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An Impact of Virtual Try-On Technology on Consumer Buying Behavior in the Fashion Retail Industry.

DR. N. Velmathi[1], P. Jayalakshmi[2]

[1]*Assistant Professor,* [2]*Research Scholar (Part-time), Department of Commerce, NIFT- TEA College of Knitwear Fashion, Tirupur, India*

***Abstract*— The rapid proliferation of electronic commerce has facilitated the adoption of Virtual Try-On (VTO) technology as a mechanism to reduce consumer uncertainty in digital shopping environments. This investigation examines consumer cognizance, adoption patterns, evaluations, determinative factors, and recognized benefits of Virtual Try-On technology within the online retail sector. Utilizing a descriptive research framework combined with quantitative analytical approaches, empirical data were collected from 151 respondents in the Tirupur district through a standardized questionnaire instrument, which underwent subsequent analysis via percentage distribution, weighted mean calculations, and Garrett ranking methodologies. Findings demonstrate that Virtual Try-On adoption is predominantly concentrated among younger, academically qualified consumers, with apparel constituting the predominant product category. Although participants manifest a moderately favorable assessment of Virtual Try-On, certain dimensions exhibit ambivalence, particularly regarding its impact on purchasing behavior. Significant determinants identified encompass operational simplicity, system dependability, and bandwidth availability, whereas the most substantial perceived advantages encompassed efficiency gains and augmented consumer confidence. Ultimately, this research concludes that Virtual Try-On technology enhances shopping accessibility, strengthens purchase propensity, and diminishes merchandise return frequencies, thereby functioning as a consequential strategic mechanism for optimizing customer satisfaction and facilitating sustainable advancement within the e-commerce landscape.**

***Keywords*-- E-Commerce, Consumer, purchase decision, virtual try-on technology.**

I. Introduction

The rapid proliferation of electronic commerce has fundamentally transformed consumer purchasing behaviors, necessitating the integration of advanced technological solutions to augment the quality of digital retail transactions. A particularly significant innovation is Virtual Try-On technology, which enables consumers to simulate product visualization for items including clothing, footwear, optical wear, cosmetic products, and personal accessories before committing to a purchase decision.

Through the facilitation of instantaneous product engagement, Virtual Try-On endeavors to attenuate the disparity between physical retail environments and digital shopping platforms, thereby reducing purchase uncertainty and facilitating more informed consumer decisions.

Notwithstanding its increasing adoption by e-commerce enterprises, consumer cognizance, utilization patterns, and evaluations of Virtual Try-On technology demonstrate substantial heterogeneity. It is imperative for retail organizations to develop a comprehensive understanding of consumer perceptions regarding its functional value, operational accessibility, and impact on purchasing conduct in order to optimize customer satisfaction and mitigate product return frequencies. Determinants including purchase confidence, shopping efficiency, and experiential quality constitute essential variables in determining consumer receptivity toward this technological innovation.

Accordingly, this investigation seeks to examine consumer awareness, adoption patterns, and perspectives regarding Virtual Try-On technology within the context of digital retail commerce. The questionnaire instrument has been systematically designed to elicit demographic characteristics, awareness levels, usage frequency, consumer evaluations, purchasing conduct, perceived benefits, determinative factors, and satisfaction metrics. The findings from this research will furnish valuable insights for e-commerce platforms and marketing professionals to optimize Virtual Try-On features and enhance consumer participation and commercial outcomes.

II. Reviews Of Literature

RaheelaBatool and JianMou (2024), In their scholarly investigation entitled A Systematic Literature Review and Analysis of Try-on Technology: Virtual Fitting Rooms, the researchers examined the trajectory and implications of virtual try-on technology within the context of digital clothing commerce. This comprehensive systematic review synthesized eighty peer-reviewed articles spanning the period from 2005 to 2023, retrieved from authoritative academic repositories including Scopus, Springer, Science Direct, and IEEE Explore.

