

Exploratory Research on The Impact of Mysejahtera Application on to The Elderly Based on User Experience

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Abstract: *The number of smartphone users in Malaysia is predicted to rise by 1.74 million by 2025, owing to the country's expanding population. According to Statista (2021), in a survey on smartphone ownership, only 30% of respondents aged 65 and up have a smartphone. However, the researcher shall overview an increasing number of elderly individuals interacting with digital technology during the Covid-19 pandemic. The problem statement has been found in other scholars stating that most people over the age of 60 use mobile phones for minimal purposes, such as calling or SMS in emergencies (Coates. H, 2001). Most complaints are related to displays that are too small and difficult to see, buttons and characters being too small, causing them to push wrong numbers frequently (Hassan. H et al., 2014). Based on previous literature, the problems faced by the elderly using mobile phones are form factors and user interface (UI.) of mobile phone devices such as rubbery buttons, small screen display, small buttons, colors, backlighting, and text characters for viewing (Md Nasir et al., 2008). In this research, the researcher will conduct an exploratory study on the impact of the MySejahtera Application on the elderly. As we know, the elderly have severe difficulty with sight vision and other effects. Thus, the interface design and navigability with the information presented on the screen, and the number of functions, are amongst factors that make smartphone adoption difficult for the elderly. On the other hand, this research aims to determine or discuss UI/UX recommendations focused on elderly users. The outcome of this research will benefit the elderly in Malaysia as a developing country in terms of technological utilization.*

Keywords: *user interface design, digital technology, user experience*

1. INTRODUCTION

Age can weaken our vision and eyes, but we can take steps to ensure our eyes and overall health for the rest of our lives. It could be as easy as using brighter lights to stop accidents caused by poor vision. We must visit the doctor more often to screen for age-related disorders. Various typical eye issues can be linked to elderly age-related macular degeneration, cataract, and diabetic retinopathy. Age-related macular degeneration is a degenerative central retinal disease that is a primary cause of vision loss worldwide. Most of the vision loss occurs in the late stages of the disease due to neovascular (“wet”) age-related macular degeneration or geographic atrophy (“late dry”) (Lim, et al., (2012). According to Wong et al. (2014), in 2040, the total number of patients with any AMD will reach 288 million people worldwide. Patients may feel blurring or distorted pictures in their central visual field (metamorphopsia). As the condition advances, the center field may become obliterated, and significant vision loss (scotoma) may occur (Marmor, 2010). Cataracts are the most common cause of reversible vision loss around the globe. Cataract, or opacification of the lens, is one of the most prevalent causes of visual loss, affecting an estimated 16 million individuals globally (Asbell, et al., 2005). In addition to growing older, several risk factors have been discovered, including genetic makeup, UV light exposure, and diabetes. However, no method has been proven to prevent the formation of a cataractous. Nonetheless, innovations in cataract surgery, including small-incision surgery, the use of viscoelastic, and the invention of intraocular lenses, have made therapy exceedingly effective and visual recovery very quick in most cases. Despite these advancements, cataract remains a primary public health concern that will only grow in importance as the world’s population grows and life expectancies increase. Diabetic retinopathy (DR), a primary microvascular consequence of diabetes, has a massive impact on health systems worldwide (Zheng, He, & Congdon, 2012). This will have a considerable impact if quick action is not taken. The number of people with DR will rise from 126.6 million in 2010 to 191.0 million by 2030. The number of people with vision-threatening diabetic retinopathy (VTDR) will increase from 37.3 million to 56.3 million. DR frequently leads to low visual functioning and is the most significant cause of blindness in working-age society, despite rising data proving the benefit of routine DR screening and early medicaments.

Research Background

Everything that was once deemed normal was changed when we experienced the pandemic. The coronavirus affected businesses, schools, and even travel, and we were all forced to stay at home. Hence, the Malaysian Government has developed the MySejahtera application to help monitor the outbreak of COVID-19 in the country by allowing users to assess their health risks for COVID -19. This application also provides the Ministry of Health (MOH) with the necessary information to plan early and effective countermeasures. It helps people assess themselves and their families and self-assess their well-being. During the COVID-19 epidemic users recorded their health improvements.

Fifty-nine percent of people aged 65-69 use smartphones, and this number is expected to grow in the future. Most use the smartphones to check their email and look for health and medication information (Nikola, 2019). The mobile usability of older users differs from others because they have limitations in terms of technical ability, physical ability, and cognitive ability. Therefore, these aspects must be considered in the UI design process when developing applications for seniors. General findings show that seniors have difficulty using a smartphone due to the complexity of the Design of UI, which is the text size, navigation, visual design, functional requirements, etc. (Abdulrazak et.al, 2013).

Problem Statement

MySejahtera is a smartphone application advanced by the Malaysian Government to aid contact tracing operations in the country's reaction to the Covid-19 outbreak. The objective of creating this application is to quickly identify a person who may have close contact with anyone who has tested positive for Covid-19. However, there are several issues regarding using this application since the app is still new and was launched by Adham Baba, the former Health Minister, on April 20, 2020.

PS 1: Malaysia's life has become more digital due to Covid-19. The elderly society may be left behind (Ayamany, 2021). The statement above shows that the elderly have a technology barrier to living in a technology era - this clashes with the generations that grew up with technology information.

