

DOES AUGMENTED REALITY SWAYING CONSUMER PURCHASE INTENTION?

¹Dr Sudin Bag, ²Kousik Mandal

^{1,2}Vidyasagar University

¹sudinmba@mail.vidyasagar.ac.in, ²kousikmandal1997@outlook.com

¹ORCID - 0000-0002-6289-245X, ²ORCID - 0000-0003-1642-2278

Abstract:

With the growth of technology and changing circumstances, augmented reality (AR) is a potential and developing sector in the marketing research and practise industry. Due to a lack of relevant literature on how AR apps can affect consumers' purchase behaviour towards beauty and personal care products, the purpose of this study is to investigate the impact of mobile augmented reality services on consumers' purchase intention in the beauty and personal care industry. The study identifies customer attitude as a moderating component between consumer technological adoption and incentive to utilise AR.

This research presents a theoretical framework based on the extended TAM model. A quantitative research study was executed, using a deductive research approach. To increase the response rate and collect standardized data from the participants, a survey research method was implemented. A beauty and makeup AR mobile app called "Sephora" was used as a stimulus to do the questionnaire survey. Smart PLS was used to do data analysis.

This study found that in the field of fashion and beauty makeup, perceived intrusiveness and perceived ease of use are more relevant to change consumer attitudes towards intention to purchase. AR technology can also encourage attitudinal behavior, which can directly affect their intention to purchase. Finally, when using mobile AR technology, consumers with different levels of attitude and motivation to use AR in beauty products will gain different perceptions of their purchase intention.

Keywords: *augmented reality; telepresence; hedonic motivation; perceived ease of use; attitude towards use;*

Introduction

During the last few years, the marketing and advertising world has experienced a change in the digital world called augmented reality (AR). AR is a blend of the real and virtual world using technologically generated data and can create a positive consumer experience. AR acts as a solution for the problem arising for consumers going for online purchases. It is being observed that online shoppers face the trouble of not being able to test the products before purchasing them, which in turn ends in their disappointment when they try their newly purchased product for the first time. Augmented reality apps for marketing are now solving this problem, as it helps the purchaser virtually try the product before purchasing it, eventually leading to customer satisfaction. The strategists have predicted that the

Indian market for Augmented Reality and Virtual Reality will grow from \$1.83 billion in 2020 to a CAGR of 38.9 % by 2027 (Research and Markets, 2021).

Augmented Reality (AR) is a new mobile technology platform that has evolved as a powerful, interactive tool for delivering visual product information. AR is a development of 3D technology, which allows for a 360-degree view of virtual items. AR incorporates the virtual product into the actual surroundings of the customer, making it simpler for the user to visually inspect things in their own physical settings. AR has recently been identified as a prominent digital market trend in a variety of businesses, including Ikea, Tiffany & Co., Converse, and the beauty industry. AR services let customers to test on cosmetics or other merchandise.

According to Kowalczyk et al. (2021), incorporating augmented reality into e-commerce can enhance the consumer's experience and add a unique touch to the purchasing process. Moreover, AR technology promotes the shift from offline to online shopping, and it is expected that customers will be more willing to try and purchase experiential products like food, cosmetics, or medicines (Hsu & Chen, 2018). An example of an AR-based app in the cosmetics industry is the MyGlamm app. This app allows users to browse cosmetic products from different vendors and try them on using their cellphone camera and AR technology. Consumers can experiment with various products, such as lipstick, mascara, and powder.

Prior research on AR has highlighted its favourable impacts in a variety of fields, including education (Liou, Yang, Chen, & Tarng, 2017), gaming (Kogan, Hellyer, Duncan, & Schoenfeld-Tacher, 2017; Morschheuser, Riar, Hamari, & Maedche, 2017), and tourism (Chung, Hand, & Joun, 2015). This study closes a knowledge gap in the literature on mobile AR technologies in the cosmetics sector. This information will not only aid in the e-development of brands, but will also aid in the growth of merchants in the beauty sector, offering the required competencies for the expansion and use of this interactive technology. In terms of marketing strategies, the study of consumer characteristics gives the information basis for marketers to construct marketing strategies, making it simpler for them to formulate marketing strategies that are advantageous to the brand for different customers.

