



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SECP 1513
TECHNOLOGY AND INFORMATION SYSTEM

Design Thinking:
SMART SECURITY

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ABSTRACT

This report consist of design thinking to solve the problems faced by the users nowadays on the network privacy and security. An application is designed to overcome the problems faced by the network users to ensure their network privacy and security is secured. The problems that faced by the users are discussed so that the problems can be really found and settled through design thinking. Basically we interviewed different individuals to identify the problems on network privacy and security. We developed the prototype and made analysis on the feedbacks from the users so that we can enhance our product to solve the problems better. The results if analysis shown that our application can help to settle problems faced by the network users.

1.0 INTRODUCTION

Nowadays, technology and information systems develop rapidly in the world. Internet has become an irreplaceable thing in people's daily life. Everyone needs internet in working, entertaining and even in the daily routine. Internet actually facilitate people but in the other hand it may bring problems if our network privacy and security is unsecured. Network privacy is the online privacy, which is a subset of data privacy and a fundamental human right whereas network security is a set of configuration or rules designed to protect the integrity, confidentiality and accessibility of computer networks and data using both software and hardware technologies.

When both online privacy and security of users are endangered, the personal safety of users should be concerned. Most of the internet users are least concerned on their own network privacy and security. Thus, this leads to cases happen on cybercrimes such as data manipulation, malware, internet scams and so on. Cybercrime now is the most lucrative crime in Malaysia (DSP Mahfuz Bin Dato' Ab. Majid, Royal Malaysia Police) . Almost everyone is in the risks of being a cybercrime victim as people now are all active internet users, especially the younger generation are the most vulnerable. As most of the users lack of information or knowledge about the network privacy and security, they do not know how to actually overcome the problem they faced.

2.0 PROBLEM BACKGROUND

In the development of high technology in the world, all of us from different ages spending majority of the time on internet. When it comes to privacy, security and ethics most of the people do not take it as serious matter. Due to lack of awareness on these problems, they do not know cybercriminal can access the browser and steal the personal data which is stored in the hard drive such as history files, browser cache and cookies.

The situation become worse when people are browsing the web, they do not aware of receiving notifications and ad cookies. They do not read whatever pops-up in the software and simply click yes and quickly move on to the visited site. People also forget to clear cookies from the browser. They sometimes may access to the unsecured websites through web bugs which is invisible images or HTML code hidden in the web page, this also will threaten the network privacy and security of users.

There is also a problem where some people do not create a strong password to secure their personal information. People enter password to access online banking, email account and etc. An easy password may cause hackers to crack their password and view the information. Password is there for a reason to prevent unauthorized access to privileged and confidential information. So, creating an easy password puts us at higher risk than people who have complex password.

Furthermore, computer crimes such as malicious programs and DoS which is designed by the crackers or cyber criminal can damage a computer system. Some device does not start up the antivirus system or antimalware system routinely and the malwares are not detected to be eliminate. It results to serious damage to the computer system. User also face problems when they receive internet scams through e-mail or phishing. Privacy dan security of users are threaten. Thus, these problems need to be overcome not only for the online privacy and security, but also the personal safety of the users.

3.0 METHODOLOGY

3.1 EMPATHIZE

Observation

We observed that many people are lack of knowledge and information about the network privacy and security and this cause them do not know how to protect themselves and do not know how to overcome the problems when it happens. For example, they always forget to routinely backup their data and this cause them to lost all the data. Some of them did not restrict access on their social media cause their account being hacked by identity theft.

Engage

To understand the problems facing by users better, we conducted a questionnaire by google form and shared to people from different age groups and background. There are few questions asked and the list of questions are as below:

1. What kind of problems are you having in privacy and security system?
2. Do you aware of receiving cookies during serve internet?
3. Do you know that when browsing the website, critical information is stored on the hardware like history files, cookies and etc.?
4. From your opinion, how the illegal hackers take someone's personal information?
5. What kind of scam do you receive?
 - chain letter
 - encouraging to click a link
 - medical scam
 - lottery scam
 - others: state that
6. What types of software do you use to protect your device and network?
7. Do you know how to format your device?
8. Have your device been attacked by hacker or malware? If yes, what usually you do if your device has been attack.