PS 2: Based on a statement by Perthig et.al, (2019), due to contemporary technological advancements, the senior citizen population has been forgotten, as their inadequate abilities and knowledge of new technology advancement have been overlooked.

PS 3: The utility and features of the application generally lead to fear, anxiety, and consequently rejection among the elder generation in Malaysia (Soh et.al, 2020).

Purpose of Research

This research aims to determine or discuss UI/UX recommendations focused on elderly users due to the uncondusive method and propose a new mobile application that benefits the elderly in Malaysia, a developing country, in terms of technological utilization. In this research, we can see the further improvement of this application for future healthcare, which is for virtual consultation in response to Covid-19.

Research Objectives

This research aims to determine UI/UX design suitable for elderly users. The objectives of this research are:

- RO 1: To identify the barriers faced by the elderly when using the MySejahtera application
- RO 2: To analyze inadequate abilities and knowledge of new technology to be implemented on the MySejahtera application in line with elderly users' eyesight.
- RO 3: To propose a Significant User Experience PrincipaL application to help increase the effectiveness of the application.

Research Question

By interviewing with experts, the research question will be guided. This research question's conclusion will assist the researcher in receiving feedback from the target audience.

- RQ 1: What is the elderly users' main barrier to using the MySejahtera application?
- RQ 2: What suitable elements can be implemented on the MySejahtera application to help with the elder generation's eyesight?
- RQ 3: What is a suitable method to help increase the effectiveness of the application?

Significance of Study

This research gives benefits to the researcher and society. Nowadays, everyone uses a cell phone in their daily life, especially the younger generation, while the older generation is yet to get familiar with the new technology developed in Malaysia as they are not digital natives. So, the mobile application should be user-friendly as many generations will use this technology. According to the Oxford Journal, user experience design aims to improve customer satisfaction and loyalty through the utility, ease of use, and pleasure provided in the interaction with a product. Hence, this research will apply several UX principles from Don Norman. The UI /UX recommendations are aimed at older users, as the method is not target-oriented. A new mobile application is proposed to benefit the elderly in Malaysia a developing country in terms of technology use.

Research Scope

This research aims to identify UI /UX recommendations that focus on elderly users as the method is not targeted, and propose a new mobile application that benefits the elderly in Malaysia, in terms of technology use. Therefore, this research will focus on old people aged 60 to 65. This study will also investigate users' experience with the MySejahtera application.

Limitation

In conducting this exploratory research, several problems prevent a satisfactory study. Lack of time is one of the research problems, and the results are promising. In conclusion, this problem will cause many aspects not to be entirely focused on, and only a few studies can be addressed and focused on. Therefore, to write a good paper, the researcher should manage time wisely, maintain potential, and focus only on one study.

There is also a lack of reference material, which is quite limited. This study needs information from images and written materials such as journals, books, articles, newspapers, and other sources. These are very limited to get a good result for a good job. In addition, finding information about the problems of people who use the MySejahtera application is difficult because too many media or data contain different data.

Delimitation

The age group focused on in this study is between 60 to 65 years old and older. They are mature enough to give their opinion and evaluate their experience with the MySejahtera application. They can also provide an informed idea and thus can gather sufficient information to prepare this study. The selection of respondents for the online survey focuses more on young people and older people to see how they interpret the topic in the MySejahtera application and their thoughts about the current topic.

1.1 MOBILE APPLICATION

Ballard. B (2007) reported that a mobile phone is like a Swiss Army knife because we always want a new function on the phone, such as SMS, voice, browsing, a camera, music, and television. We would like to have these things in our pockets, and the phone is already there. On the other hand, like a Swiss Army knife, the usability of the individual functions leaves a lot to be desired. A Swiss Army knife does not offer the cutting quality of a chef's knife, nor does it feel as good in the hand as a good pocketknife.

Islam et.al, (2010) stated that mobile applications consist of software/programs that run on a mobile device and perform specific tasks for the user. Moreover, mobile applications are a new and rapidly developing global information and communication technology segment. Mobile applications are simple, easy to use, inexpensive, downloadable, and can run on most cell phones, including low-cost and entry-level phones.

User Experience (UX)

Although there is no consensus in the literature on the definition of UX, it is agreed that it is a complex concept and should not be equated simply with usability or user interface. Based on Folstad and Rolfsen, the literature on UX regarding usability can be divided into three camps: UX encompasses usability, and UX complements usability. UX is one of several components that make up usability. A statement from Hassenzahl et.al, 2000, argues that an expanded perspective on usability would drive the design of the user experience rather than merely making software usable. If a software system is both functional and exciting, it can be perceived as appealing so that the user likes to use it.