The researchers categorized the reviewed literature according to publication chronology, geographic origin, methodological approaches, theoretical frameworks employed, and principal determinants of influence. The investigation initially focused on examining methodological approaches and theoretical constructs, including the Technology Acceptance Model (TAM) and the Stimulus–Organism–Response (S–O–R) framework, to elucidate mechanisms underlying consumer adoption patterns. The findings demonstrated that factors such as image interactivity, telepresence, perceived utility, and user satisfaction exert favorable influences on consumer purchasing intentions and shopping confidence, whereas perceived risk and technical limitations serve as barriers to adoption. The research concludes that virtual fitting rooms substantially enhance the online shopping experience and mitigate product return rates, while simultaneously identifying lacunae in existing literature to guide subsequent scholarly inquiry in fashion e-commerce and virtual retail innovation.

Quan Hong Nguyen, Truong ThiHanh, Nghiem Le My Hanh, Nguyen Duong LanNhi, Dang Ngoc Anh, and Ha ThuyLinh (2021)which investigated how virtual try-on technology influences consumer purchasing intentions in digital retail environments. The primary objective was to evaluate the direct effects of virtual try-on capabilities on consumer perceptions and purchase behaviors, alongside examining how consumers' existing technology proficiency moderates these relationships. Information was collected via a comprehensive survey distributed to digital shoppers who had previously engaged with virtual try-on platforms. The outcomes revealed that virtual try-on technology substantially strengthens purchase intention by enhancing perceived value, user satisfaction, and confidence regarding product decisions. Furthermore, the results showed that established technology experience strengthens the relationship between virtual try-on adoption and purchase intention, indicating that consumers possessing advanced technological competency demonstrate more positive engagement with such innovations. The research establishes that virtual try-on technology functions as a valuable tool for optimizing online retail performance, particularly for consumers with considerable technological proficiency.

Tingting Zhang, William Yu Chung Wang, Ling Cao, and Yan Wang (2019), conducted research entitled The Role of Virtual Try-On Technology in Online Purchase Decision from Consumers' Aspect, which examined how virtual try-on technology influences consumer purchasing behavior in online settings.

The study aimed to understand how consumers perceive and evaluate virtual try-on capabilities available on online apparel retail platforms. Information was collected through a systematic questionnaire administered to online shoppers with prior exposure to virtual try-on technology. The investigation focused on key variables such as perceived usefulness, perceived enjoyment, perceived risk, and confidence in virtual try-on systems. Findings revealed that virtual try-on technology substantially enhances consumer purchase intention by reducing uncertainty related to product fit and visual presentation. Additionally, the research found that perceived enjoyment and perceived usefulness positively influence consumer attitudes toward virtual try-on technology, while perceived risk negatively affects purchasing decisions. Overall, the study underscores that virtual try-on technology serves as an important mechanism for strengthening consumer confidence and facilitating decision-making in online retail environments.

Nandini Dixit (2022), research, titled Effect of AI Virtual Try-On Technology on Customer Purchase Intent and Buying Experience, examined how artificial intelligence-powered virtual try-on technology affects consumer purchasing intentions and the overall quality of shopping experiences in e-commerce environments. The study aimed to understand the influence of AI-enhanced capabilities—such as accurate fit representation, customization options, and user-friendly interfaces—on how consumers make purchasing decisions. Information was collected through a structured questionnaire administered to users of AI virtual try-on platforms. Findings revealed that AI virtual try-on technology substantially increases customer purchase intentions by strengthening shopping confidence, perceived value, and customer satisfaction. Additionally, the research demonstrated that AI-driven virtual try-on solutions reduce purchase-related risks and concerns commonly associated with online shopping. The study concludes that implementing AI virtual try-on technology positively influences the purchasing experience and represents a valuable competitive advantage for e-commerce businesses seeking to enhance customer satisfaction and improve sales conversion metrics.

Ekta Jain and Dr.PreetiChhabra (2021), conducted research entitled The Impact of Consumer Perception Towards Virtual Reality (Try-on) Features in Online Clothing Platforms – A Detailed Review Between E-Commerce and V-Commerce, which investigated consumer attitudes toward virtual reality-based try-on capabilities across conventional e-commerce and emerging v-commerce environments.

Employing a comprehensive review approach, the study evaluated how VR try-on technologies affect consumer confidence, interaction levels, and purchase decisions. Findings demonstrated that virtual reality try-on functionalities substantially enhance consumer assurance, satisfaction, and credibility through immersive and participatory retail experiences. Furthermore, the research highlighted that v-commerce platforms deliver superior experiential benefits compared to conventional e-commerce by reducing purchase uncertainty and improving product evaluation capabilities. The authors emphasize that favorable consumer perception is essential for successful implementation of VR try-on solutions and highlight the growing importance of immersive technologies in the evolution of digital clothing retail.

