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The Impact of Technology Readiness on Customers' Willingness to Use Virtual Try-On: A Demographic Analysis

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Abstract

Virtual try-on technology (VTO) is a cutting-edge advancement designed to enhance the quality of e-learning services. Nonetheless, it remains nascent in emerging economies, and it is essential to get insight into the determinants of VTO system acceptability. This study seeks to explore how demographic variables influence customers' willingness to adopt VTO technology while also examining the influence of perceived privacy risk as an additional factor in this context. This study offers significant insights by examining (a) the technological readiness of Indian customers for adopting virtual try-on technology; (b) the perception of privacy risk associated with VTO usage; and (c) the influence of demographics on the utilisation of try-on technology. The proposed hypothesis of the research model is validated through the PLS-SEM method utilising Smart PLS 4. The study's findings, which show significant variations in the adoption of virtual try-on technology based on gender and age, suggest a strong link between these demographic factors and personality traits. This correlation is crucial for retailers, as it provides insights into customers' preferences and behaviours. By understanding the distinct characteristics and needs of different demographic groups, retailers can tailor their virtual try-on technology more effectively.

Keywords: Augmented Reality; Virtual Try-on technology; Technology Readiness; Behavioural Intentions; Demographics; Retail sector

1. Introduction

"*If you're going to make the decision of [booking] a cruise, wouldn't it be COOL if you could check out the ship [virtually] before you spend that much money*?"

— Arthur Chapin, Expedia's Senior Vice President, Product and Design

The contemporary corporate landscape is characterised by heightened competitiveness, primarily attributed to technology progress and innovative digital strategies that have transitioned operations from physical to digital platforms (Dogra and Kaushal, 2021). The utilization of emerging technologies such as augmented reality (AR) and virtual reality (VR) has been identified as a promising avenue for brands to enhance their revenue generation and customer retention strategies (Heller et al., 2021; Vieira *et al*., 2022). Recent years have seen a surge in the online sales, but the lack of the facility to try on a product virtually remains a significant barrier to online shopping. The technology which allows the user to try on products from their own comfort is augmented reality-based virtual try-on (AR VTO) (Qin *et al*. 2021) . Augmented Reality (AR) is a cutting-edge interactive technology that seamlessly integrates 3D elements into the user's real-world environment (Kowalczuk *et al*., 2021). According to Dwivedi et al. (2023), 3D environments function as the foundation for virtual interactions and transactions, mirroring real-world locations, virtual markets, and social media platforms. Theoretical insight into how humans respond to these technological advancements was provided by Javornik (2016a), and Scholz & Duffy (2018). The market for the 17 cutting-edge technologies covered in the report (Technology and Innovation Report 2023), including augmented reality, artificial intelligence, and the Internet of Things, is already worth $1.5 trillion and is projected to reach $9.5 trillion by 2030, or roughly three times the size of the Indian economy today. AR-VTOs encourage customers to design their digital selves (Huang and Liao, 2017), assist in the discovery of potential selves, and influence their self-perspective (Javornik et al., 2021). "A Virtual Try-On is an AR application subcategory that puts virtual objects on users' bodies in order to assist them with product fit (Hilken et al., 2017)." Augmented reality promotes a self-sufficient experience, which improves favourable brand results (Ambika et al., 2022). Virtual try-on technology has been introduced by a number of retailers, which allows the customers to try online various mix and matches and see the final outfit on the screen, which assists them with their choice of clothes (Li et al., 2023). Augmentation boosts positive emotions and purchase propensity (Xiao et al., 2019; Tarafdar *et al*., 2024) Compared to web-based product presentations, AR-based ones improve media novelty, immersion, enjoyment, utility, attitude towards the medium, and buy intention (Lavoye et al., 2021; Yang et al. (2023).

Try-on allows customers to visualise how the product would seem, making it easier to picturise and exchange images with others promptly through social media (Chidambaram *et al.*, 2024 Vongurai, 2021). Augmented Reality incorporates virtual items upon users' bodies or into their surroundings (Rauschnabel et al., 2022). However, the most recent iteration of clothing VTOs seems to have fixed the issue with augmentation quality (Lee et al., 2020), and it also offers the customer an interface that ingeniously mixes customisation as well as personalisation. According to studies, a lot of online retail marketers have included augmented reality (AR) features in their marketing campaigns to boost awareness among customers, brand engagement, and customer retention (Loureiro et al., 2020).

When customers are introduced to a new innovation, they may exhibit variances in reaction time and technological acceptability. According to earlier research, convenience, quick transactions, and the ability to avoid standing in long queues are some of the key reasons people choose to shop online (Wedel *et al*., 2020; Tandon, 2023). A decreased carbon footprint for society due to fewer garment returns is one of the possible benefits of the

technology (Bhattarai, 2020). Fitting room hassles for customers would also be eliminated, and businesses would not have to pay high street rent. However, customer adoption of VTOs has been meek (Riar et al., 2021). The advancements in mobile technology over the past decade have made a variety of AR mobile apps with 3D augmentation capabilities available (McDowell, 2020). VTOs in the domain of beauty and fashion currently provide a virtual mirror experience with real-time, "live AR" (Fenanda *et al*. (2024), Wang et al., 2022; Scholz and Duffy, 2018). However, VTO applications for clothing do not fall under this category since they rely on the rear camera of the mobile device to take a steady image of the user's entire body.

