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ADVANCES IN GLOBAL SERVICES AND RETAIL MANAGEMENT

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ISBN 978-1-955833-03-5

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ISBN 978-1-955833-03-5

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Does Millennial Shopping Orientation Using Augmented Reality Enabled Mobile Applications Really Impact Product Purchase Intention?

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Abstract

Augmented reality (AR) applications have emerged as rapidly developing technology used in both physical and online to enhance the purchase intention. However, the research on product purchase intention using AR enabled mobile applications is still inconclusive. Thus this study is an attempt to examine whether augmented reality enabled mobile applications really impact the product purchase intention of Millennials. The study employed a survey questionnaire and administered directly to the respondents to collect the primary data. The results indicate that hedonic motivation, Telepresence, perceived ease of use, and service quality are positively related to product purchase intention whereas there is no significant difference between gender in AR enabled mobile applications.

Keywords: augmented reality, hedonic motivation, telepresence, perceived ease of use, service quality, purchase intention

Recommended Citation: Kumar, A. (2021). Does millennial shopping orientation using augmented reality enabled mobile applications really impact product purchase intention? In C. Cobanoglu, & V. Della Corte (Eds.), *Advances in global services and retail management* (pp. 1–8). USF M3 Publishing. <https://www.doi.org/10.5038/9781955833035>

Introduction

Smartphones are becoming more popular tools for interaction in the present era as a medium of communications. With the advancement in technology new trends are coming in the market and ‘Augmented Reality’ is one of them to create a better live experience for the consumers. Augmented Reality (AR) can be said as the technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view. Such mobile technology diffusion can be seen in all segments of the society in the last few years (Salehan & Negahban, 2013). The potential of AR can be seen in market research anticipation and projected it to be \$72.7 billion by 2024(Singh, 2020) because the 1.9 billion monthly active users by 2022 boost the mobile AR applications (Tractica, 2017). Augmented reality (AR) shows the visual alignment of virtual content with real-world contexts and is a topic of immense interest particularly in the field of mobile marketing (Shankar et al., 2016). AR facilitates interaction of the consumers with the virtual products in innovative and creative form (McCormick et al., 2014). The AR creative and innovative features improve the visualization of the products and brand image to increase the buying intention of the consumers (Bonetti et al., 2018). The Millennials are highly ambitious and they expect hustle free shopping experience both online and offline (Cummins et al., 2016). The existing literature found that out of 100 internet users globally 80% of them used their mobile phones for browsing purposes (Chaffey, 2016). Such technological innovations also have the scope to change the business dimensions globally (Pantano, 2016) and AR applications should be

developed in such a manner to increase the satisfaction of consumers (Poushneh et al., 2017). Thus, it required to determine the impact of AR on customer shopping intention and experience (Shankar et al., 2016). Further, the available literature shows the importance of the field and attraction of academicians towards AR research in the last few years (Wedel, Bigne, & Zhang, 2020, Yim et al., 2017; Hilken et al., 2017; Javornik et al., 2016). All these research focused on a particular aspect of consumers and provides important direction but fail to clearly answer how consumer purchase intention is influenced by augmented reality. Thus, it becomes necessary to examine it thoroughly to get the answer. Furthermore, the AR industry in India is in its initial phase though it has potential to grow. The research firm Augmented Reality and Virtual Reality Market projected its growth at a CAGR of over 55% during 2016-2021. Finally, the existing academic research is inconclusive regarding the uses of AR to understand the consumer shopping intention. In line with this, this research addresses the research gap by concentrating on what factors drive consumers' intention to purchase using AR enabled mobile applications?

