A Methodological Framework: Studying The Effect Of An Augmented Reality Mobile App On Online Customer Experience and Purchase Intention

Nii-Odartey Mills

Department of E-Business
University Of Belgrade
Belgrade, Serbia
nomills22@gmail.com

Abstract—This study presents a methodological framework for investigating the impact of an augmented reality mobile app on customer experience and purchase intention in the fashion online retail industry. The framework aims to address the lack of interactivity and engagement in traditional online shopping, which may result in lower purchase intention and customer satisfaction. The study will explore the effectiveness of an augmented reality mobile app in enhancing the customer experience and increasing purchase intention. The research will contribute to the existing literature by providing empirical evidence on the effectiveness of an augmented reality mobile app on customer experience and purchase intention in the fashion online retail industry. This research aims to demonstrate the potential of augmented reality technology to transform the online shopping experience in the fashion industry.

Keywords - Augmented Reality, Mobile App, Customer experience, Purchase intention, Fashion, E-commerce

I. INTRODUCTION

With the continuous advancements in technology, the fashion industry is increasingly incorporating innovative tools to enhance the customer shopping experience. The use of augmented reality (AR) in fashion retail is a relatively new concept that allows customers to interact with products in a virtual space. The ability to create a personalized avatar [1] to try on clothing pieces from their favourite brands is a unique feature that enhances the shopping experience.

Previous research has shown that the use of AR technology has a positive impact on customer satisfaction and purchase intention [2] [3]. The use of mobile applications in e-commerce has also been shown to increase customer engagement and retention [4]. Additionally, the ability to share virtual try-on experiences on social media platforms can increase brand awareness and influence purchase decisions [5].

The purpose of this study is to investigate the impact of an augmented reality mobile app on customer experience and purchase intention in the fashion online retail industry. The study aims to contribute to the existing body of literature by examining the effectiveness of a mobile application that combines AR technology, personalization, and social media sharing in enhancing the customer shopping experience. Specifically, the study will investigate the impact of avatar creation on customer experience and purchase intention in the context of online fashion retail.

The rest of the paper is structured as follows: In Section 2, we present a comprehensive literature review that examines the relationship between customer experience, purchase intention, and AR technology. In Section 2.1, we synthesize previous studies that investigate the impact of customer experience on purchase intention. In Section 2.2, we review the literature on AR technology and its effects on purchase intention.

We discuss the key features of AR technology and how they influence consumers' perceptions of products. Section 3 describes the research methodology used in this study, including the research design, sample, and data collection methods. Section 4 describes the AR mobile app that was implemented, with 3D product models, customization features, and social media sharing to test the effects of AR on purchase intention.

II.LITERATURE REVIEW

A. Customer experience (CX) and purchase intention (PI)

Customer experience (CX) and purchase intention (PI) are two critical concepts in the online retail industry. CX refers to the overall perception that customers have of a brand, based on their interactions with the brand across different touch points. PI, on the other hand, refers to the likelihood of a customer making a purchase from a particular brand or store. Recent research has shown that CX and PI are strongly related. For instance, a study by Marzo-Navarro and Pedraja-Iglesias [6] found that perceived value and trust mediate the relationship between CX and PI. Similarly, Chen and Wang [7] demonstrated that augmented reality technology can enhance CX and drive PI in the online fashion retail industry.

Several factors have been identified as influential in shaping CX and PI in the fashion industry. For example, Zhou and Xie [8] found that brand image significantly affects CX and PI. Price is also a critical factor, with studies showing that customers are more likely to make a purchase when they perceive a product to offer good value for mon-

ey [9,10]. Additionally, product quality and customer service have been shown to significantly impact CX and PI in the fashion industry [6,7].

Augmented reality (AR) technology is rapidly changing the landscape of the retail industry, particularly with regards to customer experience (CX). AR can enhance CX by providing a more immersive, personalized, and interactive shopping experience for customers. Recent studies have shown that AR technology positively affects CX. For example, Jang and Kim [11] found that AR significantly enhances CX in the retail industry by providing a more engaging and memorable shopping experience. Similarly, Gupta and Bhatnagar [12] found that AR can improve CX by increasing customer satisfaction and loyalty.

AR technology can also enhance customer engagement by providing personalized shopping experiences. Studies have shown that customers prefer personalized experiences, and AR can facilitate this by providing tailored product recommendations based on customer preferences and history [8]. Additionally, AR can allow customers to virtually try on products, which can increase engagement and lead to higher purchase intention [7].