Try-on technology is still in its infancy in emerging markets, and it is crucial to get an insight into the predictors of acceptance of try-on systems. Therefore, it is critical to embark on an empirical investigation to identify the factors which promote the adoption of virtual try-on technology by customers, given India's expanding smartphone market and organised retail sector. The current study is carried out in India, an emerging nation, whereas most research focusing on customers' e-readiness is carried out in developed nations; therefore, it is likely to add new insights to the literature. The Indian market for augmented and virtual reality was valued at US $1.83 billion in FY2020 and is expected to grow by 38.29% by 2027, with a CAGR of US $14.07 billion (IBEF, 2022). For several product categories, including clothing (67%) and home appliances (56%), Indians have demonstrated a greater interest in incorporating sophisticated technologies (Indian Retailer Bureau, 2021). Incidentally, the outbreak of covid-19 has sped up online shopping by about five years (Papagiannis, 2020).

The technology readiness index (TRI) is proposed as a suitable framework for understanding customer perceptions in the realm of AI; however, its application has been restricted to a few studies (Mende et al., 2019; Belanche et al., 2020a). This study aims to examine the relationships between consumer traits, particularly technology readiness (Parasuraman, 2000), demographic factors including age and gender, and behavioural intentions regarding virtual try-on technology. This research examines relationships to contribute to the knowledge base in virtual try-on technology and offers insights for businesses and marketers aiming to improve customer engagement and technology adoption. This study investigates the impact of demographic traits on customers' inclination to adopt virtual try-on technology, while also considering perceived privacy risk as an additional determinant.

Limited efforts have been made to elucidate technology adoption using the technology readiness (TR) framework, despite its comparatively higher overall reliability as indicated by Parasuraman (2000). The application of a rigorously developed scale by TRI to data collected from a diverse array of industries and companies enhances generalisability (Parasuraman et al. 2005). It was initially proposed to include four distinct dimensions: innovativeness, optimism, insecurity, and discomfort. Several studies have integrated these dimensions into a composite measure, neglecting the distinct effects of the four dimensions (Parasuraman and Colby 2015). Parasuraman and Colby (2015, p. 61) noted that certain researchers requesting permission to utilise the scale were solely focused on assessing overall TR. Optimism and innovativeness are identified as motivators that enhance TR, while insecurity and discomfort serve as inhibitors that diminish an individual's TR. Therefore, it is necessary to evaluate the conceptualisation of the TR construct, whether as four-dimensional, two-dimensional, or one-dimensional. The findings indicate that TR is most effectively understood as a two-dimensional construct, consisting of motivators (innovativeness, optimism) and inhibitors (insecurity, discomfort). This framework provides marketing researchers and practitioners with a concise and comprehensive method for assessing consumers' TR levels.

2. Literature review

The intention of customers to utilise try-on technology is affected by technological readiness, defined as an individual's disposition to adopt and implement new technologies to achieve personal or professional objectives (Parasuraman, 2000). The Technology Readiness Index (Parasuraman, 2000) assesses customers' positive attributes

(optimism and innovativeness) and negative attributes (discomfort and insecurity) regarding their mental preparedness for technologies, differing from technology acceptance models that focus on customer motivations. Demographic variables also influence customers' behavioural intentions (Choi & Yoo, 2020); however, the existing literature on this topic is limited. This paper aims to examine the relationships between customer traits, specifically technology readiness, demographic factors such as age and gender, and behavioural intentions regarding virtual try-on technology, primarily through the TRI framework. This study aims to investigate the impact of demographic variables on customers' inclination to adopt virtual try-on technology, while also considering perceived privacy risk as an additional influencing factor.

Livingstone et al. (2005) examined gender, age, aptitude, and linguistic ability as factors influencing the presence of the digital divide. Kim and Kim (2019) identify age as a significant factor influencing customer adoption of new technologies. Customer age serves as a significant moderator in the relationship between customer-perceived characteristics (Kim and Jang, 2015). Investigating customer behaviour concerning augmented reality is essential for both commercial and scholarly pursuits. Key determinants of technology adoption encompass high levels of innovativeness and optimism, alongside low discomfort and insecurity. Additionally, an individual's demographic profile influences their personality traits (Seo et al., 2018).

This study utilises a technology readiness framework, incorporating perceived risk to privacy as an additional construct. The study assessed the technology readiness (TR) of Indian consumers regarding their inclination towards try-on technology. Brands operating in India acquire valuable market insights owing to the substantial scale of the Indian market. This study contributes significantly by examining (a) the technological readiness of Indian customers for VTO technology adoption; (b) the perceived privacy risks associated with VTO technology; and (c) the influence of demographics on the utilisation of try-on technology. This study provides insights for marketers regarding the varying utilisation of try-on technology among individuals, suggesting that these differences may be linked to customer characteristics influenced by various demographic factors.

Theoretic Framework and Research Hypothesis

3.1 Technology Readiness Index (TRI)

The awareness of customers regarding the advantages of self-service technology has been observed to be increasing. However, it is important to note that not all individuals are prepared to fully adopt this technology (Zeithaml et al., 2002). The adoption of technology is contingent upon the distinctive characteristics exhibited by individuals, which vary from person to person (Ratchford, 2020). Researchers generally employ Parasuraman's TRI scale to assess someone's technological readiness. Technology Readiness expresses an individual’s proclivity to try modern and new technologies as a mental state coming from an accumulation of mental facilitators and inhibitors. "Technology readiness (TR) is defined by Parasuraman (2000) as people's proclivity to embrace and use new technologies for achieving their goals in home life and at work. TRI involves four dimensions, which are:

- Innovativeness
- Optimism
- Discomfort
- Insecurity

Parasuraman (2000) validates the relationship between an individual’s technological readiness and their inclination to adopt the technology. Yi et al. (2005) have used the TR to investigate the influence of customer traits on the technology acceptance model.According to Walczuch et al. (2007), a person who is optimistic and innovative, with a minor level of insecurity and discomfort, has a greater inclination to adopt new technologies. Parasuraman

discovered that people who are positive, innovative, and have less insecurity and discomfort are more likely to use new technologies

