

The Impact of Augmented Reality in Fashion Retail Stores in India: Opportunities and Challenges

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Abstract: Adoption of augmented reality is a significant pattern that has gotten a far-reaching consideration and reception over different industries lately. Especially in the fashion retail industry, the utilization of computer-generated innovation in stores has the potential to rehash the client experience. In this research, we tried to understand the architecture of introduction of the augmented reality in fashion retail stores in India. The various aspects of opportunities and challenges have been considered. Technology in fashion retail stores can motivate the customers to buy and try on more products, leading to an effective progress and profit for the stores. Since its introduction, augmented reality has shown to have good potential in making the process more active, effective and meaningful in other countries. This is because its advanced technology enables users to interact with virtual and real-time applications and brings the natural experiences to the user. Data for this study was gathered through self-administered questionnaires from a sample of respondents who purchase online as well as visit the store and have knowledge and experience of purchasing/shopping. Primary data collection was done using a questionnaire which was tested empirically and secondary data collection was completed by doing literature reviews of research papers. We used the response sheet for analysis and used chi square test. This helped us to process the data and test the hypothesis. The empirical findings support the fact that the merging of augmented reality with retail stores has attracted public attention because of its ability to allow customers to be immersed in realistic experiences. This research discusses the advantages of augmented reality compared to traditional purchasing methods. The review of the results of the research shows that, overall, augmented reality technologies have a positive potential and advantages that can be adapted in fashion retail stores. The result also indicates the limitations of augmented reality which could be addressed in future research.

Keywords: Augmented Reality, Fashion Retail Stores, Smart Mirrors, Virtual Fitting Rooms, Challenges, Opportunities, Shopping Experience

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I. Introduction

Retail manages and deals with both products and services. While products are consumed, services are experienced. The simple distinction is crucial in determining success in retail today. Providing the best customer experience is how one can gain loyal customers, they are the backbone on which retail businesses pull through. Customers are counting on and desiring for a personal experience which will help to gain their trust and meet their individual wants and needs while they're shopping. Retailers looking to cement customer loyalty in today's digitized economy must create customer-centric shopping experiences. This requires a holistic strategy that uses emerging technologies to curate personalized customer experience journeys.

User experience is holistic and subjective (McCarthy and Wright, 2004), and varies across time (Law et al., 2009). Interactivity entertains users and enables them to personalize information in a 3D virtual model (Fiore, Kim and Lee, 2005), and they enjoy interacting with virtual objects more than they do handling or looking at physical objects (Li et al., 2001). The past few decades have exposed consumers to a continual stream of novel technologies, augmented reality being one of the most prominent one. Augmented reality integrates and combines computer-generated graphics to real world images. The three-dimensional product images in terms of: shapes, colors and styles, gives an enriching experience to the customers. AR is a series of technologies that integrate real world and virtual information, thereby enhancing a specific reality (Lamantia, 2009).

Under the various types of augmented reality, there is projection based augmented reality which projects digital images of physical objects in the physical space. It is either interactive and project a digital keyboard, or a dialer. Secondly, recognition based augmented reality in which whenever one scans a QR code or

scans an image, it comes to life. It detects and recognizes the marker and then replaces it with a corresponding object. Along with these two, there is location based augmented reality which takes advantage of the smart devices' location detection features.

Augmented reality technology can immensely increase the worth and image of the brand among the users and engage them in a more efficient manner. The major difference has been made by the smart/digital mirrors and virtual fitting rooms. Smart mirrors are capable of producing an image of what a customer might look like in an alternative outfit without them trying it on. Smart Fitting Room identifies the exact articles a customer brings into the fitting room, it then indicates which colors, models and sizes are available directly in the store or in the web shop. Studies have shown the advantages of such technologies as augmented reality in retail contexts, as they are media that enrich customer's experience (Pantano and Servidio, 2012; Poushneh and Vasquez-Parraga, 2017). AR combines real and virtual worlds, supplementing the real world with computer-generated virtual objects in real-time (M. Sirakaya and D. A. Sirakaya, 2018; M. Akçayır and G. Akçayır, 2017; R. D. A. Budiman, 2016; E. Solak and R. Cakir, 2015; X. Wei, D. Weng, Y. Liu, and Y. Wang, 2015). According to a study in the Journal of Retailing, some customers research products before buying and others are more impulsive. Strong visual presentations can help guide purchasers toward the company or product. The data from an augmented reality app can help the retailers to know about the customers and make them familiar with their buying decisions. According to the study, retailers that do not embrace technology could be left behind. Some customers resist purchasing online because they lack product information, and being inadequately informed about products makes a purchase decision risky (Kim and Forsythe, 2008a). Augmented reality can compensate for this lack of product information, and also the inability to handle products, by creating a three-dimensional augmented experience (MacIntyre et al., 2001; Lu and Shana, 2007; Pantano and Servidio, 2012; Papagiannidis et al., 2017). Direct contact with desired products is important to shoppers because they acquire product information through the sensory shopping experience—visual, audio, ext, and so on—that assists them in the process of decision-making (Papagiannidis et al., 2017). The technology is however, yet to fully permeate the Indian retail system, with only a handful of retailers in India being bold enough to adopt this dynamic solution to beat the challenges of long queues outside the dressing room and more so, provide an enriching shopping experience. The research conducted shows that augmented reality technology has the potential to be further developed in fashion retail stores. This is because the advantages and beneficial uses of augmented reality features are able to engage the customers in the purchasing process and help improve their buying experience in various aspects. Also, the opportunities are so much more than the challenges as augmented reality is accepted in terms of various aspects like comfort, availability of stocks, variety, time-saving, hassle-free, expert advice and suggestions, avoiding long queues and fit over factors like security and privacy. In this research we aim to study the challenges and opportunities of augmented reality in fashion retail store in India.

