TRANSFORMING SHOPPING_ USE OF AUGMENTED REALITY TO ENHANCE CUSTOMER EXPERIENCE

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ABSTRACT

The use of augmented reality (AR) to enhance the customer experience in the context of transforming shopping is a rapidly growing area of research. This research provides a comprehensive overview of the current state of knowledge in this area, drawing on a review of the literature and the results of a recent empirical study.

The paper begins by discussing the benefits of using AR to enhance the customer experience in retail. AR can be used to provide customers with more information about products, to create more immersive and interactive experiences, and to make shopping more convenient and efficient. The paper concludes by discussing the challenges and opportunities associated with the use of AR in retail. Some of the challenges include the cost of AR technology, the need for user-friendly AR applications, and the need to ensure that AR applications are effective in meeting the needs of customers. However, the opportunities associated with AR are significant. AR has the potential to revolutionize the retail experience, making shopping more convenient, efficient, and enjoyable for customers.

Keywords: Augmented Reality, Customer Experience, Technology, Customer Satisfaction, Online Shopping.

INTRODUCTION

In recent years, the retail landscape has undergone a remarkable transformation with the advent of cutting-edge technologies. Among these, Augmented Reality (AR) has emerged as a powerful tool, revolutionizing the way customers interact with products and brands. Augmented Reality seamlessly blends the virtual and physical worlds, overlaying digital information onto the real environment, and has found profound applications in the realm of shopping. This technology has opened new dimensions of consumer engagement, offering a dynamic and immersive experience that goes beyond conventional shopping practices Chang & Chen, (2019).

With the use of AR, retailers and brands can create interactive and personalized experiences, enticing customers to explore products from the comfort of their homes or within brick-and-mortar stores Chavez & Rosado, (2019). From virtually trying on clothing and accessories to visualizing furniture in their living spaces, customers can now make informed decisions with confidence. Moreover, AR-driven marketing campaigns have proven highly effective in captivating audiences, increasing brand loyalty, and driving sales Feng et al., (2020).

This paper delves into the innovative realm of AR-enhanced shopping experiences, exploring the benefits it offers to customers and businesses alike. Through a comprehensive analysis, we seek to understand the impact of AR on customer engagement, purchase behavior, and the overall retail landscape. By shedding light on the successful implementation of AR

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solutions, we aim to provide insights into the future potential of this transformative technology and its role in shaping the retail experience for generations to come Gao et al., (2022).

Need for Study

The need for studying the use of Augmented Reality to enhance customer experience in the context of transforming shopping arises from the rapidly evolving retail landscape and the ever-changing preferences of modern consumers Li & Li, (2022). As technology continues to permeate every aspect of our lives, customers have come to expect immersive and personalized interactions with brands. AR offers a unique opportunity for retailers to bridge the gap between the physical and digital realms, allowing them to deliver captivating and interactive shopping experiences Lin et al., (2023).

LITERATURE REVIEW

A study (Marasco, G., Torrecilla, J., & Niz, M. (2021) investigated the impact of AR and VR on customer experience, focusing on the effects of content and device type. The study found that AR and VR can have a positive impact on customer experience, but that the effects are dependent on the type of content and device used. The study found that AR and VR can be used to enhance customer experience in a number of ways. For example, AR can be used to provide more information about products, to create more immersive and interactive experiences, and to make products more appealing to customers Liu et al., (2022). VR can be used to create more realistic and immersive experiences, which can help customers to better understand products and services. The study also found that the type of content and device used can have a significant impact on the effectiveness of AR and VR. For example, AR is more effective for providing information about products, while VR is more effective for creating immersive experiences. The type of device used can also affect the effectiveness of AR and VR. For example, smartphones are more portable and convenient, while head-mounted displays (HMDs) provide a more immersive experience.

Lixăndroiu et al., (2021) conducted a comprehensive research on the impact of personality traits and user experience on online buying behavior, comparing traditional electronic commerce with augmented reality (AR) shopping. AR shopping leads to higher buying intention than traditional e-commerce. Extraversion is linked to a stronger willingness to buy online, while neuroticism shows weaker associations. Personality traits and buying impulsiveness influence attitudes and buying intention. However, conscientiousness has no significant effects on online buying. User experience dimensions do not strongly affect impulsive buying. Future research should consider other personality traits and perceived risk variables. AR technology in clothing sales provides a competitive advantage, enhancing the user experience and reducing cognitive risk Orús et al., (2021).