UX is a system that has emerged recently, focusing more on pleasure and entertainment and less on work in the traditional sense, which has led some to embrace a broader notion of usability with a much stronger focus on UX (Stage, 2006). Based on their earlier work, Hassenzahl et al. 2006, summarize essential differences between the traditional view of usability and UX. They argue that UX takes a more holistic approach to balance pragmatic aspects with other, non-task (hedonic) aspects of product ownership and use, such as beauty, challenge, stimulation, or self-expression. In addition, UX extends the “subjective.” UX defines as the experience a person has when interacting with a product under certain conditions (Arhipainen and Taetide, 2003)

User Interface Design Element

Mobile apps for older adults need to be meaningful, engaging, easy to use, and usable, and motivate the use of technology (Kascak, Rebola, Braustein, & Sanford, 2013). Older people’s preferences in the user interface design are often neglected, making it difficult to use mobile apps. Evidence shows that older people can use a mobile device or application effectively (Goodman et.al, 2004). The basis for studies on the elderly is that “older people want to live independently in their homes as long as possible” (Plaza et.al, 2011). The previous studies discussed various design guidelines and principles that describe how to design the user interface of a mobile application for the elderly. Several aspects of the user interface need to be considered to develop a user interface.

Donald Norman Principal Design

To accomplish the research objective, the researcher will follow Donald Norman’s principal Design in designing a new Health application.

I. Visibility

The user needs to know all the options and how to access them immediately. For example, they used intuitive iconography that indicates that more opportunities are hiding further down, for instance, the hamburger. This is more important in mobile design when screen space is limited, and there is a desire (strong) to get rid of everything but our CTA.

II. Feedback

Every action needs a reaction. There must be some indication that the user's movement has done something, like a sound, a moving dial, or a spinning rainbow wheel. Google Chrome does a great job of this when pages load. The little spinning circle starts as soon as you hit the Enter key to know something is happening and spins faster when the page loads, so you know you are about to do something again. It's simple and effective feedback.

III. Affordance

Affordance is the relationship between the appearance of a thing and its use. For designers, this means that once someone sees something, they need to know how to use it. For example, a cup has high affordance: people intuitively know how to use it. For web designers, affordance is even more critical. Users need to understand how to access the information they want on a website, or they will leave.

IV. Mapping

Mapping is the relationship between control and effect. The idea is that in a good design, the rules of something resemble what they affect. An excellent example of mapping is the vertical scroll bar. It shows you where you are on a page, and when you drag it down, the page moves down at the same speed; control and effect are closely related.

V. Constraints

Constraints are the limits of interaction or interface. Some are obvious and physical, for example, the screen size of a phone. Others are more nuanced, such as a website with a single, continuous page where an image protrudes into the main page. Logically, the user must scroll down to see the following image and thus the rest of the site.

VI. Consistency

If a website has a back button that sometimes turns off the computer, it becomes challenging to navigate the web. The same is true for visual consistency. Logos and brands have power and recognition because they use the same symbol. Twining has been using its logo for 227 years, and today everyone knows that there is tea in a box that says 'twining.

Usability Barriers for Elderly Users in Smartphone App Usage

The researcher was inspired to create a list of barriers that could negatively affect the usability of smartphone applications in senior persons due to the relevance of smartphone applications and the challenges that the elderly face when using them.

The user interface of existing smartphones is primarily complex and is developed by targeting mainly young people and not the elders (Li & Luximon, 2019). Most users use trials when operating their devices and adopt it as a technology native. However, the elderly are not familiar with smartphone technology and face difficulty while using the device (Leung, et al., 2012). Elderly users are overlooked throughout the design phase of smartphone applications, and designers ignore their wants and requirements (J, García-Peñalvo, Miguel Ángel Conde , & Vicente Matel, 2014).

I. Font, screen size, and buttons

Based on an article from (Rogers & Arthur D. Fisk, 2010), small font, screen size, font, type, button, and color contrast were considered to be the most frequent barrier to the usability of smartphone applications around 76%. Furthermore, the usability problems could be spawned by various issues such as small font size (sensory problem), confusing menus (cognitive problem), and minor keys with small gaps (sensory and motor problem) (Awan, et al., 2021). The author also stated that most elderly users take a massive time in completing a task on their smartphones because they face problems such as reading information on small size screens on their smartphone devices (Li & Yan Luximon, 2019).

II. Visibility and poor readability

They reported that the aging aspect of older adults was having problems such as poor visibility and readability of the text while using intelligent devices (Kurniawan, Mahmud, & Nugroho, 2006) . Also, they elaborated that browsing on a small screen could be problematic for the elderly user because they face problems such as visibility, focus recognition, poor understanding, operating text, and hyperlinks identification

III. Complex interface and function

An empirical study revealed that a complex interface is complicated for elderly users because of their disabilities; therefore, the interface should be

easy to use for older adults, and if possible, help tooltips should be provided (Ramokapane, Anthony C. Mazeli, & Awais Rashid, 2019)

It was found that older users are less familiar with the use of the Internet (Faisal Mohamed Yusof, Nurhanani Romli, & Mohd Faiz Mohamed Yusof, 2014). They stated that older adults are most interested in traveling, financial work, educational activities, and shopping. Due to the interests of older people, they are often away from the use of smartphone technology.

IV. Mobile device design

The use of smartphones is increasing dramatically, and it makes older adults' connections with their families and friends on social media easier. The elders can make their lives easier by utilizing smartphones; however, they have many issues while using them. The problems are often related to the aging problem and the lack of familiarity with the design of different smartphone devices. Many older people struggle to use smartphone devices. This is because, the poor design of mobile devices, such as small buttons, small font size, design, and complicated user interface, have made older people reluctant to use them. They also lack motivation and support from a family, which prevents them from fully utilizing smartphone devices.