Literature Review

With the rapid use of smartphones among the people an unprecedented growth can be seen in augmented reality (AR) enabled mobile applications (Javornik et al., 2016). Such technological advancement in AR with customized and personalized features facilitates consumer oriented interactions using mobile applications. For example, IKEA's AR app 'irrespective of the surroundings provides the width and height of the piece of furniture through the camera and seems as real. Most of the existing studies explore customer experience on AR enabled mobile app based shopping to determine their motivations and reactions (Yim et al., 2017; Hilken et al., 2017, Beck and Crié, 2018). The existing studies present that shopping using AR enabled mobile applications results in higher satisfaction of the customers as well as it benefitted the retailers also (Dacko, 2017). In a study (Zach, and Tussyadiah, 2017), examine the prospects of AR enabled mobile games in a tourism context and found players were willing to travel overnight to play the games. Such innovations in technology could be a new experience for marketers. It is evident from the previous studies that AR enabled mobile technology brings positive reactions from customers and they wish to willingly visit such stores (McCormick et al., 2014, Pantano, 2016). Due to speed up the purchase process in functional and hedonic roles consumers' react positively towards AR (Huang and Liu, 2014). AR enabled virtual environments provide product information as it seems in physical form (Poncin and Mimoun, 2014). Therefore, it helps in removing the uncertainty about the product and reduces the cognitive risk. Still different authors present different views on the long-term benefits of AR. For some authors it is just a tool for promotion (Woods, 2009) while the others think it as building brand relationships and bringing satisfaction to consumers (Owyang, 2010; Chou, 2009). The literature suggests that hedonic benefits and quality of augmented reality helps in improving the attitude of consumers' towards brands (Rauschnabel et al., 2019; Poushneh and Vasquez-Parraga, 2017). The customers evaluate the augmented quality with his experience and kind of enjoyment from it (Poushneh, 2018). Further, in another study the hedonic benefits brings motivation to the customers towards AR enabled mobile technology (Yim et al., 2017). However, AR enabled mobile technology can make shopping better/efficient and apps also help to entertain but customers didn't rate entertainment higher than efficiency (Dacko, 2017). Telepresence is the technical aspect of presence, which measures the extent to which the consumer feels herself/himself immersed in the virtual shopping environment as if they can have physical engagement with the products (Algharabat et al., 2018;). A higher level of telepresence enables consumers to visualize the physical environment through immersing into the artificial one (Park,

Ahn, & Kim, 2010). Various empirical studies have shown the profound impact of telepresence on consumers' purchase intentions (Ye et al., 2020; Lee, 2018; Lu, Fan, & Zhou, 2016). However very few studies are available to understand the real impact and get the answer for the question as to how telepresence does influence the online consumers' purchase intention? Suh and Chang (2006) indicated telepresence as an intermediate variable between augmented reality and consumer purchase intention. The literature shows that higher the telepresence perceived by customers, higher their purchase intention (Ye et al., 2020). Perceived ease of use (PEOU) has been used as indicators of users' acceptance of new technologies in recent years. It is assumed that the higher the degree of perceived ease of use of technology for a user, the greater the enjoyment he or she will feel when browsing the platform content that ultimately resulted in product purchasing by the customers (Do et al., 2020). The service quality played a key role in determining the online buying intention of the customers. The existing studies suggested that service quality dimensions are keys to provide satisfactory services to the customers in an online purchasing (Kumar & Lata, 2021; Gupta & Bansal, 2012). In contrast to it, customers do not prefer to purchase from a place where they face lack of service quality or failure in service quality (Silber et al., 2009). Consumers' gender plays an important role in a way that males are proposed to be more open to AR. The reason behind this statement lies in the previous findings of Citrin et al. (2003), that indicates that tactile cues helped a woman to evaluate the products. Similar to it there are findings that show males react more positively to technology innovations than women (Li, Glass, & Records, 2008, Rauschnabel, 2021). The above discussion suggests examining the field from the lens of millennials. Davis (1989), Technology acceptance model (TAM), and its extensions frequently used to measure the customers' acceptance and use of the new technologies. Using the previous literature, TAM and its extended model the study proposes the following hypotheses.

- **H1:** Hedonic motivation and product purchase intention has significant relationship
- **H2:** Telepresence and product purchase intention has significant relationship
- **H3:** perceived ease of use and product purchase intention has significant relationship
- **H4:** Service Quality and product purchase intention has significant relationship
- **H5:** There is a significant difference between male and female regarding product purchase intention and other study variables.