Customer behaviour is more influenced by personality than demographics (Dabholkar & Bagozzi, 2002). Thus, researchers should include customers' personalities while studying their behaviour and technology adoption (Parasuraman 2000; Lin et al. 2007). Lewis R. Goldberg (1998) found a link between demographics and personality. Therefore, comparing personality traits across demographically varied groups is beneficial. The following hypothesis are formed:

Parasuraman and Colby (2015) describe technological innovativeness as "a tendency to be a technology pioneer and thought leader" (p. 60). Martens et al., 2017 and Rodriguez-Ricardo et al., 2018 found that inventive people experiment with new technology and services. Oliveira et al. (2016) found that innovative people are more likely to adopt new technologies like AI, AR, and mobile payments. Innovation precedes adoption goals. Thus, innovative people may want to use try-on technologies. Proposed hypothesis:

Hypothesis H1. Innovativeness will positively influence behavioural intention to use try-on technology.

Technological optimism represents "a positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives" (Parasuraman and Colby, 2015, p. 60). The study of Walczuch et al., 2007 showed that Pessimistic technology users are less inclined to embrace new technologies than optimists (Lu et al., 2012). Optimists view new technologies as reliable and functional and ignore any drawbacks. Consequently, optimistic customers have a stronger favourable inclination towards new technology (Godoe and Johansen, 2012). Thus, following hypothesis is proposed:

Hypothesis H2. Optimism will positively influence the behavioural intention to use try-on technology.

Technology discomfort has been defined as "a perceived lack of control over technology and a feeling of being overwhelmed by it" (Parasuraman and Colby, 2015, p. 60). Users could be hesitant to utilise new technology-based products and services if they feel that it is complicated, inadequate and experience extreme discomfort in a new technical environment(Lu et al., 2012; Tsang et al., 2004). Innovative systems may be rejected because of a sense of powerlessness or incapacity to handle technology. Customers who find it difficult to give up control to an AI technology might not be interested in using virtual try-on technology. Thus, following hypothesis is proposed:

Hypothesis H3. Discomfort will negatively influence the behavioural intention to use try-on technology.

Technology insecurity has been defined as "distrust of technology, stemming from skepticism about its ability to work properly and concerns about its potential harmful consequences" (Parasuraman and Colby, 2015, p. 60). To be confident in AI systems, users must have at least a basic grasp of how they work (Kaplan and Haenlein, 2019). Customers that are really insecure about technology could not use them (Lu et al., 2012). Previous studies has found that customers who are insecure in a particular technology do not want to employ new technology-based services (Oliveira et al., 2016). So users who feel insecure may have negative behavioural intention towards try-on technology. Thus, following hypothesis is proposed:

Hypothesis H4. Insecurity will negatively influence the behavioural intention to use try-on technology.

3.2 Perceived Risk to Privacy

Perceived privacy risk means "an individual's perception of the risk of losing control over his or her personal information as a result of the adoption of a specific technology (Malhotra et al. 2004)". Users' assessments of risk have a significant impact on their behavioural intentions to adopt new technologies (Kumari and Devi, 2022; Namahoot and Jantasri, 2022). Zhang *et al.*, 2019 , found in his study that perceived privacy risks plays an important role in determining the attitude of customers towards us eof VTO. Human faces serve as a representation of users' unique identities (Ilia et al., 2015). Expressing oneself online always entails some degree of self-disclosure, acts such as snapping selfies and exposing personal information on social media cause users to worry about their confidentiality (Dhir et al., 2017). In a similar vein, privacy concerns may have a detrimental impact on attitudes towards newer technology but not on the intention to adopt it (Huang & Qian, 2021). Orubu (2016) also found negative influence of privacy risk on behavioural intention towards online shopping. Thus, it is critical to look into how privacy risk affects people's intentions towards try-on technologies. Therefore, following hypothesis is proposed:

Hypothesis 5: Perceived Risk will negatively influence behavioural intentions to use virtual try-on technology.

3. Role of Demographic Characteristics

Numerous studies have proposed that certain demographic characteristics, such as age (Hertzog and Hultsch, 2000), gender (Tsikriktsis, 2004), may help to explain behavioural intention of customers towards the adoption of technology. The main justification for using demographic data in this study is the requirement to account for demographic variations in intention to use try-on technology.

4.1 Moderating Role of Gender on Intention to Use Try-On Technology

Gender is a significant socioeconomic factor to consider when analysing disparities in customer purchasing decisions in an online context, as men and women exhibit differing beliefs regarding their intentions to make online purchases (Chawla and Joshi, 2020; Pascual-Miguel et al., 2015). Luksyte et al. (2018) found that males are more likely than females to engage in creative behaviours. Consequently, innovativeness is a more critical factor for men compared to women following role congruity (Eagly and Karau, 2002). Research indicates that women exhibit greater anxiety and lower self-efficacy regarding new technology compared to men (He and Freeman, 2019), often leading to avoidance of devices that induce discomfort (Faqih, 2016). Consequently, women may exhibit a lower likelihood than men to adopt new technology, despite experiencing similar levels of discomfort and uneasiness. Women are anticipated to need greater product knowledge when engaging in online shopping and exhibit a lower propensity to embrace new technology due to heightened concerns about comfort, fit, and size (Shin and Baytar, 2014). Recent research indicates that gender does not account for IT acceptance and usage (Rainer et al., 2003) or the utilisation of mobile commerce (Li et al., 2008). Research by Pascual-Miguel et al. (2015) indicates that women perceive a higher risk when intending to make online purchases. Lin et al. (2018) found that male customers' attitudes towards online purchasing are more adversely affected by perceived risk. This research examines the impact of gender on customer perceptions regarding the advantages and disadvantages of try-on technology. This study examines the consumer's intention to engage in online purchasing within the context of this discussion. We propose the subsequent hypothesis:

Hypothesis 6(A). Gender moderates the relationship between the innovativeness of customers and their intention to use try-on technology.