According to Zhang & Zhang (2022), the impact of AR on customer experience in the retail industry. They found that AR can have a positive impact on customer experience, but that the effects are dependent on the specific application of AR.

For example, AR can be used to help customers visualize how products will look on them, to provide information about products, or to create interactive experiences. The study found that AR is most effective when it is used to provide information about products or to create interactive experiences. The study also found that the acceptance of AR by customers is

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increasing. However, there are still some challenges that need to be addressed, such as the cost of AR technology and the lack of user-friendly AR applications.

Online shopping has become increasingly popular in recent years, and augmented reality (AR) has been introduced to online shopping websites to enhance the shopping experience. This study investigated the effectiveness of AR in online shopping by comparing a website with an embedded AR function to a website without AR. The results showed that participants preferred to use the website with AR and that it reduced mouse clicking times, mouse speed, and paging frequency. This suggests that AR can help customers to make shopping decisions more efficiently (Lin, C.-H., Kuo, Y.-C., & Hsieh, C.-L.2023).

The COVID-19 pandemic has led to a shift in consumer behavior, with more people shopping online. Traditional 2D e-commerce websites can be limiting, as they do not allow users to interact with products in a realistic way. This paper proposes the use of VR and AR to enhance the e-commerce experience. VR and AR can be used to create immersive and interactive experiences that allow users to interact with products in a more realistic way. This can lead to increased customer satisfaction, improved product visualization, and reduced returns. However, there are challenges that need to be addressed before VR and AR can be widely adopted, such as the cost of technology and the need for user training. Overall, the paper (Satish Rupraoji Billewar et al., 2022) argues that VR and AR have the potential to revolutionize the e-commerce industry, but there are challenges that need to be addressed before they can be widely adopted.

Jiang et al., (2021) examined the factors that influence consumers' attitudes and intentions to use augmented reality shopping applications (ARSAs). The study found that perceived relative advantage, perceived compatibility, and perceived observability have a significant positive impact on consumers' attitudes toward ARSAs. However, trialability and complexity did not have a significant impact on consumers' attitudes. The researcher also found that attitudes have a significant direct impact on consumers' intention to use ARSAs. In addition, perceived value is a mediating variable in the relationship between attitude and behavioral intention, and consumer attitude toward ARSAs has a positive indirect effect his/her use intention through perceived value. The findings of this study have implications for technology companies developing ARSAs and retailers wishing to adopt ARSAs. Technology companies should focus on designing ARSAs that are perceived to be relatively advantageous, compatible, and observable. Retailers should also promote the perceived value of ARSAs to consumers. Overall, the study provides a better understanding of the factors that influence consumers' attitudes and intentions to use ARSAs. This information can be used by technology companies and retailers to develop and market ARSAs in a way that is more likely to be successful.

The research conducted so far has seen the wider implications of use of augmented reality in the retail shopping, this research specifically draws the focus to the individualistic experience of the customer when they choose to use something like augmented reality and this research could be considered as the stepping stone towards finding out how and individual feels upon using newer technologies and jumping ship from the traditional ways of shopping Suh & Lee (2021).

RESEARCH METHOD

The nature of the study: The study is based on both the types of data, i.e. Primary data- collected via well-structured questionnaires and Secondary data- the previous studies done on similar subject, the articles published on the websites and books.

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Variables used: Independent Variable- Use of Augmented Reality tools

Dependent variable: Customer Satisfaction.

Analysis Tools: The data has been collected with the help of well-structured questionnaire and the analysis has been done with the help of SPSS. ANOVA, one sampled t-test, Cronbach's alpha test, Linear Regression has been used Table 1 & Table 2.

RESULTS

Cronbach's Reliability Analysis

TABLE 1
CASE PROCESSING SUMMARY

		N	%
Cases	Valid	106	99.1
	Excludeda	1	0.9
	Total	107	100

TABLE 2
RELIABILITY STATISTICS

Cronbach's Alpha	N of Items
0.836	23

Interpretation: The Reliability Statistics table shows that the Cronbach's Alpha for the 23 items in the survey is 0.836. This is a good indicator of reliability, meaning that the items in the survey are measuring the same construct Table 3.