Technology affects the way people communicate, learn, and think, making the relationship between technology and user experience reciprocal. If anything, the last decade has made this relationship even stronger and well defined. User experience (UX) drives technological changes, while any change in technology impacts the user experience. From standalone websites to responsive design, technology has evolved tremendously and so has design and the UX. With this, it has become important for UI/UX designers to cope up with certain technologies to offer a better user experience. Below is the exploration of world of UX different technologies of this decade that are disrupting. (Academy, 2021)

I. Voice Design

People may not know much about UI voice design but they do know Alexa, Siri, Home, and other voice assistants. Voice design may have been a growing design segment a few years back but in this decade, it is a brand-new game-changer. Voice assistants and conversations have brought an emergency for adapting voice designs for UX/UI designers. While designing

for the voice we need to do detailed research on the users, their language, their words, how they perform a task, and a lot more to add value to the user experience through technology.

II. Artificial Intelligence

If there is one word that is been buzzing in every meeting room in the last few years it is Artificial intelligence (AI). Everyone in the industry wants to explore it, adapt it, and grow with it but how is it changing a design? Well, if one thing that we have been seeing on a website other than ads it is chatbots. Anticipatory designs are need of the hour with the incorporation of AI and machine learning with user experience. Today, as designers we must know to draw a connection between artificial intelligence and human intelligence to be able to create a product that has an amazing user experience.

III. Touchless (Gesture Control)

Today people are communicating with devices without physically touching them with just some gestures of face and hand, that is touchless gesture control. From facial locks to palm gesture selfies, touchless gestures have bridged humans and devices in a fun and interactive way. This paved way for interaction designs, which most of the designers swear by today. Touchless sensing reads the user's motion and presence through a sensor. New input needs new methods, designs, and principles to make intuitive designs for gestures.

IV. Virtual Reality

Virtual reality has changed the level of human and computer engagement. While designing for a VR app it is important to understand both users and the platform. It enables us to visualize the interaction process, maintain head tracking, and keep other factors in mind while creating an immersive user experience. Trying to understand that it can be difficult for first time users and they may not be familiar with the design, will help designers produce more user friendly products.

V. Augmented Reality

Augmented reality uses technology to enhance the form of the real physical world creating an immersive experience for the users. Since people are exploring and using AR more and more with time, it is important for

designers to learn or brush up on their skills to design an AR app. Do not just design for an AR because it is trendy and on-demand; rather, understand the problem first and see if creating an AR app will add value to the solution and user experience. While designing for AR, consider devices, user comfort to the app, details of the real world, user safety, and other critical factors to offer an effective and productive experience to the users through the app.

VI. Blockchain

Blockchain is not certainly the newest technology that UI/UX designers come across but designing for it can be a bit complex and tricky. To know how blockchain is adding transparency, security, quality, and value to the lives of users they must have an idea of both the backend and the frontend side of the application. UI/UX designers must understand the value of joining or creating any network and how they can make it easier for users regardless of the complex technology used behind the scenes. Designing a blockchain product looks into how common users will navigate through a decentralized system, the challenges they face and how a design can be a bridge between technology and the users.

VII. LiDAR/3D scanning (Light detection and ranging)

LiDAR is a technology that uses light detection and ranging. Used prominently in space technology earlier today, we have been using various LiDAR applications in the field of forestry, geography, autonomous machines, weather forecasts, etc., making it one of the fastest-growing technology that needs designer's attention. The UI/UX designers need to understand how users will interact with devices and products that use laser and scanners in operation. The relation between devices and humans will be different and to leverage on this, designers must have a clear understanding of the technology, users' persona, and some backend information to design a product that is easy to adapt and productive to use.

2.8 ELDERLY USER CHALLENGES IN USING MYSEJAHTERA APPLICATION

The MySejahtera application is a technology with new information, which had been developed in Malaysia to convey the most up-to-date information. The Malaysian government developed the MySejahtera app to aid in the containment of COVID-19 outbreaks throughout the country. It assists

the users in self-evaluation of their own and family member's health. Users can still track their health improvement during the COVID-19 outbreak. Furthermore, the Ministry of Health Malaysia (MOH) can use the MySejahtera programme to monitor users' health and respond quickly to provide appropriate remedies (Government of Malaysia, 2021).

The functionality of MySejahtera has been expanded to include vaccination information. Despite these advances, MySejahtera's role as a contact tracing platform was terminated on May 1, 2022. Apart from that the elderly users also had faced several challenges in using the MySejahtera application. In the mid-2021, some Kelantan folk, especially the elderly, were unaware on how to properly use the MySejahtera application. This statement is supported by the Federal Territories Minister, Tan Sri Annuar Musa who said this problem may have led to some of the no-show during the Covid-19 vaccinations appointments in the state. Besides, some of them did not know how to use the application, leading them to miss the appointment date. On the other hand, another factor that contributed to such situation is lack of awareness when the Covid-19 in the state were low. This situation had changed people's mindset on wanting to get vaccinated after the state recorded a surge in daily infections.

