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ENHANCING DECISION MAKING PROCESS IN CHOOSING THE RIGHT OUTFIT USING AUGMENTED REALITY

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1.   INTRODUCTION

As the world responds to the coronavirus (COVID-19) pandemic, there is a shift from visiting a store to online shopping. Consumers are relying on the digital world more than ever and businesses are forced to adapt their strategies and shift toward digital transformation with much more urgency than before. With stores being closed, consumers became dependent on shopping online. In March 2020, much of the world went into lockdown, forcing many businesses to temporarily shut down. Even businesses that are reopening have restrictions enforcing social distancing, the wearing of masks, and limits on how many customers can enter a space at one time. When traditional shopping becomes difficult, or may even be scary, people are increasingly likely to shop online.

Nowadays online shopping is an important medium to purchase and selling for people around the world, especially during a pandemic. They are a lot of online shopping website or mobile application in the world such as Shopee, Lazada, Zalora, AliBaba, and more. Online shopping has grown in time, as more and more consumers have started to trust online commerce and have moved a large part of their online shopping (Lixandroiu et al., 2021). However online shopping contains problems such as security, trust, reputation, legal framework, payment mechanisms, online catalogs, and advertising (Sabou et al., 2016). Online catalogs might refer to the retail product offerings of online shopping services. Using this online catalog customers only can see the product and they could not try the product in real terms. This makes it very difficult for customers to decide to choose the product.

The rapid growth of mobile devices is making it easier to browse and shop online. Customers can place orders one-handed from a device that can speed up the process of online shopping. Decision-making is the process of identifying and selecting alternatives that are based on the decision-maker's values, preferences, and beliefs. Every process of decision-making produces a final choice that may or may not prompt action. Decision-making is a very important element to use in the online shopping application since there are many criteria that a buyer needs to consider such as colors, size, availability, and designs that are available before a buyer can decide to order an item. However, using the traditional method is difficult for customers because they must make assumptions on a product chosen as they could not feel and touch or try on them. Therefore, this project is to develop a mobile application that applied augmented reality to enhance the decision-making process in outfit selection (Terwillegar, 2019).

Augmented Reality (AR) is an immersive perception of a real-world environment in which objects existing in the real world are augmented by computer-generated perceptual knowledge, often through multiple sensory modalities like visual, auditory, and haptic. Augmented reality, a set of

technologies that covers digital data and images on physical reality. The product can be accessed in commercial industries by scanning or viewing an image with a mobile device or using marker techniques that are less AR. Therefore, this project is developed to facilitate customers to make decisions in choosing the right outfit in a shorter time.

2. METHODOLOGY

The methodology applied in the research is ADDIE Model (Drljača et al., 2017) where all five phases are followed. This project is designed by applying principles of decision making; the first phase is the search process followed by a comparison of outfits and lastly is evaluation of the decision. The mobile application is developed using Unity, Blender, and Vuforia. Usability testing evaluation method is conducted, and findings are explained in the result and discussion section.
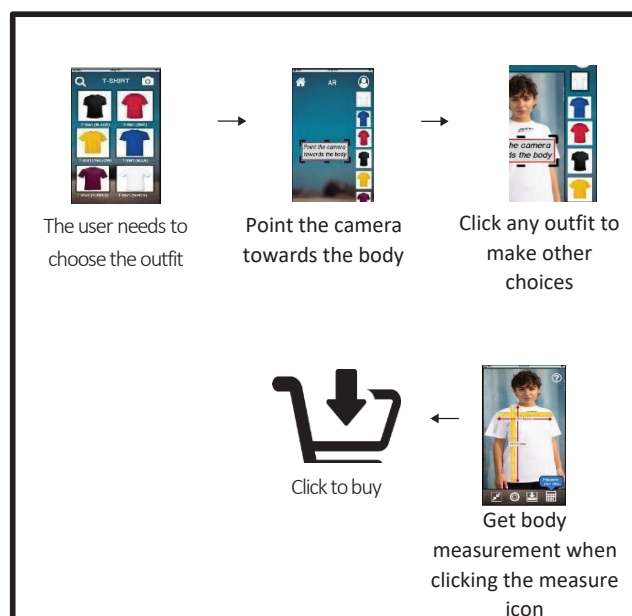
Figure 1: Experimental Design

The experimental design in Figure 1 shows an overview of the potential buyer interaction with mobile AR applications before they decide which outfit to purchase. Users can enhance decision-making using the mobile application that can increase their satisfaction and can reduce errors when buying outfits. By using this application, users can try outfits for real by using the function of the AR camera in a mobile application.

