



SECP 1513 TECHNOLOGY AND INFORMATION SYSTEM

DESIGN THINKING: CLEANSE

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CLEANSE

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ABSTRACT

This report is done based on a project called “Cleanse”. The development of the project is due to the problems on operating system which are faced by most of the smartphone users. The aim of this project is mainly to improve the user experience on smartphones by doing some improvement and maintenance on the smartphone’s operating system and create a user-friendly software. Moreover, this project is actually conducted through design thinking in which we undergo 5 stages, empathize, define, ideate, prototype and test to identify the problems and come up with the best plan. After testing our software to some smartphone users, we eventually got a positive feedback. However, we also identified some of the strengths, weaknesses, opportunities and threats using SWOT analysis. Overall, Cleanse is a successful plan as a troubleshooting software since it is needed by many smartphone users.

1.0 INTRODUCTION

System software is a type of program which is designed to manage the resources of the computer system and simplify the application’s program. It includes operating system, utilities, device drivers and language translators. Among all of the system software, the operating system can be considered the most important software on a computer. It plays a significant role as an interface between the end user and computer hardware which in turn aids us to communicate with the computer to carry out various functions. In this case, our smartphone needs an operating system to run too. For instance, Android, IOS and Windows Phone.

In this modern era, it is undeniable that smartphones have become a crucial part of our lives. It contains various of fantastic features and is very convenient. Indeed, smartphones make our lives easier. However, are smartphone's operating systems really perfect and satisfactory? People tend to face various problems when dealing with their smartphones. However, since they do not know how to solve the problem or they are not familiar with how their smartphone operating systems work, they will choose to leave it aside and this will eventually reduce the user experience and might damage the operating system as well as shorten the lifespan of the smartphone for a long time.

2.0 PROBLEM BACKGROUND

Nowadays, smartphones have become one of the most important and necessary items in our daily life. This is apparent when most of the communications and work are centered around smartphones. Embedded operating systems such as Android, IOS and Windows Phone are the most basic programs to run a smartphone. The existence of smartphones indeed has brought a lot of convenience to public. However, people somehow face problems when using their smartphones too. The lack of exposure and education regarding their smartphone's operating systems causes them to have frequent issues with their smartphones.

3.0 METHODOLOGY

3.1 Empathize Mode

Observation

Based on our observation, smartphones have undergone evolution and have become an essential piece of technology. Nowadays, smartphones have become so useful to the point that it can be considered as a pocket-sized computer that is inseparable to many people. While smartphones are very handy and offer many benefits, it definitely has its flaws. Users tend to face problems when they deal with their smartphones. For instance, they will find that the operating system that is used by their smartphones is not user-friendly especially for middle-aged people who seldom use their smartphones.

Engage

To have a better understanding about users' problems, a survey was conducted by using google form. We managed to get responses from 30 respondents from different age groups and backgrounds. In the survey, we asked them about the basic details of the respondents which were their age, job, what problems they face when they use their smartphones, whether the smartphone's operating system is user-friendly, suggestions to improve user experience and whether a troubleshooting software can improve their user experience. Apart from surveying the smartphone users, we also have a short online interview session with PM Dr Murtadha, an expert in software application, to gather more ideas about the problem of smartphone operating systems. Generally, most of them agree that troubleshooting software can aid to improve their user experience. Below shows the statistics obtained through survey.



