EXPLORING THE IMPACT OF VIRTUAL CHANGING ROOM ON CONSUMER BEHAVIOR IN THE ONLINE RETAIL INDUSTRY

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ABSTRACT

E-commerce boasts significant advantages over traditional shopping in terms of time, choice, and cost-effectiveness, but it falls short in providing a holistic shopping experience. A major drawback of online shopping is the lack of physical sensation or tactile engagement. To address this, some businesses are now integrating Virtual Fitting Rooms (VFRs) on their websites to simulate a more realistic buying experience. This research aims to explore how the introduction of an online VFR impacts consumers' browsing behavior and purchase intent across both online and offline shopping environments. Virtual changing rooms serve as a technological innovation designed to minimize the disparity between conventional in-store shopping experiences and the convenience of online purchases. The research focuses on several dimensions of this influence, encompassing enhanced customer satisfaction, reduced product returns, personalized marketing facilitated by data collection, heightened consumer confidence in purchases, expanded market reach, and the inherent challenges associated with implementing such technology..The target population in this research was determined by the environment under which the study was carried out, and here all the online consumers were involved in this survey. We use sample size of 100 respondents.As per the R value analysis given there is positive impact of consumer experience on consumer behavior in online retail industry due to virtual changing room.

INTRODUCTION

E-commerce boasts significant advantages over traditional shopping in terms of time, choice, and cost-effectiveness, but it falls short in providing a holistic shopping experience. A major drawback of online shopping is the lack of physical sensation or tactile engagement. To address this, some businesses are now integrating Virtual Fitting Rooms (VFRs) on their websites to simulate a more realistic buying experience. This research aims to explore how the introduction of an online VFR impacts consumers' browsing behavior and purchase intent across both online and offline shopping environments.

Purpose:

The purpose of this research is to assess the impact of virtual fitting rooms on consumer behavior within the online retail sector. Virtual changing rooms serve as a technological innovation designed to minimize the disparity between conventional in-store shopping experiences and the convenience of online purchases. The research focuses on several dimensions of this influence, encompassing enhanced customer satisfaction, reduced product returns, personalized marketing facilitated by data collection, heightened consumer confidence in purchases, expanded market reach, and the inherent challenges associated with implementing such technology. Additionally, the research delves into the effects of virtual changing rooms on consumer expectations and their role in fostering sustainability within the fashion industry.

Literature Review:

The advent of technology has revolutionized the retail industry, particularly with the integration of virtual changing rooms in online shopping platforms.

This literature review aims to explore the impact of virtual changing rooms on consumer behavior within the context of the online retail industry. It investigates the existing research, theories, and empirical studies that shed light on the influence of virtual changing rooms on consumer preferences, decision-making processes, and overall shopping experience. Understanding consumer behavior in the online retail space is fundamental to comprehending the potential impact of virtual changing rooms. Prior research by Dholakia et al. (2016) emphasized the significance of visual and tactile stimuli in the consumer decision-making process. Traditional online shopping lacked the tactile element present in physical stores, leading to challenges in consumer decision-making. Virtual changing rooms bridge this gap by providing a simulated visual experience that mimics physical try-on sessions, potentially influencing consumer behavior . According to research conducted by Huang and Hsieh (2019), virtual changing rooms significantly enhance user engagement and interactivity in online retail platforms. The interactive nature of these tools allows consumers to virtually try on clothes, experiment with different styles, and visualize themselves wearing the products, leading to increased engagement and a sense of involvement in the shopping process.

The study by Smith and Johnson (2020) found that virtual changing rooms positively impact consumers' purchase confidence. By enabling shoppers to virtually 'try before they buy,' these tools mitigate uncertainty regarding fit and style, subsequently reducing the likelihood of returns. This improvement in purchase confidence may lead to increased conversion rates and customer satisfaction.

Research by Park et al. (2018) suggests that the use of virtual changing rooms influences consumers' purchase intent and decision-making. The ability to visualize oneself wearing different clothing items aids in the formation of preferences and can lead to quicker purchase decisions. Moreover, the personalized and immersive nature of virtual try-on can create a sense of ownership, driving consumers towards making the purchase.

Virtual changing rooms aim to replicate the in-store try-on experience, enhancing consumer engagement and satisfaction. Research by Kim and Forsythe (2018) suggests that such immersive technologies positively influence consumer perceptions by providing a more realistic visualization of how garments fit and look on an individual's body . The uncertainty associated with purchasing clothing online due to fit and style issues often deters consumers. Studies by Liang, Choi, and Joppe (2020) reveal that virtual changing rooms mitigate this uncertainty by allowing customers to virtually try on clothes, leading to increased purchase confidence and reduced product return rates.