After we collected all the response, we can conclude that the problems faced by the users are commonly on their social media account being hacked and personal data being leaked, system attacked by malware such as virus and worms, cookies or pops-up advertisement in websites as well as internet scams. Other problem like their computer system slows down and suddenly lost of data. Below are the other responses for some of the questions.

Are you aware of receiving cookies during serve the internet?

89 responses

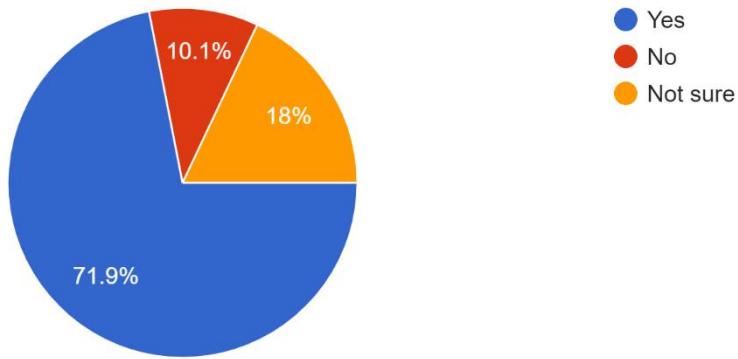


Figure 1 : Responses on awareness of receiving cookies when serving internet

Have you received any scams before?

89 responses

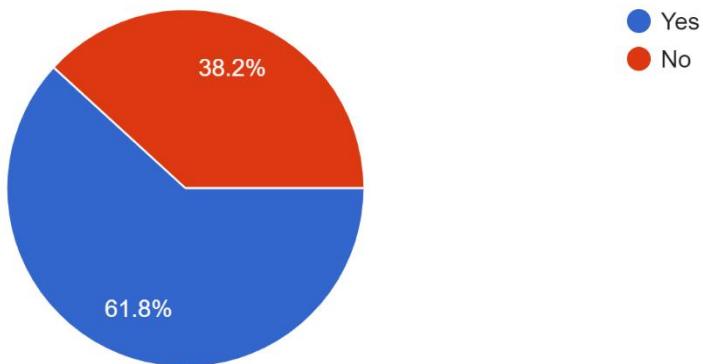


Figure 2 : Responses on whether receiving internet scams or not

If yes, what kind of scam have you received?

63 responses

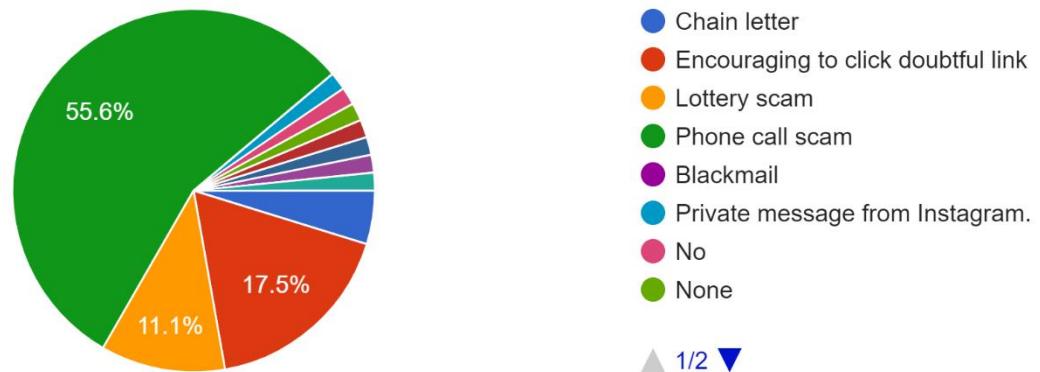


Figure 3 : Responses on kind of scam received

Have your laptop or PC been attacked by hacker or malware?

