

Development of A Dynamic Wallpaper Selection Method with Measurement Features Using A Mobile Platform With Augmented Reality Technology

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ABSTRACT

This study presents a dynamic wallpaper selection method with measurement features on a mobile platform using Augmented Reality Technology. Many wallpaper sellers only use catalogues that easily complicate a customer's selection process since customers cannot imagine how a wallpaper would look when mounted on the wall in their homes. This study aims to help customers save time by using their smartphones to select wallpapers before they actually go to the shop to purchase the wallpaper. A crucial step in the purchase of wallpaper using smartphones would be to use Augmented Reality with measuring features through mobile applications. This paper focuses on two main goals, namely to help customers save time while choosing a wallpaper using Augmented Reality (AR), and assisting customers to visualise what the wallpaper would look like once mounted on the walls in their homes. This study used a mix-method approach and applied the online survey method involving Universiti Sains Malaysia undergraduate students (n=20). Problem values, the use of calculation tools and the advantage of improved realism were evaluated and the average percentage was measured.

Keywords: *Dynamic, Wallpaper, Augmented Reality, Mobile, Environment*

INTRODUCTION

In this age of globalization people like to design their homes, and some of them even employ interior designers. A lot of people are looking for minimalism, modernity or more in their everyday aspects of life. In order to make the wall more attractive than just putting up paintings, they use wallpapers to address this issue. Decoding wallpapers is much easier as well as saves time and resources. At one time all retail wallpapers used a large catalogue where people could select a wallpaper. Browsing through catalogues take time before eventually picking and paying for the wallpaper of choice. Hence, in order to overcome some of these shortcomings, wallpaper selection in shops needs to be improved. The mobile platform allows customers to choose, calculate and visualise how the wallpaper would look like. The Augmented Reality (AR) software allows distributors to advertise their products so that consumers can choose the wallpaper using their smartphones. The most important aspect for customers is that the wallpaper is presented to them in a convenient manner (Hedman, 2017).

LITERATURE REVIEW

The measurement feature is an important part of wallpaper installation. Consumers need special equipment, such as belt tests or light metres, to measure the height and width of the wall. Therefore, consumers need more time to measure the wall and height and they do not exactly know how to use the measuring tools. For this purpose, consumers call wallpaper retailers to provide measurement services. Normally, a calculation is the first part before the user browses through a selection of wallpapers. Then they count how many rolls they need, and pick out the designs. A roll of wallpaper is generally 10 feet high and 15 feet wide. For example, if the consumer's wall is 11 feet high and 17 feet wide, then two rolls will have to be used, however, there will be remainder wallpaper.

Consumers need to calculate the area of the wall correctly to help them determine the area they want to mount the wallpaper. The scaling equation gives the prospective area a surface size that is used to determine the scaling factor of the wall area to be decorated at a later point. Measuring devices can include the choice of wallpaper in the application as it is the first item to be reviewed by the consumers before the designs are selected. The consumers simply put the phone on the wall and moves the phone vertically and horizontally.

Augmented Reality (AR) is a perception of the physical world in which objects are enhanced by computer-generated perceptual awareness about the environment, sometimes through multiple sensory modes, including visual, haptic and olfactory materials. The Augmented Reality (AR) feature allows consumers to display a wallpaper in their selected wall area, which online customers find difficult to visualise if items fit into their personal environment or have a sense of service (Cadirci and Kose 2016).

The Augmented Reality (AR) platform offers a meaningful online shopping experience by minimising the time taken to select a template and provide shoppers with a virtual ambient experience. One will be able to see the wallpaper almost instantly on the smartphone. In addition, visual mental imagery is necessary because knowledge in marketing and design can be recorded, interpreted and manipulated. Therefore, Augmented Reality (Ar) also motivates consumers to make better choices. The consumer knows that it takes a few hours to choose and visualise the template manually and finally end up making the wrong decision. Visualizing an ideal picture takes tremendous mental strength of thought. The higher the cognitive pressure, the weaker the assessment. Consequently, many will embrace Augmented Reality (Ar) technology in online shopping during this new age. Consumers expect information (including filtering and selection) to be quickly and conveniently identified. The decision to purchase such a complex frontline interface will improve service efficiency and make it easier and more enjoyable for customers to shop online.

Earlier research on the use of augmented realism in retailing sought to identify various factors affecting the use of digital technology by customers to assist in purchase-related decision-making. One previous study has developed a new and improved framework for selecting wallpapers from distributors using evaluation methods, such as ranking matrixes, inventory methods and clustering ideas (Hedman 2017). The researcher interviewed the staff (respondents) and used a qualitative approach that provided rich and insightful data.