Hypothesis 6(B). Gender moderates the relationship between the optimism of customers and their intention to use try-on technology.

Hypothesis 6(C). Gender moderates the relationship between the discomfort of customers and their intention to use try-on technology.

Hypothesis 6(D). Gender moderates the relationship between the insecurity of customers and their intention to use try-on technology.

Hypothesis 6(E). Gender moderates the relationship between perceived risk and the intention to use try-on technology.

4.2. Moderating the role of age in the intention to use try-on technology

Age is regarded as a crucial demographic element in marketing research (Ye et al., 2019). Customers of varied ages are likely to exhibit varied demands, habits, and preferences, which brings differences in their actions (Khan et al., 2019). Age affects consumption habits because younger people are less emotionally stable and mature than older people. Older customers rely more on catechistic processing and spend less time looking for information about products (Yoon, 1997). Therefore, in terms of adoption of try-on technology, younger people may value optimism and inventiveness more than older users. On the other hand, older customers are generally less adept at utilising technical gadgets and services (Dietrich, 2016), whereas young customers feel competent to utilise digital advances (Hauk et al., 2018). Hertzog and Hultsch (2000) found that elderly adults frequently perceive a decline in their own cognitive capacities, which may prevent them from embracing and utilising new technological advancements. For elderly customers, uncertainty and uneasiness with technology could be more significant obstacles. Some studies have highlighted that younger people are significant online shoppers and have greater technological aptitude and acceptance (Law and Ng, 2016). According to Venkatesh et al. (2003), younger users place greater value on extrinsic incentives, or favourable results, which are associated with technological optimism. As a result, optimism will play a larger role in determining a younger user's desire to use technology than it will an older user. Likewise, younger customers pick up new technology quickly (Hauk et al., 2018). However, according to Hernández et al. (2011), there is no difference in the decision-making processes that underlie different age groups' online shopping behaviour. In a research by Marriott and Williams (2018), the moderating influence of age on perceived risk towards online buying was found to have a significant effect on consumers' acceptance of online purchase. The present study investigates whether age plays a significant role in the intention to use VTO technology or not. Therefore, we formulate the following hypothesis:

Hypothesis 7(A). Age moderates the relationship between the innovativeness of customers and their intention to use try-on technology.

Hypothesis 7(B). Age moderates the relationship between the optimism of customers and their intention to use try-on technology.

Hypothesis 7(C). Age moderates the relationship between the discomfort of customers and their intention to use try-on technology.

Hypothesis 7(D). Age moderates the relationship between the insecurity of customers and their intention to use try-on technology.

Hypothesis 7(E). Age moderates the relationship between perceived risk and the intention to use try-on technology.

