

Factors Impacting the Adoption of Augmented Reality in Online Purchases

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ABSTRACT

Digital technologies have brought tremendous business transformations in the past. At present disruptive digital technologies like Artificial Intelligence, Machine Learning, Augmented Reality, Virtual Reality, Block-chain (AI, ML, AR, VR) are changing the way in which the business operations take place virtually. Ecommerce has emerged as a powerful platform in the recent past. Earlier the look and the feel on a Virtual platform for buying and selling was a challenge. Now a days with the help of disruptive digital technologies we are able to overcome these challenges. Digital content can be augmented onto a live camera feed in augmented reality (AR), so that it appears to be part of the physical world. The objective of Virtual Reality (VR) is to create a computer-generated environment that resembles the real world with scenes and objects that are real enough to make a user feel immersed in their environment. The purpose of this study is to identify the factors affecting the adoption of Augmented Reality in online purchases through Flipkart. To attract more customers and to become success in E-commerce platforms technology plays main role. In this study the following four factors are identified Perceived Ease of Use, Innovation Seeking Behavior, Perceived usefulness, Shopping Experience Seeking Behavior used to determine the consumer's adoption of Augmented Reality towards online purchase. These factors contribute significantly to the adoption of AR.

Introduction:

Online Shopping has been the major influencer when it comes to disruption of retail channels. It made many shops and brands to go multi-channel and diverse into fields that were not present before. It helped them reach markets that were inaccessible before and helped them target more specific consumers. Technologies like 'Augmented Reality' promises to induce a breath of fresh air into online channels.

Augmented Reality (AR) is a technology that implies computer-generated upgrades on top of current reality so as to make it more important through the capacity to communicate with it. Augmented reality includes design, sounds, haptic feedback and odour to the normal world as it exists. Both computer games and mobile phones are driving the advancement of augmented reality. Companies like lenskart and imagination are few of the big companies that have adopted AR to provide different solutions.

Biggest challenge of online shopping is that customers can't able to experience the product before buying it. In a brick-and-mortar environment, the customers can experience the product before buying it. While those things are not possible in ecommerce, but augmented reality (AR) offers a way to give customers deeper and more complete information about the products, right from their own home.(Big Commerce, 2003)

Review of literature:

Study says that the influence of innovativeness has a conceivable relationship behavior towards interactive augmented reality (Huang & Liao, 2015).

Online medium is one of the more attractive mediums that has significantly impacts the trial of augmented reality and people those who believes that augmented reality also makes online shopping as an involved process (Chakraborty & Gupta, 2017).

Study offer deeper understanding into the TOE framework for the adoption of AR technologies by e-commerce firms. Further, on the practical front, the study helps the e-commerce firms to strategize and focus on specific factors to implement augmented reality effectively.(Kumar et al., 2016)

This paper concludes with the results of the study pointing towards a highly positive attitude towards the acceptance of this AR technology. Augmented reality could potentially be the biggest thing in e-commerce since the search engine. It's a great concept from the desktop, but mobile takes it to a whole different level.(Kannaiah & Shanthi, 2016)

This study indicates that the AR embedded online shopping system can help customers to increase the effectiveness and satisfaction of performing online shopping. In this study, an AR

embedded online shopping system was constructed, and it was compared with the original online shopping system without AR function.(Lu & Smith, 2008)

In this study, a formal usability study was designed and conducted. Study developed an AR e-commerce system and studied the effectiveness of AR for enhancing e-commerce. verified that the developed AR e-commerce system could be used to provide more direct product information to online shoppers and thereby help them make better purchasing decisions.(Wang et al., 2015)

Research Methodology:

Conceptual Model & Hypothesis

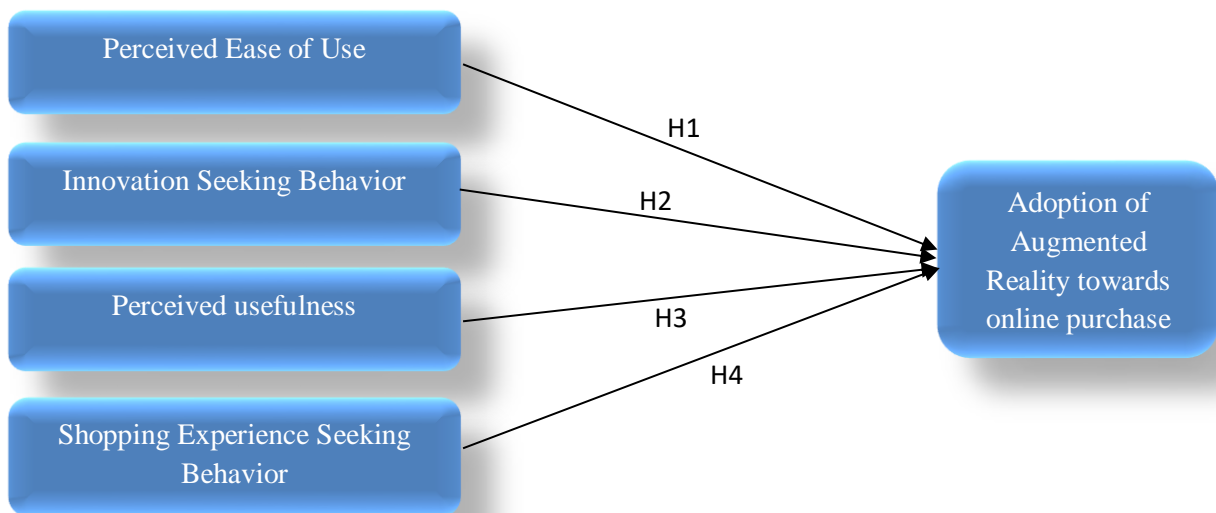


Figure 1: Conceptual Model of factors influencing Adoption of Augmented Reality towards online purchase

Perceived Ease of Use (PEOU)

This factor is adopted from the research paper of (Huang & Liao, 2015). Perceived ease of use, measures a person's belief that using a particular system is hassle-free. Using augmented reality in online purchases can enhance the probability of purchasing suitable product and by the help of augmented reality a consumer can view the product in the place where the consumer wants to place it easily with the help of mobile phone.

H1: “Perceived Ease of Use” has a significant impact on “Adoption of Augmented Reality towards online purchase”

Innovation Seeking Behavior (ISB)

The innovativeness sub-scale of the scale developed by (Parasuraman & Colby, 2015). Augmented reality is an innovative concept in online purchases, augmented reality (AR) offers a way to give customers deeper and more complete information about the products, right from their own home (Big Commerce, 2003). Now-a- days technology plays major role, Innovation seeking behavior describes about them who are interested to try new innovative technologies in their daily life.

H2: “Innovation Seeking Behavior” has a significant impact on “Adoption of Augmented Reality towards online purchase”

Perceived usefulness (PU)

According to perceived usefulness, technology should be simple to use (Sankaran & Chakraborty, 2022). Perceived usefulness indicates that the technology should be easy and useful (Lavanya, V., Yousuf, M., & Sankaran, 2021). Using augmented reality can enhance the purchasing decisions.

H3: “Perceived usefulness” has a significant impact on “Adoption of Augmented Reality towards online purchase”

Shopping Experience Seeking Behavior (SESB)

This factor is adapted from the research paper of (Chakraborty & Gupta, 2017), Online shopping saves time and a person and shop anything from anywhere by using devices like mobile, tablets, laptops and pc’s. Online shopping gave us many more options and can-do price comparison easily, an individual can select a suitable product from huge number of options.

H4: “Shopping Experience Seeking Behavior” has a significant impact on “Adoption of Augmented Reality towards online purchase”

Research Methodology

Groups of people with the same or specified characteristics constitute a population. Thousands of Indians buy products through online platforms. The population size of those using online platforms is enormous. For the study, a small part of the population has been selected as a sample. A sample is a subset of the population that is representative of the whole. Using convenience sampling, a large set of population that uses online platforms for purchasing products is sampled. A convenience sampling technique involves the use of a sample that is readily available and non-probability sampling.

Sampling Procedure

The study involves 121 responses collected from a large population of consumers who use Ecommerce platforms. There are 4 unengaged responses out of 121, which have the same ratings across all items on the 7-point Likert scale. The sample size for this study consists of 117 responses, after deleting the unengaged responses.

Instrument Development

The data was collected by circulating Google forms to participants that consisted of a 20-item structured questionnaire and a 7-point Likert scale. The scale items are Perceived Ease of Use, Innovation Seeking Behavior, Perceived usefulness, Shopping Experience Seeking Behavior, and Adoption of Augmented Reality towards online purchase which are adopted from (Chakraborty & Gupta, 2017). In this questionnaire, a 7- point Likert scale was used to determine the factors that influence consumer adoption of augmented reality through online purchase ("1 indicates strongly disagree" & "7 indicates strongly agree").

Data Collection

In this study, primary data were collected online from 121 participants using Google forms. Microsoft excel was used to remove unengaged responses, leading to 117 responses. Data used in this study do not contain any duplicates or missing values.

Data Analysis

Tools Microsoft Excel and IBM SPSS were used for descriptive analysis and for conducting statistical analysis of the data respectively. Reliability analysis was conducted by Cronbach's Alpha which was used to find the internal consistency of the factors.