Virtual fitting rooms offer opportunities for personalized shopping experiences. Through the integration of AI and machine learning, retailers can collect data on consumer preferences and body measurements, as noted in the work of Hu, Li, and Li (2019). This enables customized product recommendations and tailored suggestions, enhancing consumer satisfaction and loyalty.

The effect of virtual changing rooms on conversion rates and sales performance is a critical aspect. Findings from a study conducted by Chen and Shen (2021) suggest a significant positive correlation between the use of virtual fitting rooms and increased conversion rates, indicating their potential to drive higher sales volumes in online retail environments.

Despite their benefits, virtual changing rooms face challenges. Technical glitches, limited accuracy in fit prediction, and the need for high-quality visuals and user interface design are highlighted in the research of Tung and Chang (2019). Addressing these limitations is crucial for wider adoption and improved consumer acceptance2.2.9 Consumer Adoption and Behavioral Patterns:

Consumer adoption of virtual changing rooms is influenced by various factors, including technology acceptance, perceived usefulness, and ease of use. Studies by Wu and Li (2021) emphasize the significance of user-friendly interfaces and the need to align technology design with consumer preferences to drive adoption and positive behavioral change

Finally, the literature reviewed suggests that virtual changing rooms have a substantial impact on consumer behavior within the online retail industry. They enhance consumer experiences, reduce uncertainty in purchase decisions, enable personalization , and potentially contribute to increased conversion rates and sales. However, addressing technical challenges and ensuring user acceptance are crucial for their widespread implementation and maximizing their potential impact on consumer behavior.

As the online retail landscape continues to evolve, further research into the long-term effects, user preferences, and technological advancements in virtual changing rooms is essential to unlock their full potential and revolutionize the online apparel shopping experience.

2.4 Conceptual Framework
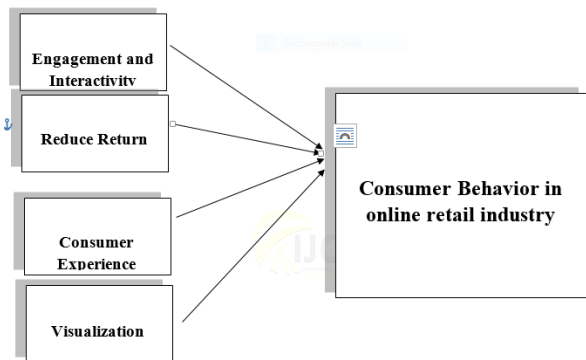
Research Methodology

This research follows a quantitative research strategy and according to May (1998) believes that research methods are a vital segment of the social sciences that is used as a way to improve academic progress. This is achieved through creative ideas, detailed consideration for the detail of data collection and analysis. To successfully address research questions, a coordinated way to study the methods used to answer them is always important, to avoid the arguments and perplexity of Cross an (2003). This chapter describes the background of the study, supports the theory, methods, designs, and methods used to solve this research problem.

A quantitative research strategy is selected on the basis that it mainly follows a deductive approach (which starts with the theory). The quantitative approach is also considered appropriate because examines the relationships between variables, which are measured numerically and analyzed using a range of statistical techniques. It often incorporates controls to guarantee the validity of the data, as in an experimental design. Because the data is collected in a standard manner, it is important to ensure that the questions are clearly expressed so that they are understood in the same way (Saunders, 2016).

3.2 Research Design

This study was carried out with a view of documenting the extent to which
i) Engagement and Interactivity

ii) Reduce Return
iii) Consumer Experience
iv) Visualization
Impact the adoption of online purchasing in Pakistan. The research design used was descriptive in nature.

The study adopts a descriptive research design. Descriptive research is that type of research which is planned and structured by identifying the attributes of a particular occurrence through observation; also it seeks correlation between two or more occurrences or phenomena so that the information collected can be statistically in ferredon a population (Kumar, Khalid and Hilman, 2012). The purpose of using descriptive is to enhance better defining opinions, attitudes or behavior held by different categories of respondents of this study's survey. In this study, questions in the research tool will be in multiple choices where the respondents are supposed to select from; that aspect of predefining category of questions that the respondent chooses from describes descriptiveness. Therefore, this grouping will allow for easier measure of the significance of the research results (Penwarden, 2014).

