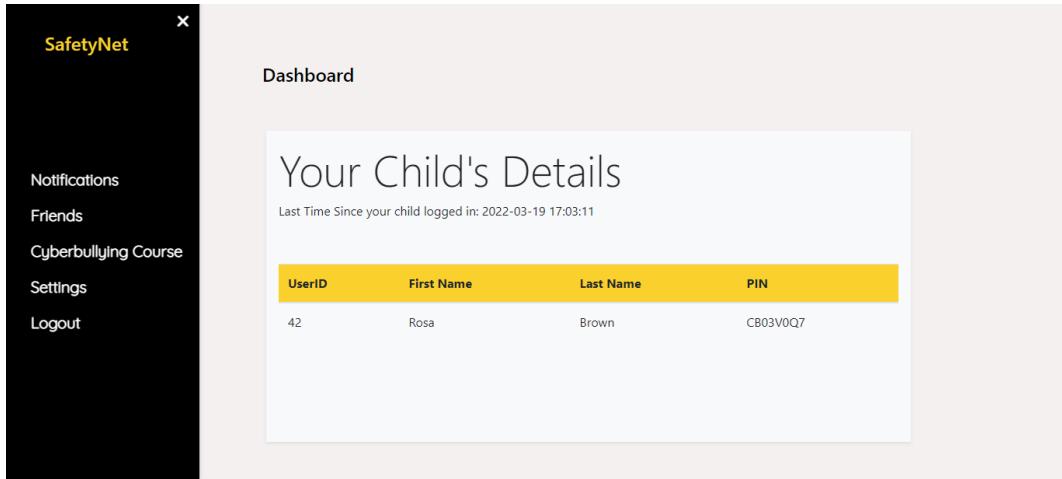
```

**Figure 60: Code to create main menu content**

For the visualization of the dashboard, tables were used because they suited the data the best out of other visuals that can be used in dashboards. The next task was to display the child's details on a table. The tables were implemented using HTML from lines 65-74 in figure 60, however, the child's data has not been extracted from the database.

This was created using PHP, the steps were from lines 78 to 104. Firstly, the page had to establish a connection to the database, afterwards, a SQL statement was created that searches for the child's details, with the use of 'mysqli\_num\_rows' returns the number of rows in the table, and the data gets fetched from the database and it is put into the columns of the table. Lastly, the database updates the field 'lastlogintime' whenever the child logs into the chat application to show the parent the last time their child logged onto the platform.

Therefore, line 104 shows that the data is extracted and shown as part of the visualization. This was the result:



The screenshot shows a mobile-style dashboard for 'SafetyNet'. On the left is a dark sidebar with white text containing 'SafetyNet' at the top, followed by 'Notifications', 'Friends', 'Cyberbullying Course', 'Settings', and 'Logout'. The main area has a light background with a header 'Dashboard' and a section titled 'Your Child's Details'. Below this, a message says 'Last Time Since your child logged in: 2022-03-19 17:03:11'. A table displays the child's information:

User ID	First Name	Last Name	PIN
42	Rosa	Brown	CB03V0Q7

**Figure 61: Dashboard Menu displaying child's details**

#### 4.3.9 Friend Request Functionality

The task after developing the UI was to develop the functionalities that gives the parent some control of their child's account.

The first user functionality that was programmed was searching for users on the platform to send friend requests. This was the longest part as it took 2 weeks to analyse the logical way to complete this task. The thought process was the parent must be able to search for a PIN that has been given by their child to help them add a friend to their account.

The dashboard searches the database in real time and displays the user's details with a button to send a request to the user parent's dashboard for the parent to accept so there can be communication between the users. A problem encountered while programming this system was that using PHP alone makes this difficult to implement because it is impossible to search for data in real time on PHP, one way is that it redirects the user to a new page, but that ruins the

structure that was set for this project. To solve this, AJAX was used, and this will be explained in detail.

**Figure 62: Code for searching for user pin**

As shown in figure 62, line 77 shows that the parent can search for the PIN of the user and the PIN is passed through to AJAX using jQuery. Line 129 shows that the dashboard searches for results only when the user stops typing, this means that strangers cannot add accounts because it only displays exact searches of the PIN, not similar searches. Line 130 shows that the variable named 'friendpin' represents the PIN that the parent has searched for, this variable will be passed to another page called 'search.php'. This page will extract the details and AJAX brings back the data to the dashboard without refreshing the page, so everything is in real-time as intended. Lastly, Line 141, shows if it's successful, the table will show the results of the data.

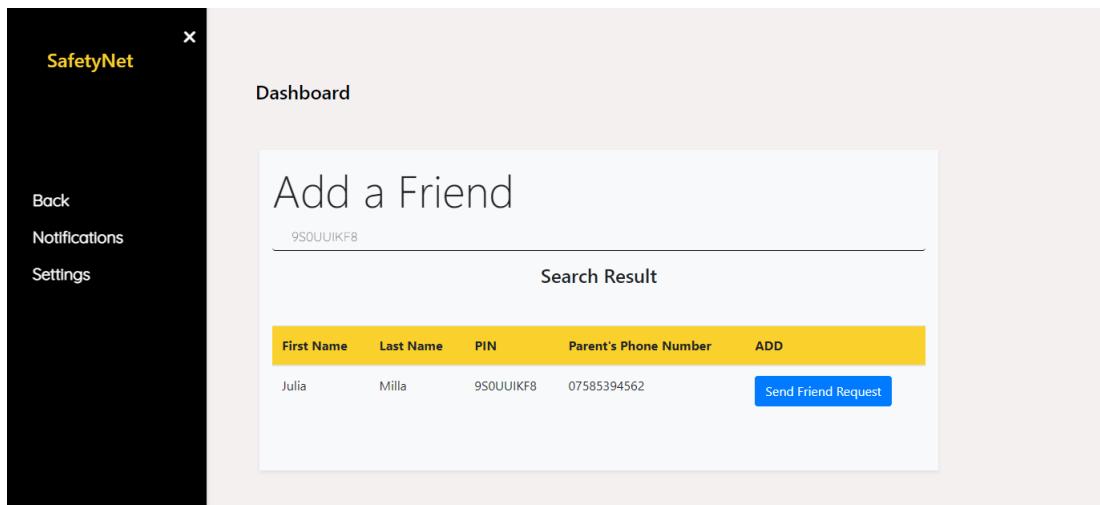
```

6  $sql = "select * from users WHERE pin ='".$_POST["search"]." AND NOT pin  = '".$_SESSION["pin"]."";
7
8  $pinl = $pin;
9  $data = mysqli_query($conn, $sql);
10
11 if (mysqli_num_rows($data)> 0)
12 {
13 // this will then display it in the table
14 echo '<h4 align = "center">Search Result</h4>';
15 echo '<table class="table">
16 <thead class="thead">
17   <tr>
18     <th scope="col">First Name</th>
19     <th scope="col">Last Name</th>
20     <th scope="col">PIN</th>
21     <th scope="col">Parent\'s Phone Number</th>
22     <th scope = "col">Send Friend Request</th>
23
24   </tr>
25 </thead>';
26
27 while($row = mysqli_fetch_array($data))
28
29
30
31 {
32   echo
33   "
34 <tr>
35 <td> " .row ['childfname']. "</td>
36 <td> " .row ['childname']. "</td>
37 <td> " .row['pin']. "</td>
38 <td> " .row['phone_number']. "</td>
39 <td><button type='button' class='btn btn-primary' id = 'requestbutton'>Add Friend</button></td>
40
41
42 </tr>
43
44
45
46 "
47
48
49
50 ";
51
52 }
53
54
55
56 else {
57   echo "no records found";
58 }
59

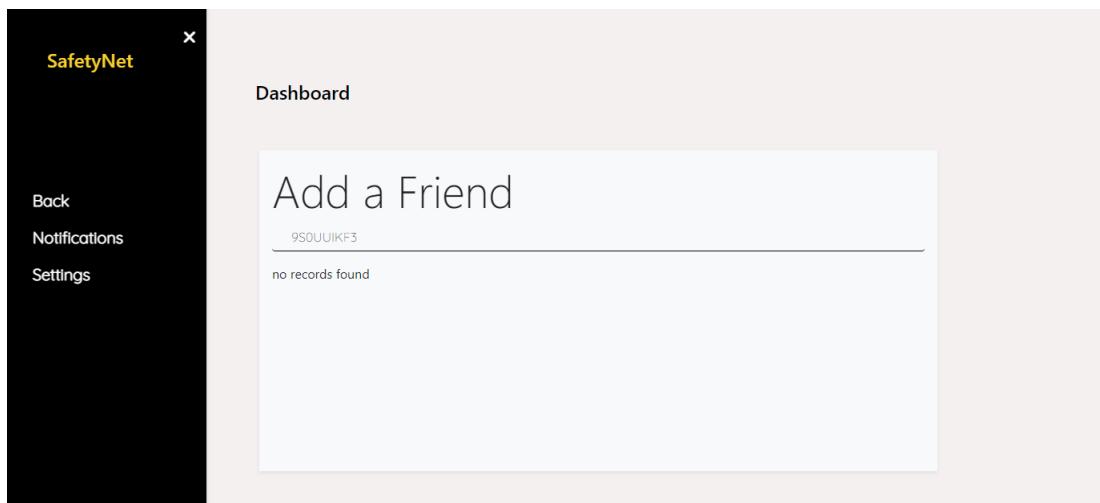
```

**Figure 63: search.php**

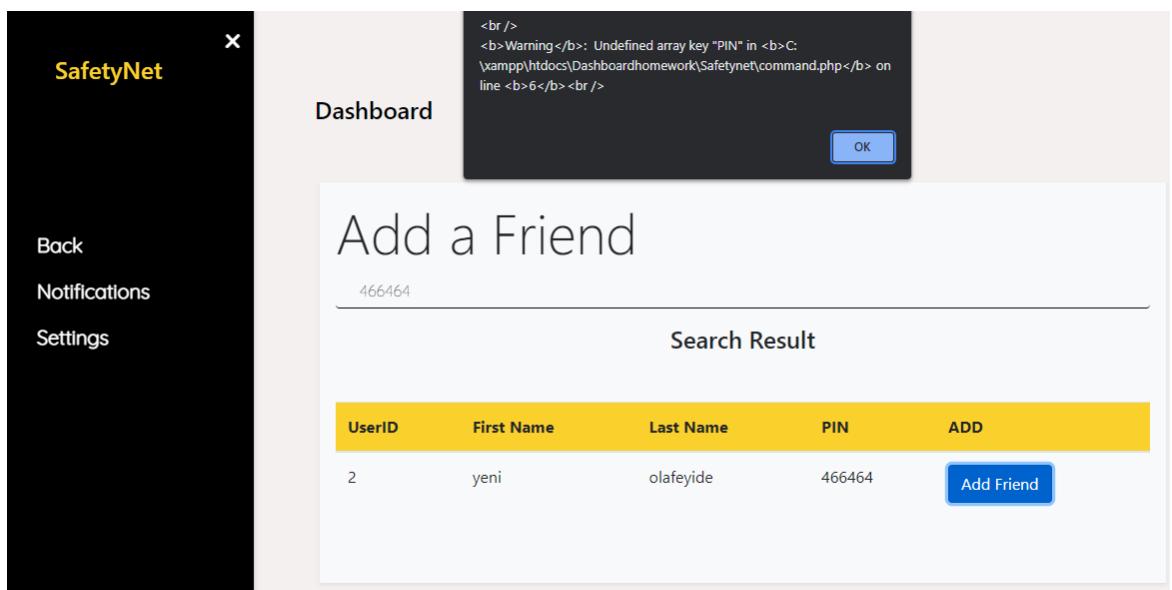
Figure 63 shows the 'search.php' page and how the code works to bring back the information back to the dashboard. A SQL statement is defined which searches for users in the database that have the same PIN as the one that was passed through when the parent searched on their dashboard. A query is then created and if the PIN exists, the data will be applied in the table rows and there will be a button to send a friend request. If the record does not exist, line 57 shows that it will say 'no results found'.



**Figure 64:** The search results when the parent searches for a PIN that exists



**Figure 65:** The search results when the parent searches for a PIN that does not exist



**Figure 66:** Error when attempting to add a user

There was an error when attempting to send a friend request because the PIN was undefined, meaning that the PIN being selected for the request has no meaning, therefore it cannot send a friend request, since the system does not know who the parent is sending a request to.

The reason for this error was because the code that displays the user's details (i.e PIN) to the dashboard comes from the 'search.php' page which is an entirely different page and the code that starts the process of sending the friend request to the database was done on the dashboard page and since the PIN variable does not exist on the dashboard page, it would not work to retrieve the variable from the dashboard page. To solve the issue, the code to send the friend request was all done on the 'search.php' page, instead of the dashboard page.

```
69 <script>
70 var pinl = "<?php echo $pin; ?>";
71 //variable of the user pin
72 //the code activates when the parent clicks the button to send friend request
73 $('#requestbutton').on('click', function(){
74     //it passes the pin through to a new page that's waiting for a specific action and it will create a notification to the other user
75     $.post('command.php?endscommand=sendRequest&pin=' + pinl, function(response){
76         if(response == 'request sent'){
77             $('#requestbutton').hide();
78             alert('the request has been sent');
79         }
80     })
81
82
83
84
85 })
```

**Figure 67: passing the PIN through a function to create a friend request**

As seen in figure 67, this is the next step after the parent sends a friend request. To create a friend request, the connection between the two users' needs to be stored on the database and a notification message also needs to be created for the other parent to see it. This code passes the user PIN that the parent intends to add through a new page to store the friend request on the database. Two tables need to be created in the database, 'friendstable' and 'notificationstable'.

Database Table	SQL code
Friendstable	<pre>Create table friendstable (     Id int NOT NULL, Auto_Increment,     Sending_from varchar(200),     Sending_to varchar(200) );</pre>
Notifications	<pre>Create table notifications (     Id int(11) NOT NULL AUTO_INCREMENT,     Notifications_sentfrom varchar(200),     Notifications_sentto varchar(200),     Message text,     Accepted varchar(20) Default 'N/A' );</pre>

**Table 7: Code for friendstable and notifications tables**

Friendstable field	Meaning
Id	Numeric column that is generated with an integer whenever a new user creates a friend request.
Sending_from	The user that sends the request.
Sending_to	The user that receives the request

**Table 8: friendstable meaning**

Notifications field	Meaning
Id	Numeric column that is generated with an integer whenever a new user creates a friend request.
Notifications_sentfrom	This is where the friend request is sent from.
Notifications_sentto	This is where the friend request is sent to.
Message	This is the friend request message that the parent sees in the notifications system
Accepted	This represents the connection between the two users. It is 'N/A' by default meaning there's no connection. If it is 1, this means it has been accepted, if it is 2 this means that it has been rejected and if it is 0 this means the user has been blocked.

Table 8: notifications table meaning

```

1 <?php
2
3 include 'safety.php';
4 session_start();
5 if ($_REQUEST['sendscommand'] === 'sendRequest') //if the command is the command to send the request
6 $requestsentto = $_REQUEST['pin']; //the request is being sent to the user with this pin
7 $requestsentfrom = $_SESSION['pin']; //the request is being from the user logged in here
8 //stores the friendrequest to the database
9 $sql = "INSERT INTO friendstable(sending_from, sending_to) VALUES ('$requestsentfrom', '$requestsentto')";
10 //extracting data to make the message
11 $requestsentfrom_firstname = "SELECT childfname from users WHERE pin = '$requestsentfrom'";
12 $requestsentto_firstname = "SELECT childfname from users WHERE pin = '$requestsentto'";
13
14 $result1 = mysqli_query($conn, $requestsentfrom_firstname);
15 $result2 = mysqli_query($conn, $requestsentto_firstname);
16
17 $row1 = mysqli_fetch_assoc($result1);
18 $row2 = mysqli_fetch_assoc($result2);
19 //the message is created
20 $message =
21     $row1['childfname']. ' sent '. 'your child ' . $row2['childfname']. ' a request' ;
22
23 //the notifications is created and this is sent to the database
24 $notifications = "INSERT INTO notifications (notifications_sentfrom, notifications_sentto, message) VALUES ('$requestsentfrom', '$requestsentto', '$message')";
25
26
27 if (mysqli_query($conn, $sql) && mysqli_query($conn, $notifications)) {
28
29     $worked = "request sent";
30 }
31 else {
32
33     $worked = "Error: " . $sql . "<br>" . mysqli_error($conn);
34 }

```

**Figure 68: Storing friend request and notifications on the database**

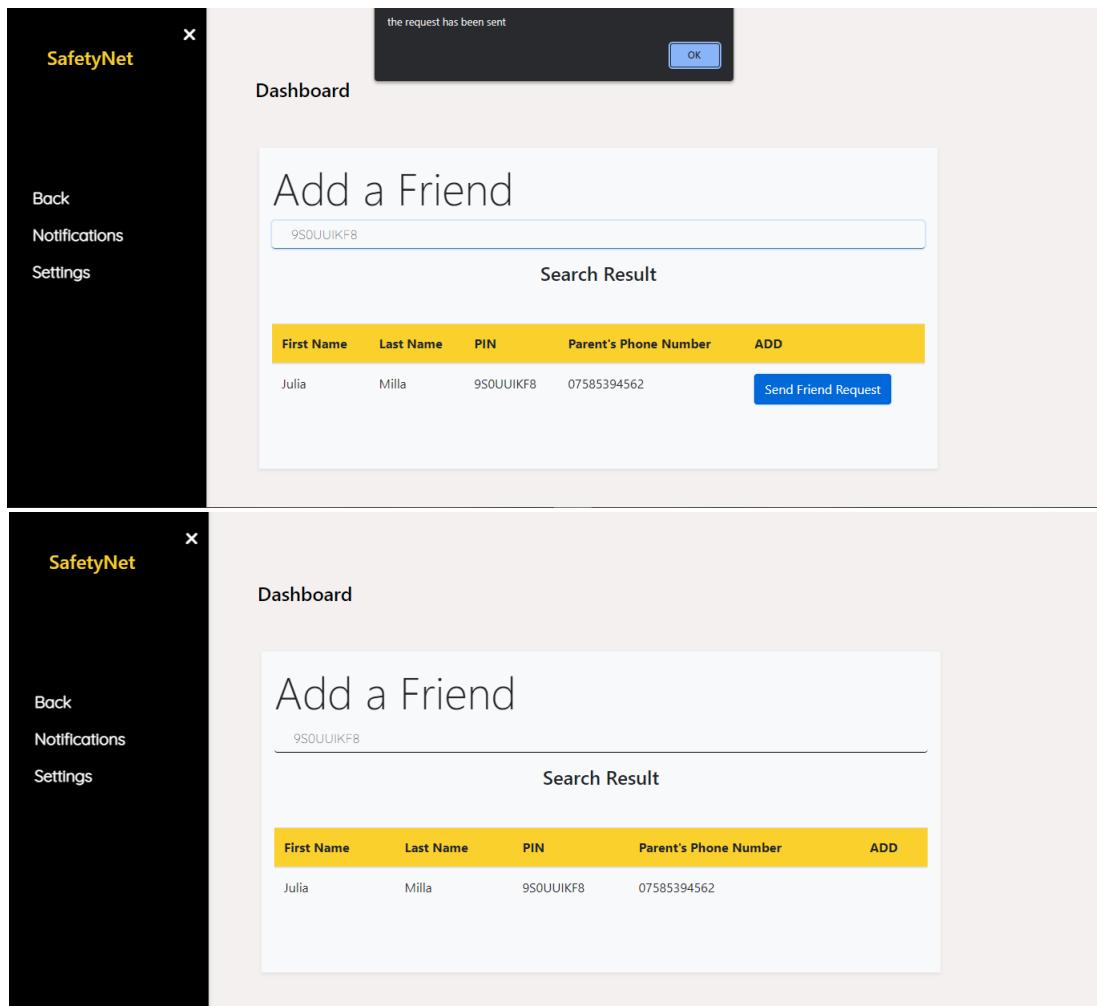
Figure 68 shows how the friend request gets created and stored on the database and a notification is created so the other parent can see the message to accept the request. Variables are created to represent the pins of the two users. A SQL statement is created which stores the data over to the 'friendstable', the data consists of the user that sent the request and the user that it was sent to.

Shortly afterwards, the names are extracted from the users table using the PIN of the two users to create a message that the parent will see as a notification. Finally, data is inserted in the 'notificationstable' which includes the sender of request, receiver of request, notification message and the accepted status. When everything is done, it will tell the user that the request has been sent.

id	notifications_sentfrom	notifications_sentto	message	accepted
77	CB03V0Q7	9S0UUJKF8	Rosa sent your child Julia a request	N/A

**Figure 69: Data stored in friendstable and notificationstable**

There was a problem where the user was able to add multiple requests, because the 'Send Friend Request' button did not disappear so the user could keep clicking this button and it kept updating the database. To solve this, the request button had to disappear when the user sends a request, however, it shows after the user types a new PIN.



**Figure 70: The button disappearing after the user clicks the request button**

## 4.4 Notifications System

```
81 <div class = "col-md-10 shadow-sm p-3 bg-light bb" style = "height:400px;" id = "chartscreen">
82   <h1 class="display-4">Notifications</h1>
83
84
85   <div class="card" style="width: 500px; height:170px;">
86     <div class="card-body">
87       <h5 class="card-title">Friend Request</h5>
88       <?php if (empty($row)): ?>
89         <tr>
90           <td colspan="5" style="text-align:center;">You currently do not have a friend request</td>
91         </tr>
92       <?php else: ?>
93         <?php foreach ($row as $result): ?>
94           <?php echo $result['message']; ?>
95           <form method = "POST" action = "friends.php">
96             <input type = "submit" class="btn btn-primary" value = "accept" name = "accept"/>
97             <input type = "submit" class="btn btn-primary" value = "reject" name = "reject"/>
98           </form>
99
100        <?php endforeach; ?>
101      <?php endif; ?>
102    </div>
103  </div>
```

**Figure 71: The code for the notifications UI**

The next task was developing the notification system which took over 3 days due to how straightforward it was. Foreach loops are an efficient technique in PHP because data is displayed depending on a yes/no logic. For example, if the parent does not have a friend request in the notifications menu, lines 88 to 93 in Figure 71 show it will display that the user does not have a friend request to the user. On the other hand, lines 93 to 100 display the friend request with buttons for the parent to either reject or accept the request. This is a useful technique because it allows programmers to write quick and efficient lines of code.