The computer had a hand scanner screen connected to the Midbec Store and the QR-barcodes for each wallpaper. When a user reads a barcode using a scanner or smartphone, the user is connected to a newly developed Midbec online wallpaper platform that displays wallpapers in multiple environments.

Pathan, (2019) proposed an AI pitching paint and design system for walls in accordance with the house's requirements and furniture. The idea is to take advantage of the experience of a colour designer and propose colours that suit the walls, fit the furniture and harmonise the room with different colours. The model was trained to predict colour on 1000 papers and to list the attributes of the room and furniture. The aim of this technique is to create the best wall colour scheme. In the painting industry and households, this tool can be an excellent application to help customers choose simple shades and wallpaper from various options available. Tim Hilken, Ko de Ruyter, Mathew Chylinski, Dominik Mahr & Debbie I Keeling (2017) had created the 'AR price improvement' to enhance online user's experience. This authentic experience, expressed in the sense of spatial presence, acts as a mediator and predicts customers' comfort zone or desired ambience. By using an online survey approach, prospective customers had to visit an online store, explore options and select a couple of sunglasses they would buy.

Comparing two unique cultural backgrounds, E Pantano, A Rese, D Baier (2017) investigated the impact of ART on retail customers' behaviour. They also developed an intelligent glass mirror. The project intended to enhance the online decision-making process by using factual information and allowing retailers to better navigate online platforms. Data were obtained through the survey method. In addition to conventional buildings built on the TAM, the proposed conceptual model assumes the existence of technology-related buildings (aesthetic quality, interactivity, response time and quality of information). When virtual attempts to test items, like sunglasses and lenses, are used, consumers demonstrated a positive attitude that usually requires physical testing prior to purchase.

PROBLEM STATEMENT

Consumers must concentrate on the compilation and calculation required for mounting wallpapers. Therefore, the technology involving conventional collection can be boosted only by utilizing a smartphone to choose wallpapers from online catalogues. Consequently, there is no solution for improving customers' options. The use of Augmented Reality (Ar) technology enables users to visualise the wallpaper in a particular environment to improve alternate tools. Imaginary visualization is essential when dealing with a collection of wallpapers since it could lead to the decision to purchase. Some customers find it challenging to browse through designs in a catalogue and eventually feel disappointed when the wallpaper is actually mounted on a large wall. Hence, several purchasing decisions enable customers to mentally imagine broad visual patterns from tiny scattered pictures. Augmented Reality (Ar) camera technology is also a perfect alternative for measuring wallpaper size. It is therefore not necessary for the user to measure the wall using a measuring tape. One only needs to measure and calculate the area (height x width) of the wall. This allows consumers to adjust the shape, colour and size of the wallpaper very quickly and helps consumers to continue purchasing wallpapers.

OBJECTIVE OF THE STUDY

This study intended to help consumers save time when selecting wallpapers by using their smartphones before they eventually go to the shop to purchase the wallpaper. The key technology used to help consumers purchase wallpapers involves the use of augmented hand-held realism with an emphasis on unfolding client experiences.

METHODOLOGY

This study utilized the mix-method methodology by performing interviews and online sampling. This approach also includes a detailed study of phenomena through the compilation of quantifiable evidence and mathematical analysis. This study examined how Augmented Reality (AR) could turn the physical environment into a fully personalized world through choosing wallpaper designs. The online survey method was used during the Movement Control Order (MCO), which forbid face-to-face meetings.

20 respondents were chosen and they came from diverse backgrounds, such as housewives, students and staff. The researcher used Google Document and Microsoft Office applications to gather information. A one-way covariance study (ANCOVA) was undertaken to assess the usefulness of Virtual Reality measuring instruments. The empirical findings are described in the form of charts representing the goals of the report.

RESULTS

The overall outcome only indicates part of a broader sample that the analysis has accomplished the purpose of the study. 20 respondents were invited to participate in the survey and further endorse the study. All the dilemma values for the use of the measurement methods and the benefits of increased realism were obtained and the average percentage was calculated.