2.1 Process of Decision Making

The process of decision-making can help the user to choose to purchase outfits. There are three steps in the decision-making process. The first step is the search process, comparison of the outfits, and lastly is evaluation of the decision. These three steps are very important to help the user in decision-making. Figure 2, 3, and 4 shows the interface design that applied the principles of decision making.
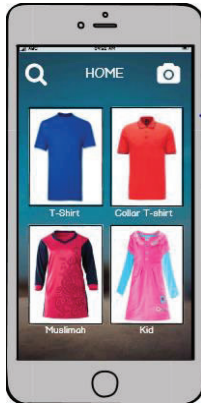
Figure 3: Searching Process

Figure 4: Comparison of Outfits

Figure 5: Evaluation of Decision

The searching process is important to help users to find the suitable outfits that they wanted to purchase in a shorter time. They can search the outfit by using keywords only. For example, users can search "Red" and all outfits in red will appear. Next is to compare the outfits that they desire based on the size or colour that the user looks good on when the selected outfit displays. In this application, users can directly change the outfits that they feel like ordering by clicking any outfits image displayed. The process of changes is automatically done through an AR Camera. Evaluation of decision is the last process in the decision making. Lastly, a user needs to check their ideal size. By utilising this application users can directly know their size from the view of the measurement using the AR camera.

3. RESULTS AND DISCUSSION

Usability testing (UT) is the practice of testing how easy a design is to use with a group of representative users. Usually, it involves observing users that attempt to complete the given task, which can be done for different types of design. Usability testing in this was conducted on 15 respondents where they were given briefed descriptions of the mobile application. User is observed while they explore the AR mobile application. They were asked to answer all task-related questions given and complete the usability testing. This application was evaluated based on the mean score of the usability testing. There are three sections in the questionnaire which are: Section A (respondents' information), Section B (Satisfaction), and Section C (Efficiency). Each element is rated using a scale of Strongly Disagree (1) to Strongly Agree (5). All dimensions received a mean score of above 4, which indicated that generally, the mobile application received a good evaluation.

In Satisfaction dimension in the usability testing questionnaire shows that this application is likely to be used to assist the user to decide on purchasing outfits. This is supported mostly by users that they strongly agree that it is easy for them to learn and use this application since the navigation of the mobile application design is familiar to users such as buttons and icons used throughout the navigation.

In the efficiency assessment dimension, usability testing is done to determine the functionality of this application. Most users agree that using Augmented Reality (AR) helped them to make the right decision in finding the best outfits that fit as AR features allow them to make a comparison on different sizes and makes them feel as if they tried the outfit in the real setting. The AR camera is easy to use where they only need to direct their camera to the image of the outfit and the AR feature will display an image of the outfit model on the user. Furthermore, an audio description regarding the

outfits is also provided which can support the user to feel comfortable in choosing outfits as it will appear when they "try on" the outfit in the virtual environment. Users also found that they are engaged with the mobile application since they can move around easily with the outfit with the assistance of the button and zoom function. Lastly, the mobile application also supports users with feedback when the selection of outfits is chosen. This feature also increased user's satisfaction with the application. Therefore, usage of mobile AR has enhanced their experience through navigation during decision making that also gives a lot of new insight on new experiences in deciding on outfits that are being displayed. From the usability testing evaluation, users raised concerns and recommended some solutions to improve the mobile application. Features in the Augmented Reality 3D objects feature can be enhanced to be more realistic like a real outfit. Users also suggested that the researcher can input some avatar that can describe or guide the user throughout the decision-making process. More animation and effects were suggested to create a virtual world where people can enjoy and have fun at the same time experience a new approach in a shopping walkthrough.

4. CONCLUSION

The AR mobile application is designed and developed to help the user in deciding to choose the right outfits before the order is submitted in any online shopping application. This mobile AR application is design for the user who would like to find information on selected outfits, interact with the application, decide in choosing the right outfit and gain new experience using Augmented Reality. The process of making decisions and usability testing evaluation method helps to measure user satisfaction when they interact with the application and experience Augmented Reality. In conclusion, the objectives of this research have been achieved where the system has been successfully designed and developed according to predefined requirements. With pandemic, new shopping habits that due to quarantine, has changed people's way of buying items. Even when the quarantine ends, people will be cautious, and many people will still prefer shopping online from the safety of their homes. It is hoped that this mobile application can support people to shop in a more convenient environment and bridging the gap between online and offline shopping.

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