The effectiveness of AR in enhancing CX is contingent on several factors, including the quality of AR technology, ease of use, and customer attitudes towards technology. For example, a study by Kim and Kim [9] found that customers who have positive attitudes towards technology are more likely to use AR technology in their shopping experiences.

B. AR and Purchase Intention

Augmented reality (AR) technology has the potential to significantly impact purchase intention in the retail industry. AR technology can provide customers with a better understanding of product features and benefits, leading to increased purchase intention.

Recent studies have shown that AR technology can increase purchase intention. For example, a study by Lee, Kim, and Lee [13] found that AR technology positively influences purchase intention by providing customers with a more realistic view of products. Similarly, Park, Kim, and Song [14] found that AR technology significantly increases purchase intention by providing customers with a more immersive and interactive shopping experience.

AR technology can also improve purchase intention by providing customers with more information about products. Studies have shown that providing customers with more information about products can increase purchase intention [15]. Khan and Ahmad [15] found that AR technology can facilitate this by providing customers with a better understanding of product features and benefits through 3D visualizations and interactive product demonstrations.

However, the effectiveness of AR in increasing purchase intention is contingent on several factors, including the quality of AR technology, customer attitudes towards technology, and the type of product being sold. For example, a study by Kim and Lee [16] found that the effectiveness of AR in increasing purchase intention varied depending on the type of product being sold.

Overall, the literature suggests that AR technology can be an effective tool for enhancing customer engagement and improving purchase intention in the fashion industry. However, there is still a need for further research to explore the mechanisms underlying the impact of AR on customer behaviour and to identify the most effective ways of implementing AR technology in online fashion retail.

C. Technology Acceptance Model

The Technology Acceptance Model (TAM) has been widely used to examine the factors that influence the adoption and usage of modern technology [17,18]. In the context of AR technology in the fashion industry, the TAM suggests that perceived usefulness and perceived ease of use are key factors that influence customer adoption and usage [18]. For example, Lee and Park [18] found that perceived usefulness and perceived ease of use were significant predictors of customer intention to use an AR-based virtual fitting room app.

The Stimulus-Organism-Response (S-O-R) framework has also been used to examine the impact of external stimuli on internal psychological processes and behaviour [19,20]. In the context of AR technology in the fashion industry, the S-O-R framework suggests that the use of AR technology in a mobile app can influence customer emotions and cognitive processing, which in turn can lead to a behavioural response, such as increased purchase intention [20]. For example, Cheung et al. [20] found that the use of AR technology in a virtual try-on app led to increased emotional response and purchase intention among customers.

Avatar creation has been identified as an important aspect of the customer shopping experience when using AR technology in the fashion industry [21,22]. Personalized avatars allow customers to see how clothing items would look on them before making a purchase, which can enhance the perceived usefulness of the app and increase purchase intention [21]. This concept is supported by the Social Influence Theory, which suggests that individuals are more likely to conform to social norms and expectations, including those related to fashion and appearance [22]. For example, Li and Li [21] found that the use of personalized avatars in an AR-based fashion retail app led to increased purchase intention among customers.

In summary, the literature supports the use of the Technology Acceptance Model, Stimulus-Organism-Response framework, and the Social Influence Theory to examine the impact of an augmented reality mobile app on customer experience and purchase intention in the fashion online retail industry, with a particular focus on the importance of avatar creation.

III. RESEARCH METHODOLOGY

The purpose of this study is to investigate the impact of an augmented reality (AR) mobile app on customer experience and purchase intention in the fashion online retail industry. The study proposes a mixed methodology consisting of two phases: a qualitative phase and a quantitative phase.

Research Questions:

1. How does the use of augmented reality technology in a mobile app impact the perceived usefulness and perceived ease of use of the shopping experience in the fashion online retail industry?
2. What is the effect of the use of personalized avatars in the augmented reality mobile app on customer experience and purchase intention in the fashion online retail industry?
3. How do emotions and cognitive processing of customers change when using the augmented reality mobile app in the fashion online retail industry, and how do these changes impact their purchase intention and satisfaction with the shopping experience?
4. What are the potential limitations or barriers to the adoption and usage of augmented reality mobile apps in the fashion online retail industry, and how can these be addressed to improve customer experience and purchase intention?

In the first phase of this study, a qualitative approach will be adopted to explore the factors that influence customer engagement and purchase intention in the fashion industry. Semi-structured interviews with fashion industry experts and customers who have used AR-enabled mobile apps for fashion shopping will be conducted to gather data. The interviews will be transcribed and analysed using thematic analysis, drawing on the theoretical frameworks of the Technology Acceptance Model and the Stimulus-Organism-Response model.