```

2 <?php
3 session_start();
4 // create the database connection
5 require_once 'safety.php';
6 $pin = $_SESSION['pin'];
7 $notificationsquery = "SELECT * from notifications WHERE notifications_sentto = '$pin' and accepted = 'N/A'";
8 $result = mysqli_query ($conn, $notificationsquery);
9 $row = $result->fetch_all(MYSQLI_ASSOC);
10 ?>

```

The screenshot shows a web application window titled "SafetyNet". On the left, there's a sidebar with a "Back" button. The main area is titled "Dashboard" and contains a "Notifications" section. Inside the notifications section, there's a box for a "Friend Request" from "Rosa" to "Julia". It includes a message saying "Rosa sent your child Julia a request" and two blue buttons: "accept" and "reject".

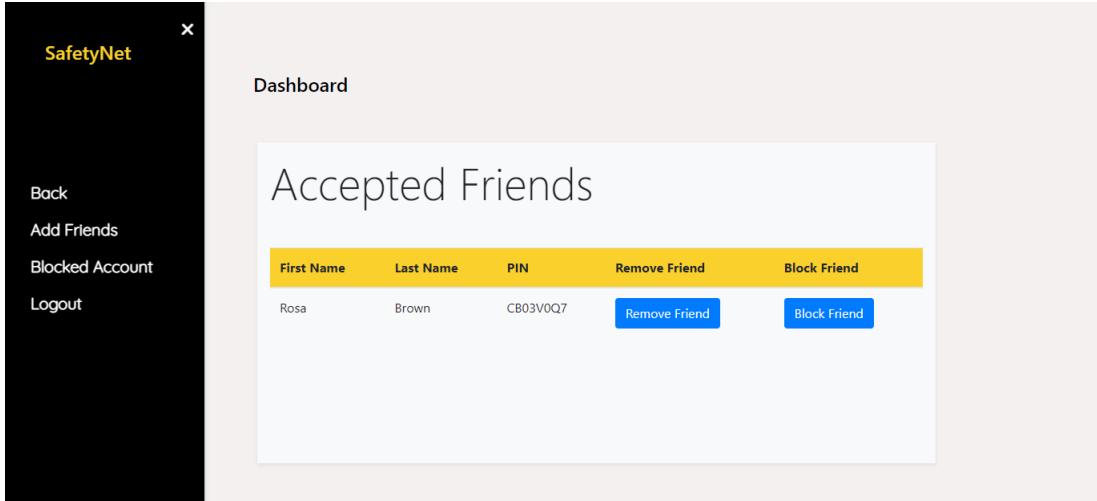
**Figure 72:** The parent receiving the friend request on their dashboard

As seen in figure 72, the dashboard searches the notifications table on the database to find any records where a user sends a request to the parent that is logged onto the platform. With the accepted status being set to 'N/A', this means a connection is yet to be established between the two users. If the parent accepts the request, their child will become friends with this user and their accepted status will become 1.

							accepted
<input type="checkbox"/>	Edit	Copy	Delete	77	CB03V0Q7	9S0UUUIKF8	Rosa sent your child Julia a request 1
<input type="checkbox"/>	Edit	Copy	Delete	78	9S0UUUIKF8	CB03V0Q7	You are now friends 1

**Figure 73:** Database updating notifications table to establish a connection between users

#### 4.4.1 Removing and Blocking Users



**Figure 74: Parent viewing their child's Friends List**

When the parent has accepted the friend request for their child to communicate with a friend, the parent can look at their child's friends list while having the option to either block or remove the user.

```
216  function sendsblockcommand(constant, pin){  
217      //pin is passed to another page to update the connection on the database  
218  $.post(`blockcommand.php?sendscommand=sendRequest&pin=${pin}`,function(response){  
219      if(response == 'request sent'){  
220          $('#blockbutton').hide();  
221          alert('the user has been blocked');  
222          //when it's successful, the user will be blocked  
223      }  
224  
225  
226  
227  
228  })  
229  
230  }  
231  
232  
233  
234  function sendsremovecommand(constant, pin){  
235      //pin is passed to another page to update the connection on the database  
236  $.post(`removecommand.php?sendscommand=sendRequest&pin=${pin}`,function(response){  
237      if(response == 'request sent'){  
238          $('#removebutton').hide();  
239          $('#blockbutton').hide();  
240          //when it's successful, the user will be removed as a friend  
241          alert('the user has been removed as a friend');  
242      }  
243  })
```

**Figure 75: Passing the PIN to another page in order to update the accepted status**

```

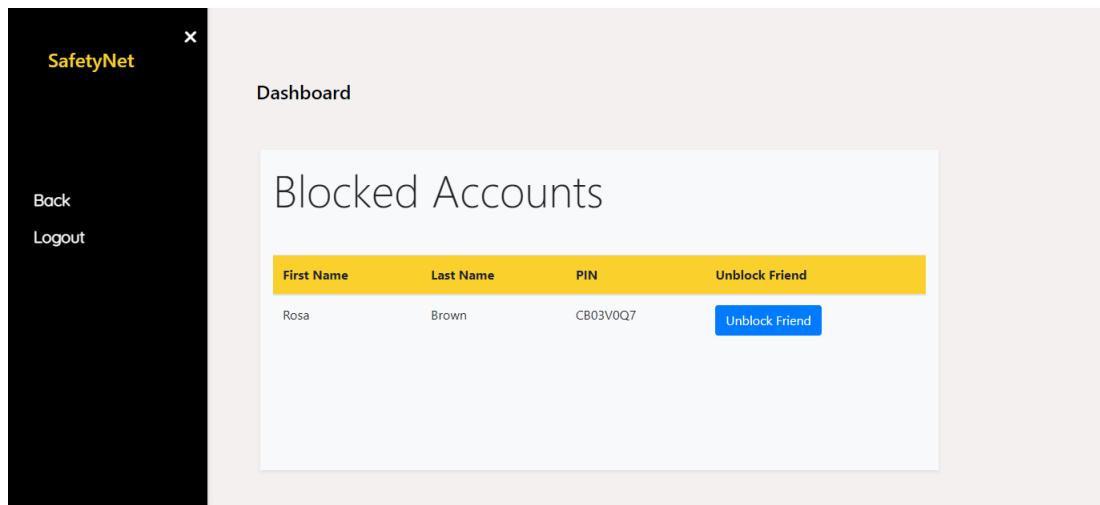
2
3 include 'safety.php';
4 session_start();
5 if ($_REQUEST['sendcommand'] === 'sendRequest'){//if the command is the command to send the request
6 $blocksentto = $_REQUEST['pin']; //the request is being sent to the user with this pin
7 $blocksentfrom = $_SESSION['pin'];//the request is being from the user logged in here
8
9
10 $sql = "INSERT INTO blockedaccounts(blocksentfrom, blocksentto) VALUES ('$blocksentfrom','$blocksentto')";
11
12 $sql1 = "UPDATE notifications set accepted = 0 where notifications_sentfrom = '$blocksentfrom' AND notifications_sentto = '$blocksentto'";
13
14 $sql2 = "UPDATE notifications set accepted = 0 where notifications_sentfrom = '$blocksentto' AND notifications_sentto = '$blocksentfrom'";
15
16 $sql3 = "UPDATE message set connection = 1 where senderpin = '$blocksentfrom' AND receiverpin = '$blocksentto'";
17
18 $sql4 = "UPDATE message set connection = 1 where senderpin = '$blocksentto' AND receiverpin = '$blocksentfrom'";
19
20
21 include 'safety.php';
22 session_start();
23 if ($_REQUEST['sendcommand'] === 'sendRequest'){//if the command is the command to send the request
24 $notifications_sentto = $_REQUEST['pin']; //the request is being sent to the user with this pin
25 $notifications_sentfrom = $_SESSION['pin'];//the request is being from the user logged in here
26
27 //set the connection between the users to blocked
28 $sql1 = "UPDATE notifications set accepted = 2 where notifications_sentfrom = '$notifications_sentfrom' AND notifications_sentto = '$notifications_sentto'";
29
30 $sql2 = "UPDATE notifications set accepted = 2 where notifications_sentfrom = '$notifications_sentto' AND notifications_sentto = '$notifications_sentfrom'";
31
32
33
34
35
36
37
38
39
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50
51
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```

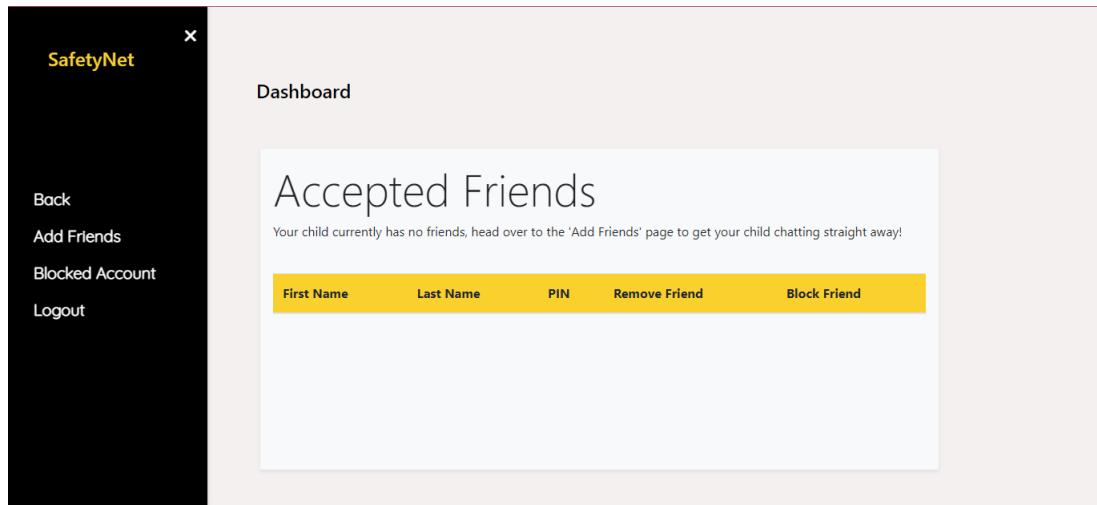
**Figure 76: Updating the connection status between the users to blocked**

Figure 76 follows the same process as it was done earlier to send a friend request in the report. The PIN value is passed through a function onto a PHP page that will update the connection status between the two users on the database. When the user PIN that the parent wants to block is passed through, the PIN and the parent's child PIN are used to create a SQL statement which updates the connection between both users is equalled to 0 meaning the user is blocked. The messages between the users are also updated so that the messages will disappear when the parent blocks the user.

Therefore, the child is no longer friends with this user and will not be able to communicate afterwards. The parent is also able to remove friends from their child's account, when the parent clicks on the 'remove friend' button, the 'notificationstable' is updated and the friend connection is updated from 1 to 2, which means it has been rejected.



**Figure 77: An image of a list of block accounts on the parent's dashboard**



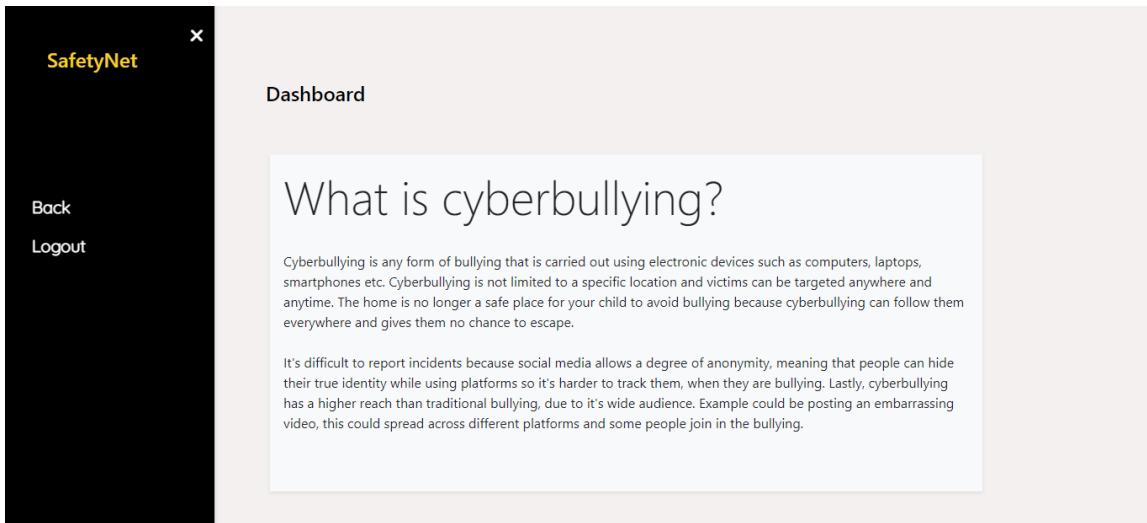
**Figure 78: Parent Dashboard after removing a friend from their child's account**

#### 4.4.2 Cyberbullying and Internet Safety Guide

```
86 <div class = "col-md-10 shadow-sm p-3 bg-light bb" style = "height:400px;" id = "chartscreen">
87
88 <h1 class="display-4">What is cyberbullying?</h1><br>
89 <p> Cyberbullying is any form of bullying that is carried out using electronic devices such as computers, laptops, smartphones etc. Cyberbullying is no
90 longer a safe place for your child to avoid bullying because cyberbullying can follow them everywhere and gives them no chance to escape.<br>
91
92 <br>It's difficult to report incidents because social media allows a degree of anonymity, meaning that people can hide their true identity while using
93 traditional bullying, due to it's wide audience. Example could be posting an embarrassing video, this could spread across different platforms and some
94
95
96
97
98 </p>
```

**Figure 79: Programming the 'what is cyberbullying page'**

Programming this stage of the project was seen as the least time consuming due to it being content that parents and their child just need to read on their respective platforms, it required no interactivity being implemented into this side of the project. It took over 12 days due to research and as seen in Figure 79, this was programmed by inserting all content inside a paragraph tag. This was added to inform parents about the topic of cyberbullying and what to expect.



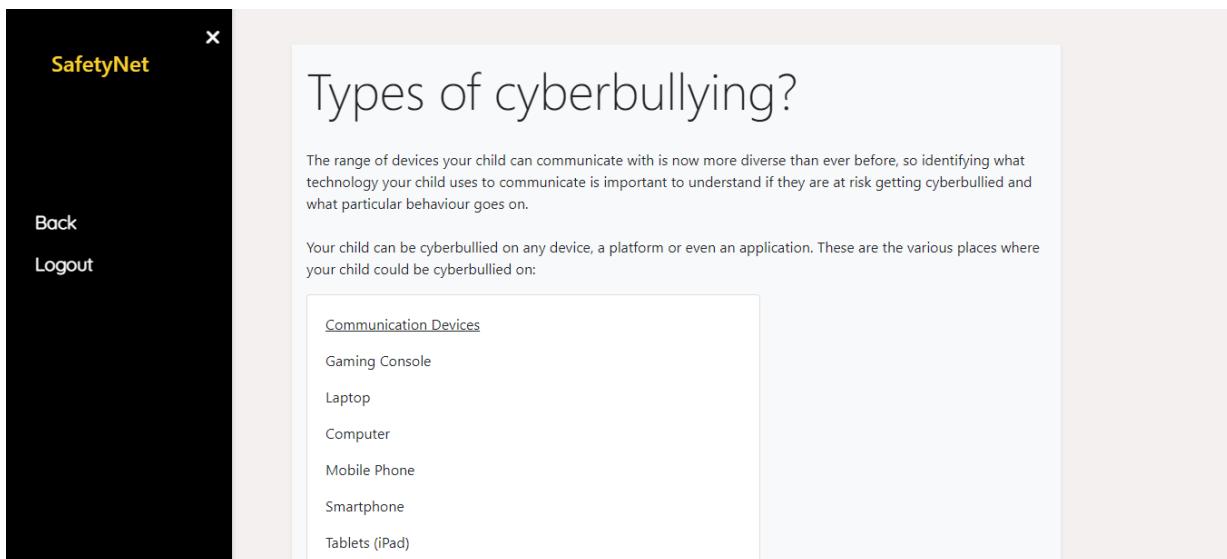
**Figure 80: What is cyberbullying page**

```

88 | <h1 class="display-4">Types of cyberbullying?</h1><br>
89 | <p> The range of devices your child can communicate with is now more diverse than ever before, so identifying what technology your child uses to communicate
90 | is important to understand if they are at risk getting cyberbullied and what particular behaviour goes on.<br><br>
91 |
92 | Your child can be cyberbullied on any device, a platform or even an application. These are the various places where your child could be cyberbullied on:
93 |
94 |
95 |
96 | </p>
97 |
98 | <div class="card" style="width: 500px; height:350px;">
99 |
100 |   <div class="card-body">
101 |     <p class = 'underline' style = 'text-decoration:underline;'>Communication Devices</p>
102 |     <p class = 'list'>Gaming Console</p>
103 |     <p class = 'list'>Laptop</p>
104 |     <p class = 'list'>Computer</p>
105 |     <p class = 'list'>Mobile Phone</p>
106 |     <p class = 'list'>Smartphone</p>
107 |     <p class = 'list'>Tablets (iPad)</p>
108 |
109 |
110 |
111 |   </div>
112 | </div>>
113 | <br><br>
114 | <div class="card" style="width: 500px; height:350px;">
115 |
116 |   <div class="card-body">
117 |     <p class = 'underline' style = 'text-decoration:underline;'>Websites, Applications or other services</p>
118 |
119 |     <p class = 'list'>Email</p>
120 |     <p class = 'list'>Instant Messages</p>
121 |     <p class = 'list'>Phone Calls</p>
122 |     <p class = 'list'>Social Networking sites</p>
123 |     <p class = 'list'>Chat Application</p>
124 |     <!-- <ul style="list-style-type: none; padding-left: 0; margin: 0; -->