89 responses

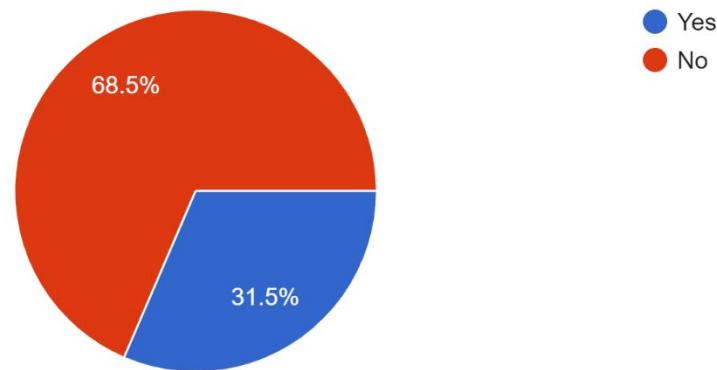


Figure 4 : Responses on the experience on computer system being attacked by hacker or malware

So with all these responses, we can see that actually internet users are having high risk on the privacy and security threats.

Immerse

After we collected responses from different individuals, we knew more detail about the problems they faced. We try to access the internet and find briefly what is the things that commonly leads to the danger of users' network privacy and security. Then we found that cookies and web bugs are very easily found in the websites, and the malware is possibly found in the unsecured websites. We can see the cybercrimes is really a serious problem lately in the society based on the report done by the Royal Malaysia Police, DSP Mahfuz Bin Dato' Ab. Majid.

3.2 DEFINE

After we go through the empathize stage, we discussed and analyzed about the responses of the people and thought about the solution to overcome their problems. We did research on the privacy and security support in the system software and also searched for the available application software that provide protection on the privacy and security of our devices. Besides that, we had an interview with Mr. Mohd Zahari Zainal Abidin, the network admin of UTM to get more information on network privacy and security. Lastly, we made a decision that we want to design an application which can aware the users on the privacy and security problems.

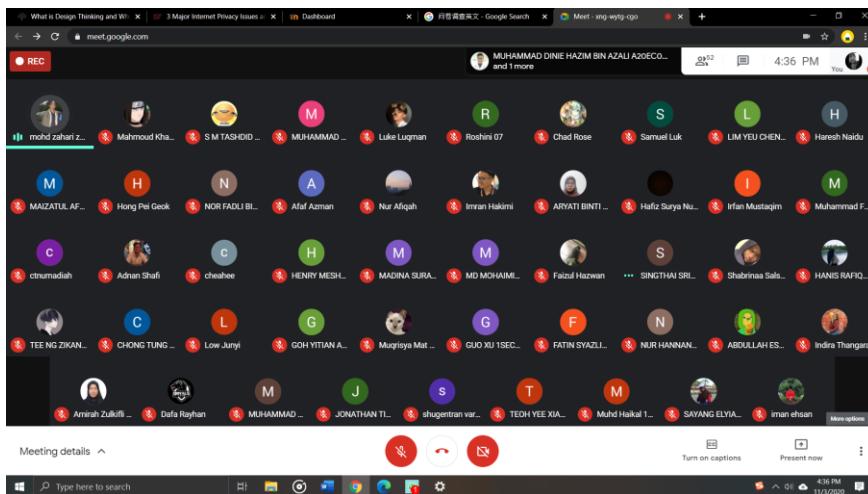


Figure 5: Interview with Mr Mohd Zahari via google meet

3.3 IDEATE

We conducted a minute meeting within our group members to think about the features of our product. Firstly, we decided the specific function of the application, which is a application software that can manage the firewall and antivirus system in the system of device to check routinely on the existing of malware, web bugs and other privacy threats. So, we thought antimalware system or antivirus system is very important to secure the privacy and security. Besides that, we realized that lack of awareness of users on network privacy and security also lead them to the problems. A guidance about network privacy and security must add into the application. Since in the immerse phase we found that cookies and web bugs are easily found online, we thought that a function to block cookies and web bugs also should be there in a device. But we found that users always ignore the notification pops-up in the device on the problem of privacy and security. After a long time on brainstorming, we design an application which access to speaker of device and can voice by speaker in certain situation. Then, we discussed on the design of the application. We all gave different ideas on the design of application but we decide to make out the designs so that we get a best design of the application. Finally, we also discussed on the name of this application and made a conclusion together.