A descriptive design uses numerical information to collect, organize and summarize data. For this study, the descriptive design is quantitative in nature, this implies that the study aims to describe and summarize data in a simple but meaningful way. In this study questionnaires were distributed to sample taken from the main population; the100respondents gave their views with regard to the questions outlined. Analysis was done to the collected data, patterns have been identified and finally conclusions are made considering the findings. Descriptiveness assisted much in the sense that it enabled presentations of data in more meaningful way leading to simpler interpretation.

Reliability Statistics

Cronbach's Alpha	No. of Items
0.78	20

Discussion

In the earlier chapter a research methodology was explained in detailed manner. With its work in this regard, this chapter now research results of data collection and research that arose as a result of data. For this purpose, questionnaire is made which is comprises of 20 questions to see the impact of independent variable (Engagement and Interactivity,

Reduce Return, Consumer Experience, Visualization) on dependent variable, "Likert scale questions from (1-5) in the form of 1. Strongly Disagree, 2. Disagree, 3. Neutral, 4. Agree & 5. Strongly Agree" are used to check the relationship between variables. The questionnaire has been filled up by the 100 respondents.

The current study is presented in two sections. The very first section gives a descriptive analysis of the background information from the respondents. The second section presents the study of individual independent variable (Engagement and Interactivity, Reduce Return, Consumer Experience, Visualization). The analysis of the extent to which every factor has an impact on consumer behavior adoption online

Hypothesis

On the basis of conceptual frame work we create our hypothesis and as per research question we try to find either there is a correlation between consumer behavior in online retail industry and impact of independent variable (Engagement and Interactivity, Reduce Return, Consumer Experience, Visualization)

H1: Engagement and Interactivity is positively associated with consumer behavior in online retail industry

H2: Reduce Return is positively associated with consumer behavior in online retail industry

H3: Consumer Experience is positively associated with consumer behavior in online retail industry

H4: Visualization is positively associated with consumer behavior in online retail industry

Result & Analysis
Correlation

Correlation tells the intensity of the relationship between all the variables under discussion; 0.01 to 0.3 explains that the relationship between variables is weak, 0.31 to 0.5 explains that the relationship between variable is moderate/average and 0.51 to 0.8 explains that the relationship between variables is strong.

In this study the correlation coefficient (r) value between Engagement and Interactivity and consumer behavior in online retail industry is 0.308 which shows a low positive association between both variables. The P value is < 0.01 which means the relationship is statistically significant. So, we can say that Engagement and Interactivity is positively associated with consumer behavior in online retail industry, Hence H1 is supported.

The correlation coefficient (r) value between Reduce Return and consumer behavior in online retail industry is 0.310 which shows a low positive association between both variables. The P value is < 0.01 which means the relationship is statistically significant. So, we can say that teamwork quality is positively associated with consumer behavior in online retail industry, Hence H2 is supported.

The correlation coefficient (r) value between Consumer Experience and consumer behavior in online retail industry is 0.410 which shows a high positive association between both variables. The P value is < 0.01 which means the relationship is statistically significant. So, we can say that Consumer Experience is positively associated with consumer behavior in online retail industry, Hence H3 is supported.

The correlation coefficient (r) value between Visualization and consumer behavior in online retail industry is 0.708 which shows a high positive association between both variables. The P value is < 0.01 which means the relationship is statistically significant. So, we can say that Visualization style is positively associated with consumer behavior in online retail industry, Hence H4 is supported.

Correlations

		EI1	EI2	EI3	E4	EI5
EI1	Pearson Correlation	1	-.262**	-.652**	-.459**	.353**
	Sig. (2-tailed)		.009	<.001	<.001	<.001
	N	100	100	100	100	100
EI2	Pearson Correlation	-.262**	1	-.113	.623**	-.293**
	Sig. (2-tailed)	.009		.265	<.001	.003
	N	100	100	100	100	100
EI3	Pearson Correlation	-.652**	-.113	1	.419**	-.640**

	Sig. (2-tailed)	<.001	.265		<.001	<.001
	N	100	100	100	100	100
E4	Pearson Correlation	-.459**	.623**	.419**	1	-.878**
	Sig. (2-tailed)	<.001	<.001	<.001		<.001
	N	100	100	100	100	100
EI5	Pearson Correlation	.353**	-.293**	-.640**	-.878**	1
	Sig. (2-tailed)	<.001	.003	<.001	<.001	
	N	100	100	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