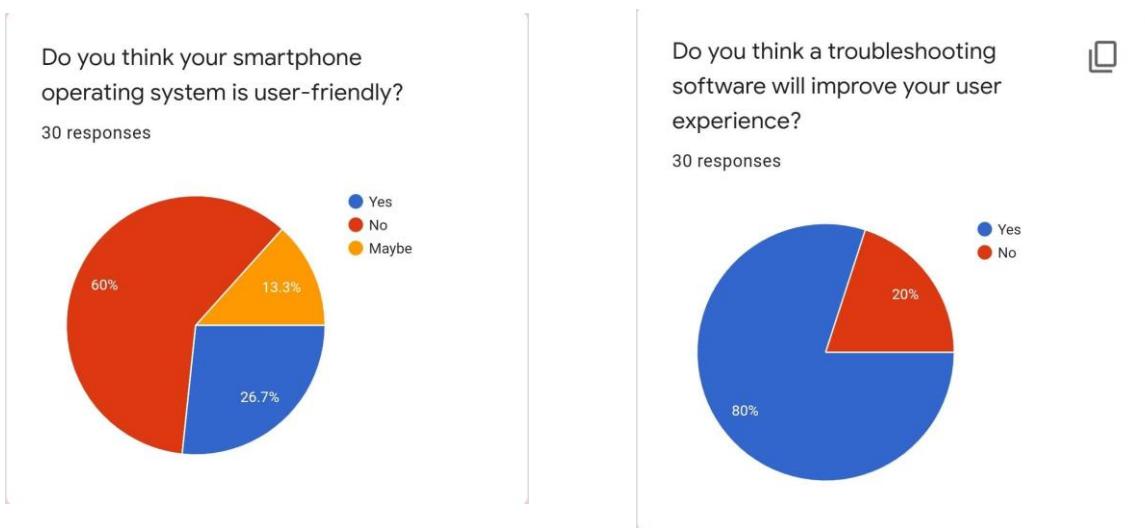


Figure 1: Statistics on Results of Survey

Immerse

As smartphone users, we agree with the result from the survey. Generally, most smartphone users face similar problems. Especially for the middle-aged group as they are less exposed to the technology. Moreover, most of them have used simple handphones which only offered basic features for many years which is why modern smartphones can be complicated and difficult for them. However, based on the survey and our own experiences, not only middle-aged group face this problem, but majority of teenagers nowadays also face these problems with their smartphones.

3.2 Define Mode

Based on the survey, we have collected problems faced by the responses regarding the smartphones. The list of problems is:

1. They are hard and complicated to use.
2. The batteries tend to drain fast.
3. The memory and storage are used up fast and will lag when applications run.
4. Risk of getting malware.
5. Too many settings.

To have a better understanding about the needs and requirements of smartphone users, we had a discussion through Google Meet. After discussing alongside giving some analysis

and research, we found that the best way to improve user experience would be to create a helper that can help maximize the benefits of the smartphone's operating system. Operating system is the main program that is used to run smartphones. However, due to the complexity of these operating systems, users cannot take their smartphone to its full potential. It needs a software to assist the user on optimizing their smartphone's operating system while also improving their overall user experience.

3.3 Ideate Mode

In this phase, we had a more detailed discussion and brainstorming session. We had come out with an idea to create a user-friendly troubleshooting software which is helpful in detecting problems that may decrease user experience and find solutions to it, overall improving the operating system. All of us agreed with the idea since it is most likely to be helpful to smartphone users. We had discussed about the main feature and also some of the side features which can really aid the smartphone users. We also discussed about the special feature so it can be more user-friendly. Besides, we also made some designs for the software. At the end, we managed to come out with the draft of the whole project. We named the project as "Cleanse".

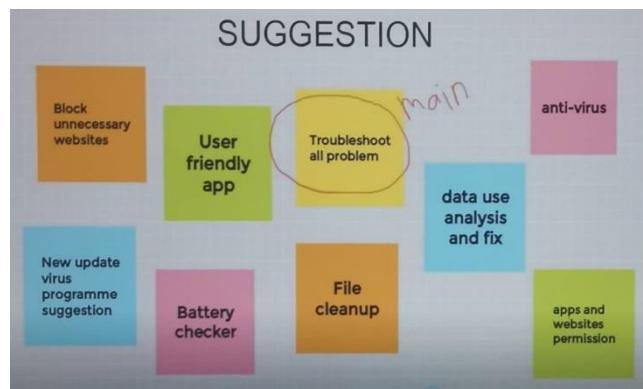


Figure 2: Brainstorming Ideas

3.4 Prototype Mode

Based on the design with the most votes at the brainstorming session, we made a model for our software. We created the pages that will be present in our software by using an editing program. The pages are about same size with our smartphone screen size to make it seems more applicable in a smartphone.

3.5 Test Mode

In this phase, we introduced and explained our software to some smartphone users by presenting the prototype which we had done for their better understanding. After that, we did a survey for user feedback. Based on the feedback, we made some improvements. Overall, we managed to get a positive feedback.

4.0 Task Assignment

Since we were not able to perform face-to-face discussions due to Covid-19 pandemic, we conducted every discussion through either Google Meet or WhatsApp. First, we did a survey by spreading the Google Form to our friends. After we had collected all the feedbacks, we had a meeting again through Google Meet to discuss in detail and undergo the define mode. We also had a brainstorming session and all of us made a point to solve the particular problem. Then, we voted for the most solid and realistic plan which is Lee Jia Yee's plan to make a troubleshooting software. We named the project "Cleanse. We also discussed about the design of our software. Then, Aiman had done the prototype to bring our ideas to physical form. We also did a user feedback survey to test our prototype. We would carry out meeting sessions when any of us faced problems. To finish this assignment in a smooth and efficient way, we divided the jobs into two parts, where Aiman and Chong Kah Wei were assigned to do the report and prototype while Lee Jia Yee and Nik Syahdina were assigned to do the assignment video.