3.4 PROTOTYPE

After brainstorming, we created out the design stated in the minute meeting and show to each other to get feedback within the group. We improved our design for several times so that we can really give a good experience to the users while using the application. Then, we finally come out with the prototype. Our prototypes are as below:

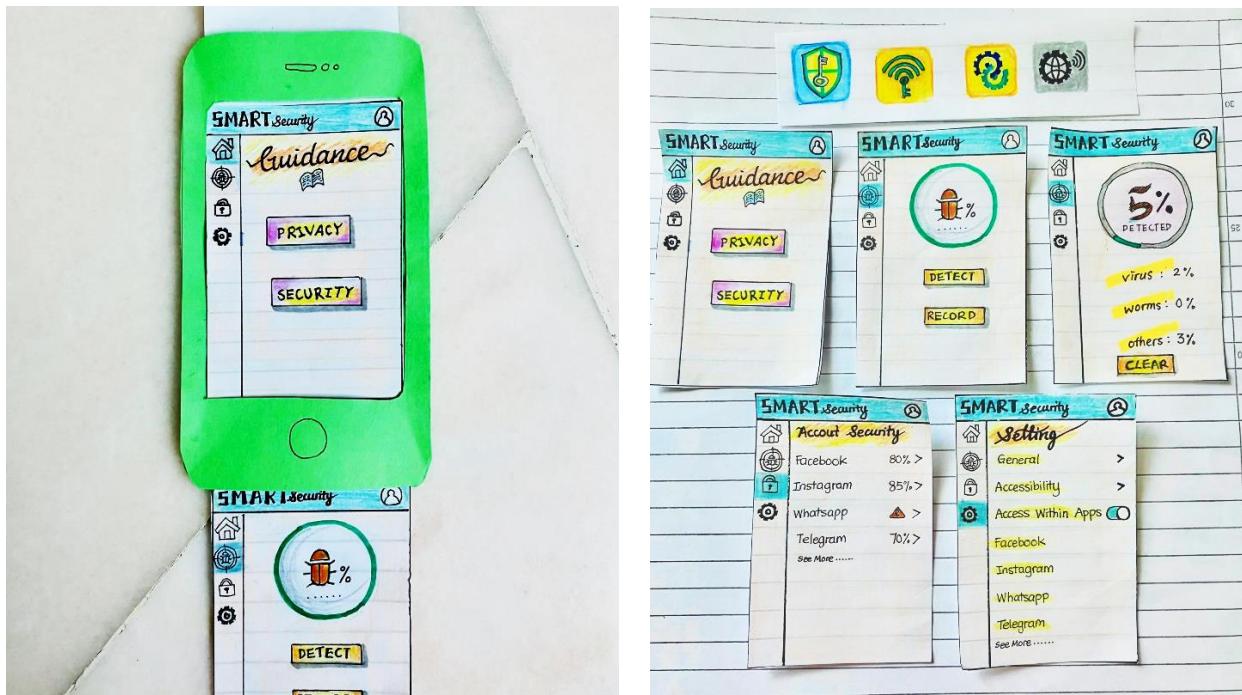