Other than that, Segambut member of parliament Hannah Yeoh suggested that the vaccination process for senior citizens be simplified. She received feedback that the elderly struggled to walk into vaccine centres, were stressed out about not having the MySejahtera application, and were not able to read small print on their smartphone screens.

METHODOLOGY

3.1 INTRODUCTION

In this chapter, the researcher will discuss and explain data collection methods and data analysis methods to complete the thesis. To achieve the objectives of this report, a quantitative approach was used to promote the data collection sessions required by the researcher. The methodology for this study starts with detailed findings from the online survey and case studies, which generated a conclusion from the analysis.

According to Richard Swedberg, 2020, exploratory research can be defined as a good research soul. Without the goal of saying something new, the research would come to a halt. Besides, non-exploratory research is a result of repetition of what is already known, and apart from research with the goal of replication, this will not advance science.

3.2 EXPLORATORY RESEARCH

Exploratory research, as the name implies, seeks to elucidate research questions rather than provide definitive answers to existing problems. This type of research is typically conducted to investigate a problem that has not yet been clearly defined. Exploratory research, which is conducted to determine the nature of a problem, is not intended to provide conclusive evidence, but rather to help us gain a better understanding of the problem.

When conducting exploratory research, the researcher should be willing to change course as a result of new data and insights. As a result, exploratory studies are frequently carried out using interpretive research methods, and they provide answers to questions such as what, why, and how (Thornhill & Lewis, 2012).

3.3 RESEARCH DESIGN

(Vaus, 2006) states that the research design is the overarching method we adopt to combine the various components of the study logically and cohesively, ensuring that we will effectively address the research problem. It is the blueprint for data collecting, measurement, and analysis. Research methodology is a holistic step a researcher takes to start research work (Leedy, Ormrod, & Jeanne Ellis, 2011).

As a result, a quantitative research approach is concerned with quantifying and analyzing variables to arrive at conclusions. It entails using specialized statistical approaches to analyze numerical data to answer questions such as who, how much, what, where, when, how many, and how. Quantitative research is described as explaining a phenomenon or an issue by gathering data in numerical form and analyzing it with the aid of mathematical methods for the statistic.

The process of collecting and interpreting numerical data is known as quantitative research. It can look for patterns and averages, make predictions, test causal linkages, and extrapolate results to larger groups. Quantitative research is the opposite of qualitative research, in which non-numerical data is collected and analyzed (e.g., text, video, or audio) (Bhandari, 2020). Usually, quantitative research is popularly used in the natural sciences such as biology, chemistry, psychology, economics: sociology, marketing and many more. The quantitative method is used to gain information on the issue stated in the research question above. In this research, the researcher will use an open-ended question on the pre-test and be distributed to a specific target audience aged 41-66 years old and above. Elderly users form the most suitable scope group of generations for this research.

DATA COLLECTION PROCEDURE

3.5.1 EXPERT REVIEW USING SURVEY (PROPOSE SAMPLING MOBILE APPLICATION)

The objective of this pre-test survey is to display the final design that the researcher will be producing. A pre-test survey is the first step before moving on to post-test. The survey was distributed through an online google form as it is much easier since we are living in a technology era. Moreover, the aim of this survey is to gain information from the respondent related to the recommendation of UI/UX design for elderly users.

3.5.2 SURVEY ON ELDERLY USER EXPERIENCE USING MYSEJAHTERA APPLICATION

The same process was used in the pre-test to set up a post-test which was carried out through an online survey. The respondent is the focus group which consists of those aged between 41 to 66 years old. The purpose of doing this survey is to test the effectiveness of UI/UX design with using the theory from Donald Norman in the new MySejahtera application design. Feedback and suggestions from the respondents are gathered for final conclusions of this research. The survey was conducted with close-ended questions. The designer also created a design based on observation from visual analysis and comments from the designer. Based on the review, it is found to be helpful in assisting the researcher as well as improve the findings.

3.6 RESEARCH INSTRUMENT

In this research, the quantitative method is used to collect feedback from the respondent. To achieve appropriate data, an open-ended question was used to complete the survey as open-ended questions allow the audience to give opinions and reflect on the design used. For small-scale preliminary research, the questionnaire consisted of four sections. The first section included questions about demographics consisting of name, age, gender, and occupation. Section B consisted of questions about user experience and impressions from the target audience. Next, section C is about interface design. The audience were allowed to choose which design application they thought was suitable for the elderly user. The last part of the online survey is general knowledge of interface design in section D. The questionnaire was checked to ensure that the respondents had no difficulty understanding and answering the question and could follow the instructions correctly. Next, for preliminary research, the questionnaire consisted of several questions of the UI design of MySejahtera application. The online survey was generated using Statistical Package for the Sosial Science Software (SPSS).

3.7 CONCLUSION

This chapter begins with an introduction and then describes the research design used in this study. Library and fieldwork were used to collect data. For field research, the quantitative method was chosen and applied to the group of target audience involved in the research process. The data obtained were then analyzed and addressed.

DATA ANALYSIS AND FINDINGS

4.1 INTRODUCTION

This chapter discusses more on the findings of data analysis based on the data collection that had been collected by the researcher. The main source of data is the interview, which is supplemented by library research. The findings will be presented in relation to the study's stated research objectives.