Thevaranjan Dinesh (2018) study, titled Factors Affecting Consumer Attitudes towards Online Shopping, examined the key determinants influencing how consumers perceive online shopping platforms. This research sought to analyze critical variables including perceived usefulness, ease of use, trust, security, convenience, and perceived risk that shape consumers' online purchasing decisions. Information was collected through a structured questionnaire administered to consumers with prior online shopping experience. The findings revealed that perceived convenience, trust, and ease of use substantially improve consumer attitudes, while perceived risk and security concerns negatively impact online shopping adoption. The research emphasizes that understanding consumer attitudes is essential for online retailers to increase customer satisfaction, build confidence, and optimize the overall online shopping experience.

HyunwooHwangbo, EunHie Kim, So-Hyun Lee, and Young Jae Jang (2020) undertook research entitled Effects of 3D Virtual "Try-on" on Online Sales and Customers' Purchasing Experiences, which investigated how 3D virtual try-on technology impacts consumer purchasing decisions and online sales performance. The investigation focused specifically on the ways that 3D visualization and interactive try-on capabilities influence the shopping experience for customers in e-commerce environments. Information was collected using experimental methodologies and evaluations from consumers who engaged with 3D virtual try-on platforms. Findings revealed that 3D virtual try-on technology substantially enhances customer interaction, perceived fit accuracy, and buying confidence, thereby driving increased purchase intent and improved online sales figures. Additionally, the research showed that engaging 3D experiences improve customer satisfaction by reducing the risk and doubt associated with evaluating products online.

The study concludes that 3D virtual try-on technology represents an important tool for improving the customer purchasing experience and driving sales growth in online fashion commerce.

III. Statement Of The Problem

E-commerce offers significant convenience; however, the inability to physically examine products before purchase introduces considerable uncertainty regarding sizing, visual presentation, and overall appropriateness. This uncertainty frequently results in reduced buying confidence, suboptimal product selections, and elevated return frequencies. Virtual Try-On (VTO) technology has emerged as a solution to address these concerns, permitting shoppers to simulate product experiences before committing to a purchase. Yet, despite growing market penetration, substantial gaps persist in understanding consumer familiarity, adoption rates, perceived dependability, ease of use, system reliability, data protection concerns, and the actual impact on purchase behavior and customer satisfaction. Consequently, this research seeks to investigate consumer perspectives, the underlying drivers of these perspectives, and the practical effectiveness of Virtual Try-On technology in improving the overall online retail experience.

IV. Objectives Of The Study

This research aims to examine the demographic characteristics of survey participants, identify which product categories demonstrate the highest Virtual Try-On adoption rates, analyze the key factors influencing Virtual Try-On implementation such as usability, accuracy, and system reliability, evaluate the consumer-perceived benefits of Virtual Try-On technology, measure overall consumer satisfaction with Virtual Try-On solutions, and deliver evidence-based recommendations.

V. Research Methodology

The research employs a quantitative research design to investigate consumer attitudes towards virtual try-on technology in the context of online apparel shopping. Data is gathered through a structured questionnaire administered to participants who have previously utilized virtual try-on features. The findings are evaluated using statistical methods, including percentage analysis, mean ranking, correlation, and regression, to determine the influence of virtual try-on on purchase intention, confidence, and overall shopping experience.

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Research Design

This study employs a descriptive research design to investigate consumer awareness, usage, perceptions, and satisfaction with Virtual Try-On technology in the context of online shopping. This approach is appropriate because it enables a comprehensive and organized examination of consumer characteristics and viewpoints derived from systematically collected data.

Research Approach

A quantitative research methodology is implemented, utilizing a structured questionnaire to collect numerical data. This data is subsequently subjected to statistical analysis to understand consumer behavior and attitudes toward Virtual Try-On technology.

Data Source

The study draws upon primary data obtained directly from study participants through a self-administered questionnaire. Supplementary secondary data, comprising academic journals, peer-reviewed articles, online resources, and published reports, were incorporated to strengthen the study's theoretical foundation.