4. RESEARCH METHODOLOGY

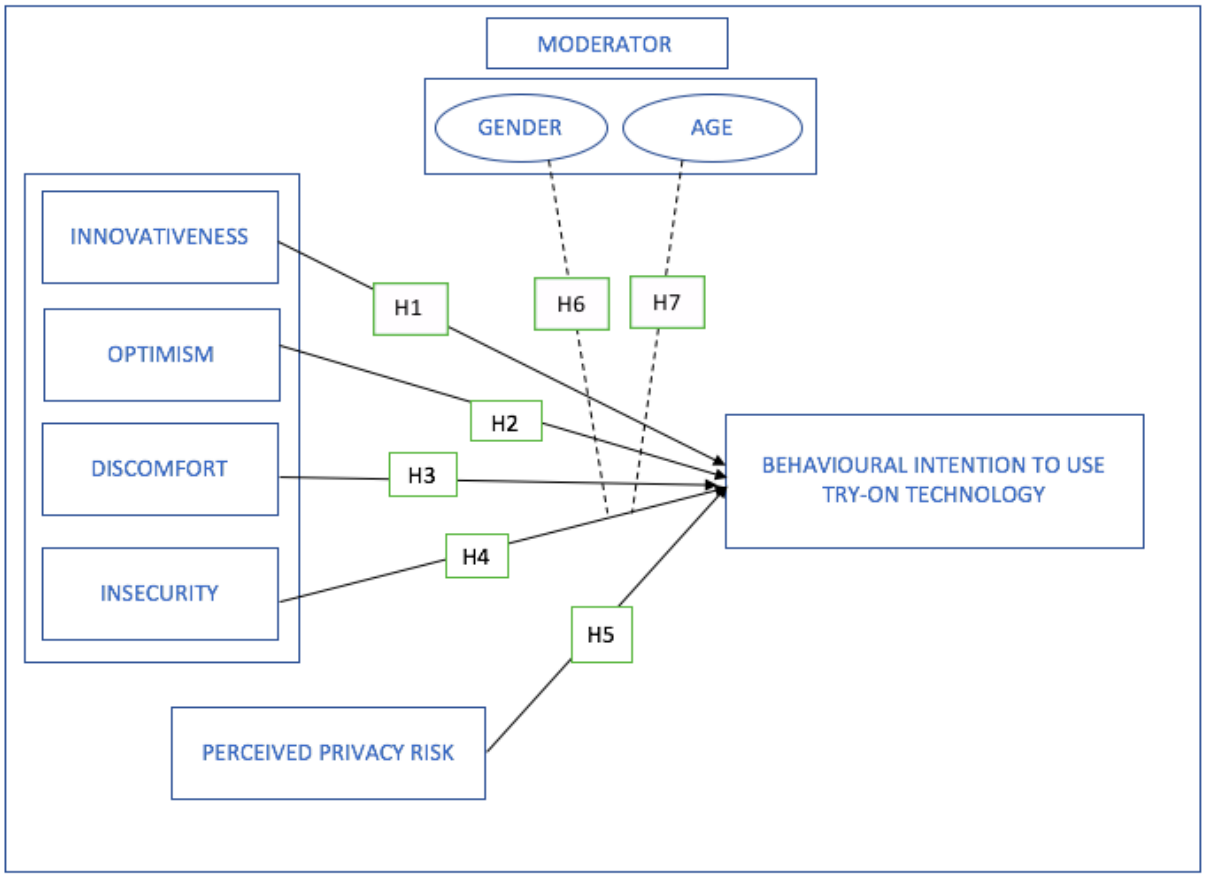

Figure 1. The Technology Readiness Model

5.1. Research Instrument

For the purpose of gathering and analysing data, the current study used a quantitative methodology. Verified scales from the prevalent literature were modified for the questionnaire. The scale components used in this study for the TR index were obtained from Parasuraman 2000. The perceived risk was assessed using five items from Faqih 2022; Rauschnabel et al., 2018. Venkatesh et al. (2012) provided four behavioural intention items. The survey instrument has two main components. The first component of the report comprised the respondents' demographic data. In Section 2, respondents were given 25 "five-point Likert scale" questions about TR, perceived risk, and behavioural intention. The questions ranged from 1 for "strongly disagree" to 5 for "strongly agree". To prevent response bias and routinization, the scale items for the TRI's four dimensions were randomly combined. The questionnaire contains six closed-ended questions on respondents' preferred online shopping platform as well as questions about demographic data.

A pilot test with 25 respondents was conducted before an official survey was undertaken. The link to a virtual try-on technology video was provided in the questionnaire for participants to familiarise themselves with the technology. After watching the video, the respondents agreed that they had prior exposure to such a technology. They realised that different business platforms, like Amazon, Nykaa, etc., had made it possible for them to visualise a product in their image and to maximise the physical fit between themselves and the human visualisation. All relevant viewpoints from the pilot study were taken into account and included in the questionnaire.

5.2. Data Collection

We specifically selected respondents in our study who had used the try-on technology in general. Individuals who have used even one AR app, such as Google Lens, Snapchat Lens, or other retail applications, etc., were considered to have prior experience utilising mobile AR technology for this study (Kang et al., 2023). This was further ensured using the screening question from the questionnaire. In order to define the behaviour of individuals regarding the adoption of various technologies in different contexts, the snowball sampling technique has been used in this paper, which is consistent with the body of existing literature (Maqbool et al., 2022; Waters, 2015; Ali et al., 2023; Maertens and Barrett, 2013). The final questionnaire was circulated both online and offline to get the required data.

A total of 280 questionnaires were received; however, 21 unqualified responses were deleted and 259 filled-out questionnaires were used for the study. Table 1. provides the respondents' demographic information. The data shows that the bulk of respondents (52.90 percent) are male and fall within the 25–34 age range. Male users are more prevalent in the Indian market than female users, with females making up 47.1% of the data. In addition, 43.6% of the respondents have an education level equal to graduation.

Table 1. Demographics of Respondents

Respondent characteristics		**Frequency (percentage)**
Age	Less than 25	35.5% (92)
	25-34	42.5% (110)
	35-44	12.7% (33)
	45-54	5.4% (14)
	Above 55	3.9% (10)
Gender	Male	52.9% (137)
	Female	47.1% (122)
Income	Below $1000	30.50% (79)
	$1000-$5000	27.41% (71)
	$5000-$10000	27.03% (70)
	Above $10000	15.08% (39)
Educational level	Undergraduate	23.6% (61)
	Graduate	43.6% (113)
	Post graduate	30.9% (80)
	Doctoral	1.9% (5)
Nationality	Indians	257
	Non-Indians	2

5. Data analysis

Following the completion of data collection, Sarstedt et al. (2021) suggested a two-step analytical method to evaluate the measurement model and then authenticate the SEM procedures. A preliminary "reflective measurement model" that depicts the connection between all latent variables and approved observable scales is used to evaluate the constructs' validity and reliability. Next, the structural model is evaluated by looking at the "path coefficients," "hypotheses," "correlation analysis," and "R^2 coefficient" to find the hypothesized connections between constructs and the overall prediction of the suggested model (Sia et al., 2023).

6.1. Measurement Model

The quality of the measurement model was largely calculated for the constructs' validity and reliability in order to assure the soundness of the measures used to examine the proposed model. Convergent validity and reliability were calculated using construct reliability and average variance extracted (AVE). According to Fornell and Larcker (1981) and Hair et al. (2010), the desired construct reliability value for each construct should be above 0.70 and the AVE value should be above 0.50. Table 2 displays the findings for validity and reliability as well as the factor loadings of the items.