```

**Figure 81: Programming the types of cyberbullying page**



**Figure 82: Types of Cyberbullying**

```

85 |
86 | <div class = "col-md-10 shadow-sm p-3 bg-light bb" style = "height:500px;" id = "chartscreen">
87 |
88 |   <h1 class="display-4">Impact of cyberbullying?</h1><br>
89 |   <p> Cyberbullying can be really dangerous to your child as it can negatively affect their mental and physical health. There can also be long term psychological problems such as emotion
90 | and peer problems and psychosomatic problems including headaches and stomach aches.
91 |
92 |
93 |   </p>
94 |   <p> If you fail to notice your child being cyberbullied, it could lead to your child being depressed and it could lead to them taking out their
95 | trauma on someone else and end up being a cyberbully on the internet. Cyberbullying also increases the likelihood of children committing
96 | suicide or having suicidal thoughts. If your child was cyberbullied, their self esteem may decrease and they may develop anxiety and loneliness. It could also
97 | affect their grades at school, due to lack of focus.
98 |
99 |
100 | </div>

```

**Figure 83: Programming of Impact of Cyberbullying section**



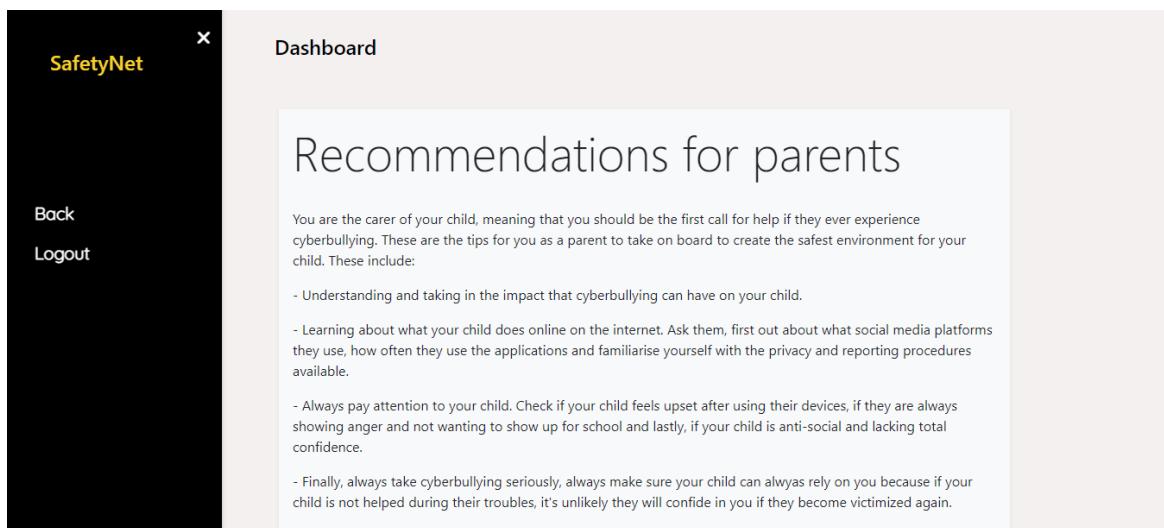
**Figure 84: Impact of Cyberbullying page**

```

68 <div id = "dashboardcontent">
69   <div class = "container-fluid">
70     <button class="openmenubutton" onclick="openmenu()" id = "openbutton">#9776; </button><h4 class ="h4">Dashboard </h4>
71     <div class = "container">
72       <div class ="row">
73         <div class = "col-md-10 shadow-sm p-3 bg-light bb" style = "height:500px;" id = "chartscreen">
74           <h1 class="display-4">Recommendations for parents</h1><br>
75           <p>You are the carer of your child, meaning that you should be the first call for help if they ever experience cyberbullying. These are the tips for you as parent to take on board to create the safest environment for your child. These include:</p>
76
77           <p>- Understanding and taking in the impact that cyberbullying can have on your child.</p>
78             <p>- Learning about what your child does online on the internet. Ask them, first out about what social media platforms they use, how often they use and familiarise yourself with the privacy and reporting procedures available.</p>
79
80             <p>- Always pay attention to your child. Check if your child feels upset after using their devices, if they are always showing anger and not wanting to show up for school and lastly, if your child is anti-social and lacking total confidence.</p>
81
82             <p>- Finally, always take cyberbullying seriously, always make sure your child can always rely on you because if your child is not helped during their troubles, it's unlikely they will confide in you if they become victimized again. </p>
83
84           </div>
85         </div>
86       </div>
87     </div>
88   </div>
89 </div>
90

```

**Figure 85: Programming of Recommendation of parents**



**Figure 86: Recommendation for parents' page**

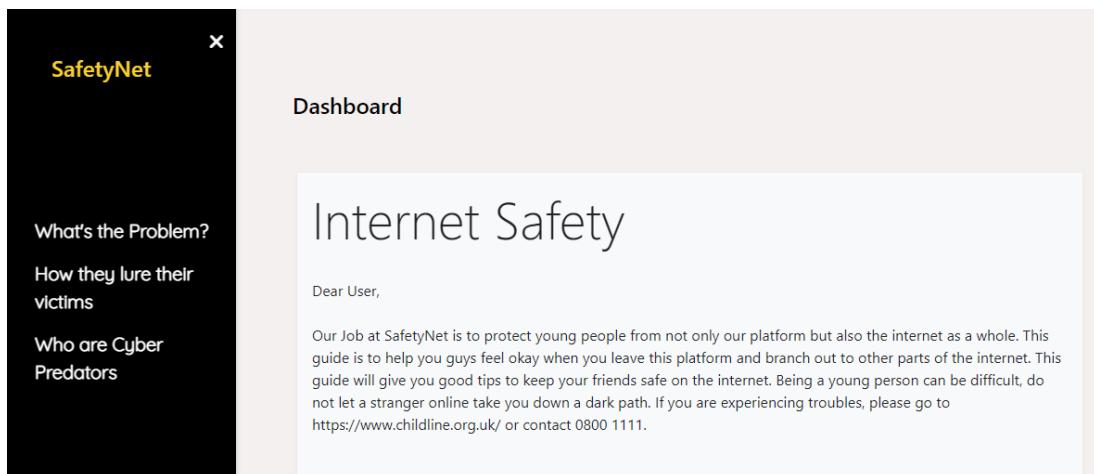
```

86
87 <div class = "col-md-10 shadow-sm p-3 bg-light bb" style = "height:400px;" id = "chartscreen">
88
89 <h1 class="display-4">Internet Safety </h1><br>
90 <p> Dear User,<br><br>
91 Our Job at SafetyNet is to protect young people from not only our platform but also the internet as a whole. This guide is to help you guys fe
92
93
94 <br>
95

```

**Figure 87: Inserting content for the internet safety guide**

The same process was done for the internet safety guide as research was conducted to inform the user about internet safety and how to behave online and shown in figure 87, all the information was inserted in paragraph tags on different pages to display the information to the user. Find the rest of the screenshots in [Appendix A](#).



**Figure 88: An insight into the Internet Safety guide**

## **Create Chat Application with all functionalities included**

### **4.4.4 Chat Application UI**

After the dashboard had been programmed with all the functionalities set in place, the last stage of the development phase was to develop the chat application where users can communicate. The user interface had to be programmed first, however, there was a problem with how the UI was going to be programmed hence why it took over 12 days in total. Bootstrap had been used throughout the project's design, but it was difficult using this framework to create the UI layout because it was not going to work as it was planned.

The plan was for the UI to be the organization of columns that work together while the user interacts. For example, if a user clicks on a friend to communicate with on the contacts column, the column will hide in the transition while a new column takes the whole width in transition and displays the chat menu as an application would. There was no way to implement this idea using bootstrap, so it was achieved using Flexbox. Flexbox is a one-dimensional layout system made in CSS to arrange items in rows and columns. Using Flexbox was the most efficient way to make this layout because it is flexible, meaning it is adaptable to change width if needed and this was needed for the project.

```

100 <div id = "rightside">
101     <div id = "header">
102         <div id = 'animationloadingscreen'>
103             <img style = "width: 50px; " src = "loading.gif" >
104
105     </div>
106     <h3><img src = "logo.png" class = "logo" style = 'position:relative; bottom:15px;' /></h3>
107
108     <?php foreach ($row3 as $result3): ?>
109         <p class = "username"><small> Hi, <?php echo $result3['childfname']?> </small> </p>
110     </?php endforeach; ?>
111 </div>
112 <div id = "container">
113     <div id = "contacts">
114         <div id = "chatlist"></div>
115         <div id = "friendslist">
116
117             <?php if (empty($row)): ?>
118                 <div class = 'nofriends'>
119                     <h2 class = 'friends'>You currently have no friends</h2>
120                     <div class = 'secondmessage'>
121                         <h2 class = 'friends'>Just add a friend and you can start chatting!</h2>
122                     </div>
123                     <img src = 'lonely.png' class = 'pic' style = 'position:relative; top:-50px;'/>
124
125             </div>
126         <?php else: ?>
127             <?php foreach ($row as $result): ?>
128                 <div id = 'contact' style = 'text-align:center; animation:' class = 'hh' pin = '<?php echo $result['pin']; ?>' onclick = "beginchat(eve
129                     <img class='rounded-circle' src = "<?php echo $result['images']; ?>" />
130                     <p><?php echo $result['childfname'] ; ?></p>
131                 </div><br>
132
133             </?php endforeach; ?>
134         <?php endif; ?>

```

**Figure 89: Creation of columns for the UI**

Figure 89 shows how the different columns are created, and sections are placed inside these columns which will represent the content that will be shown to users. Foreach loops are used in line 117 to avoid errors if the data does not exist. For example, if the user does not have a friend, the loop will display something else to tell the user to add a friend, this will therefore avoid any errors from showing on the application because PHP cannot display something that is not there.

```

603     #leftside{
604         padding-top:30px;
605         flex:1;
606         border-right: 1px solid grey;
607         min-height:500px;
608         background-color:black;
609         text-align:center;
610     }
611     #rightside{
612         flex:25;
613         text-align:center;
614         min-height:500px;
615     }
616
617     #header{
618         height:60px;
619         background-color:#FAD02C;
620         color:white;
621         font-family:quicksand;
622         font-weight:BOLD;
623         padding:20px;
624         border-bottom:1px solid grey;
625         font-size:20px;
626     }
627
628     #contacts{
629
630         flex:1;
631         background-color:#F4F0F0;
632
633         min-height:450px;
634         transition:all 2s ease;
635         max-height:100%;
636         position:relative;
637         vertical-align:top;
638
639
640

```

**Figure 90: CSS for styling the columns**

CSS was used for styling the different parts of the application and make it look like the wireframe that was designed in the report. The header and the left and right column were programmed with the height and width being set using flex. After this was achieved, the next step was making the columns flexible depending on the user's actions and this was done using radio buttons. Radio buttons were added into the page, and they were linked to several buttons that the user can interact with. When the user clicks on one of these buttons, there was code that enables the columns to either decrease in width or expand in width.

```

83 <div id = "getcontacts">
84     <label for = "radiocontacts"><i class="fa fa-address-book" style="font-size: 25px;" title="Contacts" ></i></label>
85 </div>
86 <div id = "getchats">
87     <label for = "radiochats"><i class="fa fa-comments" style="font-size: 25px;" title = "Chats"></i></label>
88 </div>
89 <div id = "getsettings">
90     <label for = "radiosettings"><i class="fa fa-user-plus" style="font-size: 25px; color:white;" title = "Settings"></i></label>
91 </div>
92 <div id = "logout">
93     <label for = "radiologout"><i class="fa fa-sign-out" style="font-size: 25px; color:white;" title = "Logout"></i></label>
94 </div>
95 <label></label>
96 </div>

```

**Figure 91: Code for linking the buttons and radio buttons**

As shown on Lines 83 to 93 on figure 91, the icon buttons that the user interacts with are linked with the radio button using the 'label for' attribute specifying the element that a label is bound to. The radio buttons were seen initially during its development to test whether it is connected to the icon buttons which can be shown here:



**Figure 92: The testing of radio buttons on the initial design which is out of scope**

After testing the radio buttons to ensure a connection exists between it and the icon buttons, it was developed further to ensure that a specific action takes place where the column either decreases or increases in width after an icon gets clicked.

```
695     #radiocontacts:checked ~ #chats{
696
697
698
699     flex:3;
700 }
701
702
703     #radiocontacts:checked ~ #chats{
704
705
706     flex:0;
707 }
708
709     #radiocontacts:checked ~ #chats{
710
711
712     flex:0;
713 }
714
715     #radiochats:checked ~ #chats{
716
717
718     flex:1;
719 }
720
721
722     #radiosettings:checked ~ #chats{
723
724
725     flex:0;
726 }
727
728
729     #radiologout:checked ~ #chats{
730
731
732     flex:0;
```

**Figure 93: Linking the radio buttons and the columns together using CSS**

Figure 93 shows that when a radio button is checked, '~~' is used to create a relationship with the element and flex is used to either decrease or increase the column. For example, if the user clicks on the contacts icon, because it is linked to a radio button, it becomes checked, meaning that the column increases its width, and if a user also clicks the settings button, it's width will decrease entirely, and it functions like how an application would. The next task was to display content inside these columns for the user to interact with them and it began with allowing the user to see their friends list.

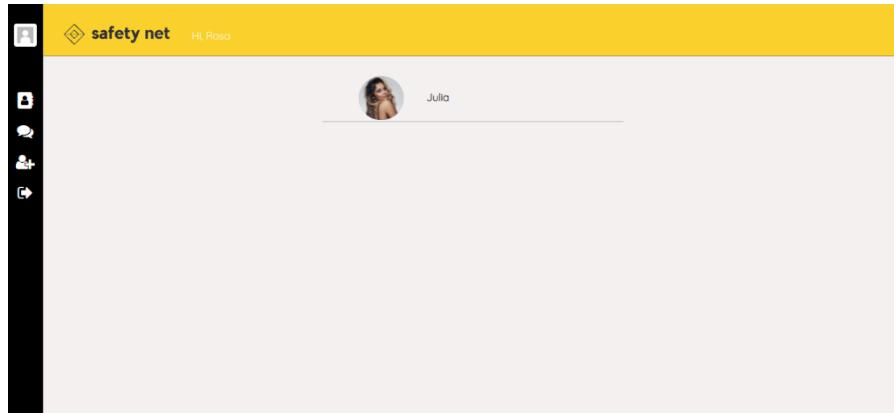
#### 4.4.5 Viewing a Friends List

```
176  function getcontacts(){
177
178      var chats = document.getElementById("chats");
179      chats.style.overflow = "hidden";
180
181      var chatlist = document.getElementById("chatlist");
182      chatlist.style.visibility = "hidden";
183      var friendslist = document.getElementById("friendslist");
184      friendslist.style.visibility = "visible";
185      var settings = document.getElementById("settings");
186      settings.style.visibility = "hidden";
187
188      var logout = document.getElementById("logout1");
189      logout.style.visibility = "hidden";
190
191      var contact11 = document.getElementById("contactss");
192      contact11.style.visibility = "hidden";
193
194
195      var loader = document.getElementById("animationloadingscreen");
196      loader.style.visibility = "visible";
197
198      var request = new XMLHttpRequest();
199      request.onreadystatechange = function() {
200          if (request.readyState == 4 && request.status == 200) {
201              loader.style.visibility = "hidden";
202
203              document.getElementById("friendslist").innerHTML = request.responseText;
204          }
205      };
206      request.open("post", "contacts.php", true);
207      request.send();
208  }
```

**Figure 94: Using AJAX to display data from other pages onto the chat application**

This task took over 4 days because it only requires displaying the friends that the parent has added for the user, and this was achieved by using AJAX to display pages onto the columns without refreshing the application. Figure 94 shows the function that takes place when the user clicks the contacts button.

When this happens, other pages that may have been on the screen are automatically hidden and a request is sent to 'contacts.php', a file that gathers the friends that the user's parent has added for them on their dashboard. When this process is successful it will send the response in the section area called 'friendlist' and the user will see their friend's list in result.



**Figure 95: User looking at their friend's list on the chat application**

#### 4.4.6 Starting a Chat with a user

The next task was developing the functionality which allows the user to begin a chat with the friend that they clicked on. This took over a week to develop due to the level of interaction between the user and application. The plan was when the user clicks on someone that they wish to communicate with, the left column of the application displays the user that they are talking to, and the right column displays the chat menu, which will allow the user to type and send a message.

```

<?php foreach ($row as $result): ?>
<div id = 'contact' style = 'text-align:center; animation:' class = 'hh' pin = 'php echo $result['pin']; ?' onclick = "beginchat(event)">
    <img class='rounded-circle' src = "php echo $result['images']; ?" />
    <p><?php echo $result['childfname']; ?></p>
</div><br>
315  function beginchat(e){//this is lead us to the particular chat that got clicked
316  //a problem here was i wanted to be able to click on any part of the div images, names etc for the chat section to be linked with the user id of the person
317  //now i needed to get the attributes of the user's pin which i could pass through into the php section
318
319
320  var pin = e.target.getAttribute("pin");
321  if (e.target.id == ""){
322      pin = e.target.parentNode.getAttribute("pin");
323
324
325  }
326  selecteduser = pin;
327  //the variable becomes the pin
328  var radiochat = document.getElementById("radiochats");
329  radiochat.checked = true;
330
331  $.post("chats.php", {user: selecteduser}, function(result){
332      //the pin is passed over to this page
333      $("#friendslist").html(result);
334  });
335  //the pin is passed over to this page
336  $.post("chatsl.php", {user: selecteduser}, function(result){
337      $("#chats").html(result);
338  });
339
340
  
```

**Figure 96: Starting chat event**

As seen in figure 96, an event is created when the user clicks on their friend's profile. However, the application needs the friend's pin to pass it through the chat menu to extract the messages between the two users and present some information in the right column. A problem recorded was when the user clicked on the friend, sometimes the application would not pass the PIN through to the chat menu.

This was solved on lines 320 to 322, this code allows the user to click any part of the friend's profile card and the PIN will still get passed through to the chat menu. The variable 'selecteduser' represents the user's friend PIN value and it is then passed over to the two pages through parameters representing 'user' as shown on line 331. 'Chats.php' is a page that represents the chat profile that the user is communicating with and 'chats1.php' will represent the chat menu, which will extract the PIN and establish a connection between the two users will allow them to communicate. These sections will be presented inside the columns within the Chat Application user interface using AJAX.

```

1  <?php
2   error_reporting(0);
3
4   require 'safety.php';
5   session_start();
6
7
8   if (isset($user)){
9     $user = $_POST["user"];
10    $sql = "select * from users WHERE pin ='". $_POST["user"]."'";
11    $data = mysqli_query($conn, $sql);
12    $row = $data->fetch_all(MYSQLI_ASSOC);
13  }
14  else{
15
16    echo"it wasnt found";
17
18  }
19
20 ?>
21
22
23      <?php if (empty($row)): ?>
24      <tr>
25        <td colspan="5" style="text-align:center;">No Chats Currently</td>
26      </tr>
27      <?php else: ?>
28      <div id = 'contactss' class = 'aa' >
29        <?php foreach ($row as $result): ?>
30          <div class = 'image'>
31            <img class='rounded-circle' id = 'image' src = "<?php echo $result['images']; ?>" >
32          </div>
33          <div class = 'p'>
34            <p class = 'p' style = 'margin-bottom:70px; right:120px;'><?php echo $result['childfname']; ?></p>
35            </div>
36            <?php endforeach; ?>
37            <?php endif; ?>
38
39
40      <script>

```

**Figure 97: Creating chat profiles on chats.php**

As shown in figure 97, the PIN was successfully passed through the function as intended and the variable 'user' on line 9 represents this. From here the file searches the 'users' table in the database to search for users with that PIN value to display on the application. For users to be able to communicate, messages will need to be stored in the database so they can be displayed on the application. A table needs to be created first.