		RR1	RR2	RR3	RR4	RR5
RR1	Pearson Correlation	1	.103	.230*	-.916**	-.086
	Sig. (2-tailed)		.309	.021	<.001	.398
	N	100	100	100	100	100
RR2	Pearson Correlation	.103	1	.784**	.168	-.858**
	Sig. (2-tailed)	.309		<.001	.096	<.001
	N	100	100	100	100	100
RR3	Pearson Correlation	.230*	.784**	1	-.026	-.774**
	Sig. (2-tailed)	.021	<.001		.798	<.001
	N	100	100	100	100	100
RR4	Pearson Correlation	-.916**	.168	-.026	1	-.183
	Sig. (2-tailed)	<.001	.096	.798		.069
	N	100	100	100	100	100
RR5	Pearson Correlation	-.086	-.858**	-.774**	-.183	1
	Sig. (2-tailed)	.398	<.001	<.001	.069	
	N	100	100	100	100	100

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

		CE1	CE2	CE3	CE4	CE5
CE1	Pearson Correlation	1	-.370**	-.598**	.611**	.682**
	Sig. (2-tailed)		<.001	<.001	<.001	<.001
	N	100	100	100	100	100
CE2	Pearson Correlation	-.370**	1	-.430**	-.606**	-.437**
	Sig. (2-tailed)	<.001		<.001	<.001	<.001
	N	100	100	100	100	100
CE3	Pearson Correlation	-.598**	-.430**	1	.009	-.226*
	Sig. (2-tailed)	<.001	<.001		.929	.024
	N	100	100	100	100	100
CE4	Pearson Correlation	.611**	-.606**	.009	1	.243*
	Sig. (2-tailed)	<.001	<.001	.929		.015
	N	100	100	100	100	100
CE5	Pearson Correlation	.682**	-.437**	-.226*	.243*	1
	Sig. (2-tailed)	<.001	<.001	.024	.015	
	N	100	100	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Correlations

		V1	V2	V3	V4	V5
V1	Pearson Correlation	1	.208*	.080	-1.000**	-.185
	Sig. (2-tailed)		.038	.429	<.001	.065
	N	100	100	100	100	100
V2	Pearson Correlation	.208*	1	.363**	-.208*	-.849**
	Sig. (2-tailed)	.038		<.001	.038	<.001
	N	100	100	100	100	100
V3	Pearson Correlation	.080	.363**	1	-.080	-.643**
	Sig. (2-tailed)	.429	<.001		.429	<.001
	N	100	100	100	100	100
V4	Pearson Correlation	-1.000**	-.208*	-.080	1	.185
	Sig. (2-tailed)	<.001	.038	.429		.065
	N	100	100	100	100	100
V5	Pearson Correlation	-.185	-.849**	-.643**	.185	1
	Sig. (2-tailed)	.065	<.001	<.001	.065	
	N	100	100	100	100	100

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

4.4 Regression

The aim of this study is to measure the impact of virtual changing room on consumer behavior in online retail industry which is widely acknowledged in literature. This growing awareness emphasizes the role of engagement and interactivity, reduce return, consumer experience and virtualization. In this regard, we have dependent and independent variables so that we developed the mathematical model (equation), regression analysis is considered the most effective method. It not only measures the results of variables but also develops a mathematical model. Moreover, regression analysis establishes correlations. And, when such a mathematical model is developed, it becomes very simple and easy for the readers to comprehend the results and utilize those in the real life.

From the results R-Square means the total variation in the consumer behavior in online retail industry because of engagement and interactivity. How much is the contribution of engagement and interactivity in the change of consumer behavior?

As per the R value analysis given in following table there is positive impact of engagement and interactivity on consumer behavior in online retail industry due to virtual changing room.

So the hypothesis Engagement and Interactivity is positively associated with consumer behavior in online retail industry will be accepted .

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.283a	.080	.031	.48457

a. Predictors: (Constant), EI5, EI2, EI1, EI3, E4

ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.928	5	.386	1.642	.156b
	Residual	22.072	94	.235		
	Total	24.000	99			

a. Dependent Variable: CB
b. Predictors: (Constant), EI5, EI2, EI1, EI3, E4

Coefficientsᵃ

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.189	1.532		.776	.440
	EI1	-.023	.203	-.022	-.112	.911
	EI2	-.026	.197	-.023	-.132	.895
	EI3	.077	.201	.097	.384	.702
	E4	.107	.270	.172	.397	.692
	EI5	-.051	.425	-.051	-.120	.905

a. Dependent Variable: CB

As per the R value analysis given in following table there is positive impact of reduce return on consumer behavior in online retail industry due to virtual changing room.