5.0 The Proposed Solution

5.1 Acknowledgement of Similar Product

Majority of respondents declared that they were no software which have exactly the same features as Cleanse. Some of them find that Cleanse implement some of the features of other phone secure applications such as clear storage and memory, scan virus and ad block feature but they claim that Cleanse is more advanced. The special troubleshoot feature that it provides focuses on user-friendliness while also providing the user with solutions to optimize their smartphones for example by suggesting helpful applications or giving step-by-step instructions. This feature differentiates Cleanse compared to other related software.

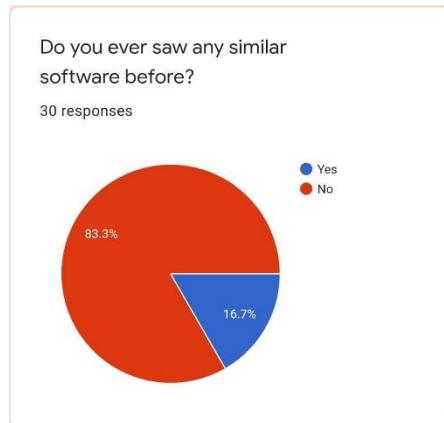


Figure 3: Statistic on User Feedback Survey

5.2 FEATURES OF PRODUCT

Cleanse is focused mainly on being a troubleshooting software. It includes several side features such as clear storage and memory, optimize battery usage, control data usage, scan and detect virus, checking permission of each application and blocking advertisement and spam messages as well as spam call. All of these features help the operating system to carry out its job better and also so that users can have a better user experience. Since we prioritize our software on user-friendliness, it has a simple layout to make it easier to be used. However, the main feature will be the troubleshooting feature. It can detect the problems of the smartphone and list down all the main causes of the problem which can harm the device by only a click of the “TROUBLESHOOT” button. By clicking each of the problem, it can generate the steps to eradicate the problem and optimize the smartphone. It will also suggest the best software which is needed by the smartphone to improve its operating system based on the phone model. Figure 1 to Figure 5 show the screenshot of features of Cleanse.



Figure 4: Layout of the Menu



Figure 5: Troubleshooting



Figure 6: List of Problems

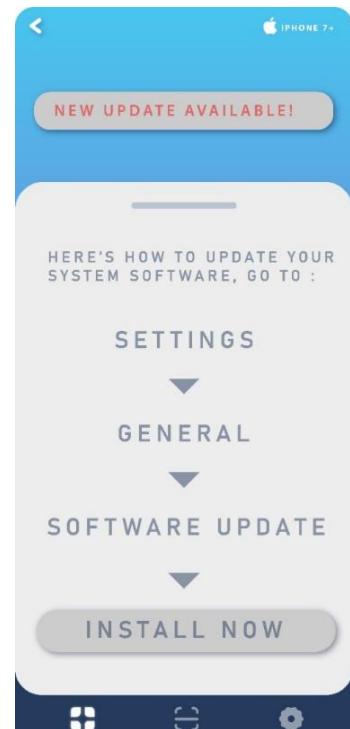


Figure 7: Steps to solve each problem

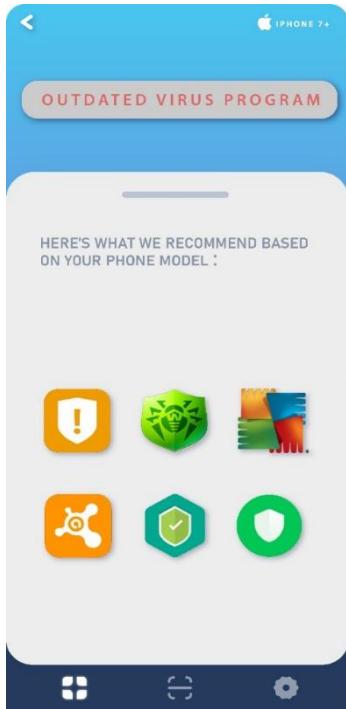


Figure 8: Suggestion of Software

5.4 User Feedback

We had done a survey to get user feedback after presenting our prototype to them. We managed to get responses from 30 respondents. Most of them were quite pleased and satisfied with our software. They claim that our software is user-friendly. Besides, they agree that our software is useful to them and it can help them to maintain and polish their smartphone's operating system. However, some respondents are afraid and worried that the software will harm the operating system and recommend them untrustworthy application. Furthermore, a few of them doubt the safety and security of the software. There is also suggestion from the respondents to make a multi-language choice. However, overall, they have shown a positive feedback to our software.