Marketers have extensively researched the potential uses of AR, but certain areas of marketing still lack sufficient theoretical evidence. In particular, the impact of mobile AR services and cultural characteristics on consumers' purchase intentions, attitudes, and satisfaction with environmental stimuli requires further investigation. According to research by Javornik (2016) and Watson et al. (2018), these factors are crucial in shaping consumer behavior.

This research has two major objectives. To begin, we want to use the TAM model to investigate how a mobile AR service influences purchasing intentions. Second, we want to identify hedonic motivation as an independent component that impacts the effect of AR on purchase intentions indirectly. The study includes a theoretical framework, a research model, the creation of hypotheses, research methods and analysis, findings, discussions, and conclusions. Finally, we offer topics for further investigation and recognise the study's shortcomings.

Literature Review

Theoretical Background of Augmented Reality

Augmented Reality (AR) is a part of technology that provides consumers with distinctive and engaging experiences of using the product in virtual or augmented reality, amalgamating the characteristics of both the real and virtual worlds (Lamantia, 2009). The digital platform is leapfrogging businesses to a new dimension. As technology advances, the implementation of AR is also rising, making it one of the preferred modes of B2C marketing. AR has the potential to create value for both customers and retailers (Huang & Liu, 2014). The application of AR in the retail industry will increase consumer engagement and online consumer experience, which will help the consumer buy the product (Pantano, 2009; Pantano & Timmermans, 2014).

Augmented Reality and Online Marketing -

Pantano et al. (2017) study on the behaviour of consumers during online purchases through AR highlights that the application of AR in online retailing positively influences the consumer's purchase decision. This study can help marketers plan their strategy following the country's economic conditions and the business's location. It is observed that the taste and preferences of the consumers differ between countries, where one can focus on elements of enjoyment, and the other can focus on product quality and the platform's functionality.

According to Poushneh et al. (2017), AR technology can have an unfavourable effect on consumers' purchase decisions if there is a dissimilarity between the expectation of the product in mind and the experience they acquire after utilizing the product. For instance, the low-quality AR application makes it difficult for consumers to interact with the product, leading to consumer dissatisfaction and decreasing customer satisfaction. Therefore, the more enriching the consumers interact with the product through AR technology, the more the chances of getting them to purchase the product.

It is observed in different studies that the intrusiveness of too much information can negatively affect consumers towards the brand, which may impact the final purchase decision. For example, previous studies have noted that the intrusiveness of information regarding personalized or location-based advertisements has impacted consumers negatively, leading to a decrease in purchasing behaviour (McCoy et al., 2008; Baek & Morimoto, 2012; Doorn & Hoekstra, 2013).

Research Model and Hypotheses

The model for this study is developed using Technology Acceptance Model (TAM). The researchers have developed the TAM model, which describes the application of technology and its effect on the consumers' various behavioural intentions with respect to the psychological and sociological part (Gefen & Straub, 2000). Based on the above literature, the following conceptual model has been designed, and the hypotheses are as follows:

Figure 1: Conceptual Model

H₁: Hedonic Motivation influences attitude to use AR to purchase beauty products

H₂: Perceived Intrusiveness influences attitude to use AR to purchase beauty products

H₃: Perceived Ease of Use influences attitude to use AR to purchase beauty products

H₄: Perceived Telepresence influences attitude to use AR to purchase beauty products

H₅: AR-oriented attitude influences purchase intention of beauty products

Research Methodology

Research Design

A quantitative research study has been executed. As sufficient theories were found to develop the hypothesis, therefore deductive research approach was implemented in the study. An explanatory research design has been performed in this study, which helps to understand the relationship between the constructs. To increase the response rate and to collect standardized data from the participants efficiently and economically, the researcher has implemented a survey research method for this study.