Sampling Method

A non-probability judgement sampling technique is utilized to identify participants with relevant experience or familiarity with online shopping and Virtual Try-On technology. This approach was selected due to its practical feasibility and time-related considerations.

Sample Size

Data were collected from one hundred fifty-one respondents who engage in online shopping within the Tirupur district. The sample comprises 151 participants (with detailed demographic breakdown to follow based on collected data), encompassing varied demographic characteristics such as age, gender, educational background, and income level.

Data Analysis Techniques: Following the completion of data collection, the research team applied suitable analytical instruments and approaches to examine the findings. The investigation utilized percentage-based analysis, weighted average calculations, and Garrett ranking methodology to clarify and present the outcomes.

Limitations of the study: The precision of the data is influenced by potential biases.

VI. Data Analysis And Interpretation

TABLE I
DEMOGRAPHIC FACTORS OF THE RESPONDENTS

Demographic Factors		No. of Respondents	Percentage
Gender	Male	78	52
	Female	71	47
	Prefer Not to Say	2	1
Age Group	Below 20	40	27
	21-30	98	65
	31-40	11	7
	41-50	2	1
Education Level	School Level	7	5
	Undergraduate	67	44
	Postgraduate	62	41
	Professional	15	10
Monthly Income	Below Rs.15,000	78	52
	Rs.15,001–30,000	39	26
	Rs.30,001–50,000	16	10
	Above Rs.50,000	18	12
Total		151	100

Source: Primary Data

Interpretation

The survey findings presented in Table 1.1 demonstrate that a substantial majority of participants are young adults, with 65% representing the 21–30 age bracket, highlighting increased uptake of virtual try-on technology among younger consumer segments. Gender distribution shows near parity, with 52% male and 47% female participants, reflecting comparable engagement levels between genders. Concerning educational attainment, the respondent pool is predominantly composed of undergraduate (44%) and postgraduate (41%) degree holders, indicating stronger familiarity and adoption of virtual try-on technology among individuals with advanced education. A considerable share of participants (52%) earn below Rs.15,000 monthly, demonstrating that virtual try-on technology maintains appeal across lower-income consumer groups as well.

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TABLE NO.2
RESPONDENTS OPINION ABOUT VIRTUAL TRY-ON TECHNOLOGY

Overall Opinion		No. of Respondents	Percentage
Products used on Virtual Try-on	Clothing	77	51
	Footwear	12	8
	Eyewear	39	26
	Cosmetics	11	7
	Accessories	12	8
Used Virtual Try-on Shopping Online	Always	31	21
	Often	18	12
	Sometimes	51	34
	Rarely	34	23
	Never	17	10
Virtual Try-on influence your Purchase Decision	Highly Influential	18	12
	Influential	41	27
	Neutral	70	46
	Less Influential	13	9
	Not Influential	9	6
Virtual Try-on makes Shopping	Much Easier	21	14
	Easier	91	60
	No Change	30	20
	Difficult	9	6
Recommend Virtual Try-on to others	Yes	48	32
	No	37	25
	Maybe	66	43
Total		151	100

Source: Primary Data

Interpretation

Table No. 2 demonstrates that Clothing represents the predominant product category for application (51%), trailed by eyewear (26%), underscoring the dominance of fashion-related uses. Regarding engagement patterns, the majority of participants interact with virtual try-on technology either sporadically or consistently, with a minority reporting no prior experience.

Approximately 46% of respondents maintain a neutral stance on the technology's influence over their purchase behavior, though a considerable proportion acknowledges its significance. A strong majority (74%) concur that virtual try-on enhances the online shopping experience by improving accessibility and buyer assurance. However, willingness to recommend remains cautious, with 43% of respondents expressing uncertainty about promoting it to their peers. Overall, the findings reveal growing adoption of virtual try-on technology among younger, highly educated, and value-oriented consumers, though additional refinements are required to strengthen its impact on purchasing behavior.