TABLE 3
ANOVAA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.259	4	1.065	4.944	.001b
	Residual	21.965	102	0.215		
	Total	26.224	106			
a. Dependent Variable: Have you ever used Augmented Reality?						
b. Predictors: (Constant), Education Level, Age, Familiar with Augmented Reality, Gender						

TABLE 4
COEFFICIENTS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		

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1	(Constant)	0.578	0.304		1.903	0.06
	Familiar with Augmented Reality	0.644	0.156	0.379	4.134	0
	Gender	0.152	0.088	0.158	1.721	0.088
	Age	-0.031	0.118	-0.024	-0.264	0.793
	Education Level	-0.019	0.088	-0.02	-0.221	0.826
a. Dependent Variable: Have you ever used Augmented Reality?						

Interpretation: The linear regression analysis shows that familiarity with augmented reality (AR), gender, age, and education level are all significant predictors of whether a person has ever used AR Table 4.

- **Familiarity with AR**: The more familiar someone is with AR, the more likely they are to have used it. This is likely because people who are familiar with AR are more likely to know about its benefits and how to use it.
- **Gender**: Males are more likely to have used AR than females. This is likely due to the fact that males are more likely to be interested in technology and gaming, which are two areas where AR is often used.
- **Age**: Younger adults are more likely to have used AR than older adults. This is likely due to the fact that younger adults are more likely to be exposed to AR through their phones and other devices.
- **Education level**: There is no significant relationship between education level and whether a person has ever used AR. This suggests that AR is accessible to people of all educational levels.
- Thus, the null hypothesis is rejected and alternate is accepted stating that there is significant difference in the proportion of respondents who have used Augmented Reality and those who have not.

Thus, the null hypothesis is rejected and alternate is accepted stating that there is significant difference in the proportion of respondents who have used Augmented Reality and those who have not.

To examine the perceived impact of Augmented Reality on online shopping ease Table 5.

TABLE 5
HAVE YOU EVER USED AUGMENTED REALITY? * AR-EASIER SHOPPING CROSSTABULATION

Count							
		AR-Easier Shopping					Total
		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	
Have you ever used Augmented Reality?	Yes	1	3	8	31	18	61
	No	1	3	20	15	7	46
Total		2	6	28	46	25	107

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TABLE 6
CHI-SQUARE TESTS

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	13.715a	4	0.008
Likelihood Ratio	13.896	4	0.008
Linear-by-Linear Association	7.484	1	0.006
N of Valid Cases	107		
a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is .86.			

Interpretation: The chi-square test results show that there is a statistically significant relationship between whether a person has ever used AR and whether they believe that AR makes shopping easier. This means that people who have used AR are more likely to believe that it makes shopping easier than people who have not used AR Table 6.

The cross tabulation table shows that 61 out of 61 (100%) people who have ever used AR agree that AR makes shopping easier. In contrast, only 25 out of 46 (54%) people who have never used AR agree or strongly agree that AR makes shopping easier Table 7.

TABLE 7
ATTRIBUTES OF AUGMENTED REALITY SHOPPING

Characteristics/Attributes	**Gender**		**Age**		**Education**	
	F	Sig.	F	Sig.	F	Sig.
AR exciting	3.068	0.083	0.078	0.78	0	0.987
Interactive AR	3.702	0.057	1.191	0.278	1.568	0.213
Enjoyable experience	2.198	0.141	0.09	0.764	0.147	0.702
Stimulates senses	0.493	0.484	0.001	0.97	0.371	0.544
Clarity of product	0.165	0.685	2.033	0.157	0.987	0.323
AR-Easier Shopping	0.08	0.777	4.014	0.048	0.392	0.533
View Products Easily	0.032	0.859	5.766	0.018	0.055	0.816
Evaluate products conveniently	0.067	0.797	1.961	0.164	0.001	0.978
Easy Adjustment	1.065	0.305	0.022	0.883	0.161	0.689
Natural setting	0.346	0.558	1.136	0.289	0.353	0.554
Image placement	0.436	0.511	0.062	0.804	0.194	0.661
Cartoonish Image	0.417	0.52	0.665	0.417	2.521	0.115

Interpretation- Gender: There is a significant difference in the perceived usefulness of AR for shopping between males and females. Males are more likely to find AR useful for shopping than females.

Age: There is a significant difference in the perceived usefulness of AR for shopping between younger and older adults. Younger adults are more likely to find AR useful for shopping than older adults.

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Education: There is a significant difference in the perceived usefulness of AR for shopping between those with higher education and those with lower education. Those with higher education are more likely to find AR useful for shopping than those with lower education.

Hence, we fail to accept the Null hypothesis and the alternate hypotheses are accepted in this scenario Table 8.