Research Methodology

The deductive approach was used in the present study because it is closely associated with quantitative methods. A survey questionnaire based on 5-point Likert scale was developed and administered directly to the respondents to collect the primary data. The questionnaire was divided into two parts, first being the question related to the demographics of the respondents and the second part dives into the factors that influence their behaviour in augmented reality towards the product purchase intention. The items in the questionnaires were taken from the existing studies. The target population identified for this research was respondents as Millennial (i.e. people born between early 1980's to early 2000's) in Bangalore India. These major attributes in these people are early adopters and regular users of technology, have a higher purchasing power, and highly brand-conscious and demanding customers. The convenience sampling was adopted to collect the primary data because it involves the sample to be drawn from a population that is easy to reach (Perannagari and Chakrabarti, 2019). Total 500 millennials were contacted for this survey, out of this 240 questionnaires were received. Out of these 240, six questionnaires were discarded because of incompleteness. Thus, the actual sample size of this study was 234. Multiple regression analysis

was used to find out the relationship among independent variables with the product purchase intention. Further, the study also finds out the significant mean difference in the product purchase intention among demographic variable gender. Table 1 shows the demographic profile of the respondents.

Table 1. Demographic Profile of the Respondents

		Frequency	Percent
Gender	Male	143	57.26
	Female	91	42.74
	Total	234	
Education	Undergraduate	61	26.07
	Graduate	112	47.86
	Above graduate	61	26.07
Age	21-25	65	27.78
	26-30	119	50.85
	31-35	32	13.68
	36 and above	18	7.69

Findings

The data were analyzed with the help of SPSS 25 and multiple regression analysis techniques were applied to find out the significant impact of independent variables on dependent variables. The result of the regression analysis is shown in table II. In the table II, Adjusted R square is 0.423 which indicates that independent variables bring 42.3 % change in product purchase intention of an individual.

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. Change
1	.658a	.432	.423	.46170	.432	43.617	4	229	.000

a. Predictors: (Constant), SQ, PEOU, TELP, HM

Further, from the table III, ANOVA table, it is clear that p value is less than 0.05 and an indication that the impact is at a significant level.

Table 3. ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	37.190	4	9.298	43.617	.000 ^b
	Residual	48.814	229	.213		
	Total	86.005	233			

a. Dependent Variable: PPI

b. Predictors: (Constant), SQ, PEOU, TELP, HM

Further, from the table IV, it is clear that all the variables have significant relationship with product purchase intention. From Table IV, the highest beta value (0.314) is for Telepresence (TELP) and its significance also. This means the variable Telepresence has the highest impact on product purchase intention. Thus it is the most significant variable. In contrast, the lowest beta value between product purchase intention and perceived ease of use is 0.145 which is least important. Thus it can be concluded that the study variables have significant predictor power.

Table 4. Coefficients Table in the Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients		T	Sig.
	B	Std. Error	Beta			
1 (Constant)	.420	.136			3.090	.002
PEOU	.138	.055	.145		2.524	.012
HM	.184	.072	.164		2.561	.011
TELP	.247	.050	.314		4.943	.000
SQ	.213	.057	.223		3.716	.000

a. Dependent Variable: PPI

The study is Multicollinearity free because the VIF values are below 10 and none of the tolerance levels is less than or equal to 1. The study also shows that there is no autocorrelation in the collected data because the value of Durbin Watson is between the acceptable ranges (i.e. of 2.148). The threshold value for Durbin Watson should be between 1.5 to 2.5 .

One-way analysis of variance is used to determine whether there is any statistical significance between the gender versus the various constructs included in the study. As shown in table V, it is clear that there is no difference between male and female respondents regarding product purchase intention using AR enabled mobile applications.

Table 5. ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
PEOU	Between Groups	.025	1	.025	.061	.806
	Within Groups	95.061	232	.410		
	Total	95.086	233			
HM	Between Groups	.313	1	.313	1.076	.301
	Within Groups	67.574	232	.291		
	Total	67.888	233			
TELP	Between Groups	.042	1	.042	.070	.792
	Within Groups	138.638	232	.598		
	Total	138.679	233			
PPI	Between Groups	.075	1	.075	.202	.654
	Within Groups	85.930	232	.370		
	Total	86.005	233			
SQ	Between Groups	.009	1	.009	.022	.883
	Within Groups	93.579	232	.403		
	Total	93.588	233			

The results as shown in the table indicate that there is no difference between gender and the study variables. Thus hypothesis H5 is rejected and it is thus concluded that there is no significant difference for male and female and purchase intention as well as other study variables. However, men react more positively to technology innovations than women (Rauschnabel, 2021). Further, the mean is higher for males for hedonic motivation, and Telepresence while in rest of the variables female mean value is higher as shown in table VI. Although these are not significant still it is worth considering that product purchase intention, perceived ease of use and service quality are important factors for females.