Table 2: Loading, Reliability, and Validity

Construct and Items	**Factor loadings**	**Cronbach's**	**Composite reliability (rho_a)**	**Composite reliability (rho_c)**	**Average variance extracted (AVE)**
Innovativeness		**0.927**	**0.93**	**0.943**	**0.734**
1. **INN1**	0.886				
2. INN2	0.89				
3. INN3	0.875				
4. INN4	0.807				
5. INN5	0.846				
6. INN6	0.832				
Optimism		**0.907**	**0.925**	**0.935**	**0.782**
1. OP1	0.905				
2. OP2	0.921				
3. OP3	0.916				
4. OP4	0.789				
Discomfort		**0.839**	**0.838**	**0.893**	**0.676**
1. DIS1	0.842				
2. DIS2	0.876				
3. DIS3	0.821				
4. DIS4	0.744				
Insecurity		**0.761**	**0.779**	**0.861**	**0.674**
1. INS1	0.81				
2. INS2	0.798				
3. INS3	0.853				
Perceived risk to privacy		**0.832**	**0.845**	**0.88**	**0.595**
1. PP1					

	0.812				
2. PP2	0.792				
3. PP3	0.76				
4. PP4	0.748				
5. PP5	0.741				
Behavioural intention		**0.889**	**0.89**	**0.923**	**0.75**
1. BI1	0.872				
2. BI2	0.877				
3. BI3	0.873				
4. BI4	0.842				

Discriminant validity is calculated in accordance with Fornell and Larcker's (1981) criterion when a construct's square root of AVE is greater than its correlation with all other constructs. According to our findings, a construct's connection with all other constructs is outweighed by its square root, or AVE. In light of this criterion, discriminant validity is achieved (Table 3).

Table 3. Discriminant validity (Fornell and Larcker)

	Behavioural intention	Discomfort	Innovativeness	Insecurity	Optimism	Perceived risk
Behavioural intention	**0.866**					
Discomfort	-0.208	**0.822**				
Innovativeness	0.695	-0.117	**0.857**			
Insecurity	-0.145	0.354	-0.192	**0.821**		
Optimism	0.623	-0.184	0.845	-0.182	**0.885**	
Perceived risk	-0.179	0.428	-0.124	0.423	0.087	**0.771**

6.2. Assessment of the structural model

The PLS-SEM method was utilised to test the research model's proposed hypothesis using Smart PLS 4. The Standardized root mean square residual (SRMR) is a common signal for PLS-SEM to validate the overall suitability of the model. The SRMR value for model evaluation verification in this work is 0.05 which is lower than 0.08, indicting good model fit. As a result, the model used in this investigation had a good overall fit. R^2, also known as in-sample predictive power, quantifies the amount of variation explained by each endogenous construct and indicates the model's explanatory strength (Rigdon, 2012). The model of our study explains 50.5% variance (R2), which is more than the cutoff of 10% as suggested by Falk and Miller (1992). After applying the moderation impact of demographics on the intention to use AR try-on, the value of variance (R^2) increased to 59.1%, which indicates that there is a significant impact of demographics on personality traits.

6.3. Results of Testing Hypotheses

The present study investigated the moderating role of demographics on the relationship among personality traits and behavioural intention to use try-on technology, the results of which are shown in Table 4. The result revealed that not all demographics affect personality traits in the same manner, therefore accepting some of the proposed hypotheses while rejecting others. Among all the characteristics that have a significant impact on behavioural intention to use try-on technology, "innovativeness" (t value = 4.071, p = 0.05) is the most important factor, followed by "optimism" (t value = 2.011, p = 0.05). The study's findings are consistent with those of Na et al. (2021). The study also showed that only positive TR components influence customer intention (Moon and Moon, 2019; Lee et al., 2012; Choi et al., 2014). Therefore, support H1, H2, and reject H3, H4, and H5. This implies that "insecurity" (H3), "discomfort" (H4), and "privacy risk" (H5) have no impact on the behavioural intention to use virtual try-on technology.

Gender: The mean score for each TR dimension was calculated in order to look for statistically significant gender differences, with the exception of optimism and discomfort, which were not significant. Consistency between samples is shown by gender and anticipated direction variances in two of the four dimensions. No gender differences in TRI were found by Wang and Sparks [2014] in their study of travelers in aviation and hotels. Our findings showed that gender moderated the effect of innovativeness, which are consistent with Lee's [2020] finding that men and women differ in innovativeness; hence, H6(A) is supported. The findings also revealed that gender influences insecurity; hence, H6(D) is supported. Hypotheses H6(B), H(C) and H6(E) are not supported, indicating that there is no gender difference in terms of optimism, discomfort and perceived privacy risk.

Age. There is a difference between young users and older users in their intention to use virtual try-on technology. Age positively impacts innovativeness, optimism, and discomfort. Therefore, hypotheses H7(A), H7(B), and H7(C) are supported, and there is no significant difference between the young and older generations when it comes to insecurity H7(D), therefore rejecting H7(D) and H (E).

Table 4. Structural model results

Final	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Result
INNO -> BI	0.629	0.623	0.093	6.767	0.00	H1: **S**upported
OP -> BI	0.219	0.209	0.121	2.011	0.03	H2: Supported
IS -> BI	0.097	0.072	0.088	1.103	0.27	H3: Not Supported
DI > BI	-0.067	-0.068	0.085	0.784	0.433	H4: Not Supported
PP -> BI	-0.12	-0.12	0.085	1.409	0.059	H5: Supported
GG x II -> BI	0.43	0.34	0.14	1.97	0.026	H6 (A): Supported
GG x OP -> BI	-0.253	-0.215	0.203	1.248	0.212	H6 (B): Not Supported

GG x DI -> BI	-0.085	-0.077	0.121	0.704	0.481	H6 (C): Not Supported
GG x IS -> BI	-0.107	-0.093	0.114	1.992	0.048	H6 (D): Supported
GG x PP -> BI	0.062	0.054	0.118	0.521	0.603	H6 (E): Not Supported
AG x II -> BI	0.184	0.201	0.094	2.065	0.05	H7(A): Supported
AG x OP -> BI	0.208	0.444	0.125	2.29	0.019	H7(B): Supported
AG x DI -> BI	-0.136	-0.111	0.089	2.01	0.0075	H7(C): Supported
AG x IS -> BI	0.28	0.05	0.119	0.24	0.405	H7(D): Not Supported
AG x PP -> BI	-0.06	-0.06	0.064	0.946	0.344	H7(E): Not Supported