Figure 6 : Prototype 1



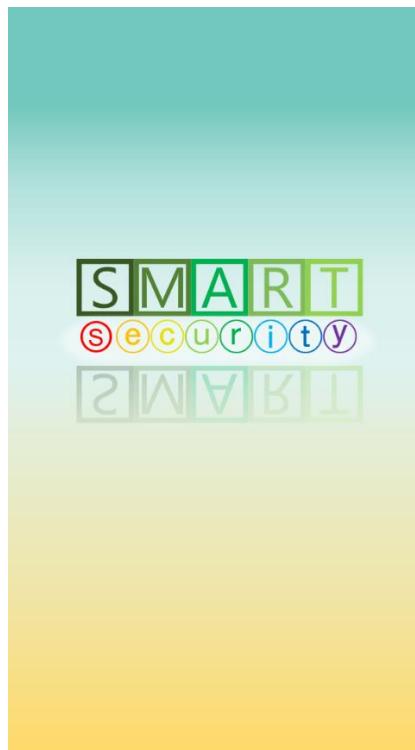
Figure 7 : Prototype 2

3.5 TEST

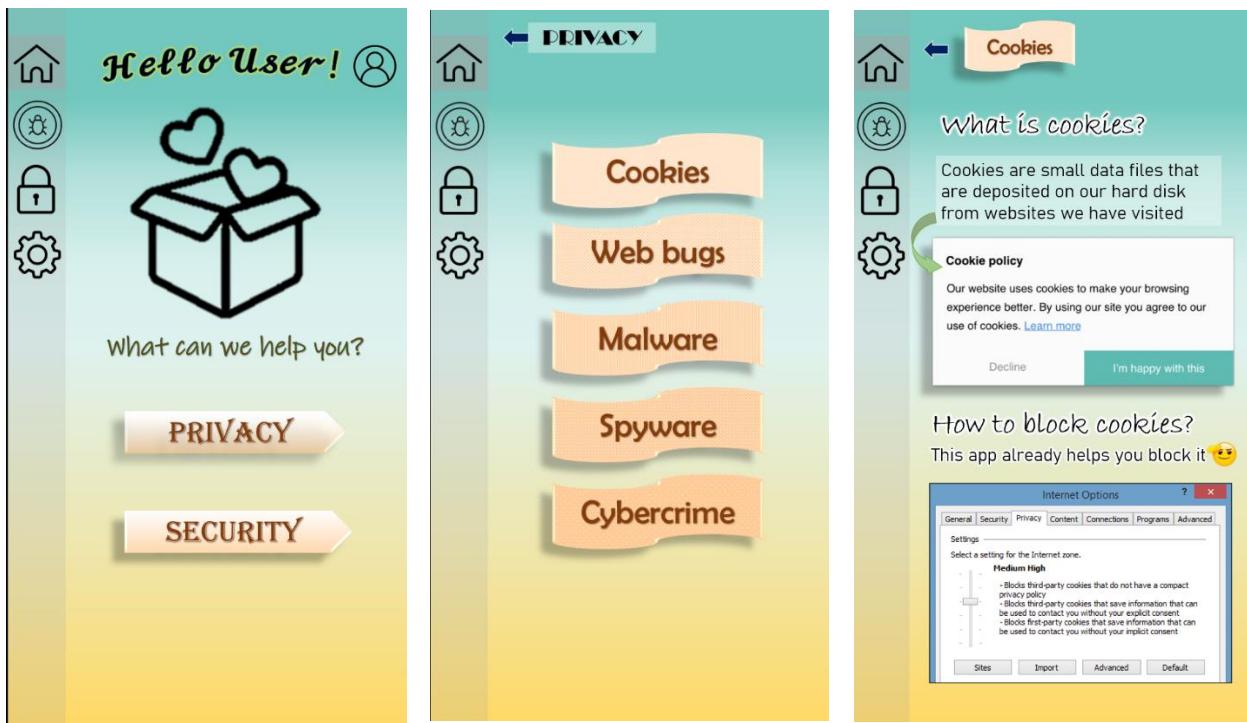
To improve our design, we interviewed some users to get feedbacks on our products. In the interview, we briefly explained the function of the applications and asked for feedback. Their feedback help us so much to realize the problems that we did not notice before.