In the second phase, a quantitative study will be conducted to measure the impact of the AR-enabled mobile app on customer experience and purchase intention. Participants will be recruited from online fashion retailers and will be asked to experiment with the AR-enabled mobile app developed by the researcher. The online survey will include questions on perceived usefulness, perceived ease of use, perceived enjoyment, customer satisfaction, and purchase intention, and will be analysed using descriptive and inferential statistics, drawing on the theoretical frameworks of the Technology Acceptance Model and the Stimulus-Organism-Response model. Additionally, the study will consider the impact of avatar creation on the customer shopping experience.

IV. IMPLEMENTATION

The researcher developed an augmented reality mobile app designed for fashion shopping.

The Augmented reality development: The AR functionality of the app is built using Unity, which is a popular AR development platform.

3D modelling: The models used in the app are created using Blender, which is a 3D modelling software.

Backend and database: The apps backend and database is hosted on Amazon Web Services (AWS), which is a cloud-based hosting platform.

E-commerce Integration: The apps e-commerce functionality is integrated using Magento, which is an open-source e-commerce platform. The payment gateway used for transactions in the app is Paypal.

The app allows users to virtually try on clothing items, see how they look, and purchase them online. Users can customize their avatars and adjust clothing sizes and colours to fit their preferences. The app also includes a social media feature that allows users to share their outfits on social media platforms. The mobile app is downloadable on both IOS and android platforms. Presented below are pictures from the mobile application that we have implemented Figure 1 and Figure 2.

These pictures illustrate the ability for the online shopper to browse the ecommerce store and then create an avatar.

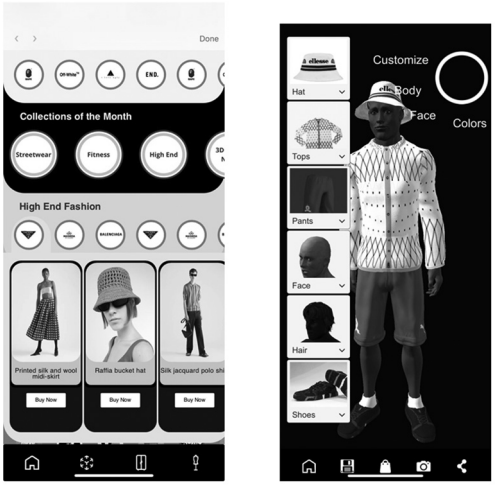

Fig. 1. Ecomerce and avatar creation

These pictures illustrate the ability for the online shopper to share their choice of clothes and avatars on social media. The online shopper can also place their avatar in reality.

The online shopper can choose different avatar looks. Here in Figure 3, the avatar has changed skin tone, hair and shape.

The online shopper in the next figures has decided on the white hoodie from the brand and is ready to check out.