#### **4.4.7 Sending Messages**

Table name	SQL code
Messages	<pre>Create Table messages (     Id bigint(20),     Senderpin varchar(11),     Receiverpin varchar(11),     Date datetime,     Connection DEFAULT '2',     Messages text);</pre>

**Table 9: Code to create messages table**

Field name in messages table	Meaning of field
Id	Numeric column that is generated with an integer whenever a new user creates a friend request.
senderpin	The user that sends the message.

receiverpin	The receiver of the message.
date	The time the message was sent.
Connection	The represents the message status, if a message is sent the status is 1, if the user is blocked, the connection status will be 2, therefore the user will no longer see any messages.
messages	The actual message.

Table 10: Meaning of messages table

**Figure 98: Chat menu being styled with CSS**

Figure 98 shows how the information is displayed on the chat menu, with message bubbles that contain details about the message being implemented, and text input that allows the user to type and send a message. CSS is used to style out these elements to make them visually appealing. An event is created when the user presses the button to send the message, however, the user can take a shortcut by pressing the 'enter' key.

```
110 var send = document.getElementById("send");
111 var messagetab = document.getElementById("messagetab");
112 messagetab.addEventListener("keyup", function(event) {
113   if (event.keyCode === 13) {
114     event.preventDefault();
115     document.getElementById("send").click();
116   }
117 });
```

**Figure 99: Shortcut for user to send message**

As seen in figure 99, the user can take a shortcut by pressing enter on the keyboard to send the message. The enter keycode is equalled to 13, therefore as the user presses this key, the message is sent.

#### **4.4.7 Offensive Language/Profanity Filter**

# Offensive Word/Profanity Filter

```
321     function message(){
322         //the message text
323         var message = document.getElementById("messagetab").value;
324         var offensivewords=new Array(
325             //filter messages with offensive language
326             "fuck off","piss off","shit","damn","bitch","dipshit","fuck","faggot","shit","nigger", "fat boy", "kys", "kill yourself", "smd",
327             "dickhead", "\\\\x\\\"\\h", "s\\\\x\\\"\\k", "n\\\\x\\\"\\x\\\"\\er", "f\\\\x\\\"\\x\\\"\\ot", "k\\\\x\\\"\\x\\\"\\l", "d\\\\x\\\"\\x\\\"\\x\\\"\\ad", "nigga", "n\\\\x\\\"\\x\\\"\\a", "paki", "p\\\\x\\\"\\x\\\"\\i",
328             "wanker", "wank", "w\\\\x\\\"\\x\\\"\\k", "w\\\\x\\\"\\x\\\"\\er", "asshole", "a\\\\x\\\"\\x\\\"\\hole", "bulshit", "bull\\\\x\\\"\\x\\\"\\x\\\"\\", "cunt", "c\\\\x\\\"\\x\\\"\\t"
329         );
330         var regex = new RegExp('\\b(' + offensivewords.join('|') + ')\\b', 'i');

331         if (messagetab.value.trim() == ''){//this stops the user from sending empty messages
332             alert("please type a message");
333             return;
334         }else if (regex.test(message)){
335             //disallowing users to send offensive messages
336             alert("This kind of language will not be allowed on Safety Net");
337         }else{
338             //sending message through to a file
339             $.post("sendsmesage.php", {message:messagetab.value.trim(), user: selecteduser}, function(result){
340
341                 $("#chats").html(result);
342                 playAudio(); //playing an audio when a message is sent
343                 var messagetab = document.getElementById("messagetab");
344
345                 var messagewrapper = document.getElementById("messagewrapper");
346                 messagewrapper.scrollTo(0,messagewrapper.scrollHeight);
347                 messagetab.focus();
348
349
350
351
352         });
353     };

```

**Figure 100: Offensive Word/profanity filter to check the message before it is sent**

As seen in Figure 100, an event takes place when the user attempts to send a message, the application does not allow the user to send a message if there is no input before sending. If the user has inputted text into the textbox and sends the message, the application checks the message to find any offensive language that might hurt the users on the platform. This task was achieved by creating an array with a list of offensive words and the messages are checked to find any pattern of offensive language. If the message is deemed unacceptable to send, it will not allow the user to send unless the message is changed, if the message is acceptable, it will pass the message through to another page for the message to be inserted in a database and the page will be displayed on the chat menu.

```

44 if($answer = mysqli_prepare($conn, $sql3)) {
45
46     // binds the variables together to be used as parameters
47     mysqli_stmt_bind_param($answer, "ss", $bindedsender, $binded_receive);
48     $bindedsender = $_SESSION['pin'];
49     $binded_receive= $_POST["user"];
50     if(mysqli_stmt_execute($answer)){
51
52         mysqli_stmt_store_result($answer);
53         //if it matches the user input from the database it will send that message
54         if(mysqli_stmt_num_rows($answer) == 1){
55
56
57             $sqlmessage = "INSERT INTO message(senderpin, receiverpin, messages, date, messages_id) VALUES ('$sender', '$user', '$message', '$date', '$msg_id')";
58             $result6 = mysqli_query($conn,$sqlmessage);
59
60             } else{
61                 $sqlmessage = "INSERT INTO message(senderpin, receiverpin, messages, date, messages_id) VALUES ('$sender', '$user', '$message', '$date', '$msg_id'";
62             $result6 = mysqli_query($conn,$sqlmessage);
63             }
64         } else{
65             $query = "INSERT INTO message(senderpin, receiverpin, messages, date, messages_id) VALUES ('$sender', '$user', '$message', '$date', '$messages_id')";
66             $result4 = mysqli_query($conn,$query);
67         }
68
69
70     mysqli_stmt_close($answer);
}

```

	← →	▼	<b>id</b>	<b>senderpin</b>	<b>receiverpin</b>	<b>date</b>	<b>messages</b>
<input type="checkbox"/>				472	CB03V0Q7	9S0UUIKF8	2022-02-27 00:53:20 hello
<input type="checkbox"/>				482	9S0UUIKF8	CB03V0Q7	2022-02-27 21:15:29 hi are you okay

**Figure 101: inserting the message into the database**

As seen in Figure 101, the PIN number of the sender of the message and the receiver of the message are used in creating a SQL statement and the message will be inserted into the database with the pin numbers of the two users between attached to the message.

```

92  => <?php
93  $work= "select * from message where senderpin = '$sender'";
94  $resultmessage = mysqli_query($conn,$work);
95  $row1 = $resultmessage->fetch_all(MYSQLI_ASSOC);
96
97
98  $userdetails= "select * from users where pin = '$sender'";
99  $resultuser = mysqli_query($conn,$userdetails);
100 $row2 = $resultuser->fetch_all(MYSQLI_ASSOC);
101
102 $leftmessage = "select * from message where senderpin = '".$_POST["user"]."."'";
103 $resultleftmessage = mysqli_query($conn,$leftmessage);
104 $row3 = $resultleftmessage->fetch_all(MYSQLI_ASSOC);
105
106 $userreceiver= "select * from users where pin = '".$_POST["user"]."."'";
107 $resultreceiver = mysqli_query($conn,$userreceiver);
108 $row4 = $resultreceiver->fetch_all(MYSQLI_ASSOC);

```

**Figure 102: Extracting the messages and user details for presentation**

The data is extracted from the messages table and the details of the user including the time that the message was sent, the name of the user that sent the message and the profile picture of the user.

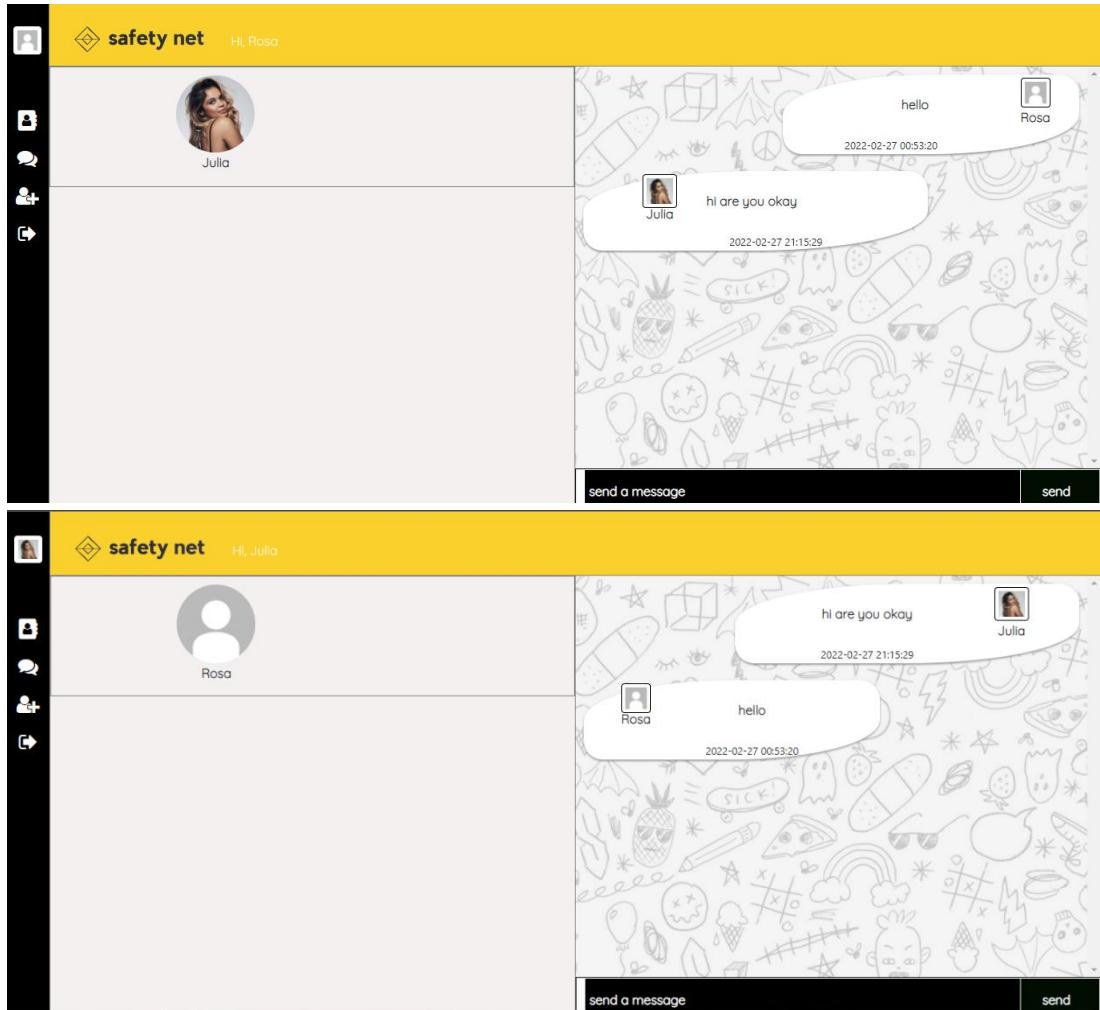
```

388  => setInterval(function(){
389
390    if (selecteduser != ""){
391
392      $.post("chats1.php", {user: selecteduser}, function(result){
393        $("#chats").html(result);
394      });
395
396    }
397
398
399
400
401  }, 5000);

```

**Figure 103: Updating the messages in real-time**

Initially, a problem encountered was that the user had to refresh their application to see the new messages, this was solved using a set-interval function. The purpose of this function is that it repeats a function at a set time-interval. Therefore, every 5 seconds, the chat menu reloads itself in the application so it updates the messages, and the user can see it in real time without refreshing their web application.



**Figure 103: Two perspectives of users communicating**

#### 4.4.9 Viewing Previous Chats

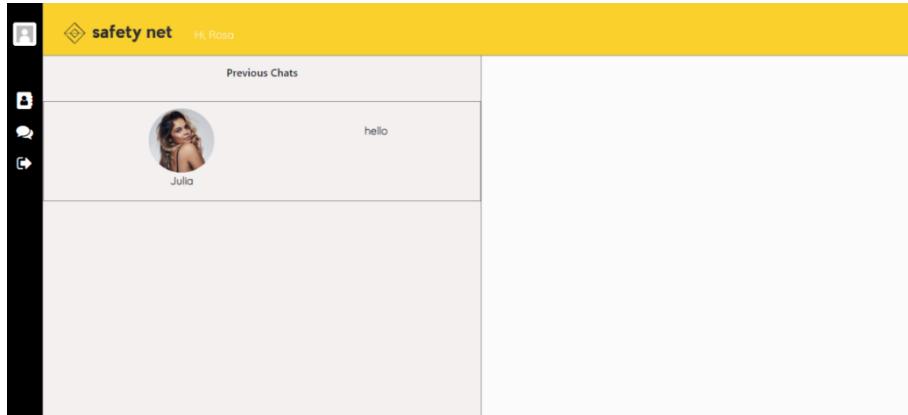
```

9      $sender = $_SESSION['pin'];
10     $sql = "select * from message WHERE senderpin ='$sender' order by date desc limit 1";
11     $data = mysqli_query($conn, $sql);
12     $row3 = $data->fetch_all(MYSQLI_ASSOC);
13   }
14
15   else{
16
17     echo"it wasnt found";
18   }
19
20 ?>
21
22
23 <?php foreach ($row3 as $result): ?>
24   <?php $pin = $result['receiverpin'];
25     $sql5 = "select * from users WHERE pin = '$pin'";
26     $data5 = mysqli_query($conn, $sql5);
27     $row5 = $data5->fetch_all(MYSQLI_ASSOC);
28 ?>
29
30   <?php foreach ($row5 as $result2): ?>
31     <h6 style = 'margin:15px;'>Previous Chats<br><br></h6>
32       <div id = 'contactas' class = 'aa' pin = '<?php echo $result2['pin']; ?>' onclick = "beginchat(event)" >
33         <div class = 'image' position:relative; bottom:30px;'>
34           <img class='rounded-circle' id = 'image' src = "<?php echo $result2['images']; ?>" >
35         </div>
36
37         <p class ='recentmessages' style = 'float:right; position:absolute; margin-top:70px; margin-right:50px;'><?php echo $result2['messages']; ?></p>
38           <div class = 'p'>
39             <p class ='p' style = 'margin-bottom:60px; right:120px;'><?php echo $result2['childfname']; ?></p>
40           </div>
41       </div>
42     <?php endforeach; ?>
43     <?php endforeach; ?>

```

**Figure 104: Developing the previous chat section**

Lastly, it took over 7 days to develop a functionality for users to see previous chats on the chat application. The code shown in figure 104 simply extracts the friends that the user has communicated with on lines 10 to 12 and displays the last message between them and shows it next to the user's profile. The data is used to display this information in the UI.



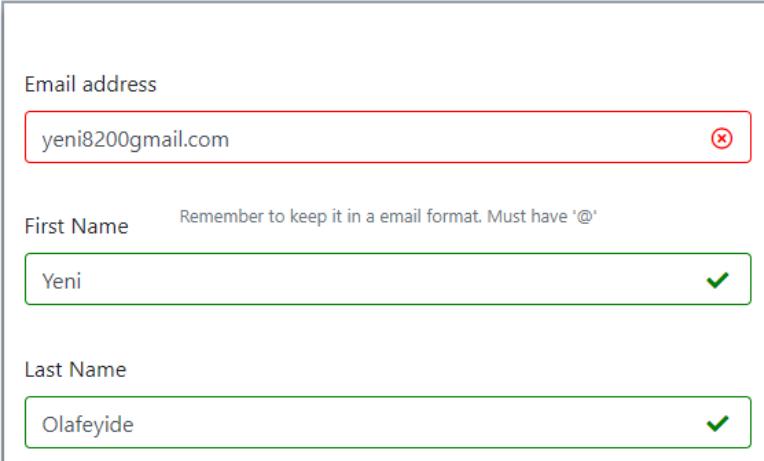
**Figure 105: Previous chats page**

## **4.5 Testing**

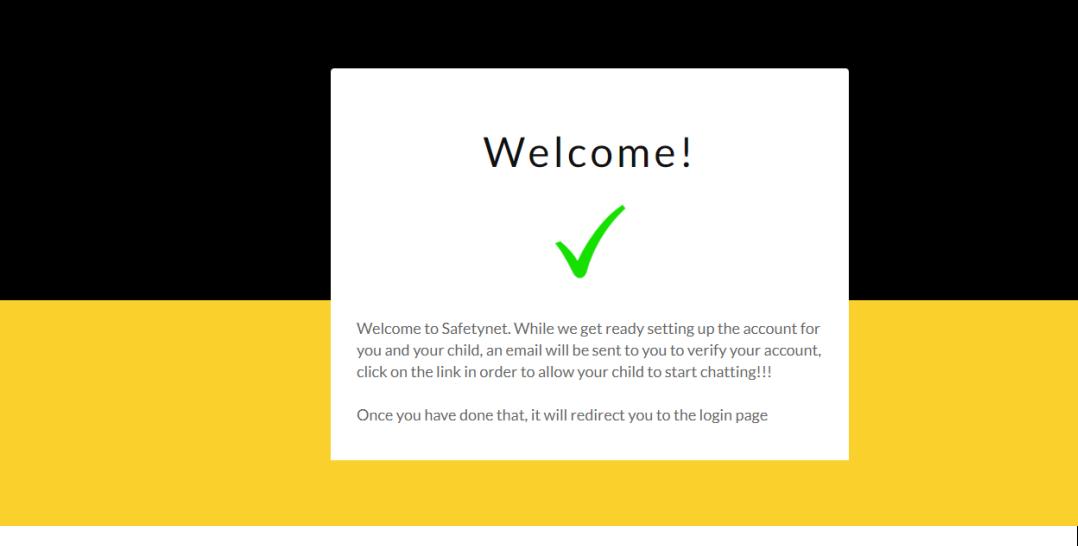
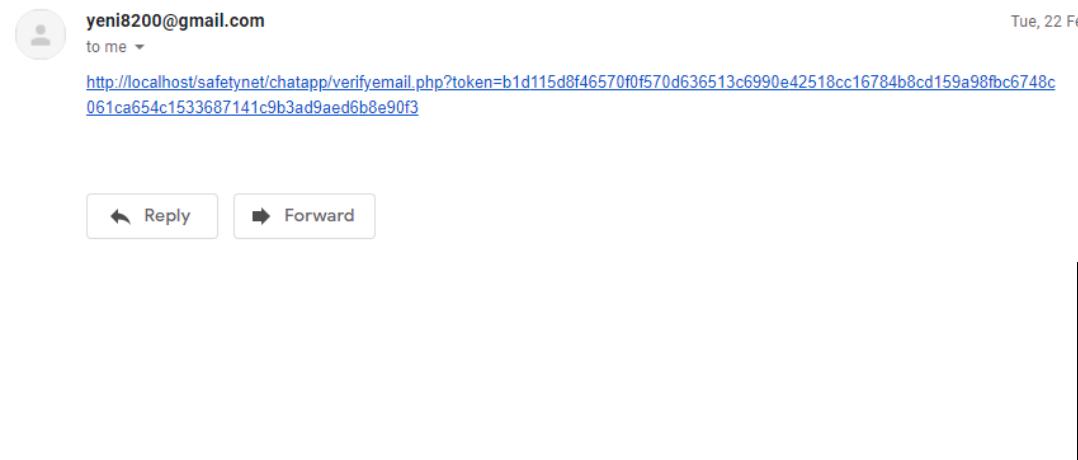
Testing is the set of activities used to show that the application is functioning well with minimal errors.