Statement of the problem

Customer experience impacts the willingness of a customer to be loyal advocate of the brand. Delivering a great customer experience has now become top strategic priority for most brands. Companies are looking at out-of-box solutions to provide the best immersive experiences, and harnessing the power of augmented reality and are one of the ways. The present study proposes to understand the issue of introducing augmented reality in fashion retail stores in India and the challenges and opportunities associated with it.

Objectives of the study

- To establish and find out if people are aware about augmented reality and its latest technologies and advancements in fashion retail stores.
- To understand how the introduction of augmented reality will affect the customer's buying decision.
- To study the challenges and opportunities of augmented reality in fashion retail stores in India.

Rationale of the study

This paper provides information on how augmented reality is an effective tool that every fashion retail store should adapt to increase their customer in-store shopping experience and how augmented reality is helping digitally manage limitless product options in real time with ease of access, rich visual experience and overcoming nuances to trial room rush, if people are aware about it. This will help the retailers to know about their coming challenges as well as opportunities. This study will help the customers to know about augmented reality and will also help retailers to be prepared to compete for top talent.

II. Method: Sample, Data Collection and Statistics

The purpose of the study is to know how much the customers are familiar with the latest technologies in the field of apparel retailing and how would they respond to the introduction of augmented reality in the fashion retail stores in India by analyzing its challenges and opportunities. For this purpose, the questionnaire

was rolled out. The questionnaire was tested for reliability. The primary data is collected from the customers who purchase online as well as visit the store and have knowledge and experience of purchasing/shopping. For the collection of primary data, convenience sampling was used. An online survey web link of the questionnaire was circulated among the respondents on WhatsApp and Instagram. In total 400 responses were gathered and were found to be useful for analysis.

After the collection of the responses, data was analyzed by applying different statistical tools like tables, percentages, pie charts, bar charts and Chi-Square Test.

III. Results and Discussion

The primary data was collected from 400 responses, in which 47.5% were male, 51.5% were female and 1% did not prefer to say. 39.25% of the respondents are from the age bracket of 21–35 years, 38% are between the age group of 14-20 years, 22.25 % are having age 36 years or above and only 0.5% are below 14 years of age. Out of 400, majority of the people prefer shopping by physically visiting the store than purchasing online i.e. 291 respondents (72.8%) like to visit the store and 109 respondents (27.2%) like to purchase online.

Table 1: Frequency distribution of reason for preferring online shopping

STUDY SPECIFIC	FREQUENCY	PERCENTAGE (%)
Wide variety of options	76	30.2
Discounts offered	83	32.9
Accessibility	24	9.5
Time saving	56	22.2
Others	1	5.2

A question was asked to find out the reason that makes online shopping so unique and tends to attract customers. From Table 1, the main reason for online shopping is detected to be because of the discounts (83 respondents), wide variety of options (76 respondents) and time saving (56 respondents). Furthermore, respondent’s biggest complaint and what is stopping them from physically going to the store and shopping was also inquired. The frequencies of different types of problems faced while shopping in retail stores are shown in Table 2. Majority of the people faced the issue of unavailability of stock for their desired products and sizes (128 respondents) and long queues at the trial room (113 respondents).

Table 2: Frequency distribution of types of complaint while shopping in retail stores

TYPES OF COMPLAINT	FREQUENCY	PERCENTAGE (%)
Lack of stock availability	128	32
Long queues at the trial rooms	113	28.3
Queues are too long for billing	37	9.3
A lack of personalized service	43	10.8
A lack of product knowledge	23	5.8
Unavailable sales associates	15	3.7
Uninspiring store atmosphere	26	6.5
Others	15	3.6

A question was asked to know about the awareness of augmented reality among the respondents. 60% of them were aware about the augmented reality while 40% were not.