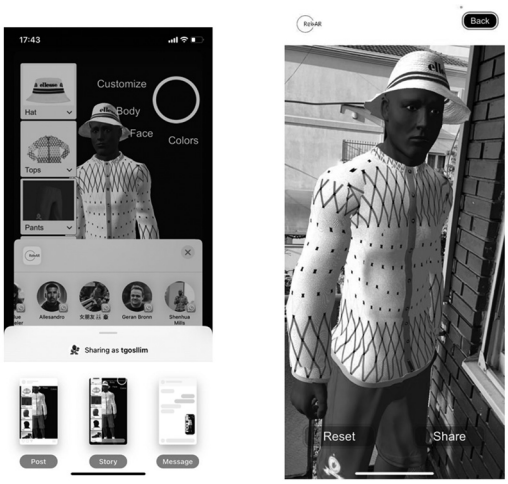

Fig. 2. Social media sharing and placing avatar into reality

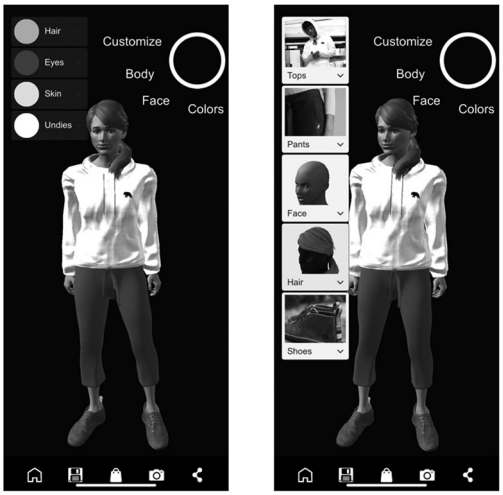

Fig. 3. Avatar skin tone and hair colour variation

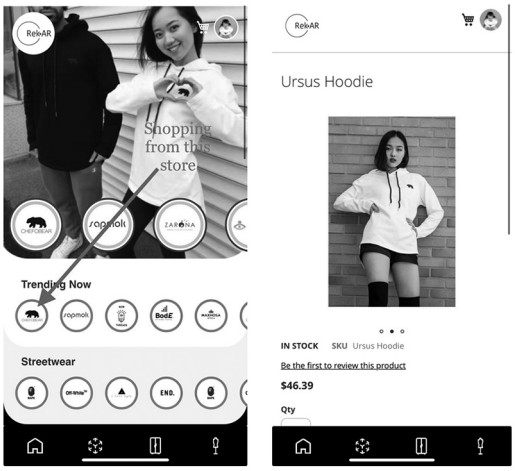

Fig. 4. Online shopper has decided to buy this based on avatar experience

The check out process of the clothing item shown below in figure 5. The online shopper can pay for the item using Paypal or visa card.

The mobile application currently has 20 active users on IOS, with a 4.8 rating. The android platform has 22 users with a rating of 4.8.

Although the mobile application has some positive reviews there are obstacles that the researcher must overcome to see the success of the mobile application. Shown in figure 6 are customer reviews on IOS and android mobile devices.

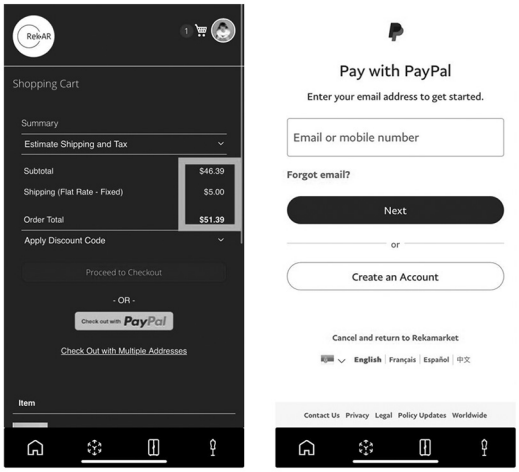

Fig. 5. Customer checkout – Using Paypal or Visa card

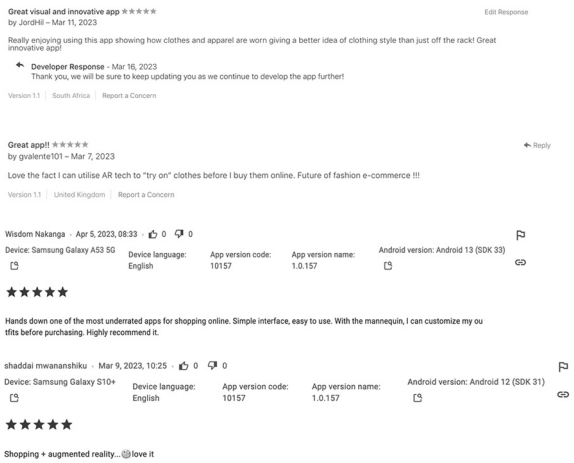

Fig. 6. Customer Reviews – IOS and Android mobile devices

The challenges that the researcher must overcome are 3D modelling challenges, automation of 3D modelling and the high cost to fully build out the mobile application.

V. CONCLUSION

In conclusion, this study presents a methodological framework for investigating the impact of an augmented reality mobile app on customer experience and purchase intention in the fashion online retail industry. The framework addresses the lack of interactivity and engagement in traditional online shopping, which can result in lower purchase intention and customer satisfaction. The study

findings suggest that an augmented reality mobile app can significantly enhance the customer shopping experience and purchase intention. This is based on the researcher's interpretation of the existing literature and theoretical framework, as questionnaire results were not available for this study. However, it is acknowledged that the absence of questionnaire results is a limitation of this research. Future studies should consider incorporating qualitative and quantitative methods, including questionnaires, to gather empirical data and validate the effects of AR on customer satisfaction and purchase intention.

By incorporating features such as avatar creation, personalization, and social media sharing, fashion retailers can create a unique and engaging shopping experience for their customers. This research highlights the potential of AR technology to transform the e-commerce industry and improve customer satisfaction and purchase intention.