Descriptive Statistics

Below table 1 describes the demographic information of the responses used for the study, Majority of the respondents are between age group of 18 – 25, followed by the age group of 26 – 35. Male respondents are 86 (74%) and female respondents are 31 (26%). Most of the respondents participated in the study are employed (61), followed by students (45).

Table 1: Demographic Information

Item	Value	Frequency	Percentage
Age	18 - 25	54	46%
	26 - 35	40	34%
	36 - 45	21	18%
	45+	2	2%
Gender	Female	31	26%
	Male	86	74%
Profession	Employee	61	52%
	House wife	6	5%
	Retired	1	1%
	Self-Employee / Business	4	3%
	Student	45	38%

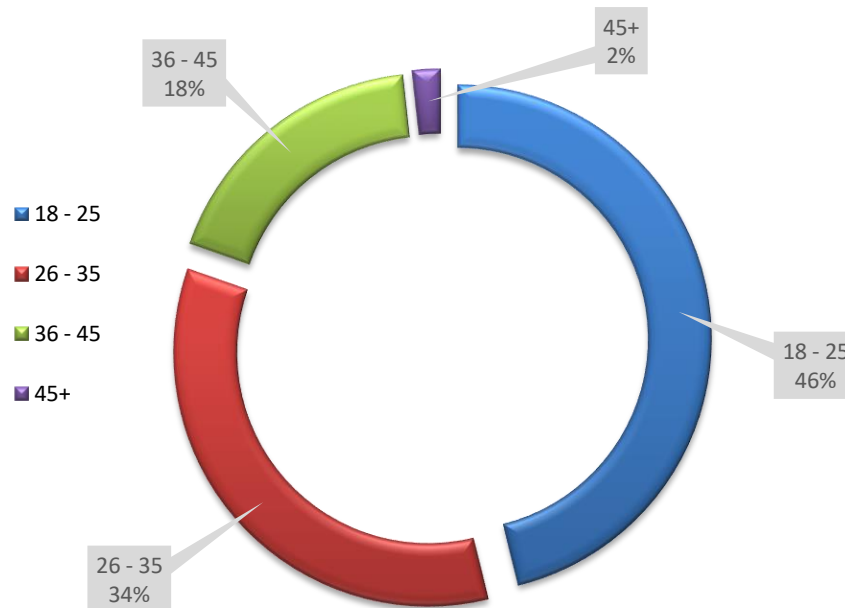


Figure 2: Graphical representation of responses based on Age group

Instrument Validity

Cronbach Alpha value was used to test for internal consistency of the factors impacting the online e-commerce platforms used by consumers. Table-2 shows the Cronbach Alpha values of all the obtained factors. In order to increase consistency, the item AAR4 has been removed from the factor Adoption of Augmented Reality towards Online Purchase (AAR). Each factor had a Cronbach alpha value greater than 0.7 recommended by (Hair et al., 2010).

Table 2: Values of Cronbach Alpha

Factor	Cronbach Alpha
Perceived Ease of Use (PEOU)	0.867
Innovation Seeking Behavior (ISB)	0.885
Perceived Usefulness (PU)	0.912
Shopping Experience Seeking Behavior (SESB)	0.866
Adoption of Augmented Reality (AAR)	0.916

The value of Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.813 which is significant. In terms of significance and KMO measure, the P-value is less than 0.05, which means the data are suitable for further consideration of factor analysis.

Table 3: KMO and Bartlett's Test Summary

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.813
Bartlett's Test of Sphericity	Approx. Chi-Square	1599.640
	df	171
	Sig.	<.001

Factor Analysis

By using IBM SPSS, we identified the distinct factors and reduced the number of items into the most prominent factors. There are five distinct factors observed in table-4, and item AAR4 has been removed for internal consistency. A factor scores of at least 0.5 was observed for all 5 factors.

Table 4: Factor Analysis Pattern Matrix

Pattern Matrix^a					
	Component				
	1	2	3	4	5
PEOU1				.810	
PEOU2				.913	
PEOU3				.848	
PEOU4				.809	
ISB1		.900			
ISB2		.766			
ISB3		.833			
ISB4		.932			
PU1			.571		
PU2			1.007		
PU3			.789		
PU4			.885		
SESB1	.845				
SESB2	.700				
SESB3	.825				
SESB4	.861				
AAR1					.889
AAR2					.852
AAR3					.883
Extraction Method: Principal Component Analysis.					
Rotation Method: Promax with Kaiser Normalization.					