The method used to analyze the data is already covered in the methodology chapter. This chapter will include a presentation of the online survey findings and analysis. The responses from the online survey were analyzed using the embedded Google Form tool.

4.2 LITERATURE REVIEW

The researcher did an observation from visual analysis to gain more data in designing the interface design of the MySejahtera application for elderly users. The researcher chose five international COVID-19 tracing application and one healthcare application from Malaysia. The visuals were analyzed in terms of the consistency of the colour layout, placement of navigation menu bar, simplicity of the theme or concept, standardization of fonts used, and uniqueness of combination image and videos.

4.3 VISUAL ANALYSIS

Visual analysis is a method of comprehending art that focuses on the visual elements of an artwork, such as color, line, texture, and scale. In its most basic form, it is a description and explanation of visual structure for the sake of visual structure. However, the purpose of visual analysis can also be used to recognize the choices that an artist made in creating the artwork, as well as to better understand how an artwork's formal properties communicate ideas, content, or meaning. Visual analysis is frequently used as a springboard for art-historical writing.

COVID-19 TRACING APPLICATION

I. TraceTogether (Singapore)

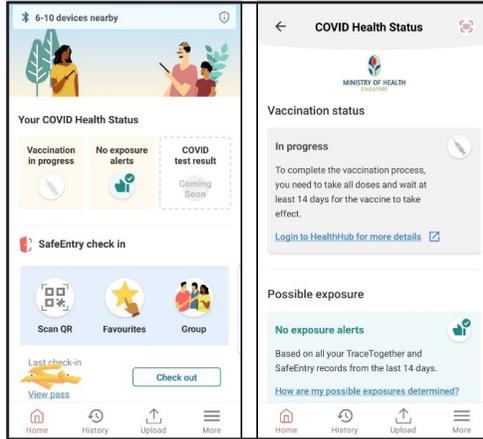


Figure 1 TraceTogether UI design

From figure 1 we can see an example application for COVID-19 which is from our neighbouring country, Singapore. TraceTogether is a digital system the Government of Singapore implemented to facilitate contact tracing efforts in response to the COVID-19 pandemic in Singapore. The application has a standardization in terms of the font. The typography used is San Serif with different styles which show separated content and format on every page. Besides, this application shows simplicity because of the use of minimal colours such as grey and light blue as a theme. This interface can be related with the Don Norman theory which is visibility and consistency. They used iconography which indicates more opportunities for less spacing. Consistency in the design interface is important in making the look of the application simpler and clear. This is shown in the above picture where the application uses an even graphic icon and has colour consistency in the layout. As we can see, the menu navigation is placed at the bottom of the layout. The navigation is user-friendly but maybe some of the elderly users might not be able to see the icon properly

II Stay.Safe (Philippine)

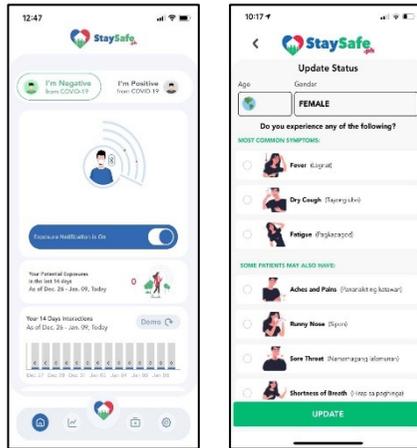
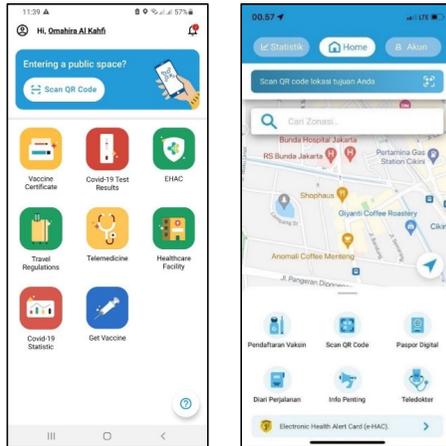


Figure 2 Philippines. Stay.Safe

The above figure shows another international COVID-19 trace application from the Philippines. Stay.Safe is a digital contact tracing app launched by the Philippine government as a response to the COVID-19 pandemic in the country. From the layout interface design, this application has a theme color which is blue and green. These colors are used in the logo of Stay.Safe. The layout might look crowded but still can be understood by the user. This application has its own uniqueness since it has a variety of graphic icons. For example, the way they convey the common symptom of Covid-19 in icon form is creative. Users can be well-informed of their function. Besides, it also has a standardization in terms of typography. We can clearly see the different font styles on every page. This application used San Serif as its primary typography to have better readability. The navigation section is placed at the bottom bar of the layout. Lastly, stack layout is one of the designs that can show proper information and avoid crowded design. Mapping from the Don Norman theory can be related to the design. For example, the mapping of the vertical scroll bar.