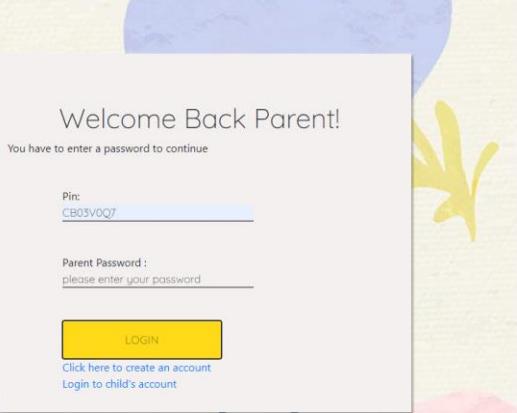
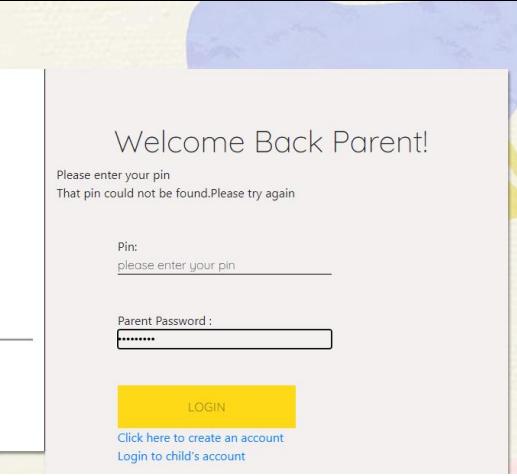
### **4.5.1 Unit Testing**

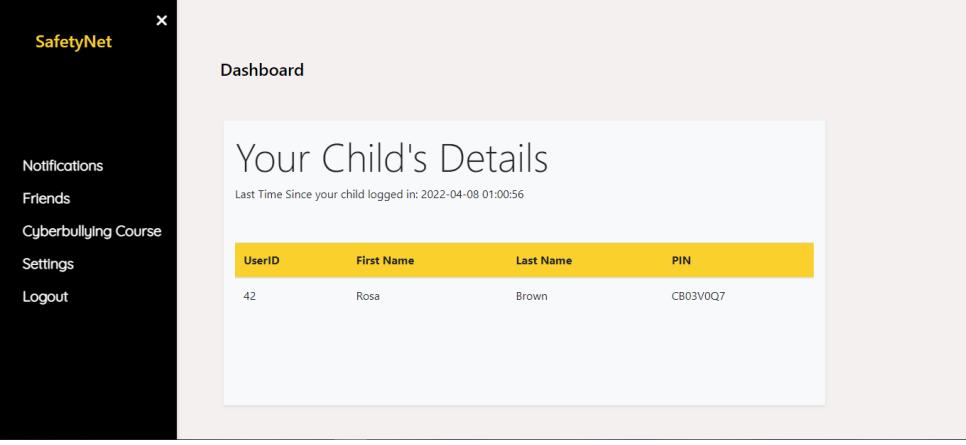
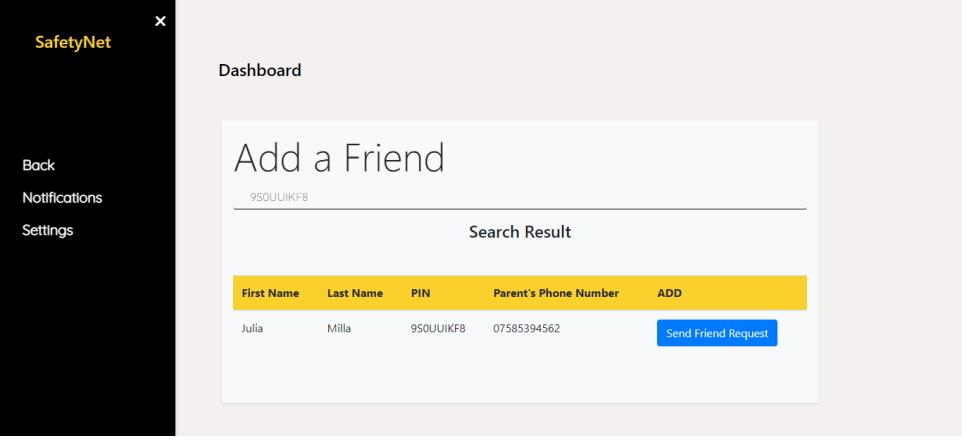
This is a type of testing where individual components of the web application are tested and this was mainly used because it improves the quality of the code because any defects available will be identified and the code will be fixed.

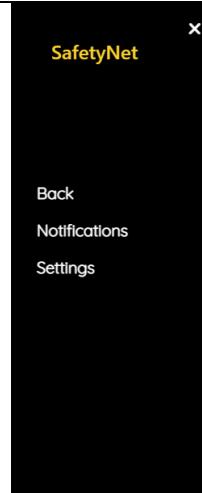
Test No	Action	Input	Expected Outcome	Actual Outcome	Screenshot	Test Result
1	Input incorrect email format in input field for the registration form	'yeni8200gmail.com'	The border should be red when the user clicks off the input field	The border becomes red after clicking off the input field	<p>Email address</p>  <p>The screenshot shows a registration form with three fields: Email address, First Name, and Last Name. The Email address field contains 'yeni8200gmail.com' and has a red border with a close button (X) on the right. A tooltip message 'Remember to keep it in a email format. Must have '@'.' is displayed next to the field. The First Name field contains 'Yeni' and has a green border with a checkmark (✓) on the right. The Last Name field contains 'Olafeyide' and has a green border with a checkmark (✓) on the right.</p>	Pass

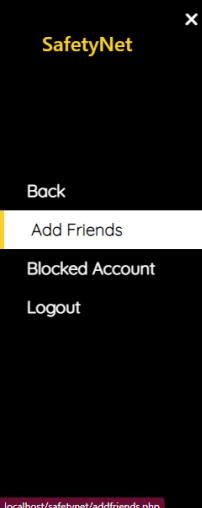
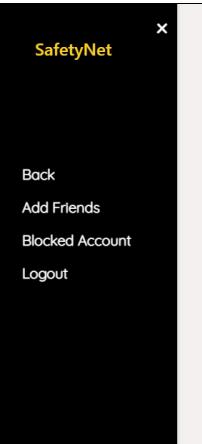
2	Click the Submit button without entering values on the registration form	Click	The page must tell the user that they must fill in all input fields	The page shows the errors the user has made.	You must agree to the privacy policy and terms of service. Please enter a password. Please confirm password. Please enter a password for your child. Please confirm your child password. Please enter a email. Please enter a First Name. Please enter a Last Name. Please enter a child First Name. Please enter a child Last name.	Pass
---	--	-------	---	--	--	------

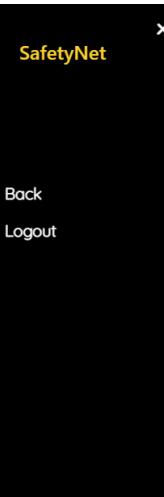
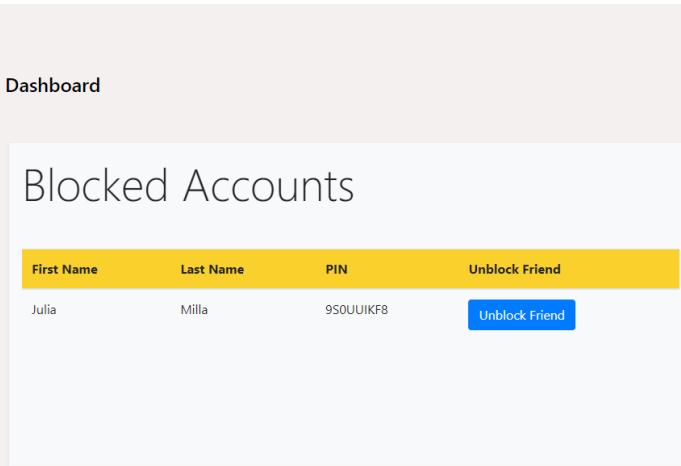
3	Click the submit button to register the account	Click button	The application will tell the user to verify their account by checking their email	The message is displayed to the user	 A screenshot of a mobile application. At the top, it says "Welcome!" with a large green checkmark. Below that, there is text: "Welcome to Safetynet. While we get ready setting up the account for you and your child, an email will be sent to you to verify your account, click on the link in order to allow your child to start chatting!!!". At the bottom, it says "Once you have done that, it will redirect you to the login page".	Pass
4	Go to email for activation code	View	The email must show the activation code to verify the account	The email shows the activation code	 A screenshot of an email inbox. An email from "yeni8200@gmail.com" is shown, with the subject line "http://localhost/safetynet/chatapp/verifyemail.php?token=b1d115d8f46570f0f570d636513c6990e42518cc16784b8cd159a98fb674c061ca654c1533687141c9b3ad9aed6b8e90f3". Below the email are "Reply" and "Forward" buttons.	Pass

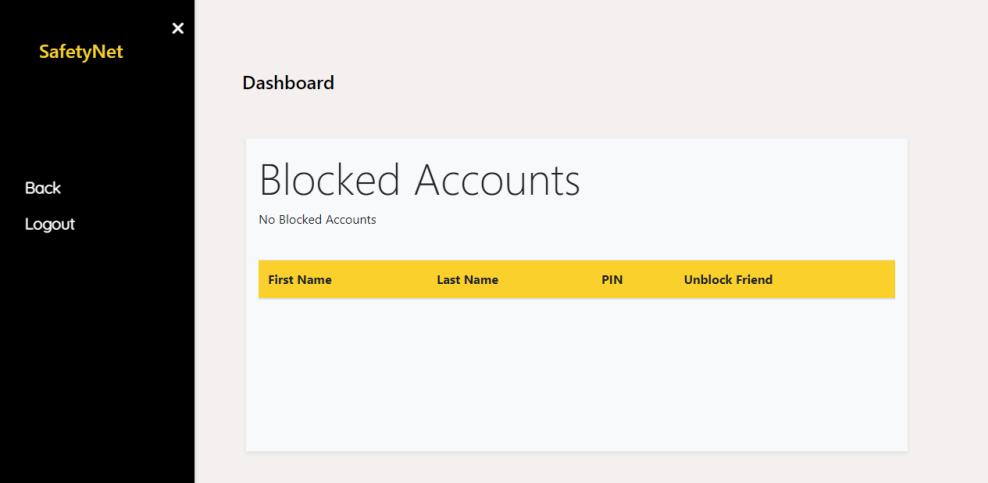
5	Input the email but not the password field	Input 'CB03V0Q7'	The application will tell the user to enter their password	The application tells the user to enter their password	 	Pass
6	Input the Password but not the pin field	Input 'Yeni12345'	The application will tell the user to enter their PIN	The application tells the user to enter their PIN	 	Pass

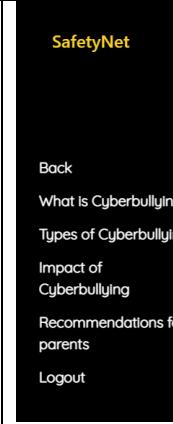
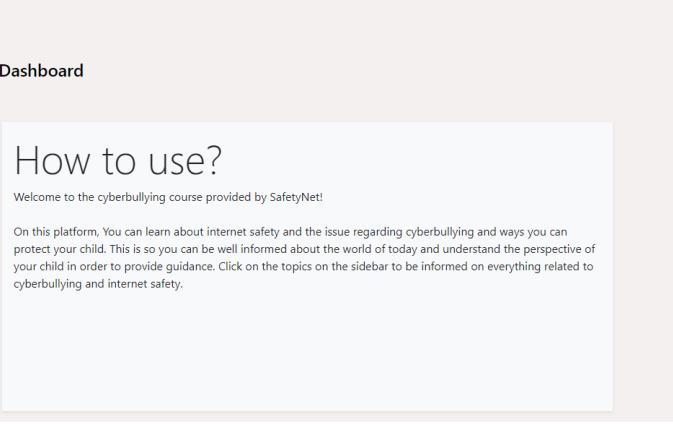
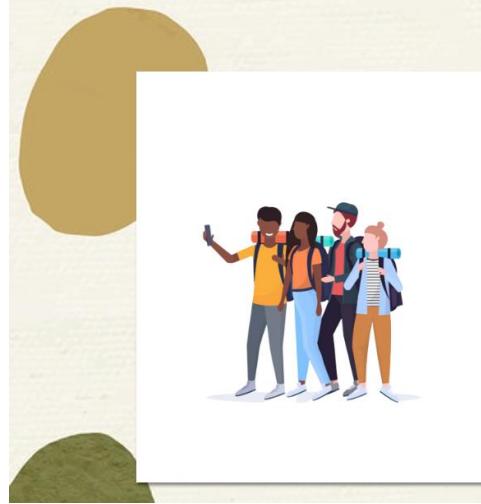
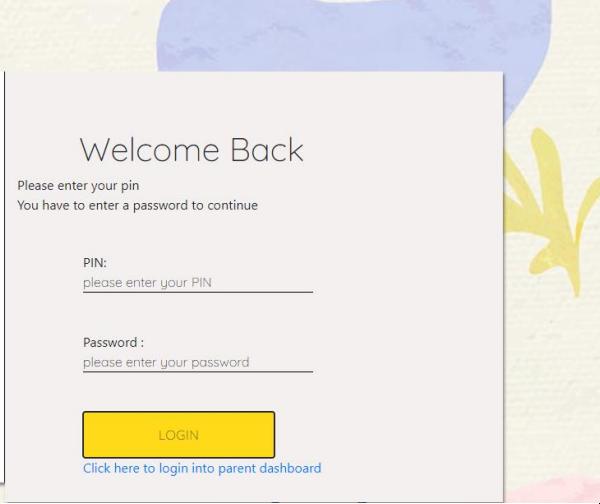
7	Enter the correct details and click submit	Input PIN - 'CB03V0Q7'  Password – Yeni12345	The application will take the user to the parent dashboard	The parent dashboard will be displayed		Pass
8	Input a user pin in the search input	Input – '9S0UUUIKF8'	The application will show the details of the user	The application shows the details of the user		

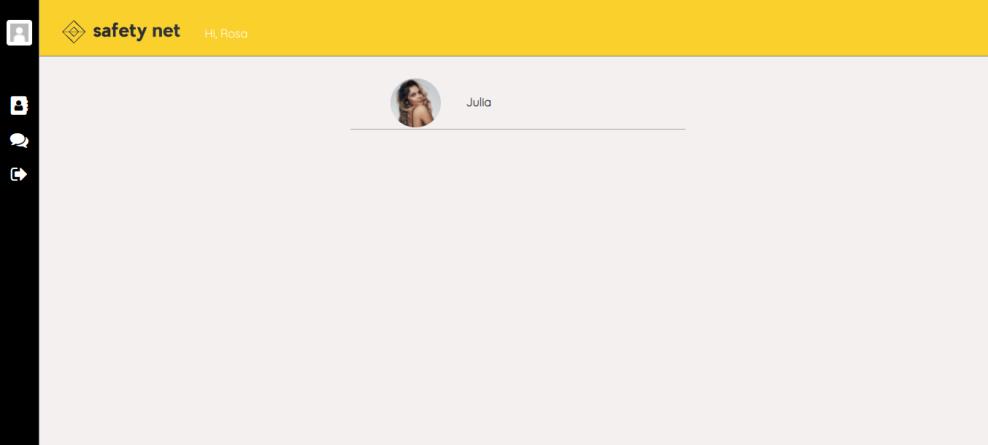
9	Click the button to send a friend request	Click	A request should be sent	The application tells the user that a friend request	 <p>The screenshot shows the SafetyNet mobile application interface. On the left is a black sidebar with the SafetyNet logo at the top and three menu items: Back, Notifications, and Settings. The main content area has a white background. At the top, there is a dark overlay with the text "the request has been sent" and a blue "OK" button. Below this, the title "Add a Friend" is displayed, followed by a search bar containing "9S0UUUIKF8". A section titled "Search Result" shows a table with columns: First Name, Last Name, PIN, Parent's Phone Number, and ADD. Under these columns, the data for one result is shown: Julia, Milla, 9S0UUUIKF8, 07585394562, and a blue "Send Friend Request" button.</p>	Pass
---	---	-------	--------------------------	--	--	------

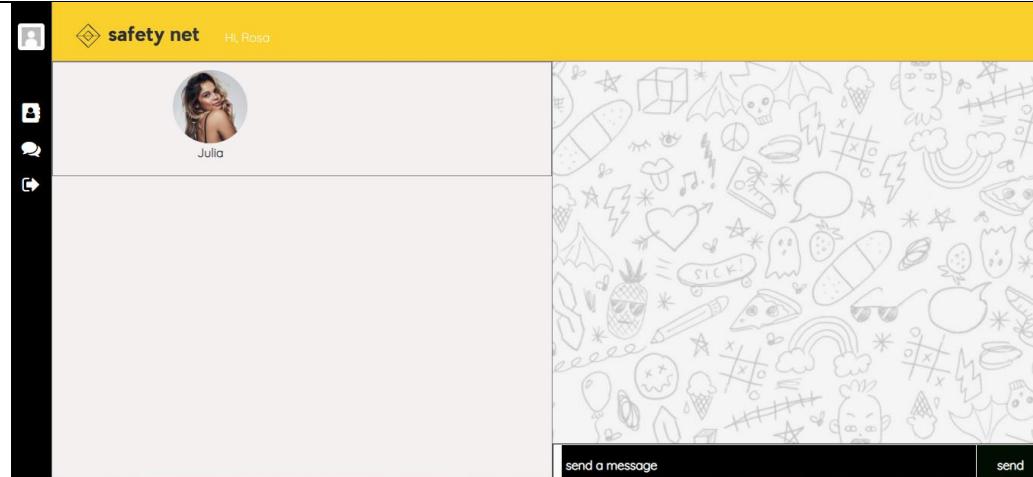
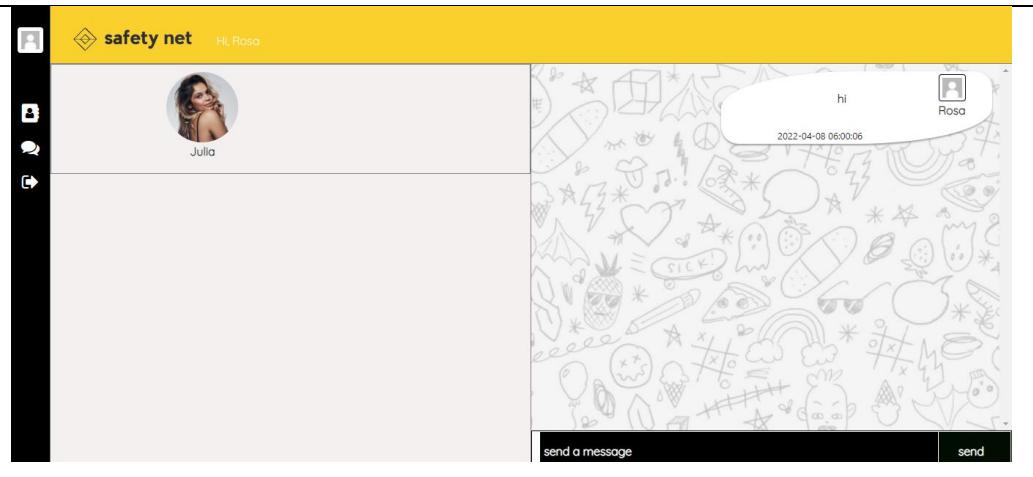
10	Login into another account and click on notifications and accept the friend request	Click	The user must be in the accepted friends page	The user has a friend in their friends list	 <small>localhost/safetynet/addfriends.php</small>	<p>Dashboard</p> <h2>Accepted Friends</h2> <table border="1"> <thead> <tr> <th>First Name</th> <th>Last Name</th> <th>PIN</th> <th>Remove Friend</th> <th>Block Friend</th> </tr> </thead> <tbody> <tr> <td>Julia</td> <td>Milla</td> <td>9S0UUUIKF8</td> <td><button>Remove Friend</button></td> <td><button>Block Friend</button></td> </tr> </tbody> </table>	First Name	Last Name	PIN	Remove Friend	Block Friend	Julia	Milla	9S0UUUIKF8	<button>Remove Friend</button>	<button>Block Friend</button>	Pass
First Name	Last Name	PIN	Remove Friend	Block Friend													
Julia	Milla	9S0UUUIKF8	<button>Remove Friend</button>	<button>Block Friend</button>													
11	Click the 'remove friend' button	Click	The application should remove the friend	The application removed the user from the friend's list		<p>Dashboard</p> <h2>Accepted Friends</h2> <p>Your child currently has no friends, head over to the 'Add Friends' page to get your child chatting straight away!</p> <table border="1"> <thead> <tr> <th>First Name</th> <th>Last Name</th> <th>PIN</th> <th>Remove Friend</th> <th>Block Friend</th> </tr> </thead> </table>	First Name	Last Name	PIN	Remove Friend	Block Friend	Pass					
First Name	Last Name	PIN	Remove Friend	Block Friend													