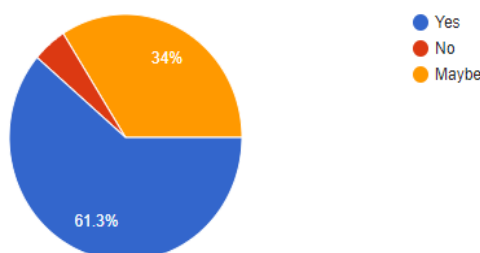


Figure 1: Pie chart of respondents who expect their favorite stores to offer augmented reality experiences

As shown in Figure 1, a question was asked to understand whether the customers are ready for a change in their regular shopping patterns by introducing augmented reality. Majority of the respondents 61.3% (245) of the respondents expect their favourite stores and brand to offer augmented reality experiences in the near future while 4.7% (19) don't expect and 34% (136) chose the maybe option.

A question was asked as shown in the Figure 2, to understand the psychology of the customers and in which particular category would they like to see the effect of augmented reality. The responses are given in Table 3. Hypothesis testing is also done to check the significance of the responses.

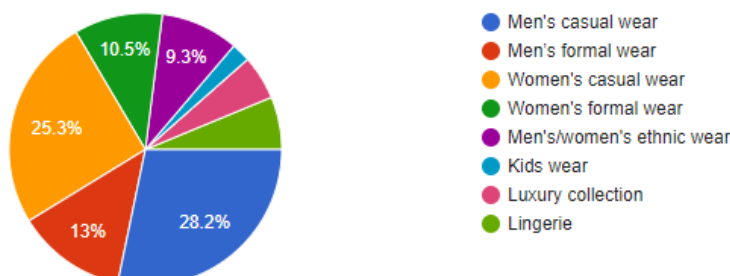


Figure 2: Pie chart of preference of augmented reality in retail stores

Table 3: Frequency of category preference for augmented reality and values required for calculating chi square

	OBSERVED FREQUENCY (O)	EXPECTED FREQUENCY (E)	(O-E) ²	(O-E) ² /E
Men's Casual Wear	113	50	3969	79.38
Men's Formal Wear	52	50	4	0.08
Women's Casual Wear	101	50	2601	52.02
Women's Formal Wear	42	50	64	1.28
Men's/Women's Ethnic Wear	37	50	169	3.38
Kids Wear	9	50	1681	33.62
Luxury Collection	21	50	841	16.82
Lingerie	25	50	625	12.50
Total Chi Square				199.08

Hypothesis testing for store category preference for augmented reality:

Ho: There is no significant difference between observed and expected frequency and there is no preference in category by the respondents where they want to see augmented reality in retail stores. All of them are equally likely to be selected.

Ha: There is a preference in category by the respondents where they want to see augmented reality in retail stores.

Alpha level at 0.05, Chi square (χ^2) = 199.08

Degree of freedom df = 8- 1 = 7

Critical value of Chi square (χ^2) = 14.067 (from Chi square (χ^2) table)

Here $\chi^2 > 14.067$

From the results of the Chi square test, we can see that the Pearson chi-square value for the hypothesis is (199.08) which is greater than (14.067) which means that we reject the null hypothesis (Ho).

Thus, there is a significant difference and there is a clear preference in category by the respondents where they want to see augmented reality in retail stores. We can infer that most of the respondents prefer augmented reality experiences from men's and women's casual wear.

About 28.2% of the respondents prefer augmented reality in men's casual wear and 25.3% prefer in woman's casual wear while rest of them think that the technology is accessible in kids wear, luxury collection etc.

Rating given to each criterion:

Being one of the major aspects with feedback in a comparative or rating form for a specific criterion, which would help us figure out how keen are the Indian customers and what all are they expecting with the introduction of augmented reality in retail stores. On a scale of 1 (lowest) to 5 (highest), various factors like hassle free, expert advice and suggestions, privacy, security, avoiding long queues and fit are rated. Responses required for each category were based on a Likert scale from 1 to 5 where; 1 represents Never, 2 represents

Rarely, 3 represents Sometimes, 4 represents Often and 5 represents Always. The responses observed are shown in Table 4. Considering 'sometimes' i.e. rating 3 as a mean or average and any criteria with a higher count in 'always' and 'often' (rating 5 and 4) as an opportunity and in 'rarely' and 'never' (rating 2 and 1) as a challenge in the study. It can be inferred that comfort, availability of stocks, variety, time saving, hassle-free, expert advice and suggestions, avoiding long queues and fit are considered as an opportunity while security and privacy to be a challenge.