4.0 DETAILS OF PRODUCTS

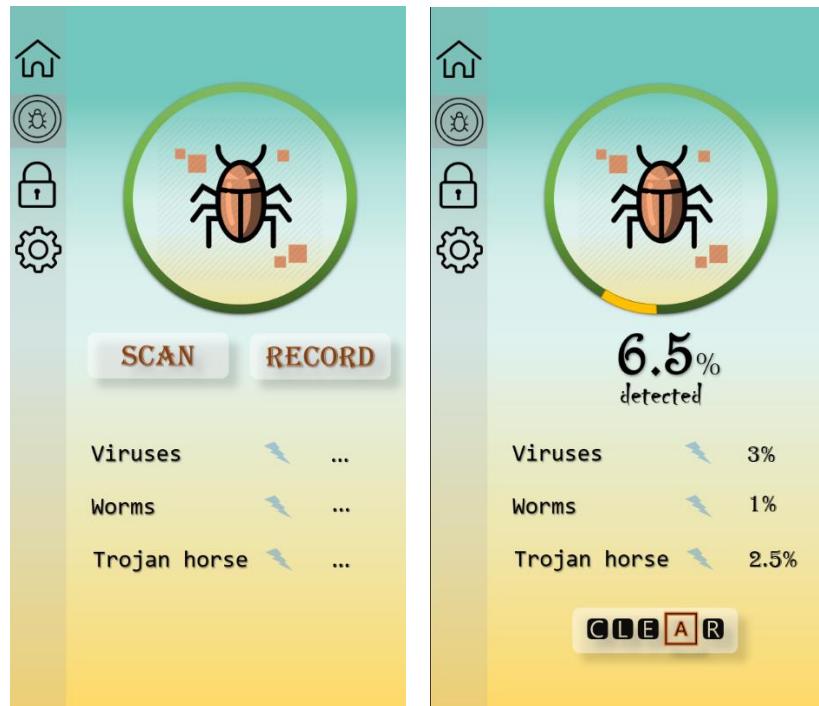
Our product of design thinking is an application software which manage to secure the network privacy and security. The name of the application is SMART Security.



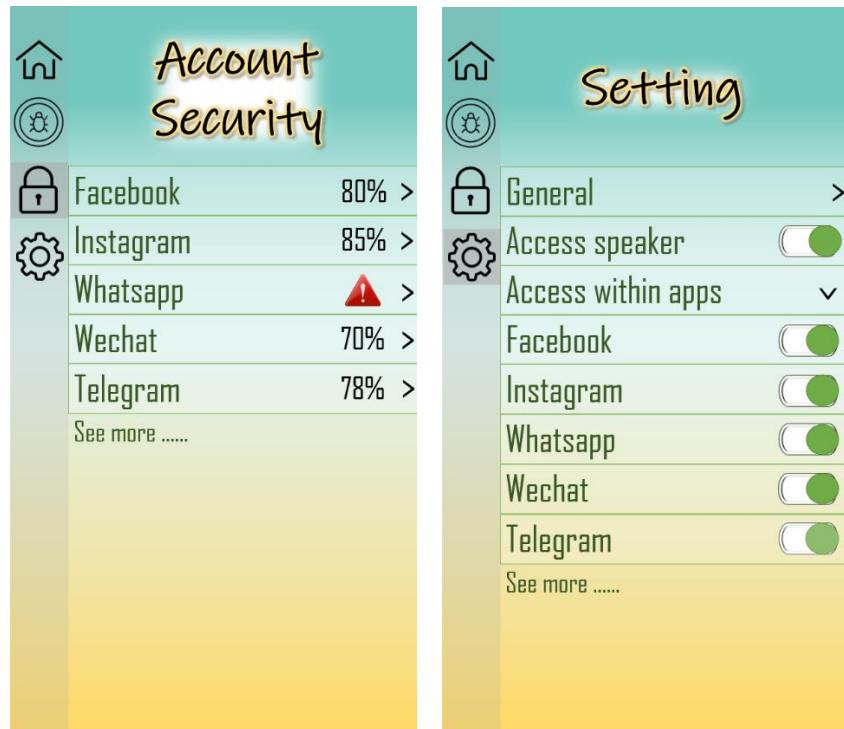
The main function of the SMART Security is to provide basic information on network privacy and security to users. Users can search what they do not know on privacy and security. So, in the home page, there are guidance to the users about privacy and security. Furthermore, this application helps to block cookies and web bugs automatically when users are staying online so that the privacy is secured and no data will be stealing.



Besides that, this application detects malware routinely by antimalware system to prevent the damage to the device due to malware. The application system will send notification to users if the duration from last detection for malware is too long. The detection on malware is recorded.