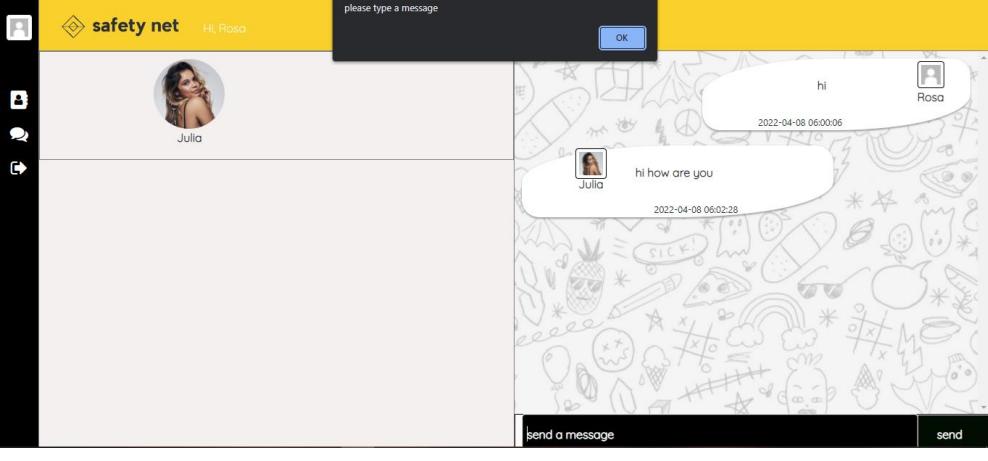
12	Add the friend again and block the account	Input - 9S0UUUIKF8 Click 'Send Friend Request' View friends list Click 'block friend'	The application should block the friend and the user should see the blocked users in 'blocked accounts'	The user sees the blocked account in the blocked accounts page			Pass
----	--	--	---	--	---	---	------

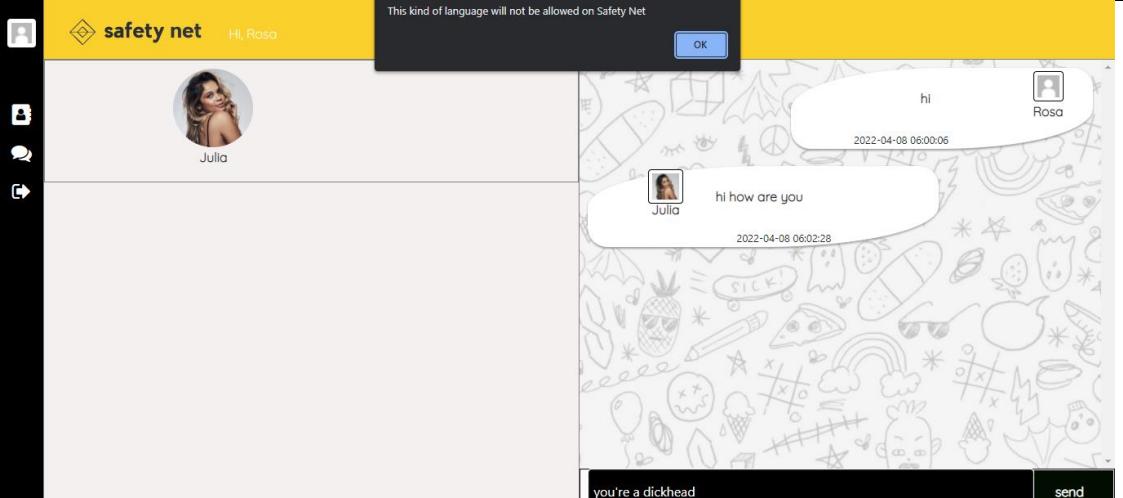
13	Click the 'unblock friend'	Click	The application should unblock the friend and the user will need to re-add the friend	The application unblocks the user		Pass
----	----------------------------	-------	---	-----------------------------------	--	------

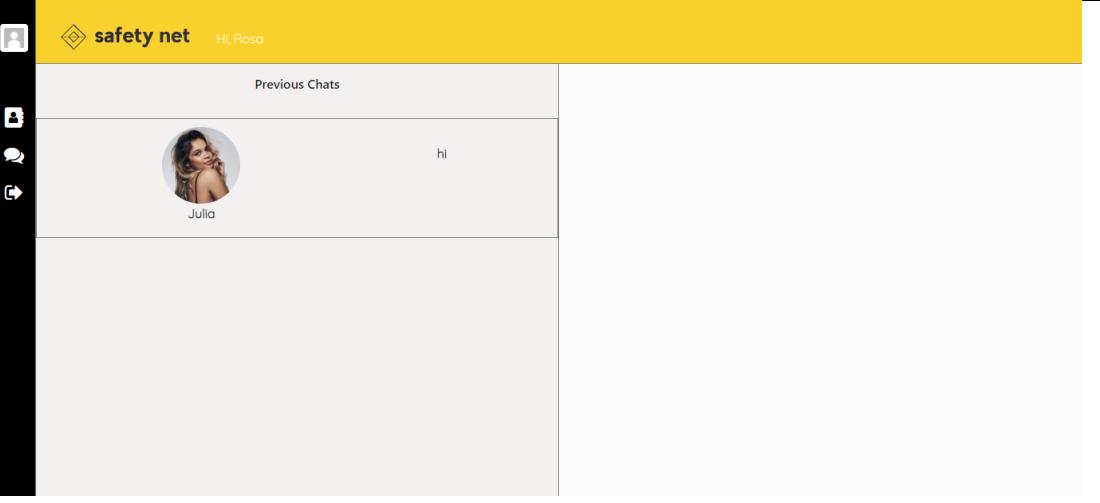
14	Click the cyberbullying course link	Click	The application should show the content	The application shows the content			Pass
15	Click the Login button without entering values on the login form for the Chat	Click	The page must tell the user that they must fill in all input fields	The page shows the errors the user has made.			Pass

	Application login form					
16	Input the right details to log onto the chat application	Input – 'CB03V0Q7'  Password – 'Yeni12345'	It must take the user to the chat application	The user is taken to the chat application	 <p>A screenshot of a mobile application interface. At the top, there's a yellow header bar with the 'safety net' logo and the name 'Rosa'. Below this is a dark navigation bar with icons for profile, messages, and other functions. The main screen shows a message from 'Julia' with a profile picture.</p>	Pass

17	Click on the friend profile	Click	It should take the user to the chat menu	The user is taken to the chat menu		Pass
18	Send a message	Input 'hi'	It should allow the user to send the message	The user sends the message, and it is displayed		Pass

19	Send a message logging in as the other user	Input 'hey are you good'	It should allow the user to send the message	The user sends the message, and it is displayed		Pass
20	Try to send an empty message	Click	It should stop the user from sending a message with no text	The user is not allowed to send the message		Pass

21	Send an offensive message to a user	Input 'You're a dickhead'	It should stop the user from sending the message due to inappropriate language	It will stop the user from sending the message		This kind of language will not be allowed on Safety Net	OK	Pass
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22	Click on the chat icon	Click	It should show previous chats	It will display the previous chats of the user	 <p>The screenshot shows the Safety Net application's interface. At the top, there is a yellow header bar with the text "safety net" and "Hi Rosa". Below the header is a sidebar on the left containing icons for users, messages, and a refresh arrow. The main area is titled "Previous Chats". It displays a single message from a user named "Julia" with the text "hi".</p>	Pass
----	------------------------	-------	-------------------------------	--	--	------

*Table 11: Test Plan*

# **CHAPTER 5**

## **RESULTS / DISCUSSIONS**

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### **5 Results Evaluation**

This project was thoroughly planned and developed to meet the client's demands and the aim of the project which was to build a platform that creates a safer experience for teenagers while communicating in real time. This project was tested by different success criteria's which has been set by the client to ensure the project is successful. A testing plan was also designed so it can be implemented in the future.

#### **Was it successful?**

#### **Objectives related to the chat application**

- To develop a full functioning chat UI private messaging application.
- The user must not be publicly visible to everyone on the platform and the user will only be able to converse with people that their parents add directly, instead of being able to communicate publicly.
- To develop a filtering system that will monitor the messages the user sends in order to check whether offensive words are in the message if there are the message will not be sent.

#### **Success Criteria**

The project must meet these objectives and be delivered on time.

### **Was it successful (with explanations)?**

The outcome successfully contributed to the aims of the project because a platform was developed which allowed users to communicate with selected users on the platform. It also had certain safety measures to create a safe environment because it was developed as a private chat application meaning that the user is only visible to people that the parent chooses, and they cannot go out of their way to talk to strangers that may take advantage of them.

The chat application is directly connected to the parent's dashboard so any decisions the parent makes will be reflected on the application. For example, the parent can remove a friend from the user's account, and they will no longer be able to communicate with them. Therefore, the parents have a say in how they can keep their children safe while using social media.

The chat application also protects the user from receiving a form of offensive language from another user, and it blocks any use of profanity or offensive slurs as a message. Due to the data collected in the research, offensive language was one of the most common types of bullying hence why it was implemented.

This result was tested to ensure it was high-quality code and data integrity. A testing plan was carried out to verify the different components of the chat application and to test its data integrity, an experiment was carried out. The experiment was conducted to find out whether messages are successfully stored in the database, therefore they can be displayed to the receiving user. The method in which the experiment was conducted was by logging onto the application with two different accounts on different browsers on the same laptop. The message 'Hi' will be sent to a user, and the database will be checked for any updates.

The findings of this experiment were that the data was created and stored in the database which allowed the application to present the sent message to the receiving user's account. This experiment showed that the outcome was successful because it was a requirement of the project for a user to send a message successfully and if the experiment failed then the project was not successful because a key requirement was not met. This experiment can be found here in [Appendix A](#).

Experiment 2 was conducted for the chat application to investigate the offensive word filter system in the chat application to find any flaws in the system. This experiment needed a laptop to load the chat application and a server to enable connectivity. The method in which this experiment was carried out was by logging onto the application and sending a user a message with the word 'Zezak' was also used which means the 'n-word' but in the Albanian language.

The results of this experiment were bad because the user can bypass the system if they say something offensive in another language. This proves that the system is flawed so users from other countries can take advantage of this. For future updates of the project, the system must be restructured to have tighter detection measures to prevent loopholes shown in the experiment. This experiment can be found here in [Appendix A](#).

Experiment 3 was conducted to test the response time of sent messages from one user to another user. A laptop was needed with two browsers windows opened with different users being logged onto the application, a server to enable the connection and a stopwatch to record the time. The method in which the experiment was recorded was by logging onto the application and sending the word 'testing' to the user. As soon as the message is sent, the stopwatch is started and will stop when the message appears on the other browser window. The results of this experiment were good because the response time was 3.10

seconds, which is acceptable. A limitation of this experiment was that there are not a lot of users using the application so there will be fewer requests that will be sent, therefore the performance will be excellent.

However, In the long term, the server might need upgrading because the performance levels might decrease due to the large amounts of requests that may be generated in the future. Having a powerful server will keep the high-performance levels and the users will not be able to receive and send messages late. To improve this experiment in the future, more users on different computers can be used to carry out the methods of the experiment and record if the response time worsens due to more requests being sent to the server. The results can be found in [Appendix A](#).

Experiment 4 was conducted to find out the system's response to users sending messages to one another. A laptop was needed to load the application and two browsers so two users can be logged on separate accounts. The method in which this experiment was carried out was sending messages back and forth where the transcript can be found in [Appendix A](#).

This was a bad result because even though the messages are sent to the user, they are not organized by the timestamps by which the messages are sent. This means that users may get confused because they have kept track of the timestamp of the message instead of the application organizing it to make it easier to understand the conversation. This should be improved and included in the test plan that will be implemented in the future.

### Objectives related to the Parent Dashboard

- To integrate the parents of the user into the platform by developing a heavily designed dashboard.
- The parent and the child must share the same PIN.
- The dashboard must have a friend's system embedded which allows parents to add a friend and approve the friend request that their child requested in their application.
- The parent must also be allowed to remove and block friends on the dashboard if necessary.
- The parent must know the last time their child logged in on the platform.
- Cyberbullying parent to inform parents that might not be informed about cyberbullying

### Success Criteria

- The project must meet these objectives and be delivered on time.

### Was it successful (with explanations)?

The outcome of the result was successful because all the objectives were successfully developed and delivered. Within this project, a dashboard was specifically designed for the parent of the user with various functions to give the parent some control of the user's account.

The dashboard uses a friend system to allow the parent to add users to their child's account, with the ability to remove or block those same users. The parent has the details of the user such as their password and the last time the child logged in. These outcomes contribute to the aims of the project because it promotes internet safety, and it allows users to communicate safely. For

example, many parents do not know what goes on in their child's social media life and this project, these objectives make sure that the parent has a say in the decisions that their child makes.

For example, the parent can view the user profile that their child wants to communicate with and to increase the likelihood of safety while communicating, the parent can call the guardian's phone number, which the parent can find when searching for the user, to confirm that the user is whom their child says it is, this will prevent the child from talking to strangers or people impersonating someone else.

Since the objective where the parent can remove, or block users has been met, this means that users that might be bullied by their friends on the platform, should their parent see this since they have access to their passwords etc, removing or blocking users can prevent their child from being depressed or unhappy in their daily lives which proves that it has achieved the aim of the project.

Lastly, the outcome of having a cyber-bullying course within the dashboard promotes internet safety because it informs the parents about cyber-bullying and what should be done as a parent regarding the issue. To ensure the results of these objectives were high quality, a test plan was carried out to test the functionalities of the dashboard and it works how it was intended.

An experiment was carried out to find out the system's response to a parent blocking or removing a user on the dashboard. The equipment needed was the laptop to load the application and the server to provide connectivity. The methods in which the experiment was carried out were by logging onto the parents' dashboard, selecting a random user and blocking them. Afterwards, analyse the response of the chat application.

The findings were that the change only takes place if the user refreshes the application. This was unexpected because the intended action was for the application to display the changes made by the parent in their dashboard in real-time. A test plan regarding this will need to be implemented in the future as part of the success criteria for future updates to the project. This can be found in [Appendix A.](#)

### **Future Testing Plan**

***Table 12: Future testing plan***

Future Development in Project	Testing Step	Expected Outcome
Implementation of Mobile App	<ul style="list-style-type: none"> <li>- By loading the application on different mobile devices.</li> <li>- Tapping the input box to enter a message.</li> <li>- Checking the system's response to receiving a message without being active on the application.</li> <li>- Opening the app to view the UI</li> </ul>	<ul style="list-style-type: none"> <li>- The app is adaptable to different screen sizes.</li> <li>- The onscreen keyboard appears immediately for the user to send a message</li> <li>- The application does not stop functioning in the background of the mobile device.</li> <li>- The text of the mobile application is readable and clear.</li> </ul>

	<ul style="list-style-type: none"> <li>- Change font sizes on the phone and reload the application.</li>   <li>- Use the application constantly without a single phone charge.</li> <li>- Record the loading times for the application.</li> <li>- Load the application on different platforms (IOS, Android)</li> </ul>	<ul style="list-style-type: none"> <li>- The font size on the application adapts to the user's settings on their mobile phone.</li>   <li>-</li> <li>- The application does not drain the mobile phone during usage.</li> <li>- The application takes less than 10 seconds to load.</li> <li>- The application is compatible with different platforms.</li> </ul>
Implementation of a Group Chat	<ul style="list-style-type: none"> <li>- Click into a random group chat</li> <li>-</li> <li>- Select different users and attempt to create a group chat</li> <li>- Send a message into the group chat</li>   <li>- View the group chat on different computers/mobile devices</li> <li>- Leave the group chat</li> </ul>	<ul style="list-style-type: none"> <li>- The chat application will display the group chat for the user.</li> <li>- The chat application will create a group chat with the users selected.</li> <li>- The message will be sent into the group and the time receipt will be recorded on the message.</li> <li>- All the users will be able to view the message on their chat application.</li>   <li>- The chat application will remove the user from the group chat they have selected</li> </ul>
Chat Application	<ul style="list-style-type: none"> <li>- Sending emojis as a message to a user</li> <li>- Sending GIFs to a user</li> </ul>	<ul style="list-style-type: none"> <li>- The chat application will send the emojis to the user</li> </ul>

	<ul style="list-style-type: none"> <li>- Change the user's online status and view their profile from another user's chat application. (Online, Offline, Busy)</li> <li>- Share a video with the user</li> <li>- Record the time it takes for a user to send a message</li> <li>- Apply asterisks in an offensive word and send the message to a user</li> </ul>	<ul style="list-style-type: none"> <li>- The user will receive the GIF message on their screen</li> <li>- The online status will change in real time as soon as the user changes it.</li> <li>- The application will let the user send videos to other users.</li> <li>- It will take less than 5 seconds for the user to receive the message.</li> <li>- It will detect any loopholes the user can take to bypass the system.</li> </ul>
Parent Dashboard	<ul style="list-style-type: none"> <li>- Check how many hours their child was on the chat application in a week.</li> <li>- Send two friend requests to a user's dashboard.</li> </ul>	<ul style="list-style-type: none"> <li>- The application will show the statistic on the dashboard.</li> <li>- The notifications will show a number to the parent indicating the number of requests.</li> </ul>

- |  |   |   |
|--|---|---|
|  | <ul style="list-style-type: none"><li>- Set a timeout for their child on the usage of the chat application.</li></ul> | <ul style="list-style-type: none"><li>- The chat application will be disabled for the amount that the parent sets it for.</li></ul> |
|--|---|---|

# **CHAPTER 6**

## **CONCLUSIONS / FUTURE WORK**

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### **6 Conclusions**

At the start of the report, it was stated that the project aims to develop an innovative approach for young people to communicate safely online on social media. There was a review of existing social media apps such as Facebook Messenger, WhatsApp etc and they were analysed in detail in Chapter 1 which states the advantages they bring to society, but also the disadvantages that it brings to understanding how to structure the project. The preliminaries about the challenges and potential problems faced in the usage of social media were summarised and cyberbullying was the major problem.

Therefore, an investigation was made to discover how severe cyberbullying is for young people online. The investigation led to discovering the psychological effects of cyberbullying, the factors leading to the problem and how easily young people are brought towards it on social media. Real-life case studies were used to show the long-term detrimental effects that cyberbullying has on young people in their daily lives. It was also found out during the research that many parents are not involved in their child's social media life and other parents are not aware of that main problem.

Using this investigation, different objectives were set to tackle cyberbullying but before the project went under development, it was planned efficiently to ensure the project was executed properly. Specifications, including requirements, technologies that were needed to develop the project, and cost implications to ensure it is possible to execute the project successfully. A project schedule was

made to organize the tasks of the project to ensure the project will be delivered on time to avoid project failure. Different designs were constructed during the development of the components of the project and algorithms were made to understand the data flow of the systems within the platform.

The results of the project were that a chat application was developed which allowed users to communicate safely in with each other in one. The chat application was connected to the parent dashboard that gives parents authorization over their child's social media account to make certain changes to keep them safe while communicating online.

The development of the chat application was the most difficult because even though all the data was already available, i.e (account details, friends etc) It was the idea of making these data interactive to the user. For example, the parent has already added a friend for their child, however, the information is still useless to the chat application, because the information has no functionality or purpose to the user.

Creating a system where the user can interact with this information and use it to communicate with another user was not an easy task. This was solved by thinking about the structure of the system from a logical point of view. What data should be collected when the user clicks a certain part of the application? What data will be displayed? These questions were also thought about when developing the parent dashboard because developing a friend request system required a lot of logical sense.