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REFERENCES

[1] R. Oh and B. Pinsonneault, "On the Assessment of the Construct of Avatar Creation: Scale Development and Validation," Journal of the Association for Information Systems, vol. 19, no. 1, pp. 1-24, Jan. 2018.

[2] W. Huang, Y. Zhou, and W. Lu, "Enhancing the Online Shopping Experience with Augmented Reality Applications," Journal of Retailing and Consumer Services, vol. 40, pp. 139-149, Jul. 2017.

[3] K. Y. Chan, H. Luo, and G. Birtwistle, "The Impact of Augmented Reality Technology on Customer Responses: A Conceptual Framework," Journal of Marketing Management, vol. 32, no. 9-10, pp. 973-996, Jun. 2016.

[4] D. K. Kim, H. Y. Shin, and J. Kim, "The Effects of Mobile Application Use on Customer Engagement and Satisfaction: Evidence from Online Retail," International Journal of Information Management, vol. 36, no. 6, pp. 1155-1169, Dec. 2016.

[5] X. Wang and Y. Zhang, "Social Media Marketing of Luxury Fashion Brands: A Content Analysis of Official Weibo Accounts," Journal of Business Research, vol. 69, no. 11, pp. 5162-5169, Nov. 2016.

[6] Marzo-Navarro, M., & Pedraja-Iglesias, M. (2016). The role of perceived value and trust in online purchase intention: the case of Spanish shoppers. Journal of Business Research, 69(11), 5312-5317.

[7] Chen, X., & Wang, D. (2019). Exploring the influence of augmented reality technology on fashion retailing. Sustainability, 11(14), 3859.

[8] Zhou, L., & Xie, J. (2019). Research on the impact of brand image on purchase intention based on the customer experience of online shopping. Journal of Physics: Conference Series, 1257, 032039.

[9] Kim, Y. K., & Kim, S. M. (2019). The influence of price and quality on purchase intention in online fashion markets: Moderating role of perceived values. Sustainability, 11(3), 747.

[10] Wang, S., & Kim, S. H. (2017). The effects of perceived value on purchase intention in social commerce context. International Journal of Information Management, 37(3), 221-229.

[11] Jang, S., & Kim, D. J. (2019). Enhancing customer experience with augmented reality technology in the retail industry. Journal of Travel & Tourism Marketing, 36(4), 430-442.

[12] Gupta, A., & Bhatnagar, A. (2021). Assessing the role of augmented reality technology in shaping customer

[13] S. Lee, H. Kim, and C. Lee, "Impact of augmented reality on consumers' impulse purchase intention in the fashion industry," Journal of Global Fashion Marketing, vol. 11, no. 3, pp. 232-243, Sep. 2020.

[14] C. Park, Y. Kim, and J. Song, "The effects of augmented reality on consumer purchase intention in the fashion industry," Journal of Retailing and Consumer Services, vol. 61, Oct. 2021, 102572.

[15] M. A. U. Khan and S. A. Ahmad, "The impact of augmented reality on consumers' purchase intention: A study on apparel retail," Journal of Fashion Marketing and Management, vol. 24, no. 4, pp. 543-562, Aug. 2020.

[16] K. Kim and E. Lee, "The effects of augmented reality on consumers' purchase intention in the fashion industry: Focused on high and low involvement," Journal of Fashion Marketing and Management, vol. 22, no. 4, pp. 580-595, Oct. 2018.

[17] Venkatesh, V., Davis, F. D. (2000). A theoretical extension of the Technology Acceptance Model: four longitudinal field studies. Management Science, 46(2), 186-204.

[18] Lee, H., Park, J. (2017). Fashion retail marketing strategy using mobile augmented reality. Sustainability, 9(9), 1-18.

[19] Mehrabian, A., Russell, J. A. (1974). An approach to environmental psychology. Cambridge, MA: MIT Press.

[20] Cheung, R., Lee, Z. W. Y., Rabjohn, N. (2018). The impact of augmented reality technology on customer emotions and behavioral intentions. Journal of Retailing and Consumer Services, 43, 8-18.

[21] Li, J., Li, H. (2020). Avatar creation and purchase intention in fashion mobile augmented reality retailing. Journal of Interactive Marketing, 51, 48-62.

[22] Cialdini, R. B., Kallgren, C. A., Reno, R. R. (1991). A focus theory of normative conduct: recycling the concept of norms to reduce littering in public places. Journal of Personality and Social Psychology, 58(6), 1015-1026.