6. Discussion and Implications

7.1. Discussion

The objective of the study is to understand the moderating influence of demographics on personality traits to determine customer technological readiness. We discovered that respondents' TR responses are influenced by demographic characteristics such as gender and age. First, characteristics such as innovativeness and optimism influence the intention to use virtual try-on technology. These findings are partially compatible with previous research by Moon and Moon (2019), Lee et al. (2012), and Choi et al. (2014), which found that only positive TR constructs influence customer intention. Second, the relationship between discomfort and intention to use try-on technology is not significant, meaning that discomfort as a personality trait does not impact the VTO use. The findings are consistent with the research of Flavián et al. (2022), which showed that users' discomfort does not prevent them from using robo-advisors. The fact that technology discomfort was first identified as a TRI factor impeding adoption draws this conclusion more intriguing (Parasuraman, 2000; Parasuraman and Colby, 2015). Third, insecurity has no impact on the intention to use try-on technology. This conclusion is in line with the findings of Lee [2020], who proposed that the insecurity of technology-based service (TBSs) users in hotels had the biggest effect on TBSs usefulness. Such findings may be explained by the fact that digital natives, who were exposed to a range of digital settings from birth and have never felt uncomfortable or insecure, do not feel any discomfort or nervousness while embracing new technology (Seo et al., 2018). Because AI systems are automated, the user does not have to deal with the difficult and frequently challenging chores of comprehending and using the technology. Instead, analytical AI does these tasks on their behalf (Belanche et al., 2020b). Third, the result showed that privacy risk negatively impacts the customers' intention to use try-on technology. The risks linked to new technology frequently deter customers from experimenting with and utilising such technology during online purchases. Lee and Porterfield (2022) elucidated that the primary concerns customers encounter are technical and personal in nature. Consumers' apprehension regarding the time and effort necessary to master new technology, the requirement to input personal data, and anxiety about achieving the desired outcomes frequently hinders their adoption of such innovations. The garment industry serves as a significant context (Beck and Crié 2018) for examining the adoption of VTO in India. Saxena et al., (2022) indicated that both facilitating and risk factors significantly influence

consumers' intentions to embrace and adopt mobile banking. The clothing brands may partner with VTO designers to incorporate interactive elements like mix-and-match ensembles, 360-degree perspectives, and virtual runway shows.

Fourth, the influence of innovativeness on intention to use try-on technology differed across men and women. Men embrace new technology more quickly than women, according to studies (Kim et al. 2019, Ab Halim 2012, Victorino et al. 2009). Men reported more time spent on ICT, information capability, the Internet, and mobile utilisation than women, according to a study conducted by Ju et al. [2018]. According to research by Choi and Yoo [2020], males had higher levels of positive technology readiness than women for mobile tourist applications, but women had higher levels of negative technology readiness. Fifth, age influences innovativeness, optimism, and discomfort but has no substantial moderating effect on insecurity or perceived privacy risk. Age has also been linked to customer technology innovation (Lee et al., 2010).

7.2. Implications

Our results have a wide range of implications. The previous TRI studies have primarily concentrated on variable relationships without taking demographics into account as moderators. Our findings have three immediate uses. First, the more favourably a user reacts to modern technology, the greater his or her intent to utilise it. As a result, it is critical to boost users' optimism and innovativeness. Given that innovativeness is a considerable component of the intention to use technology among the TRI criteria, it is recommended that various types of user apps be developed using information and communication technologies. Second, it is vital to emphasize on the convenience of evaluating, ordering, and paying through virtual try-on technology for elderly customers whose negative TRI score is high, to enhance their intent to continue using them. Third, as per result of this research, merchants should be mindful of the underlying association concerning demographics and customer characteristics rather than just executing market segmentation by demographic parameters. This study explains why different people do not use try-on technology in the same way and suggests that this discrepancy may be ascribed to customer characteristics that are determined by various demographic parameters. The findings revealed that younger people, have more positive attitudes towards technology use.

The research implications outlined above can readily be used to determine the practical implications of this study's findings. When organisations consider doing business and evaluating their own domestic markets, demographic features are essential to them. The findings show that demographic parameters (such as gender, age) impact customers' intentions to employ virtual try-on technology via customer qualities. That is, distinct personality qualities resulting from demographic considerations effect customers' willingness to embrace virtual try-on technology.

Women and older people had fewer favourable attitudes towards technology adoption, which could indicate that people prefer to engage and connect with businesses through interpersonal means rather than more modern technologies like online transactions. The retailers can leverage these insights. Retailers should align their virtual try-on offerings with the diverse expectations and preferences of their customer base, ultimately enhancing their competitiveness in the market. This meaningful link between the identified demographic variations and actionable strategies for retailers underscores the practical value of the study's findings in the evolving retail landscape.

The integration of virtual try-on technology in the retail sector has revolutionized the way consumers interact with products. However, to fully capitalize on the potential benefits of this technology, retailers must consider the diverse expectations and anxiety levels of individuals from different age groups. By aligning virtual try-on offerings with these factors, retailers can enhance user engagement, foster positive brand experiences, and ultimately increase conversion rates. In recognizion of the varying levels of anxiety towards using VR-Try On, retailers can customize

their offerings to ensure inclusivity and accessibility for all consumers. Understanding Age-Related Expectations: Different age groups possess distinct expectations when it comes to virtual try-on experiences. For instance, younger consumers may seek a more immersive and interactive interface, while older individuals may prioritize ease of use and simplicity.