Numerical values needed to be linked to parts of the system. For example, when a user becomes friends with another user, their relationship connection was set to one, and if there are no longer friends, it was set to two. Therefore, the chat application will only add users where the relationship connection is set to 1, and this proves why thinking logically makes a task seem much easier than it should

be. Creating use cases also helped to see the system in a one-dimensional view, therefore the series of steps in the system can be analysed, making it easier to execute. A key point that was learned was to never panic and always take a step back and analyse programming logically to solve issues. As stated in chapter 5, the project is seen as a success, not only because all the objectives were achieved, but also because it countermeasures most of the issues that were collected during the investigation in chapter 2 to create a safe environment for users when communicating.

For example, in chapter 2, it was discovered that offensive language was one of the most common ways of bullying on social media and it was counter-measured in this project by implementing a filtering system within the chat application which detects offensive words within messages to prevent them from being sent to the other user. This keeps the user safe from using hurtful language towards their race, gender etc.

Another point was with the findings of the investigation, the decision was to develop the chat application as a private system, eliminating the side of cyberbullying where strangers are performing the act, because users cannot be found publicly compared to other existing work in the field, like Facebook or Twitter. The parent dashboard was also developed to help overcome the challenges parents were facing because the child always had control so parents could not do the best they could to help because they did not know what was going on in their child's social media usage. Creating a dashboard where parents have the power to see their child's messages, having the ability to view friends, to block and remove them also keeps the child safe mentally from people online that may pose a danger to their child's mental health.

The case studies examined in chapter 2 illustrated the importance of verification of users because some could impersonate and cyberbully a victim in the process.

Therefore, in this project it was made sure the risk was mitigated by providing each user the parent searches for with their guardian's phone number, to contact them to verify the user that their child wants to communicate with.

Lastly, the findings showed that parents knowing about internet safety could help them understand cyberbullying more, which will lead to more discussions in the world between the parent and child about the problem, and hopefully there could be change. Therefore, a cyberbullying course was developed to inform parents about the problem and how to tackle it.

Overall, this project was successful because the objectives were met and were further developed to tackle the different circumstances that could lead to cyberbullying in real life it also considers the long-term goal which is why it informs parents about the issue and continues to bring attention to the topic. However, the project has different limitations meaning with the good work it can always be improved. The chat application had limitations because there is only one way of communicating, which limits the way a user may want to express themselves, there could have been more ways for users to interact with one another other than just messaging and this will be explained later in the report.

Due to the experiments conducted in appendix A, it was discovered that the filtering system could be flawed because users could use asterisks inside words to bypass the detection of offensive language, also offensive words in another language were not detected or this was a limitation of the project. Regarding the parent dashboard, there were limitations regarding the monitoring of the child's usage of the platform. It could have more statistical data to monitor the child's usage. Another experiment conducted in Appendix A showed that changes that

are made to the child's account through the dashboard should update the chat application immediately, however, it only updates when the user updates the browser, and the changes will appear. Lastly, this could be seen as a limitation for the long-term which is the server capabilities. A powerful server might need to be implemented to handle the large amounts of requests different users will send to keep the performance levels high for the application.

## **6.1 Future work**

To expand on the successful project, if more time were given there would be several updates to the chat application. The variety of communication was quite limited in the chat application, for future work, users should be allowed to send images because they may want to visualise their message to the user, voice notes could be an option because it's a more convenient way of messaging because it's through speaking, therefore it is quicker for a user to send a message, especially if it's lengthy. The user should be allowed to add emojis or GIFs within their message because it can express their emotion to the user that they are sending the message to.

Due to large amounts of young people having mobile phones, the intention for future work, is to expand the availability of communication and this will be done by creating a mobile version so users can use the platform everywhere, so the communication does not stop. Users must have different ways to interact with each other. This will be done allowing users to click on their profile picture to see information about the user that they clicked on. For example, an online/offline status would be implemented to inform the user whether the user that they wish to communicate with is ready to talk.

Implementing broadcast messages will be useful because it is an effective way of communicating and users will be able to send a message simultaneously to multiple people at once and saves time to deliver the same message. Group Chats would be a great addition because it will allow different users to communicate with each other and stay connected on the platform, it can also be used to collaborate and share ideas with one another. The offensive language filter can be improved in the future by allowing it to detect different offensive words in other languages as the aim is to expand this project to different countries.

For future work, the parent dashboard can be improved to have more detailed analysis to allow the parent to further monitor their child's social media usage in depth. This data could vary in the number of hours the user was logged in for, the number of hours the user spends using the application in a week and a timeout feature could be implemented to lock the user in a certain amount of time from using the application and this is to improve the parental control of the parent on the platform. Lastly, the notifications system may be refined by showing the number of friend requests next to the notifications link on the menu of the dashboard. This is to allow the parent to know the number of requests their child has received before clicking viewing them.

## **6.2 Legal, Social, Ethical and Professional Issues**

In society today, projects like SafetyNet are part of the millions of technologies used by users for different purposes. Technology has created some positive impacts on society; however, the negative issues will be discussed in this report. Information technology projects can raise a lot of ethical problems. Ethical use in technology refers to “moral principles that govern how technologies should be used. These principles include accountability, digital rights, privacy, freedom, data protection, online behaviour, and more.” (Lovegrove, 2021)

Ethics are there to establish values for responsible actions and practices within a professional community. There are some ethical violations that are not considered illegal and there are others which the law protects users from those practices being committed on them. This project was developed while applying basic ethical standards. For example, when the parent registers to the website, an email will only be sent to inform the user about the platform and provide them with a PIN and an activation code.

This is a standard ethical practice because the user is provided only with information that the user needed to improve their experience on the platform. The aim is to be honest with users, this was done by knowing sending information that was necessary to know, rather than spamming users without their permission or knowingly spreading viruses or malicious code to users while they use the web application. Spam is defined as “e-mail that is sent to large numbers of people and that consists mostly of advertising”.

(www.britannica.com, no date)

Spamming is often used for advertisement, and it is not considered illegal however it can be considered unethical because it can be argued that even though it is a form of free speech, it invades people's privacy.

"The major ethical issues related to IT are privacy, accuracy, property, and accessibility to information" (Rainer & Cegielski, 2011) Research have reported the customers' fears for the possible misuse of their personal data during their transactions on the Internet. This had an impact on the way the project was developed to protect the user's privacy. Certain measures had to be implemented to avoid any legal issues regarding the protection of users' data and information. Legal issues will arise when the project is not in line with certain laws and an example of a law that protects users' privacy is known as the data protection act. Data Protection Act 2018 is a law that is used to protect users from having their data misused or mishandled.

In the project, a web server collects data about the users that use the platform. This can vary in name, passwords, emails, phone numbers and so on. Therefore, the impact on the project was that users had to be informed on how their information was going to be used and whether their information will be sold to other companies.

## Privacy Policy

Your privacy is important to us. It is Safetynet's policy to respect your privacy and comply with any applicable law and regulation regarding any personal information we may collect about you, including across our website, <https://safetynet.com>, and other sites we own and operate.

This policy is effective as of 24 January 2022 and was last updated on 24 January 2022.

### Information We Collect

Information we collect includes both information you knowingly and actively provide us when using or participating in any of our services and promotions, and any information automatically sent by your devices in the course of accessing our products and services.

#### Log Data

When you visit our website, our servers may automatically log the standard data provided by your web browser. It may include your device's Internet Protocol (IP) address, your browser type and version, the pages you visit, the time and date of your visit, the time spent on each page, other details about your visit, and technical details that occur in conjunction with any errors you may encounter.

Please be aware that while this information may not be personally identifying by itself, it may be possible to combine it with other data to personally identify individual persons.

#### Personal Information

We may ask for personal information which may include one or more of the following:

- Name
- Email
- Date of birth
- Phone/mobile number

**Figure 106: Privacy statement**

As shown in figure, a privacy statement was created in the project and the user must agree to it before they can use the services of the platform. Privacy statements illustrates to the user how their data is collected on the platform. It also states the types of data that is required and how it is going to be used on the platform. Copyright infringement is another legal issue that occurs "when a copyrighted work is reproduced, distributed, performed, publicly displayed, or made into a derivative work without the permission of the copyright owner." ([www.copyright.gov](http://www.copyright.gov), 2022) Therefore, the project was developed from scratch with text, images, sounds and program code not being copied from any source.

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#### 1. AGREEMENT TO TERMS

These Terms of Use constitute a legally binding agreement made between you, whether personally or on behalf of an entity ("you") and Safetynet ("Company", "we", "us" or "our"), concerning your access to and use of the <http://www.safetynet.com> website as well as any other media form, media channel, mobile website or mobile application related, linked, or otherwise connected thereto (collectively, the "Site"). We are registered in England and have our registered office at 32 radland road, London, England E16 1LN. You agree that by accessing the Site, you have read, understood, and agreed to be bound by all of these Terms of Use. IF YOU DO NOT AGREE WITH ALL OF THESE TERMS OF USE, THEN YOU ARE EXPRESSLY PROHIBITED FROM USING THE SITE AND YOU MUST DISCONTINUE USE IMMEDIATELY.

Supplemental terms and conditions or documents that may be posted on the Site from time to time are hereby expressly incorporated herein by reference. We reserve the right, in our sole discretion, to make changes or modifications to these Terms of Use from time to time. We will alert you about any changes by updating the "Last updated" date of these Terms of Use, and you waive any right to receive specific notice of each such change. Please ensure that you check the applicable Terms every time you use our Site so that you understand which Terms apply. You will be subject to, and will be deemed to have been made aware of and to have accepted, the changes in any revised Terms of Use by your continued use of the Site after the date such revised Terms of Use are posted.

The information provided on the Site is not intended for distribution to or use by any person or entity in any jurisdiction or country where such distribution or use would be contrary to law or regulation or which would subject us to any registration requirement within such jurisdiction or country. Accordingly, those persons who choose to access the Site from other locations do so on their own initiative and are solely responsible for compliance with local laws, if and to the extent local laws are applicable.

The Site is intended for users who are at least 18 years old. Persons under the age of 18 are not permitted to use or register for the Site.

**Figure 107: Terms of Service Agreement when the user registers**

At the same time, copyright is secured as soon as the project was completed meaning it is also protected by copyright law, meaning that other companies cannot copy any parts of the project. The impact that this legal issue had on the project was that a Terms of Service agreement was implemented in the project. A terms of service agreement was created because the project allows users to send information to one another, having a terms of service agreement protects the project because users initially will agree to not post anything on the platform that violates the copyright infringement.

Therefore, if the user copies and pastes text from a book and sends it as a message to another user, SafetyNet will be protected because the user agreed to the terms of service. The growth of computing technology has greatly increased in society, however, there have been different changes negatively in which our society operates which are called social issues. Social issues are defined as "issues that has been recognized by society as a problem that is preventing society from functioning at an optimal level". (Social Issues: Definition & Examples, 2017) Some of these issues have made an impact on the direction of the project. Some of these issues include identity theft and cyberbullying.

Identity theft has had a major impact on the digital world with the millions of people being affected by the issue. Identity theft takes place when a person uses another user's personal information to use certain services without their permission. This is considered dangerous because it can be used to impersonate someone's identity and that was not the plan for the project. The impact of this social issue was the introduction of email verification.



**Figure 108: Email verification**

Email verification was a cost-effective way to avoid fraud and identity theft because users will have to verify their email by clicking on the link sent to their email to prove they own access to the email address they used to sign up to the platform. Without this method, users will be able to create accounts with any email addresses in the world and use the platform impersonating an existing person.

Cyberbullying has been a major social issue in society for a long time, which was why it has been the focus of this project. Cyberbullying has caused serious consequences throughout the world, especially young people and with the results collected from the development of the project previously stated earlier in the project, the aim is that this project will have a positive impact on cyberbullying in the future. Lastly, a professional body is defined as "an organisation with individual members practicing a profession or occupation in which the organisation maintains an oversight of the knowledge, skills, conduct and practice of that profession or occupation." (The Science Council, 2017) An example of a professional body is known as the British Computing Society. British Computing Society is a professional body in computing whose aims are to improve the safety journey in the digital and this is achieved by raising the standards and conduct for people that work in the field of technology.

British Computing Society has a code of conduct that is used to outline certain principles and standards that must be followed when working in technology. These principles have had an impact on the project because it lifts the standards needed which enables the project to be successful. An example was the principle that states, "have due regard for public health, privacy, security and wellbeing of others and the environment." (BCS, 2022) This was shown in the development of the project because different countermeasures were used to prevent users from being at risk of cyberbullying and the overall aim of the project was towards the safety of young people communicating online.

Another principle from the code of conduct states "develop your professional knowledge, skills and competence on a continuing basis, maintaining awareness of technological developments, procedures, and standards that are relevant to your field;" (BCS, 2022)

This mindset was used in the development of the project, with different techniques, programming languages and other skills were developed during the process to achieve the objectives set and regarding future work, there will be continuous development of knowledge to take the project to the next level.

### **6.3 Synoptic Reflections**

In my life, I can say from experience that I know what it means to be truly lost. What I mean by this is that I have shared the same experience as millions of people that have been struggling to find a purpose professionally. I was not lucky enough to discover what I wanted to do early like others, even though I related to computing due to my brother.

I only saw an interest because I could not see myself doing anything else. However, I could not figure out what field of computing I wanted to dive into, so applying to NTU was a real test to see if I could find it. When I came across the Internet Application Development module, this was the first time I had the passion to do something in computing outside of coursework or the motivation to get a higher grade if I worked harder.

From this moment I decided I was interested in becoming a web developer. Being a web developer requires a lot of learning and practice and being at NTU helped because I developed my programming skills including HTML, PHP, CSS, JavaScript, and Python. These skills will be valuable once I graduate and will help open several doors for me regarding employment. The project was a difficult process; however, I have gotten a glimpse of how projects are structured and developed in a real-life scenario, I have become more organized in my daily life, and I no longer procrastinate to do tasks as I know the value of time.

I have created a website portfolio that contains most of the websites that I have created during my time at NTU and now this project will be added to the long list of other projects that I have done in my portfolio. I am making this decision so I can showcase this project to employers to demonstrate that I have the skills required to function in a working environment. I am writing this to speak this into existence that before August 2022, I will be working as a front end developer.

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**Experiments of Chat Application****Experiment 1****1. Equipment needed**

- Laptop
- Two browsers (Google Chrome, Internet Explorer)
- Server

**2. Aim of Experiment**

- To find out when a message is sent, it will be stored on the database to allow the other user to see it.

**3. How will the experiment be carried out?**

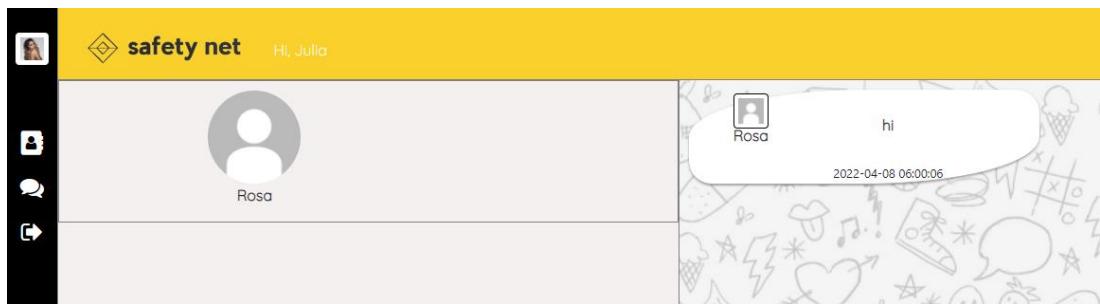
- Log into chat application using different accounts on separate browsers (Google Chrome and Internet Explorer)
- Send 'Hi' to a user and check the database to see if the message stored
- Afterwards check if the user can see it being sent to them.

**4. Results**

- The database stores the message:

<b>id</b>	<b>senderpin</b>	<b>receiverpin</b>	<b>date</b>	<b>messages</b>	<b>connection</b>
501	CB03V0Q7	9S0UUUIKF8	2022-04-08 06:00:06	hi	1

- Therefore, the other user can see the message sent to them:



## **Experiment 2**

### **1. Equipment Needed**

- Laptop
- Two browsers (Google Chrome, Internet Explorer)
- Server

### **2. Aim of the experiment?**

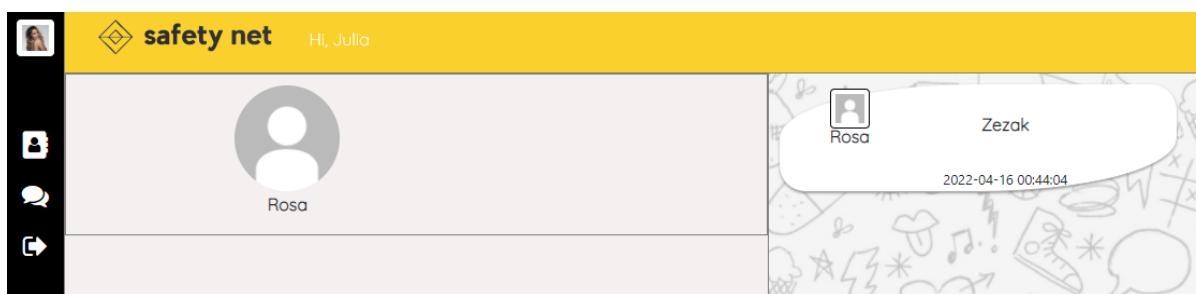
- To investigate the offensive word filter system in the chat application to find flaws.

### **3. How to carry out the experiment?**

- Log onto the chat application and select a user to message.
  - Type 'Zezak' and send it to the user and see the application's response.
- Zezak means the n-word in Albanian, so it is considered offensive if used.

### **4. Results**

- It allows the user to send these messages over to the user so the system is flawed and might need improvements.



## **Experiment 3**

### **1. Equipment Needed**

- Laptop
- Two browsers (Google Chrome, Internet Explorer)
- Server
- Stopwatch

### **2. Aim of the experiment?**

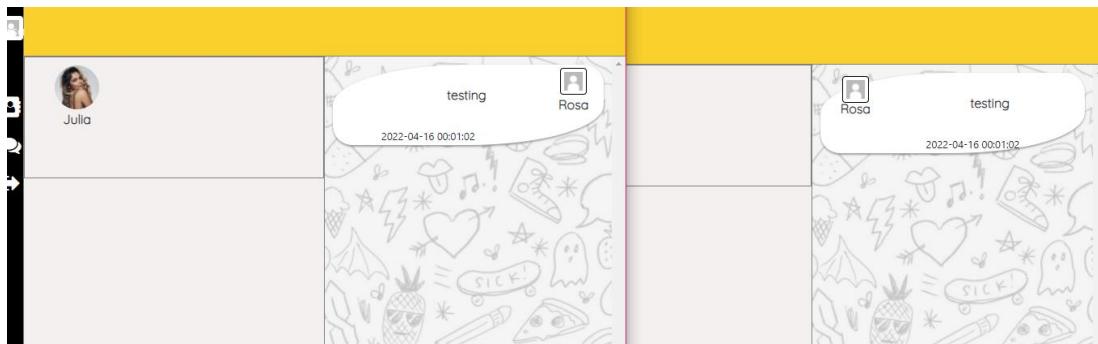
- To record the time that a user takes to receive a sent message.

### **3. How to carry out the experiment?**

- Log onto the chat application on different browser windows and send a message to another user.
- Type 'testing' and send it to the user.
- Record on time that it took to send the message on a phone.

### **4. Results**

- The time recorded the phone was 3.10 seconds.



## **Experiment 4**

### **1. Equipment Needed**

- Laptop
- Two browsers (Google Chrome, Internet Explorer)
- Server

### **2. Aim of the experiment?**

- To find out the system response to messages being sent out at different times.