III. PeduliLindungi (Indonesia)

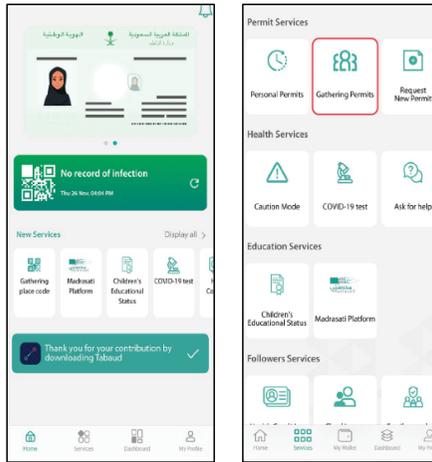


Source: Twitter

Figure 3 PeduliLindungi

The figure above shows the COVID-19 trace application from Indonesia. PeduliLindungi is the official COVID-19 tracing application used for digital contact tracing in Indonesia. PeduliLindungi is one of the applications which uses colorful colour concepts. This shows its own uniqueness as it can attract the audience to interact with the application with a happy face. Another reason why this application is unique is that they include an extra map location that can detect where you are going. It is another improvement for them to make the application more manageable and functional. Most of the feedback from the audience is positive when the application developer makes changes in designing the layout. The application does not have a different font style to show separate content or format on every page. San Serif is the common typography in designing an application. Furthermore, there is consistency in terms of the colour and graphic icon. It is related with the Donald Norman theory which is consistency. The way they express the terms for every useful button by using the icon is innovative because it can, in some way, develop a good understanding of every button to the audience. The type of layout design is flex. Finally, the navigation menu is placed on the top of the layout. The navigation button is user-friendly and can be seen clearly by the audience.

IV. Tawakkalna (Saudi)



Source: Tawakkalna.com

Figure 4 Tawakkalna UI design

The figure above shows the COVID-19 trace application from Saudi. Tawakkalna (COVID-19 KSA) is the official Saudi contact tracing application approved by the Saudi Ministry of Health to prevent the spread of coronavirus and for verifying or providing proof of an individual's vaccination status and showing current infection or history of infection. This application shows simplicity by using two types of colors, which are green and light grey. Besides, we can see a differentiation where they use gradient color to highlight important things on the application. This application uses San Serif font for easier reading. There is no differentiation in terms of typography styles between the content and format on every page. Moreover, there are two types of layouts that they choose to design which are relative and flex layouts. This application also conveys a consistent color in every page layout. They also use icons to show important buttons so the audience will easily understand what the function is all about. The navigation menu is placed at the bottom of the layout. It has good navigation to guide users, especially the elder generation who might not understand if they only see an icon without a name or interpretation. One of the theories can be related is visibility because they used of iconography which are immediately recognizable and usable.

V. Aarogya Setu (India)

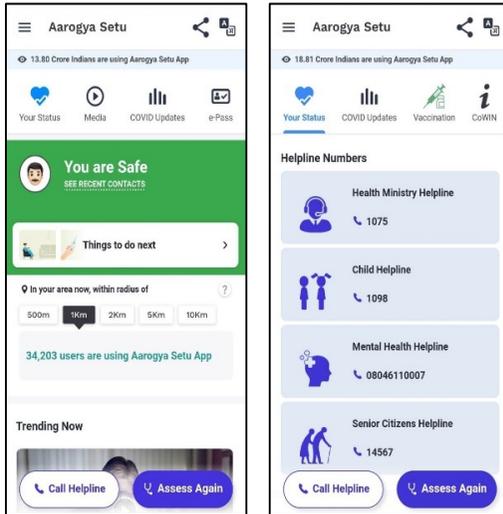


Figure 5 Aarogya Setu

The figure above shows the COVID-19 trace application from India. Aarogya Setu is an Indian COVID-19 contact tracing, syndromic mapping, and self-assessment digital service, primarily a mobile application developed by the National Informatics Centre under the Ministry of Electronics and Information Technology. Aarogya Setu uses San Serif as the main typography to be designed in the application. There is also little standardization as the font styles are different. The audience can easily see the content and format on every page clearly. Besides, this application shows uniqueness where they put the graphic image to attract the audience and give the latest information regarding the issue of coronavirus. Other than that, the layout color does not match on every page. This application also used graphic icons to display the example of important things that the audience should take note of, such as helpline numbers. For the color, this application used a variety of color such as green, dark blue, and light blue. The color of the page layout does not look standardized but still manages to show simplicity.

VI. PMCare (Malaysia)

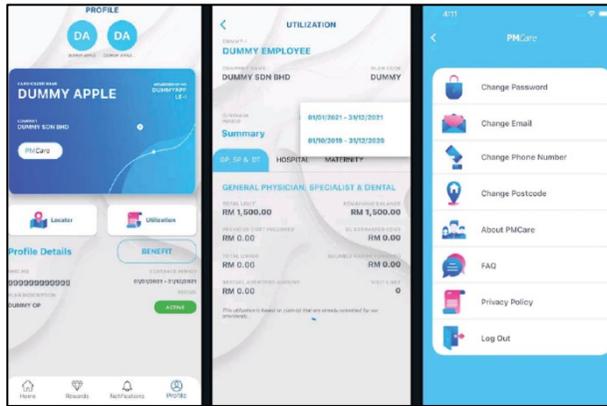


Figure 6 PMCare UX

Figure 6 shows an application named PMCare from Malaysia. PMCare is the pioneer and leading Third Party Administrator (TPA) in Malaysia. The application has a different view where they combine several colors which is blue with different shades and pinks to show modernity and to show the audience about health applications. Besides, the layout is easy to understand by users. The application also has similarities in terms of the font. The typography chosen is San Serif. It also has differentiation for the colour of the font styles as to highlight important words. The PMCare application also used graphic icons to deliver all the useful button functions. The audience can conveniently use the application without hesitation and feel attracted to look at it since it has a colourful design. Each layout has a consistent colour and design. Next, the navigation menu is placed at the bottom of the layout. The navigation is user-friendly and can guide users to use it properly.