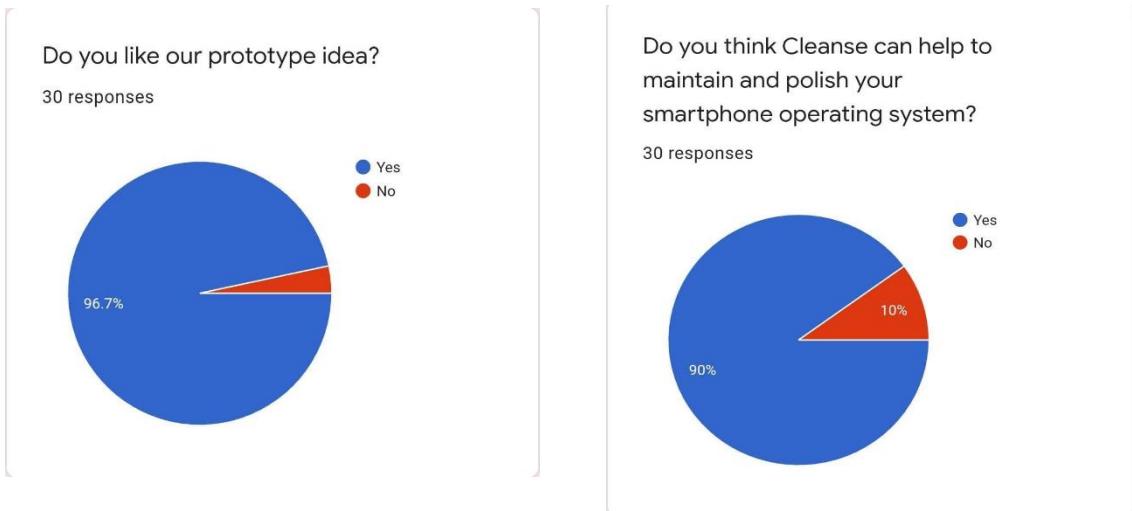


Figure 9: Statistic on User Feedback

5.5 Business Analysis using SWOT

We use SWOT analysis to identify the strengths, weakness, opportunities and threats related to our project.

S- Strengths	W- Weakness
<ul style="list-style-type: none"> - User-friendly - Extends lifespan of a smartphone - Improve smartphone user experience 	<ul style="list-style-type: none"> - Security challenges - Needs to be updated regularly
O- Opportunities	T- Threats
<ul style="list-style-type: none"> - Become the necessary software in all smartphones 	<ul style="list-style-type: none"> - Lack of confidence from users

Table 1: SWOT Analysis

5.6 Future Works/ Improvement

Cleanse satisfies all the needs of a smartphone user. However, it can be further improved too. In this case, the suggested software from Cleanse must always be a trustworthy and reliable software. The list of the software should always be up to date and can really help the users. The security of the recommended software should be the first priority to make sure it is safe to be installed and used by the user. This can be done by frequently checking the applications' credibility. Only then will the smartphone users put trust in our software. Another improves is to make sure it does not disturb the operating system by ensuring it does not clear important files and data which is required to run programs. The blocking features can be improved too to avoid the blocking of some important messages and calls.

6.0 Reflection and Conclusion

In this project, we were confronted with several problems and difficulties. First of all, we are not able to conduct the whole project face-to-face due to Covid-19. Honestly, it is quite difficult to communicate and exchange ideas digitally. Besides, we are not familiar to the given topic. In this case, we managed to overcome the problem together by offering full cooperation and commitment to make this project successful.

In fact, all of us took this course because we were interested in Technology and Information System. We are planning to get an IT career in the near future. Through this design thinking project, we get the idea on what system software is. We also managed to learn soft skills such as communication and teamwork. Besides, we were able to gain insight and enhance our thinking skills. This design thinking project provides us a chance to know more about how to work in a team and it gives us practice on solving IT problems. It makes us even more fascinated in this course and persistent with our goals. To reach our full potential in this industry though, we actually need to do more research regarding these topics. We need to develop both our soft skills and hard skills.

Cleanse is a software which is needed by most of the smartphone users nowadays. It can maintain the operating system of a smartphone and eventually extend the lifespan of our smartphones. In this case, since we cannot communicate with our smartphones properly, we are not able to know when our smartphone is “sick” and figure out the best method to

solve it. However, Cleanse can detect all the problems and optimize our smartphone's operating system and it directly improve the smartphone user experience. Furthermore, Cleanse is very user-friendly especially to the middle-aged users. The invention of modern smartphones is unexpected for them a few years ago. Some of them even fear and resist using a smartphone since they claim that it is hard to use and they are not familiar with the added features. Cleanse can help them too by helping them navigate through their smartphone's operating system and overall improve their user experience. In short, the invention of Cleanse will definitely improve and maximize the potential on the uses of smartphones.