Data Collection and Procedure

The present study was based on both primary and secondary data. The secondary data was collected from various books, journals, and articles. The secondary data was employed to explore previous studies and theories, with the help of which a literature review was extracted. The primary data was gathered through a survey. Finally, the researchers collected the data to acknowledge the research purpose and objectives.

The primary data was collected by filling up the questionnaire through Google form from the participants who have purchasing experience with Sephora using AR technology before the purchase by the consumers. For three months, the online survey was performed from September 1 to November 30, 2022.

Sampling Technique

The population determined for this study was individuals belonging to Generation Y and Generation Z from India. This Generation was selected as they are technology savvy (Immordino-Yang, Christodoulou, & Singh, 2012; Martin, 2005) and are extremely brand-conscious and demanding consumers with a higher purchasing power (Straus, Howe & Markiewicz, 2006; Morton, 2002). The study sample consisted of participants aged between 18 and 42 years old. The sample size for this study is 210 participants. Since the research was based on online lipstick shopping, women participants were considered. The researchers used the self-selection sampling method. The persons who wanted to participate in the study were approached by sending the Google form link through various online platforms like email, Facebook, Instagram, and WhatsApp.

Research Instrument

The questionnaire developed for this study was a self-administered structured research questionnaire. The questions asked in the questionnaire were

closed-ended. The items of the research questionnaire were taken from previous studies - Hedonic Motivation (Hassanein & Head, 2005), Perceived Intrusiveness (Li et al., 2002b), Perceived Telepresence (Fiore et al., 2005), Perceived Ease of Use (Davis, 1986), Attitude towards Use (Li et al., 2002a) and Purchase Intention (Bearden et al., 1984). The questionnaire was measured on 7 points Likert scale ranging from 7, "Strongly Agree", to 1, "Strongly Disagree". The statistical modelling tool used for the study was analyzed by partial least square equation modelling (PLS-SEM).

Results and Interpretation

Assessment of Reliability and Validity

To develop a structural measurement model, convergent validity, discriminant validity and reliability of indicators were considered. To test the reliability of the construct, the researchers used Cronbach's Alpha and Composite Reliability (CR). Table 1 shows that Cronbach's Alpha was higher than the recommended value of 0.7 (Cronbach, 1951), and the score of composite reliability was higher than the threshold of 0.5. Furthermore, reliability and validity results and factor loading show that all the constructs' Average Variance Extracted (AVE) is higher than 0.5 (Hair et al., 2017). Thus, results indicate that the reliability and validity are well established.

Table 1: Reliability and Validity of Conceptual Model

Constructs	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
AT	0.792	0.865	0.619
HM	0.791	0.859	0.607
PEOU	0.758	0.846	0.584
PIN	0.977	0.980	0.924
PT	0.952	0.965	0.873

Note: AT - Attitude towards Use, HM - Hedonic Motivation, PEOU - Perceived Ease of Use, PIN - Perceived Intrusiveness, PT - Perceived Telepresence.

Source: Own Calculation, Feb 2023

The Heterotrait-Monotrait (HTMT) ratio (assessment of similitude between two dormant variables) has been tested to test the discriminant validity. As per the previous research done by Bag et al. (2020), to expand discriminant validity, the HTMT ratio of each dimension should be less than 0.9 (Henseler, Ringle & Sarstedt, 2015). Table 2 provides the result of the HTMT ratio, which further solidifies the acceptance of the discriminant validity.

Table 2: Discriminant Variable Heterotrait Monotrait (HTMT) ratio

	AT	HM	PEOU	PI	PIN	PT
AT						
HM	0.479					
PEOU	0.653	0.217				
PIN	0.325	0.141	0.106	0.326		
PT	0.309	0.301	0.130	0.117	0.765	

Source: Own Calculation, Feb 2023

Testing of Hypotheses:

After the measurement of the outer model, the result of hypothesis testing was performed. The relationship between the different constructs is presented in Figure 2 and Table 3. The result reveals that Perceived Telepresence, Perceived Intrusiveness and Perceived Ease of Use have a significant positive association with consumer attitude, ultimately influencing the purchase intention of beauty and personal products in this age of technology. The result confronts the study of Han & Conti (2020), who found positive influences of telepresence on attitude and perceived ease of use towards the attitude development to use technology (Bag et al., 2020). Further, McCoy et al. (2017) also observed that intrusiveness significantly influences consumer attitudes to using online ads to buy necessities. However, the result of the study also depicts that hedonic motivation negatively influences user attitudes toward AR-related purchase intention, which confirms the study of Novela et al. (2020). But this result differs from the study of Anand et al. (2019), who found that hedonic motivation is the key attribute that drives consumer satisfaction positively and influences attitude and perception. Finally, the result depicts a positive and significant relationship between attitude and purchase intention with special reference to online shopping through the AR process, which is also found in the study by (Zhu & Kanjanamekanant, 2021).

Figure 2: Path Analysis Model
Table 3 Result of testing of hypotheses

Hypothesis Paths	Co-efficient with P - value	Remarks
H ₁ : Hedonic Motivation → Attitude to use	-0.356 (0.01)	Negatively Significant
H ₂ : Perceived Intrusiveness → Attitude to use	0.384 (0.01)	Significant
H ₃ : Perceived Ease of Use → Attitude to use	0.462 (0.01)	Significant
H ₄ : Perceived Telepresence → Attitude to use	0.130 (0.05)	Significant
H ₅ : Attitude to use → Purchase Intention	0.562 (0.01)	Significant

Conclusion And Implication

In according with the previous studies, this study fulfils the previous gaps, which is whether implementation of AR technology can improve consumer engagement and therefore improve purchase decisions of consumers in the Indian BPC sector, and also identifies factors influencing the consumers. According to our study, hedonic motivation, perceived intrusiveness, perceived ease of use, and perceived telepresence positively develop a consumer usability attitude towards products, leading to a final product purchase.

The results of this study show us that implementing AR is beneficial for the consumers and economically benefits the organization by driving more sales and increasing consumer willingness to buy online (Fiore et al., 2005). However, in previous research works, it was evident that through continuous development of technology and software quality of AR needs to be improved, which will ensure the attraction of new consumers also retain old consumers, which in the long run will become a sustainable advantage of the organization over its competition (Kang & Young, 2014; Poushneh, Vasquez-Parraga & Arturo, 2017).

The results of the study depicts that individuals motivated primarily by pleasure and enjoyment may have a more negative attitude towards technology use than those motivated primarily by utilitarian factors. This unfavourable association might be attributed to a preference for short-term pleasure over long-term advantages, as well as the possibility of excessive or addicted usage, which could lead to severe repercussions.

Overall, perceived intrusiveness is an important aspect that might influence consumers' views towards technology use. Understanding the elements that determine perceived intrusiveness, as well as how it interacts with other individual aspects, can assist researchers and practitioners in designing more effective and user-friendly technology.

According to these findings, if a technological system is regarded to be simple to use, people are more likely to utilize it. Furthermore, PEOU would boost PU, which would lead to a more positive attitude towards technology. since a result, organisations that build technology systems should ensure that the systems are simple to use, since this increases the possibility of user adoption and good attitudes towards using the systems.

Moreover, the use of augmented reality technology in the purchase of beauty products has the potential to improve the consumer experience, and perceived telepresence can be a crucial element affecting attitudes towards the usage of augmented reality in this context. Customers are more likely to be favourable about employing AR technology in beauty product purchasing if they feel present in the virtual world.

This study provides a theoretical foundation for market practitioners to develop marketing strategies. First and foremost, marketers may utilise this technology to create AR mobile services for beauty companies that provide a more intensive and personalised online buying experience. Second, based on the study's findings, technology developers may concentrate on developing distinct AR features that have the greatest customer motivation and perception to adopt this

technology in beauty businesses. Finally, this study investigated consumer attitudes in order to gain a better understanding of the intrusiveness and ease of use of mobile AR services. To attract more customers, marketers must grasp the characteristics of consumers and expand the features of AR connected with the characteristics of consumers while executing a marketing plan. As a consequence, AR may enable marketers to present their customers with an immersive experience.