4.5 VISUAL ELEMENT ON HEALTHCARE APPLICATION

From the visual analysis above, the researcher can conclude that most of the applications used bright color such as grey, blue, green, red, and yellow. This is to show modernity and to focus showing about the health application. Besides, most of the applications choose to design using relative and flex layouts. This is because a relative and flexible layout can

make the design look standardized and prevent the design from looking too crowded. Moreover, mobile application famously uses graphic illustration and icons to highlight and show every functional button. This encourages and guides people to use the application correctly. Typography is important in designing a mobile application so San Serif font is the most suitable font to be used in mobile applications because it has great readability. Finally, the navigation menu is also an important part of the design. All navigation bar menus function well and most of the applications have similar functions and the important part is, they must be user-friendly.

5.1 INTRODUCTION

This chapter demonstrates application design. It is time consuming and is an exceptional deal of struggle. The plan starts with several sketches which are then developed into digital, inserted with colour and continues to be made into animation in adobe XD.

5.2 DESIGN PROCESS

i MySejahtera application

The MySejahtera application is an application developed by the Ministry of Health Malaysia. The application is used for tracing our health development and there are many other functions that are provided for us.

ii Screen size of mobile application

In making a mobile application layout, the screen size is important. There are various screen sizes in designing a mobile application. Below is the most popular mobile screen size (width & height) for 2022.

Exploratory Research on The Impact of Mysejahtera Application on To The Elderly Based on User Experience

Mobile screen sizes (viewport)	% of mobile devices
414 x 896 e.g. iPhone 11 Pro Max, 11, XR, XS Max	22%
375 x 812 e.g. iPhone 13 mini, 12 mini, 11 Pro, XS, X	13%
375 x 667 e.g. iPhone 13, 13 Pro, 12, 12 Pro	12%
390 x 844 e.g. iPhone 13 Pro Max, 12 Pro Max	12%
428 x 926 e.g. iPhone 11 Pro Max, 11, XR, XS Max	5%
360 x 800 e.g. Samsung S20	5%
412 x 915 e.g. Samsung S20 Ultra, A32, A31, OnePlus	4%

Figure 36: Mobile screen sizes

6.1 CONCLUSION

In conclusion, this research contributes to elderly users by reducing their anxiety of using technology especially smartphones, since they are not a digital natives. The benefit of this research will give solutions to a certain type of group for this case study. The main target of this research to recommend suitable UI/UX design for elderly users' eyesight thus decreasing the difficulty and challenges faced by them when reading interfaces.

The second objective of this research is to analyse the new technology that is disrupting user experience design. The issue had been discussed in chapter four - literature review. Technology has an impact on how we communicate, learn, and think. As it stands, the more changes that occur in the technological realm, the greater the impact on how customers interact with businesses.

Last but not least, the last objective is to propose a significant user experience principal application to help increase the effectiveness of the application, as the result, From the elderly user experience survey of the MySejahtera application, the result research was not been achieved. The researcher made

an improvement in terms of the design after receiving the result from the respondent. The improvement answer had been discussed in chapter 4 under analysis and findings. This is because the researcher wants to achieve the objective of the research.

6.2 RECOMMENDATIONS

This study suggests that the future researchers can take initiatives to conduct more research studies that are related to UI/UX design specifically for the elderly since they are not a digital natives and face difficulties in using technology. Besides, the future researcher of this study may find out more about the suitable features and elements which can increase the effectiveness of the product application. Therefore, more research is necessary to find out more about the best features for designing mobile application for the elderly.

In addition, it is recommended that future researchers conduct related research by using quantitative methods. Quantitative methods are a process of collecting and interpreting numerical data. This process is less time consuming. Thus, future researchers can discover more specific and accurate explanation of findings. Keep in mind that we must help elderly users as they are not a digital natives, though we are all living in a technology era. By helping, they will be able to learn continuously.

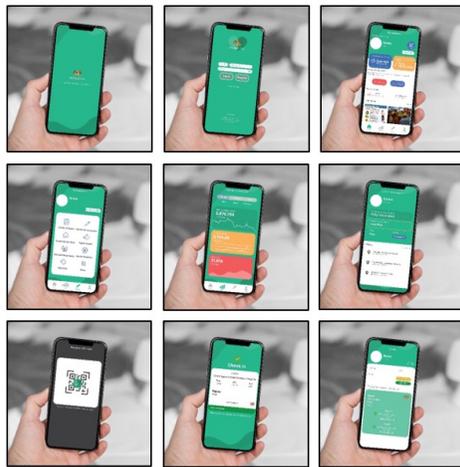


Figure 7 New Mysejantera Mobile App UX

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