Another function of this application software is help to ensure the accounts online is restricted so that unauthorized access would not happen. Percentage of security is shown in the application so that users can restrict their password or use two-factor authentication. Users need to allow this application to access within the applications. When users are in certain situation, such as visiting an unsecured website, application would warn users by speaker, advise users to quit the website as soon as possible. Thus, SMART Security also need to access the speaker.



5.0 USER STUDY

Age
89 responses

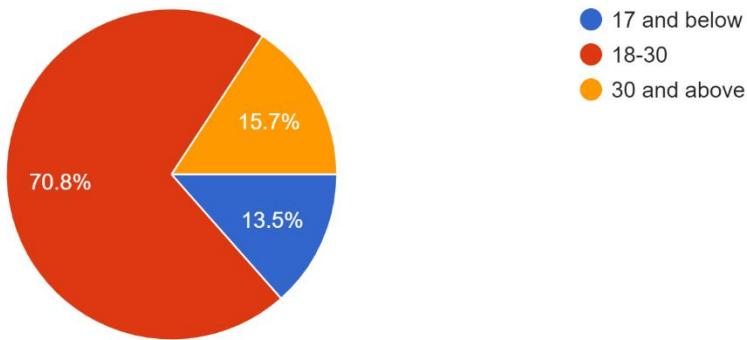


Figure 8 : Users background

Different background of users filled in the questionnaire we shared. Most of them are between 18 years-old and 30 years-old. We collected responses for empathize stage. Another two individuals are interview for our feedback on the product of design thinking. Both of them are also in between 18 and 30 years old.

The interviewees give positive feedback on the product. First interviewee stated that this application should be installed by everyone because it is very detail on the information of network privacy and security and users can search what they do not know with the application. Besides that, she said this application should has collaboration with device software so that the antivirus system can function better to protect the system. The second interviewee thought that this application is very useful, it can secure users' privacy and security when using online service, and users' profiles are secured. It also protect users from the unsecured website.

6.0 BUSINESS ANALYSIS

The evaluation of Smart Security continues with business analysis using SWOT (strengths, weaknesses, opportunities, threats) approach.

Strengths	Weaknesses
<ul style="list-style-type: none">• Help user to create strong password• Free download• Ease awareness of security and privacy• Alert user when serving to the unsecured websites• Prevent malware• Block cookies and web bugs	<ul style="list-style-type: none">• Need internet to access
Opportunities	Threats
<ul style="list-style-type: none">• Can be further improved to attract people and to be commercialized• Need technical support	<ul style="list-style-type: none">• User cannot login in into the app if forget the user Id and password.• Collect data from security of social media account

7.0 REFLECTION

Our goal with regard to the program is to learn more detail information on technology and information system so that we can become professional computer science . Besides that, we want to strengthen our soft skills such as leadership skills, communication skills, creativity and others to achieve our personal dream.

Throughout the design thinking, we learned to work together as a team. We discuss together to solve problems faced and do every part of the design thinking together. Communication skills is improved as we need to communicate between group members and the users. So, our soft skills is being strengthen. Besides that, we gain many information on technology and information system. We did research on many new knowledge to carry out the design thinking. The design thinking also encourage us to brainstorm on the users problem which improve our creativity. Thus, we manage to reach our goal throughout the project.

We should improve flexibility to manage multiple assignments at the same time and ready to work under ever changing conditions, management, environment and rules. Apart from

that, we should enhance self confidence to take smart risk and gain energy to achieve goals. Furthermore, we must improve ourself in organize the time, work and materials. It will help us to plan out task and complete them quickly. If we are well organized we may be better to meet deadlines and celebrate effectively with others. We also must improve in doing more research on new technologies will help to get more ideas and increase the efficiency of the modal.

8.0 REFERENCES

Susan Alexandra (2019), '3 Major Internet Privacy Issues and How to Avoid Them'.

DSP Mahfuz Bin Dato' Ab. Majid, Royal Malaysia Police (2012), 'Cybercrime : Malaysia', Cybercrime cases in Malaysia.