With the use of interactive technology, the business may get closer to customers and give assistance and entertainment while online purchasing. AR can potentially lead to future tool reuse behaviour, resulting in long-term consumer connections. Furthermore, AR can be used as a mobile-based service that can be accessed at any time and from any location, eliminating location and time constraints. As a result, the company may use inexpensive and extensive technology as a marketing technique. It may also become one of the most widely used marketing techniques.

Limitations of the study:

First and foremost, the survey is aimed at young customers. Future research may be undertaken on customers of various ages. Second, the study's constructions are based on technical acceptability; if it had considered consumers' emotional constructs and the utility of AR, the results would be more fascinating. Finally, because AR is integrated into people's lives, future research must include demographic characteristics that are not limited to millennial consumers.

Acknowledgement

The authors would like to thank the anonymous reviewers who provided valuable feedback on an early version of this research. There was no financial assistance for the author(s)' research, writing, or publishing of this work.

References

- Anand, T., Ramachandran, J., Sambasivan, M., & Batra, G. S. (2019). Impact of hedonic motivation on consumer satisfaction towards online shopping: Evidence from Malaysia. *E-Service Journal*, 11(1), 56-88.
- Baek, T.H., Morimoto, M., (2012). Stay away from Me. *Journal of Advertisement*, 41, 59-76.
- <https://doi.org/10.2753/JOA0091-3367410105>
- Bag, S., Aich, P., & Islam, M. A. (2020). Behavioral intention of "digital natives" toward adapting the online education system in higher education. *Journal of Applied Research in Higher Education*. doi. 10.1108/JARHE-08-2020-0278
- Bearden, W.O., Lichtenstein, D.R., Teel, J.E. (1984). Comparison price, coupon, and brand effects on consumer reactions to retail newspaper advertisements. *Journal of Retailing*, 60, 11-34.
- Cronbach, L. J. (1951). COEFFICIENT ALPHA AND THE INTERNAL STRUCTURE OF TESTS*. In *PSYCHOMETRIKA* (Vol. 16, Issue 3).

- Davis, F. D. (1986). A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results (PhD thesis) Massachusetts Institute of Technology, Sloan School of Management.
- Fiore, A. M., Kim, J., & Lee, H. (2005). Effect of image interactivity technology on consumer responses toward the online retailer. *Journal of Interactive Marketing*, 19(3), 38–53. doi: 10.1002/dir.20042
- Gefen, D., & Straub, D. (2000). The Relative Importance of Perceived Ease of Use in IS Adoption: A Study of E-Commerce Adoption. *Journal of the Association for Information Systems*, 1(1), 1-30.
- Hair, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. (2017). Advanced issues in partial least squares structural equation modeling. *Sage*. ISBN: 9781483377391
- Han, J., & Conti, D. (2020). The use of UTAUT and post acceptance models to investigate the attitude towards a telepresence robot in an educational setting. *Robotics*, 9(2), 34-45.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hassanein, K., Head, M., (2005). The impact of infusing social presence in the web interface: an investigation across product types. *International Journal of Electronic Commerce*, 10, 31–55. <https://doi.org/10.2753/JEC1086-4415100202>
- Huang, T. -L., & Liu, F. H. (2014). Formation of augmented-reality interactive technologies persuasive effects from the perspective of experiential value. *Internet Research*, 24 (1), 82–109. doi:10.1108/IntR-07-2012-0133
- Immordino-Yang, M.H., Christodoulou, J.A. & Singh, V. (2012), Rest is not idleness: implications of the brain's default mode for human development and education. *Perspectives on Psychological Science*, 7 (4), 352-364. doi: 10.1177/1745691612447308
- Kang, M., & Young, J. (2014). Augmented reality and motion capture apparel e-shopping values and usage intention. *International Journal of Clothing Science and Technology*, 26(6), 486–499
- Lamantia, J. (2009). Inside out: interaction design for augmented reality. Retrieved from <https://www.uxmatters.com/mt/archives/2009/08/inside-out-interaction-design-for-augmented-reality.php>
- Li, H., Daugherty, T., Biocca, F., 2002a. Impact of 3-D advertising on product knowledge, brand attitude, and purchase intention: The mediating role of presence. *Journal of Advertisement*, 31, 43–57. <https://doi.org/10.1080/00913367.2002.10673675>
- Li, H., Edwards, S.M., Lee, J.-H. (2002b). Measuring the intrusiveness of advertisements: scale development and validation. *Journal of Advertisement*, 31, 37–47. <https://doi.org/10.1080/00913367.2002.10673665>