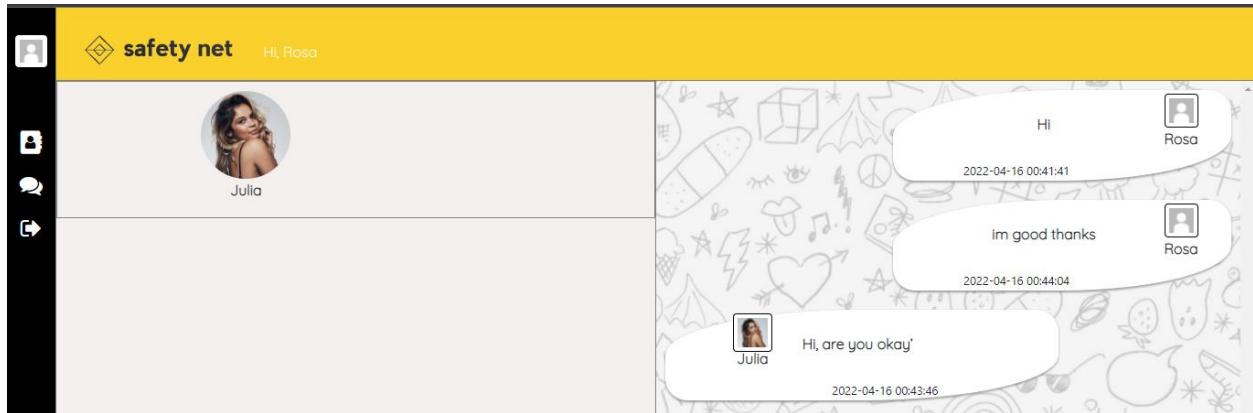
### **3. How to carry out the experiment?**

- Log onto the chat application on different browser windows and send a message to another user.
- Type 'Hi' and send it to the user.
- Reply as the other user saying 'Hi, are you okay'.

- Finally respond saying 'I am good thanks'.

#### **4. Results**

- The messages are sent however they are not organized by the timestamps.



### **Experiments for Parent Dashboard**

#### **Experiment 1**

##### **1. Equipment needed**

- Laptop
- Server

##### **2. Aim of Experiment**

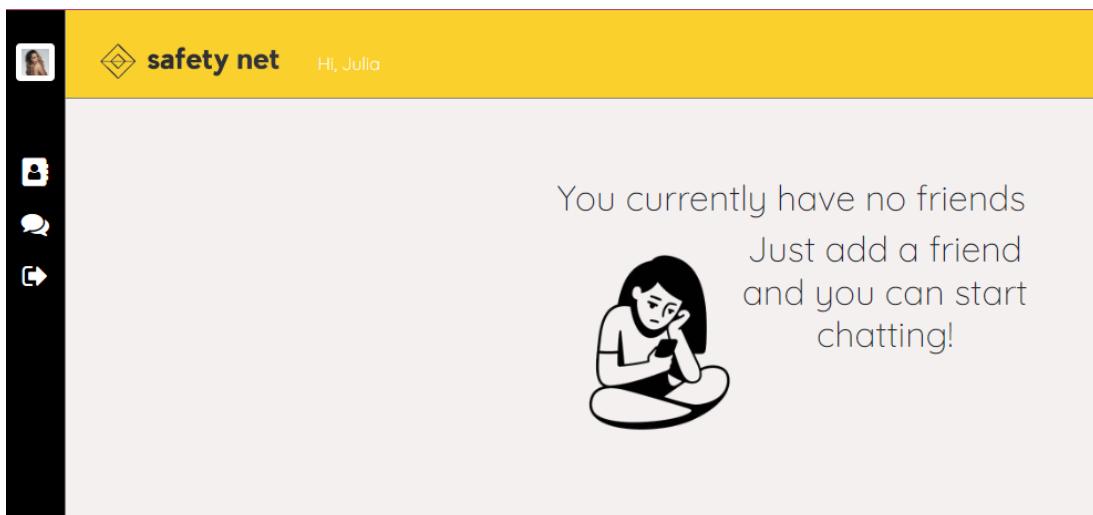
- To test out the response of the chat application when the parent blocks a user.

##### **3. How will the experiment be carried out?**

- Log into chat application and the parent dashboard and block a user to see the response of the chat application.

#### **4. Results**

- The application only shows changes when the user refreshes the page.



## User Guide

Email address  
Enter email

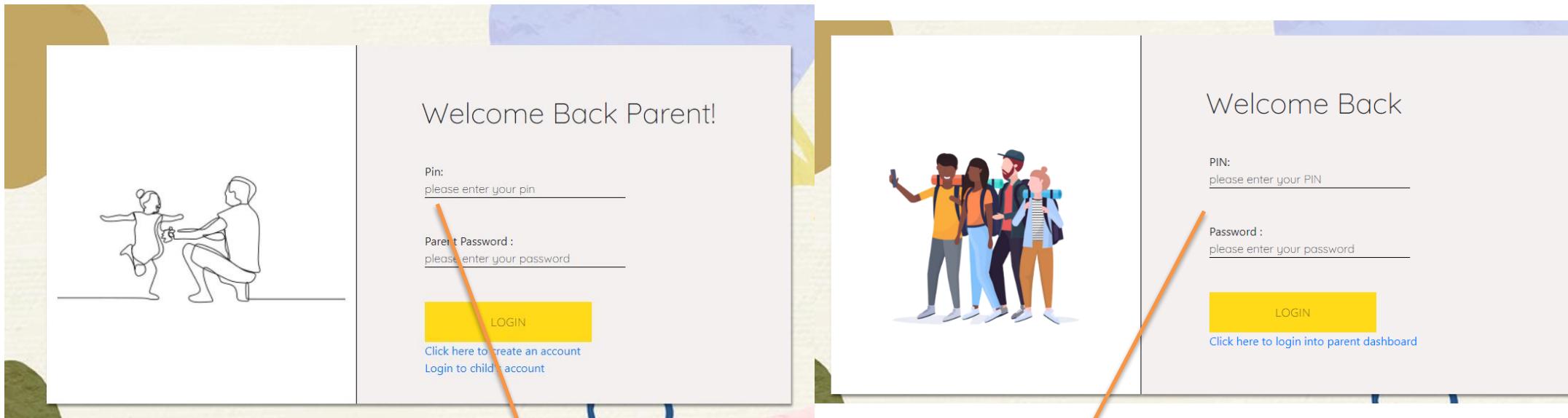
First Name     Remember to keep it in a email format. Must have '@'  
Please enter your first name

Last Name  
Please enter your last name.

Password  
Password

Your password must be more than 7 characters, with uppercase and lowercase letters with at least one number.  
Password

Register to SafetyNet here with the details of you and your child. The PIN that you and your child will share will be sent over to you via email with an activation token to activate you and your child's account. Make sure to follow the terms of service and Privacy Policy before creating an account.



Once the account has been  
created, please log in here if  
you are the Parent to take you  
over the dashboard

If you are a child log in here, please.

The screenshot shows the SafetyNet application interface. On the left is a black sidebar with white text and icons:

- SafetyNet** (title)
- Notifications**
- Friends**
- Cyberbullying Course**
- Settings**
- Logout**

A large orange arrow points from the "Friends" menu item to a callout box containing text about viewing friend requests.

The main area is titled "Your Child's Details". It displays a table with the following data:

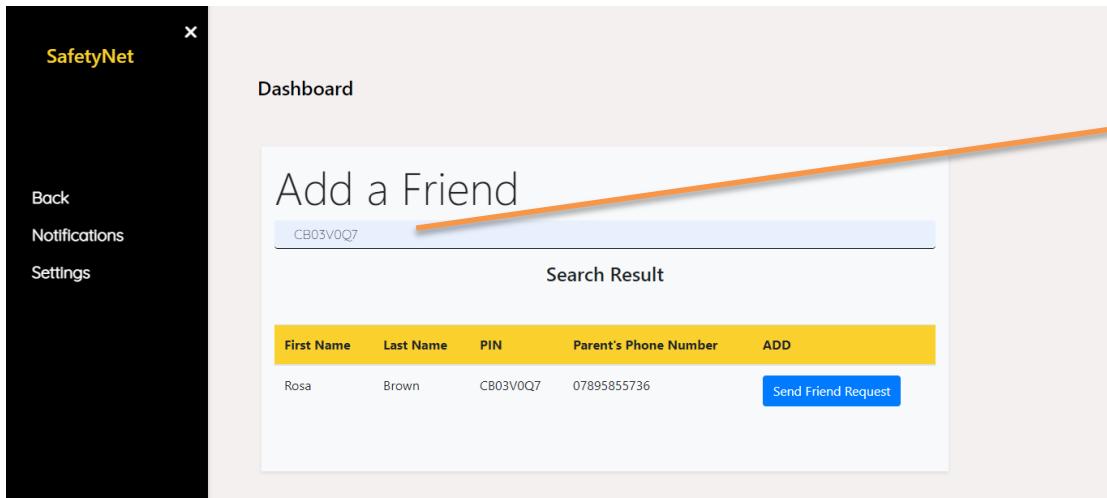
User ID	First Name	Last Name	PIN
43	Julia	Milla	9S0UUUIKF8

Below the table, the text reads: "Last Time Since your child logged in: 2022-04-18 23:27:53".

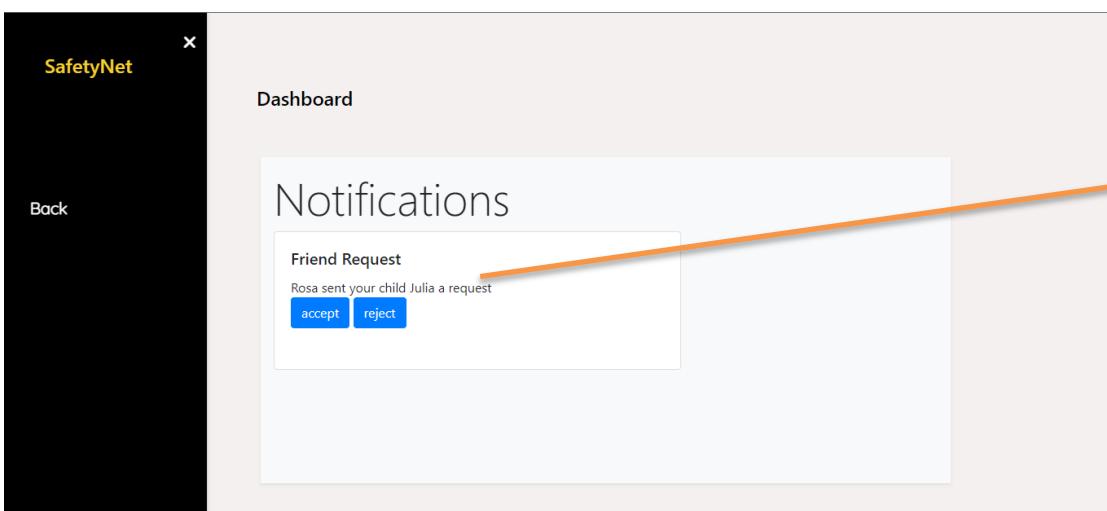
Two orange arrows point from the "Friends" section of the sidebar to the "Friends" section of the main content area. One arrow points to the "View your child's friends" text, and another points to the table row for Julia.

Callout boxes with arrows provide additional context:

- An arrow from the "Friends" menu to the "View your child's friends" text.
- An arrow from the "Friends" menu to the table row for Julia.
- An arrow from the "Notifications" menu to the text: "View the notifications link to view the friend requests that have been sent to your child."
- An arrow from the "Dashboard" button to the text: "Here you can view the details of your child with the last time they logged onto the chat application."
- An arrow from the "Logout" menu to the text: "If you are not informed as a parent about cyberbullying, please click on our guide to help you understand more."
- An arrow from the "PIN" column header to the text: "View the details including you and your child's PIN number and password."



Enter the PIN that your child gives you in here, if it exists their details will exist here. Use the phone number to call the parent to verify the person.



If your child receives a friend request from a friend, it will appear here on your dashboard for you to accept or reject.

The image shows two screenshots of the SafetyNet platform. The top screenshot displays the 'Accepted Friends' section of the 'Dashboard'. It lists a friend named Rosa Brown with PIN CB03V0Q7, with options to 'Remove Friend' or 'Block Friend'. The 'Block Friend' button is highlighted with a yellow box and an orange arrow points to it from the right, with the text: 'From here you can view your child's list, and you can decide whether you want to block and remove the user from your child's account. You can see those blocked accounts and unblock the user if you change your mind.' The bottom screenshot shows the 'How to use?' section of the 'Dashboard', which is part of the 'Cyberbullying' guide. It includes a welcome message and information about learning about internet safety and cyberbullying. An orange arrow points to this section from the right, with the text: 'You can view the cyberbullying guide in the main menu.'

SafetyNet

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Add Friends

Blocked Account

Logout

SafetyNet

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What is Cyberbullying

Types of Cyberbullying

Impact of Cyberbullying

Recommendations for parents

Logout

Dashboard

## Accepted Friends

First Name	Last Name	PIN	Remove Friend	Block Friend
Rosa	Brown	CB03V0Q7	<button>Remove Friend</button>	<button>Block Friend</button>

From here you can view your child's list, and you can decide whether you want to block and remove the user from your child's account. You can see those blocked accounts and unblock the user if you change your mind.

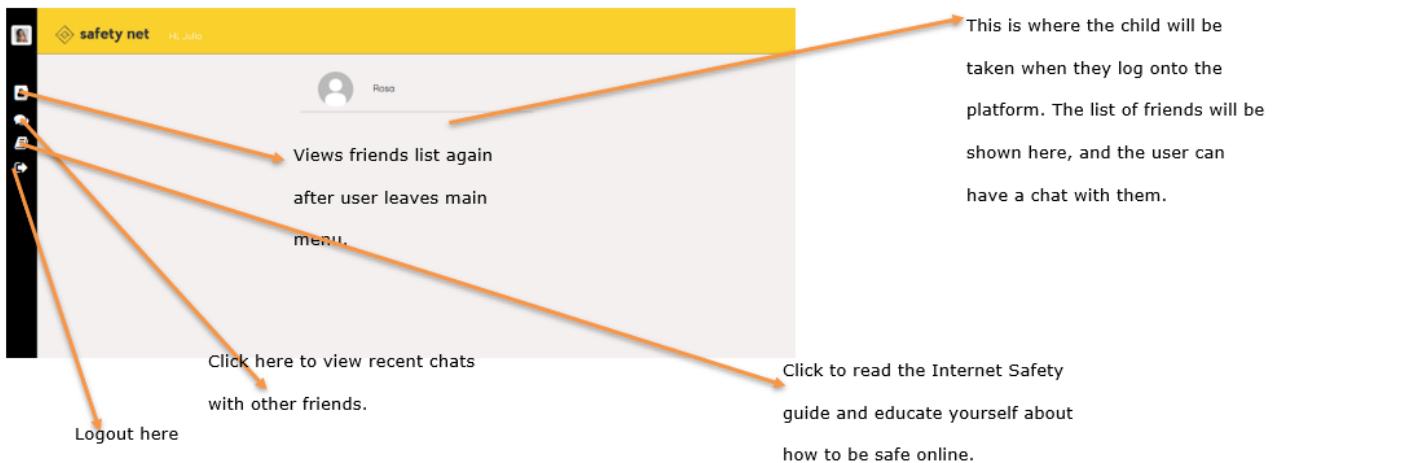
Dashboard

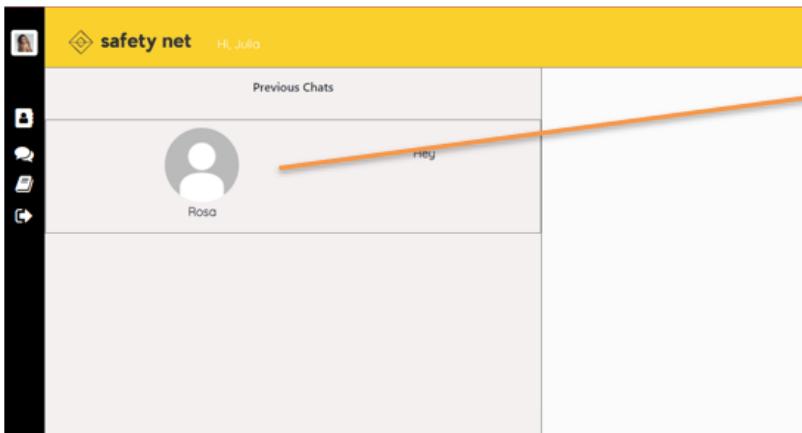
## How to use?

Welcome to the cyberbullying course provided by SafetyNet!

On this platform, you can learn about internet safety and the issue regarding cyberbullying and ways you can protect your child. This is so you can be well informed about the world of today and understand the perspective of your child in order to provide guidance. Click on the topics on the sidebar to be informed on everything related to cyberbullying and internet safety.

You can view the cyberbullying guide in the main menu





The child can view the previous chats that they have with the user. Clicking this will open the chat menu.

This image shows three panels of the SafetyNet app. On the left is a sidebar with navigation links: "SafetyNet", "What's the Problem?", "How they lure their victims", and "Who are Cyber Predators". The middle panel is the "Dashboard" with the title "Internet Safety" and a sub-section "Digital literacy when the internet.". It contains text about the purpose of the guide and a link to a full guide. The right panel is a guide titled "How do they lure their victims?". It has sections for "User Name", "Examples of Usernames", and "What can be done with this information". It also includes a link to "How to choose a username". Orange arrows point from the explanatory text in the first image to the "chat menu" icon in the top right of the dashboard panel and to the "Back" button in the guide panel.

SafetyNet

What's the Problem?

How they lure their victims

Who are Cyber Predators

Dashboard

These is the internet safety guide that your child can read to improve their Internet Safety digital literacy when the internet.

Dear User,

Our Job at SafetyNet is to protect young people from not only our platform but also the internet as a whole. This guide is to help you guys feel okay when you leave this platform and branch out to other parts of the internet. This guide will give you good tips to keep your friends safe on the internet. Being a young person can be difficult, do not let a stranger online take you down a dark path. If you are experiencing troubles, please go to <https://www.childline.org.uk/> or contact 0800 1111.

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How do they lure their victims?

User Name

Most of you guys create an username when you use social media sites. However, many people choose their username by jumbling information about themselves. This can range in their hobbies, birthdate, location etc. Doing this can allow predators to get information about their victims.

Examples of Usernames	What can be done with this information
BenandJerry_2004	This tells the predator that you like to shop at ben and jerry's and you are born in 2004.
kpopbts12	This tells the predator that the user loves listening to the KPOP genre and they are most likely 12 years old.

[How to choose a username](#)

When you choose a username other site, use these effective tips below to not give any information to potential predators:

**SafetyNet** X

**Dashboard**

**Back**

## What is the problem?

The internet can be entertaining for you guys, with the number of things that you can do can be limitless. Unfortunately, this leads to strangers taking advantage of others therefore it is important that you guys are prepared to avoid the predators that roam around on the internet. Predators are all over the internet and use it as a tool to harass, harm, even commit extreme crimes like kidnapping or rape. Predators can be located in your chat rooms or group chats as they may seek to develop a relationship with users. Predators on the internet most likely do not look like how you may imagine them in your mind. It could be women, men, old or young people, it can be anyone that just has computer knowledge.

**SafetyNet** X

**Dashboard**

**Back**

## Who are Cyber Predators

Cyber predators are people who use the intent to exploit younger people. It is hard to identify them because they sound like everyone in the platform, they use various techniques to hide their true intentions to the user with different techniques.

**Showing Unwanted Content**

When you are using social media, most likely you do not want to see explicit content and sometimes predators will send it unprovoked, if this happens to you, it is smart to stop speaking to them immediately because they use this technique to scare or befriend you.

**Impersonation**

Predators will disguise themselves as teenagers or adults to get closer to the victim. These people will befriend you and they are normally very convincing and from there you are friends with a predator. Since there is no way to truly know if the user is a predator, make sure to never give out private information to users that you do not know in real life and if the user shows any sign of harassment, it is best to end the relationship.