Table4: Rating given to each criterion

SERVICE	ALWAYS	OFTEN	SOMETIMES	RARELY	NEVER	TOTAL
Comfort	55	106	126	66	47	400
Availability Of Stocks	58	103	128	80	31	400
Variety	79	105	141	49	26	400
Time Saving	81	129	120	38	32	400
Hassle Free	69	128	124	52	27	400
Expert Advice And Suggestions	47	102	132	84	35	400
Privacy	44	74	100	77	105	400
Security	51	80	109	77	83	400
Avoid Long Queues	72	122	113	54	39	400
Fit	57	98	103	78	64	400
Total	613	1047	1196	655	489	4000

IV. Findings

Opportunities of Augmented Reality in Retail Stores

Implementation of augmented reality in retail helps retailers and consumers alike have a better shopping experience while reducing operating costs for retailers, and offering an immersive, engaging experience to consumers.

Comfort:

Augmented reality provides one of the biggest facilities of 'trying on' different outfits without physically putting them on. It gives the customers the liberty to come to the store and use augmented reality to go through the different outfits and select the one they like the best. It is very comfortable as it does not demand the customer's physical touch to it which would be very helpful post COVID-19 wherein the customers would not be keen on trying the clothes personally.

Availability of Stocks:

Another major opportunity that augmented reality has to offer is that it can help the customers to know about the available products by standing right in front of the screen and helps view more stock than the store could possibly fit in its given location. This helps the customer to know about the availability of the products in the store. It can increase the capacity of the store without having to expand the store physically. By creating a product catalogue with an option to preview is a great alternative.

Variety:

According to the research, 30.2 percent of the respondents chose online shopping because of the wide variety of options it has to offer but it is necessary to make the customers aware that with the help of augmented reality, the store can notify about all the variety of products it has to offer by physically visiting the store and the benefit of trying it on virtually.

Time Saving and Hassle Free:

It is necessary to make the shopping experience of the customer hassle free. It helps in saving a lot of time as just with the help of few clicks, the system provides all the variety of products with a range of colors and sizes. It is also hassle free as now one does not have to hold all the clothes and get into the trouble of physically trying them on.

Avoiding Long Queues

Customers holding back themselves from a rich shopping experience and waiting for their chance outside the trial room can be time consuming and exhausting. However, augmented reality can simplify this process and

find the size and color of the dress they like and present it in a digital screen right in front of them. From the retailer's point of view, this helps in maintaining a higher level of satisfaction among the customers.

Expert Advice and Suggestions

Augmented reality can be used for getting customized useful advice and suggestions. It provides the customers with more engaging shopping experience by indulging in sales conversation and increasing brand awareness. With the introduction of augmented reality customers could access assistance and guidance as they are presented with product information, ratings, reviews, complementary products and similar items available in the store. They can easily save the look and share it on various social media platforms, which could help them gain the view of their friends and family members.

Challenges of Augmented Reality in Retail Stores

Security Risks with Augmented Reality:

Augmented reality as per the definition gathers and processes a lot of details about the user and their respective environment. Therefore, it turns out to be an issue of security among most of the customers. Augmented reality has the power of collecting all the details about who the user is and what they are doing. There are no regulations associated with the application of augmented reality. In such a case, it is necessary that the retailers ensure the security of the customer data and try to make the adoption of augmented reality easier.

Privacy Issues with Augmented Reality:

Privacy risks pose significant challenges in augmented reality in retail stores. There is a possibility of getting into trouble without meaning to do so due to this. The fear of constantly being recorded and providing all the information among customers prevail. One of the major reasons for this problem is because of a lack of expertise in the field. Due to the absence of developers who have a clear idea about the technology and can provide with a valuable experience it becomes tough to operate the system. In the study that was conducted, privacy was given 1 rating by most of the respondents. A user's privacy can be threatened as the system tends to "see" what the user sees on the screen.

V. Conclusion

Augmented reality in the retail industry is and will continue to be an indelible success. Review of this research conducted shows that augmented reality technology has the potential to be further developed in fashion retail stores. This is because the advantages and beneficial uses of augmented reality features are able to engage the customers in the purchasing process and help improve their buying experience in various aspects.

Augmented reality technology is still new in this sector in India, thus there are still some limitations. However, the results indicate that most of the limitations are related to privacy and security issues. Such limitations can be overcome over time as research on the integration of augmented reality is replicated and improved. When the potential of augmented reality technologies is more fully explored, the beneficial functions of augmented reality can begin to be used widely and the efficiency will be improved. The brands that have already implemented the technology across other countries have witnessed a growth in customer experience resulting in enhanced growth and profit. It is also a tried and tested approach in successfully enhancing shopping experience among customers.

To stay ahead of the competition, retailers are looking for ways to capture customer information and gain a holistic customer view across channels; augmented reality could be a great tool to do so. Our empirical study shows that augmented reality has considerable effects if introduced in fashion retail stores in India. Retail brands willing to invest in the relatively novel technology are bound to reap dividends. However, at the same time, it would be wise to integrate the technology as soon as possible to churn increased engagement before it becomes the new normal.

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