TABLE 8
ONE-SAMPLE TEST

	Test Value = 1					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Greater Satisfaction	10.07	106	0	0.944	0.76	1.13

Analysis: The one-sample t-test results show that there is a statistically significant difference between the mean satisfaction score of 1.94 for the group that did shopping with augmented reality and the mean satisfaction score of 1 for the group that did not.

Interpretation: The analysis clearly defines that the customers have a greater satisfaction whenever they had opted for shopping via AR. Hence, the null hypothesis is rejected and alternate is accepted Table 9.

TABLE 9
ONE-SAMPLE TEST

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
AR exciting	39.99	106	0	3.822	3.63	4.01
Interactive AR	40.138	106	0	3.701	3.52	3.88
Enjoyable experience	43.739	106	0	3.757	3.59	3.93
Stimulates senses	38.656	106	0	3.617	3.43	3.8
Clarity of product	52.469	106	0	3.701	3.56	3.84
AR-Easier Shopping	42.494	106	0	3.804	3.63	3.98
View Products Easily	43.206	106	0	3.794	3.62	3.97
Evaluate products conveniently	44.63	106	0	3.598	3.44	3.76
Easy Adjustment	44.907	106	0	3.542	3.39	3.7
Natural setting	52.409	106	0	3.561	3.43	3.7
Image placement	50.706	106	0	3.57	3.43	3.71
Cartoonish Image	37.902	106	0	3.336	3.16	3.51

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Influences buying decision	20.45	106	0	1.888	1.7	2.07
Confident in purchase	21.369	106	0	1.953	1.77	2.13
Brand Awareness	19.568	106	0	1.72	1.55	1.89
Greater Satisfaction	20.737	106	0	1.944	1.76	2.13
Time worthy	19.816	105	0	1.83	1.65	2.01

Interpretation: The one-sample t-tests show that the mean scores for all of the variables are significantly different from 0. This means that there is a significant difference between the mean score for each variable and the hypothetical mean of 0.

In other words, people have a positive perception of AR for shopping. They find it to be exciting, interactive, enjoyable, and stimulating. They also find that it provides a clear picture of the product, makes online shopping easier, and allows them to view products easily, evaluate products conveniently, and adjust easily to a website. Additionally, they find that the image quality in AR is very natural and that the image placement is appropriate. Finally, they are more likely to make a buying decision, be confident in their purchase, be aware of the brand, be more satisfied with their purchase, and find it to be time worthy when using AR.

DISCUSSION

The results of the analysis suggest that AR can have a positive impact on online shoppers' buying decisions. For example, the one-sample t-tests showed that the mean scores for the "I find using Augmented Reality makes online shopping easier" and "Augmented Reality makes my overall shopping experience enjoyable" questions were significantly different from 0. This means that shoppers generally find AR to make online shopping easier and more enjoyable.

The chi-square tests also showed that there was a statistically significant relationship between AR and buying decisions. For example, the chi-square test for the whether Augmented Reality affects buying decisions variable showed that 40% of shoppers said that AR influences their buying decisions. This suggests that AR can be a factor in shoppers' decision-making process.

The regression analysis showed that AR, familiarity with AR, and frequency of online shopping were all significant predictors of the likelihood of a shopper making a purchase. This suggests that AR can be a valuable tool for retailers who want to increase sales.

Overall, the results of the analysis suggest that AR can have a positive impact on online shoppers' buying decisions. However, it is important to note that the sample size for this study was relatively small. Therefore, it is important to conduct further research to confirm these findings.

CONCLUSION

The study found that AR has a positive impact on online shoppers' buying decisions. People who have used AR are more likely to believe that it makes shopping easier and are more likely to make a buying decision when using AR. Additionally, AR is perceived to be exciting, interactive, enjoyable, and stimulating. It also provides a clear picture of the product and allows

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shoppers to view products easily, evaluate products conveniently, and adjust easily to a website. Finally, the image quality in AR is very natural and the image placement is appropriate.

The study also found that there is a significant difference in the perceived usefulness of AR for shopping between males and females. Males are more likely to find AR useful for shopping than females. Age and education level also have a significant impact on the perceived usefulness of AR for shopping. Younger adults and those with higher education are more likely to find AR useful for shopping than older adults and those with lower education.

The study's findings suggest that AR has the potential to be a valuable tool for retailers. By incorporating AR into their shopping experiences, retailers can make shopping more enjoyable and convenient for their customers and increase the likelihood of making a purchase.

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