7. Research limitations and future direction

Longitudinal investigations, which were not undertaken in this study, are preferred by Rogers (2003) because they are more helpful in understanding customers' intentions to adopt technology. The study was conducted in India, where try-on technology is still in its infancy, and the future studies may be conducted in some other countries to get more insights. In our study, we used technological readiness to determine customer preparedness to use technology via the moderating effect of demographics.

Further study is required to properly account for potential discrepancies in age or gender, as well as to evaluate if the findings of this study still hold true when a larger sample is considered. Our study improved on prior studies by using a particular technology to screen for behaviour. Future research could apply our findings to a variety of AR virtual try-on scenarios, such as web-based virtual try-on services. Despite the shortcomings noted above, this study contributes to the body of knowledge by shedding light on the trade-off effect of virtual try-on technology. Future research may include additional techniques for gathering data, such in-person interviews or questionnaires intercepted at malls.

7.2. Implications

The findings of this study yield several significant theoretical and practical implications, particularly concerning the role of demographic moderators in the relationship between personality traits and technological readiness. While prior research utilizing the Technology Readiness Index (TRI) has predominantly focused on the direct effects of TRI constructs on technology adoption, this study advances the literature by demonstrating how demographic characteristics—specifically gender and age—moderate the influence of personality traits on the intention to use virtual try-on (VTO) technology.

Theoretical Implications.

Firstly, the results affirm that individuals with higher levels of *innovativeness* and *optimism*—positive TRI constructs—exhibit stronger intentions to engage with VTO technologies. This finding is consistent with previous research (Moon and Moon, 2019; Lee et al., 2012; Choi et al., 2014), which highlighted the predominance of positive psychological traits in facilitating technology adoption. However, a notable contribution of the current study lies in identifying that even negative TRI constructs—*discomfort* and *insecurity*—can positively influence adoption intentions under certain conditions. These results diverge from early TRI conceptualizations (Parasuraman, 2000; Parasuraman & Colby, 2015) that framed these constructs primarily as inhibitors. The findings align with recent evidence (e.g., Flavián et al., 2022; Lee, 2020), suggesting that automation and intelligent interfaces may alleviate users' technological anxieties by minimizing the need for direct technological engagement.

Furthermore, the study reveals that demographic variables—particularly age and gender—moderate the influence of TRI traits. Gender differences were observed in the relationship between *innovativeness* and adoption intention, with male respondents exhibiting stronger associations. This is supported by existing literature indicating higher ICT

usage, digital capability, and technology optimism among men (Kim et al., 2019; Ab Halim, 2012; Ju et al., 2018). Similarly, age was found to influence *innovativeness*, *optimism*, and *discomfort*, though not *insecurity*. These insights contribute to a more nuanced understanding of the role of demographic characteristics as contextual variables within technology adoption frameworks.

Practical Implications

The findings offer actionable insights for practitioners, particularly in the retail sector. Firstly, the positive relationship between TRI traits and technology adoption highlights the need for retailers to develop user experiences that foster optimism and innovativeness. Application interfaces that are engaging, efficient, and personalized can strengthen users' positive predispositions and increase the likelihood of technology acceptance.

Secondly, given that older consumers tend to report higher levels of technological discomfort, efforts should be made to reduce cognitive barriers and promote ease of use. Retailers are advised to prioritize clarity, simplicity, and user-centric design when developing VTO platforms for this demographic. Providing accessible tutorials, customer support, and streamlined navigation can enhance older consumers' confidence and increase their intention to engage with VTO technologies.

Thirdly, this study underscores the limitations of conventional demographic-based market segmentation strategies. While demographic variables remain important, the findings suggest that customer behavior is significantly shaped by personality traits, which in turn are influenced by demographic background. Retailers should therefore move beyond broad segmentation strategies and instead adopt more refined, psychographically informed approaches that consider the intersection of demographic characteristics and psychological readiness.

Additionally, the implications of discomfort and insecurity as facilitators—rather than inhibitors—of technology adoption must be acknowledged. In contexts where technologies are highly automated and intuitive, users who typically exhibit anxiety or hesitation toward technology may experience greater acceptance due to reduced interaction complexity. This insight is particularly valuable in the development of AI-powered VTO platforms, where seamless automation can serve as a key driver of user engagement among more reluctant consumer segments.

Finally, understanding the varied expectations of different age groups is crucial. Younger consumers are generally more receptive to immersive and interactive digital experiences, whereas older consumers tend to value usability and minimal complexity. Tailoring VTO technologies to accommodate these preferences can improve user satisfaction, increase adoption rates, and enhance the overall customer experience.

Conclusion.

In conclusion, this study emphasizes the importance of integrating demographic and psychographic factors in understanding and predicting technology adoption behavior. Retailers seeking to leverage VTO technologies must adopt a holistic perspective that accounts for the interplay between personality traits and demographic influences. By designing inclusive, adaptable, and user-oriented technological solutions, retailers can effectively meet the diverse needs of their consumer base, thereby enhancing competitive advantage in an increasingly digital retail landscape.

8. Conclusion

In today's increasingly competitive international marketplaces, where products are influenced by advancing technology and rising customer expectations, effective methodologies for detecting emerging technologies and assessing their application and readiness are necessary. Given the increasing proliferation of technology-based systems, understanding customers' readiness to embrace them is critical. Demographic characteristics and

personality types influence the acceptability of technology-based services. Demographic considerations influence attitudes towards the adoption of new technology. in order to maximize the potential advantages offered by this technology, it is imperative for retailers to take into account the varying expectations and levels of anxiety experienced by individuals across different age and gender cohorts. After analyzing the results of the study, we can conclude that demographics moderate the relationship between personality traits and technology acceptance. As a result, it is prudent to provide clients with the option of choosing between a non-AR mode and the desired AR try-on function.

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