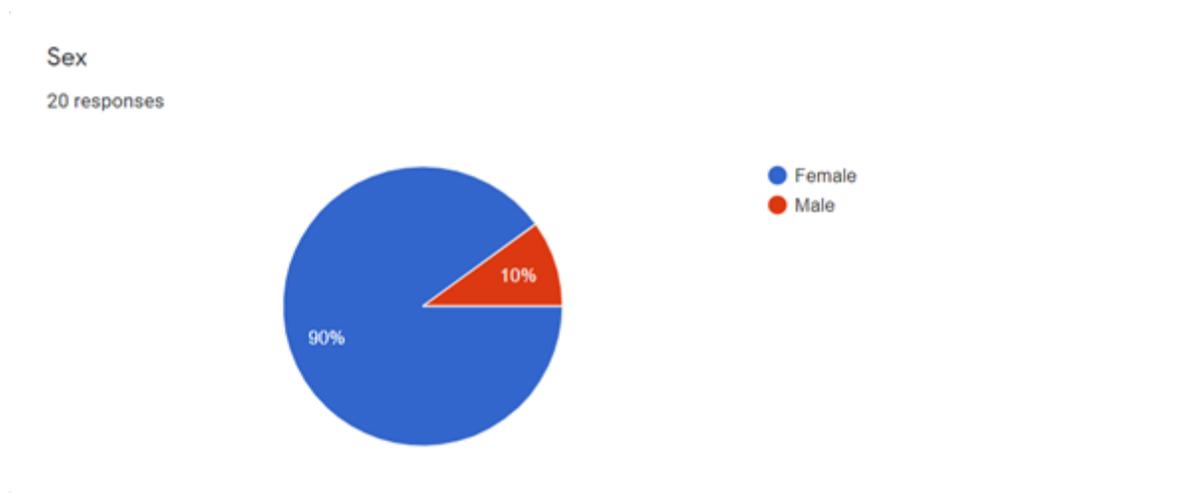


Figure 1 The proportion of men and women who completed the survey

Age

20 responses

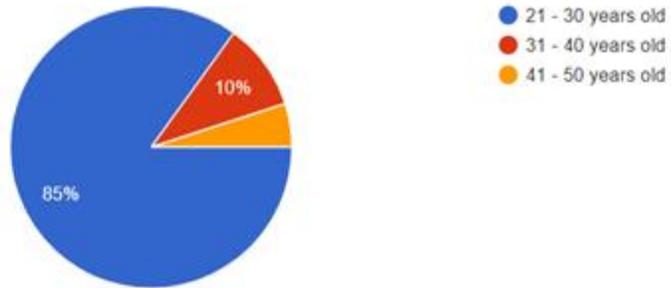


Figure 2 The age ratio

I have bought wallpaper(s) before at wallpaper retailers

20 responses

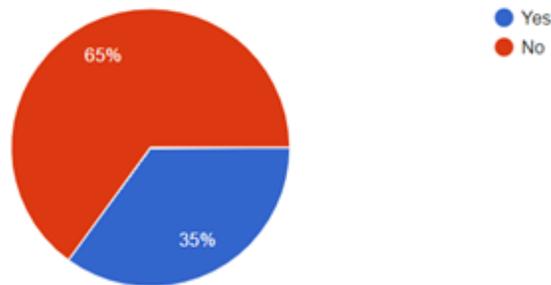


Figure 3 The most amount of wallpaper purchased from retailers

I have bought wallpaper(s) via website or online shops (Shopee / Lazada / Facebook etc).

20 responses

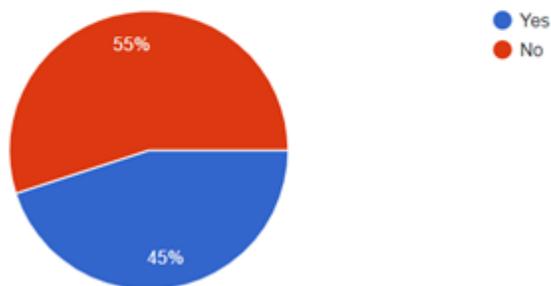


Figure 4 The most wallpapers bought from online shops

I have this problem when choosed the wallpaper(s)

20 responses

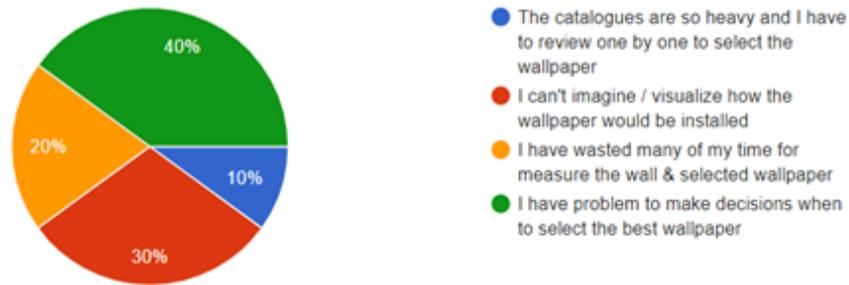


Figure 5 Difficulties in selecting wallpaper

Wallpaper industries should improved online services experiences regarding the problem that I have faced