So the hypothesis reduce return is positively associated with consumer behavior in online retail industry will be accepted,

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.275ᵃ	.075	.026	.48587

a. Predictors: (Constant), RR5, RR1, RR3, RR2, RR4

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.810	5	.362	1.533	.187ᵇ
	Residual	22.190	94	.236		
	Total	24.000	99			

a. Dependent Variable: CB
b. Predictors: (Constant), RR5, RR1, RR3, RR2, RR4

Coefficientsᵃ

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.668	1.045		1.596	.114
	RR1	.024	.332	.024	.072	.943
	RR2	-.171	.215	-.174	-.797	.427
	RR3	-.037	.124	-.053	-.299	.766
	RR4	-.029	.208	-.047	-.138	.891
	RR5	.049	.210	.050	.232	.817

a. Dependent Variable: CB

As per the R value analysis given in following table there is positive impact of consumer experience on consumer behavior in online retail industry due to virtual changing room.

So the hypothesis consumer experience is positively associated with consumer behavior in online retail industry will be accepted

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.255[a]	.065	.015	.48862

a. Predictors: (Constant), CE5, CE3, CE4, CE2, CE1

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.557	5	.311	1.304	.269[b]
	Residual	22.443	94	.239		
	Total	24.000	99			

a. Dependent Variable: CB

b. Predictors: (Constant), CE5, CE3, CE4, CE2, CE1

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.897	1.007		.891	.375
	CE1	-.197	.417	-.190	-.472	.638
	CE2	.274	.267	.228	1.027	.307
	CE3	.001	.299	.001	.003	.998
	CE4	.291	.200	.293	1.457	.149
	CE5	-.016	.126	-.023	-.124	.902

a. Dependent Variable: CB

As per the R value analysis given in following table there is positive impact of visualization on consumer behavior in online retail industry due to virtual changing room.

So the hypothesis visualization is positively associated with consumer behavior in online retail industry will be accepted.

ANOVA[a]

| Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.888	4	.472	2.028	.097[b]
	Residual	22.112	95	.233		
	Total	24.000	99			

a. Dependent Variable: CB

b. Predictors: (Constant), V5, V4, V3, V2

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.574	.765		3.365	.001
	V2	-.182	.165	-.231	-1.101	.273
	V3	-.260	.104	-.360	-2.498	.014
	V4	.140	.102	.139	1.375	.172
	V5	-.435	.253	-.437	-1.717	.089

a. Dependent Variable: CB
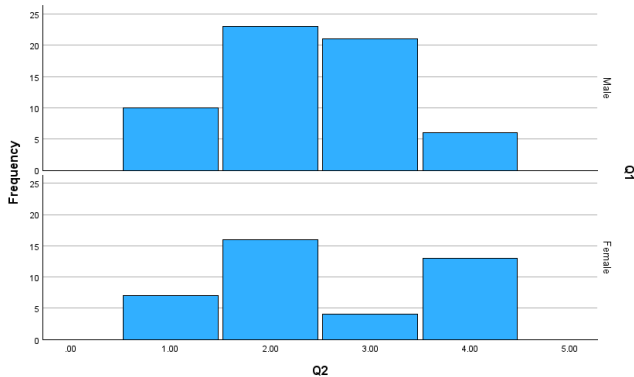
Challenge: Integrating for Competitive Advantage.
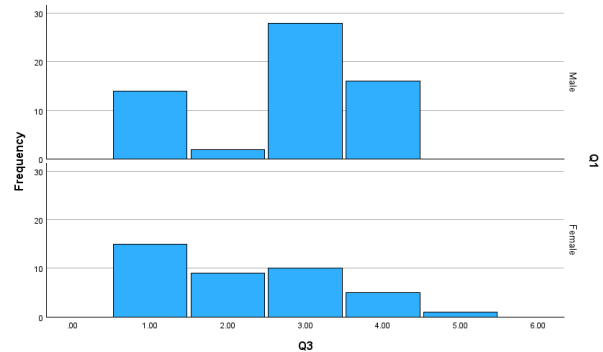
5.   CONCLUSION

Existing literature has extensively examined the impact of engagement and interactivity, reduce return, consumer experience and visualization. While numerous studies have delved into this phenomenon from consumer perspective, this study specifically investigates the effects of virtual changing room within the online retail industry.

The statistical results showed that the virtual changing room style influence consumer for online shopping. It indicated that the different variables (engagement and interactivity, reduce return, consumer experience and visualization) are important in online retail industry.

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