TABLE NO.3
RESPONDENTS' OPINION ABOUT FACTORS INFLUENCING TO USE VIRTUAL TRY-ON TECHNOLOGY

S.No	Influencing Factors	Garret Score	Garret Rank
1	User-Friendly Interface	7921	1
2	Precision and Correctness	7450	5
3	System Dependability	7916	2
4	Network Performance	7713	3
5	Data Protection and Confidentiality	7700	4

Source: Primary Data

Interpretation:

The table displays findings from Garrett Ranking Analysis, which was employed to determine the key factors affecting respondent preferences. Among the five examined factors, User-Friendly Interface achieved the top position with the highest Garrett score of 7,921, demonstrating its prominence as the most significant factor for respondents. System Dependability secured the second position with a Garrett score of 7,916, reflecting that respondents attribute substantial weight to system reliability. Network Performance ranked third with a score of 7,713, underscoring the critical role of stable and efficient network connectivity. Data Protection and Confidentiality placed fourth with a score of 7,700, signifying that data security and privacy represent meaningful priorities for respondents. Precision and Correctness ranked fifth with a Garrett score of 7,450. The analysis demonstrates that respondents prioritize user-friendly interfaces most highly, followed by system dependability and network performance.

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Consequently, enhancing interface usability, strengthening system reliability, and optimizing network connectivity could substantially improve overall user satisfaction.

TABLE NO.4
RESPONDENTS' OPINION ABOUT BENEFITS OF VIRTUAL TRY-ON TECHNOLOGY

S.No	Benefits	Calculated Value	Garret Value
1	Saves time	10	75
2	Reduces return rate	30	60
3	Increases confidence	50	50
4	Enhances shopping experience	70	39
5	Accurate product selection	90	24

Source: Primary Data

S.No	Benefits	Garret Score	Garret Rank
1	Saves time	7832	1
2	Reduces return rate	7716	3
3	Increases confidence	7717	2
4	Enhances shopping experience	7485	4
5	Accurate product selection	7485	4

Source: Primary Data

Interpretation:

Table No. 4 presents respondent perspectives on the benefits of virtual try-on technology. The ranking analysis demonstrates that Saves Time ranks highest with the greatest cumulative score, establishing it as the primary advantage of virtual try-on technology for participants. Increases Confidence ranks second, reflecting that consumers feel more secure when completing online purchases. Reduces Return Rate ranks third, indicating that virtual try-on technology effectively minimizes the risk of purchasing incorrect items.

Enhances Shopping Experience ranks fourth, suggesting that respondents appreciate the improved and interactive dimensions of their shopping journey. Accurate Product Selection ranks fifth, implying that although valued, it receives comparatively lower priority relative to the other identified benefits.

TABLE NO.5
RESPONDENTS OVERALL OPINION ABOUT VIRTUAL-TRY-ON TECHNOLOGY

Respondents opinion	Total	Weighted Average	Rank
Helps me make better purchase decisions	478	31.8	3
Reduces the risk of wrong product selection	461	30.7	6
Increases my confidence in online shopping	484	32.2	2
Improves my overall shopping experience	498	33.2	1
Reduces product returns	474	31.6	4
Likely to purchase products with Virtual Try-On features	469	31.2	5

Source: Primary Data

Interpretation:

Table No. 5 presents the respondents' overall perspective on virtual try-on technology. The technology ranks first for substantially improving the shopping experience. Second place reflects its capacity to strengthen consumer confidence in online purchasing. Third place recognizes its contribution to facilitating more thoughtful buying decisions. Fourth place acknowledges its effectiveness in reducing product return rates, with fifth place assigned to the propensity to purchase items offering virtual try-on features. Sixth place is designated for its success in mitigating the risk of purchasing unsuitable products.

VII. Recommendation And Conclusion

The research indicates that virtual try-on technology holds considerable promise for shaping consumer buying behavior, especially among younger and more educated demographics. While user sentiment remains generally favorable, enhancing precision, visual authenticity, and platform dependability can elevate consumer confidence and participation levels. Given that user-friendliness and time efficiency represent primary adoption motivators, retailers should prioritize maintaining intuitive design and consistent functionality across varying internet connectivity scenarios.

Bolstering data protection protocols, expanding market awareness via targeted marketing initiatives, and broadening virtual try-on capabilities across diverse product lines can reinforce buyer assurance and referral rates. Ultimately, virtual try-on technology serves as a cornerstone for enriching the digital shopping journey, amplifying purchase likelihood, and minimizing product returns; through on-going technical advancement and thoughtful deployment strategies, it stands to become an essential component for long-term success within the e-commerce sector.

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