- Liou, H. H., Yang, S. J., Chen, S. Y., & Tarng, W. (2017). The influences of the 2D image-based augmented reality and virtual reality on student learning. *Journal of Educational Technology & Society*, 20(3), 110-121.
- Martin, C.A. (2005). From high maintenance to high productivity: what managers need to know about generation Y. *Industrial and Commercial Training*, 37 (1), 39-44
- McCoy, S., Everard, A., Polak, P., Galletta, D.F. (2008). An experimental study of antecedents and consequences of online ad intrusiveness. *International Journal of Human Computer Interaction*, 24, 672-699.
- McCoy, S., Everard, A., Galletta, D. F., & Moody, G. D. (2017). Here we go again! The impact of website ad repetition on recall, intrusiveness, attitudes, and site revisit intentions. *Information & Management*, 54(1), 14-24.
- Morton. L. P. (2002). Targeting Generation Y. *Public Relations Quarterly*, 47 (2), 46-48 <https://doi.org/10.1080/10447310802335664>
- Novela, S., Sihombing, Y. O., Caroline, E., & Octavia, R. (2020,). The Effects of Hedonic and Utilitarian Motivation toward Online Purchase Intention with Attitude as Intervening Variable. In *2020 International Conference on Information Management and Technology (ICIMTech)* (pp. 75-80). IEEE.
- Pantano, E. (2009). Augmented Reality in Retailing of Local Products of Magna Grecia: Consumer's Response. *International Journal of Management Cases*, 11(2), 206-213. doi: <http://dx.doi.org/10.5848/APBJ.2009.00034>
- Pantano, E., & Timmermans, H. (2014). What is smart for retailing? *Procedia Environmental Sciences*, 22, 101-107. doi: 10.1016/j.proenv.2014.11.010
- 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 Consumer Services*, 38, 81-95. doi: 10.1016/j.jretconser.2017.05.011
- Poushneh, A., Vasquez-Parraga, A., & Arturo, Z. (2017) Customer Satisfaction and Satisfaction with Augmented Reality in Shopping and Entertainment. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, 30, 1-22.
- Zhu, Y. Q., & Kanjanamekanant, K. (2021). No trespassing: Exploring privacy boundaries in personalized advertisement and its effects on ad attitude and purchase intentions on social media. *Information & Management*, 58(2), 103314.
- India Augmented Reality and Virtual Reality Market. (2021). *Research and Markets*. Retrieved from https://www.researchandmarkets.com/reports/5401729/india-augmented-reality-and-virtual-reality?utm_source=BW&utm_medium=PressRelease&utm_code=mwr69t&utm_campaign=1592426+-+India+%241.83+Bn+Augmented+Reality+and+Virtual+Reality+Market+Analysis%2c+Competition%2c+Forecast+%26+Opportunities%2c+2017-2020+%26+2021-2027&utm_exec=chdo54prd

- Straus, W., Howe, N., & Markiewicz, P. (2006). Millennials and the Pop Culture: Strategies for a New Generation of Consumers in Music, Movies, Television, the Internet, and Video Games. Great Falls, VA: Life Course Associates
- Doorn, J.V., Hoekstra, J.C. (2013). Customization of online advertising: The role of intrusiveness. *Marketing Letters*, 24, 339–351. <https://doi.org/10.1007/s11002-012-9222-1>