A scree plot is shown below figure-4 which illustrates the downward sloped curve. In this graph, you can see the number of factors is obtained from a factor analysis. Figure-4 illustrates 5 factors, with the curve leveling off after the 5th factor. The curve shows the 5 significant factors from the factor analysis.

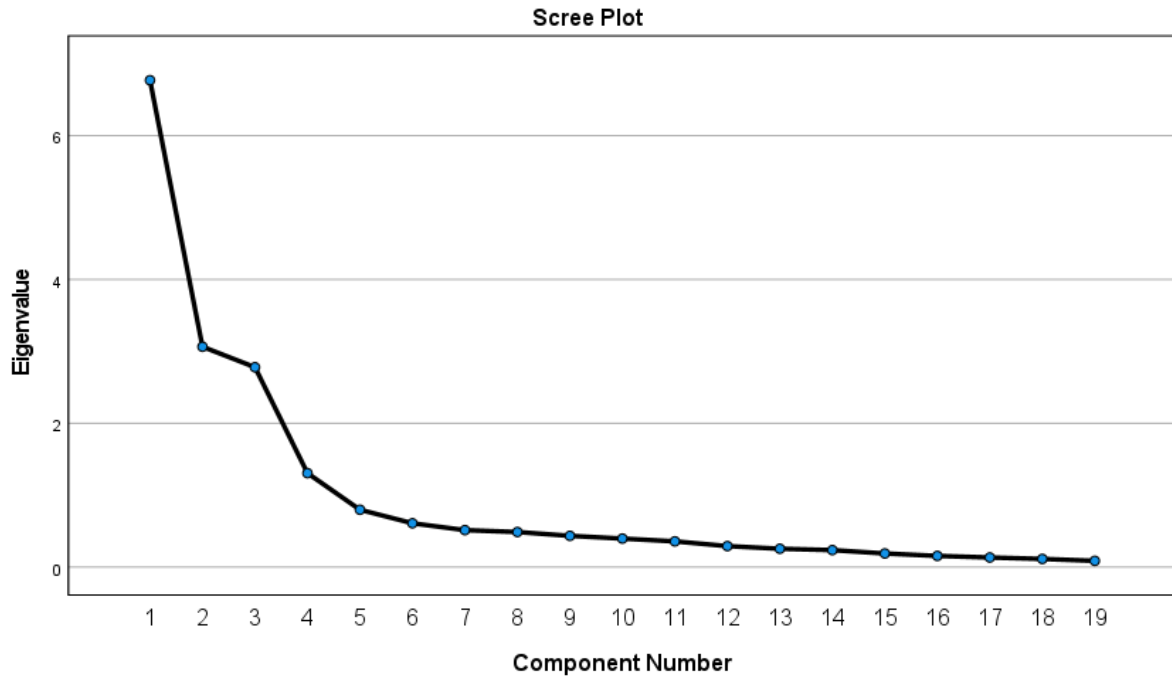


Figure 3: Scree Plot

Table 5: Hypothesis Testing Result of the Model

Hypothesis	Independent Variable	Dependent Variable	Beta value	p value	Result
H1	PEOU	ARR	-0.095	0.161	Not Supported
H2	ISB	ARR	0.039	0.572	Not Supported
H3	PU	ARR	0.358	***	Supported
H4	SESB	ARR	0.468	***	Supported

The significance value of perceived usefulness (PU) and shopping experience seeking behaviour (SESB) are both less than 0.05. Therefore, the adoption of augmented reality towards online purchase (AAR) is supporting perceived usefulness (PU) and shopping experience seeking behaviour (SESB). A significant value is greater than 0.05 for both perceived ease of use (PEOU) and innovation seeking behaviour (ISB). Adoption of Augmented Reality for

online purchases (AAR) shows no support for Perceived Ease of Use (PEOU) and Innovation Seeking Behaviour (ISB).

Conclusion

In India, augmented reality adoption has been strongly affected by perceived usefulness and shopping experience seeking behaviors of consumers who use e-commerce platforms in order to make purchases online. Among the main factors influencing the adoption of augmented reality towards online purchasing in India, perceived usefulness and shopping experience seeking behavior are found to play a significant role. Additionally, the study found that perceived ease of use as well as shopping experience seeking behavior of customers using augmented reality in e-commerce platforms have less influence on the adoption of augmented reality. This means that it may be difficult for the consumer to understand the technology.

Limitations

A very small number of 121 samples were collected for the study. Four samples were removed due to unengaged responses. Study was conducted on 117 samples, which are more from the 18-25 age group. Factors perceived ease of use and Innovation Seeking Behaviour have not supported the Adoption of Augmented Reality towards online purchases. A larger sample size may alter the study's findings. Structural Equation Models can be performed on large data sets.

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