20 responses

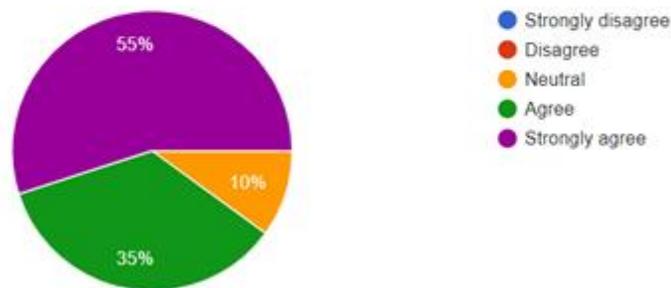


Figure 6 Wallpaper industries should improve

Measuring Tools applications will help me for measure the height & width of the wall

20 responses

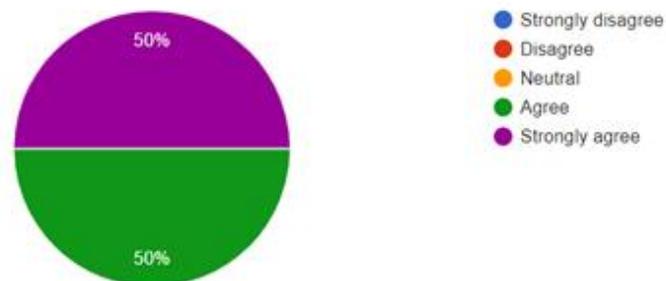


Figure 7 Measuring tool applications

Figure 1 shows the number of men and women participating in this study, with age ranging from 21 to 50 years old. Figures 3 and 4 display the bulk of wallpapers purchased from shops and the rest of the wallpapers purchased digitally.

Figure 5 reveals that 40% of respondents had a difficult time as they had to select one wallpaper at a time, 30% did not know how to mount the wallpaper, 20% thought that the wallpaper was wasted and 10% had trouble making decisions. When 10% of the best wallpaper was picked, the respondents could not visualise how the wallpaper was designed. The diagram indicates that 55% of respondents strongly agreed that the wallpaper industry can develop its own online application and 50% of respondents strongly believed that calculating software applications can help measure the height and width of a wall area in a building.

CONCLUSION

Findings show that this study has achieved its research goals. The question of values, the use of measurement devices and the effects of increased realism were analysed, and the average percentage was determined. Most comments concerning the collection of wallpaper using online applications are positive and optimistic. Hopefully, these results can contribute directly to the basis for debate and growth as a necessary framework for further progress in this area.

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REFERENCES

Cadirci, T. O., & Kose, S. G. (2016). Augmented reality as a tool to enhance the experiential value of online shopping: The future of fashion retailing. In A. Vecchi (Ed.), *Handbook of research on global fashion management and merchandising* (pp. 280–304). Hershey: IGI Global.

Hedman, I. (2017). Designing a wallpaper display system for an effective product selection designing a wallpaper display system for an effective product selection. (3) (PDF) Developing dynamic wallpaper selection with measurement features using augmented reality technology on mobile platform school of the art. Available from: https://www.researchgate.net/publication/342518637_Developing_Dynamic_Wallpaper_Selection_with_Measurement_Features_Using_Augmented_Reality_Technology_on_Mobile_Platform_School_of_the_Art [accessed Jul 28 2020].

Hilken, T., Ruyter, K. D., Chylinski, M., Mahr, D., Keeling, D. (2017). Augmenting the eye of the beholder: exploring the strategic potential of augmented reality to enhance online service experiences. Springer Link. Retrieve from <https://doi.org/10.1007/s11747-017-0541-x>

Pantano, E., Rese, A., Baier, D. (2017). Enhancing the online decision-making process by using augmented reality: A two country comparison of youth markets. *Journal of Retailing and Consumers Services. ScienceDirect*. Retrieve from <https://doi.org/10.1016/j.jretconser.2017.05.011>

Pathan, S. (2019). AI D'ecor.