Further, from the table IV, it is clear that all the hypotheses are accepted at significant level 0.05 and concluded that study variables positively influenced product purchase intention. As we propose in H1, hedonic motivation and product purchase intention has significant relationship. The hypothesis is accepted ($t=2.561$, $p = 0.011$). This result is in conformance with the previous findings also. As literature suggest that consumer's react positively towards AR because of the hedonic benefits (Huang and Liu, 2014) because it help in removing the uncertainty about the

product and bring satisfaction to consumers. The literature also suggests that hedonic benefits and quality of augmented reality helps in improving the attitude of consumers' towards brand (Rauschnabel et al., 2019; Poushneh and Vasquez-Parraga, 2017).

Table 6. Descriptive Statistics

	Study variables	N	Mean	Std. Deviation
PEOU	1	134	2.07	0.69
	2	100	2.09	0.56
HM	1	134	1.99	0.55
	2	100	1.92	0.53
TELP	1	134	2.43	0.83
	2	100	2.40	0.68
PPI	1	134	2.10	0.70
	2	100	2.14	0.47
SQ	1	134	2.10	0.67
	2	100	2.12	0.59

In H2, we propose that telepresence and product purchase intention has significant relationship. This hypothesis is also accepted ($t= 4.943$, $p= 0.00$). The findings are well supported with previous studies (Ye et al., 2020; Lee, 2018; Lu, Fan, & Zhou, 2016; Algharabat et al., 2018). A higher level of telepresence enables consumers to visualize the physical environment that ensure that higher the telepresence perceived by customers, higher their purchase intention (Ye et al., 2020). In third hypothesis H3, we propose that perceived ease of use and product purchase intention has significant relationship. The results are accepted ($t= 2.524$, $p=0.012$). The findings are according to the existing literature. It is assumed that the higher the degree of perceived ease of use of technology for a user, the greater the enjoyment he or she will feel when browsing the platform content that ultimately resulted in product purchasing by the customers (Do et al., 2020). The hypothesis fourth proposed as service quality and product purchase intention has significant relationship. The analysis result is accepted (3.716 , $p = 0.00$) and also according to the previous studies (Kumar & Lata, 2021; Gupta & Bansal, 2012). These results can be shown as follow in the equation form-

- $PPI=0.420+0.145*PEU+0.164*HM+0.314*TELP+0.223*SQ$

Conclusions

Augmented Reality enabled mobile applications have attracted the researchers and this is a kind of study to examine product purchase intentions of millennials in India. Since, scant research has investigated how these applications impact the product purchase intention of millennials. To address this research gap, the study proposes and empirically tests five hypotheses to explain consumers' product purchase intention. The results of this study show that hedonic motivation, Telepresence, perceived ease of use, and service quality are positively related to product purchase intention whereas no significant difference between gender in AR enabled mobile applications. In particular, we show that millennials product purchase intention is mostly driven by Hedonic Motivation, service quality, Telepresence, and Perceived ease of use. Additionally, the study also found no difference between millennials male and female consumers using augmented reality enabled mobile applications. The reason lies in the fact that Millennials are mostly working

couples, having higher purchasing capacity and technology savvy consumers. This is a new finding of this study and contradicts the previous study (Dacko, 2017). The study is of great interest to technology based companies for their business opportunities to better understand the new generation needs. Further, it would also benefit the marketing professionals to get a better idea about young consumer's product purchase intentions. Due to the interdisciplinary nature of the AR field the research is not limited to only the technology field but it also prevailed in the marketing field and its consequences results scattered and inconclusive. With the help of organised review of the literature thoroughly can provide future research direction. The future research could be conducted to analyze the AR potentials in mobile applications to facilitate the future consumer in better purchase decision making. This would enhance the adoption and implementation of AR in mobile application. Further, the limited geographical coverage of the study also limits generalizability of these findings. Thus, it is required to conduct a cross country research or increase the broader coverage of the population for future research to better understand the drivers of such AR enabled mobile applications.

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Acknowledgements

Thanks a lot to the reviewers for their valuable feedback and comments.