

# A Systematic Literature Review and Analysis of Try-on Technology (VFR)

Raheela Batool and Jian Mou

EasyChair preprints are intended for rapid dissemination of research results and are integrated with the rest of EasyChair.

February 23, 2025

#### A Systematic Literature Review and Analysis of Try-on Technology (VFR)

Raheela Batool	Jian Mou (corresponding author)
Pusan National University	Pusan National University
batoolrahee@pusan.ac.kr	jian.mou@pusan.ac.kr

#### Introduction

The fashion industry contributes to 2% of the global GDP. Recently, with the rapid growth of try-on technology, virtual fitting rooms (VFR) are used as a promotional tool to enhance consumer experience and attitude (e.g., fun and enjoyment) compared to traditional However, the current online apps and websites deprive consumers, of products' physical apprehension (Yang & Xiong, 2019). Among online shopping, clothing has the first purchase frequency, but it has growth barriers because of the consumer's fear of matching clothing based on their size and complexion. As a result, the return rate is reaching up to 60% more than in other e-commerce sectors (Rese et al., 2017). Fashion brands are focusing to restore virtual try-on technologies. They can use try-on technology to increase consumer experience, improve product visualization, and offer e-shopping sensory input. Consumers can use their images to grab the virtual model's apparel and accessories. It allows consumers to try sizes, styles, and colors on a computer or smartphone screen. This experience is more meaningful; consumers can have sufficient information to evaluate the products and minimize the associated risk (Rese et al., 2017).

Try-on technology can be a game changer for fashion brands if implemented intelligently while offering robust solutions. Before implementation fashion brands should understand the issues in the existing tryon technology. And its ability to complement the online ecosystem and offline experiences. Launching the try-on technology in consideration of the consumers and technological characteristics in a wide range is crucial. The existing literature on TOT is limited and we need a better understanding of this literature because of (mixed findings, and no clear overview. Therefore, we believe that to conduct a systematic literature review is to consider TOT with respect to existing issues that accounts for (technological issues) and dimensions of national cultural values that account for (consumer characteristics). Hence, it can be debated that the lack of existing research that has not considered the issues in try-on technology such as limited try-on options, try-on products inconsistency, lack of look comparison and sharing functionality, and national cultural values (e.g. uncertainty avoidance, masculinity/femininity, individualism vs collectivism, long-term orientation, and high context vs low context). Social influence (e.g. internalization, identification, and compliance). However, examining the existing issues and possible solutions in try-on technology is more complex because it is in the developing process. Therefore, we propose the following research questions.1) What similarities and differences are evident in the try-on technology literature, regarding regions, research methods, and topics? 2) What are the theories/frameworks/models adopted by studies considering try-on technology? 3) What are the key antecedents and consequences of try-on technology? 4) What knowledge gaps are evident within the extant literature on try-on technology?

To answer these questions, this study systematically classifies, highlights, and analyzes the prior studies' key findings based on try-on technologies in the marketing and information system area. The literature on try-on technology is growing gradually. Even though several studies are conducted on try-on technologies. But this research area is still quite young and has varying findings from several research methodologies. The inconsistent findings can't be beneficial in understanding issues and advancing future research. Discussing and critically identifying the gaps through systematic literature will be beneficial. Thus, this study provides thorough literature about consumer engagement with try-on technology.

#### **Literature Review**

#### The Concept of Try-on Technology (TOT)

Try-on technology (TOT) was introduced in 2005 for the first time and it was not widely studied until

2010. The increase in studies increased with the advancement of technologies and the development of ecommerce. Until the 2000s, the virtual try-on technology or virtual fitting room was primarily imaged interactive technologies (IIT) that use 3D virtual simulation techniques, with the characteristics of 3D product visualization, mix-and-match ability, and rotation properties. In the entire setting, 3D virtual simulation creates virtual reality, and IIT focuses on virtual visualization based on users, products, and the environment. In a simulated 3D world, it places users with virtual models in a computer-mediated environment (Lee et al., 2021). TOT is a form of image interactivity Technology (IIT), that is used to provide users with an online experience "real" by enabling them to make modifications in the viewing background, features, distance, or other designs and features (Merle et al., 2012). Through visual cues, the users can gain huge information regarding the product. Prior research studied three major types of IIT, such as (1) 3D (PV) product visualization (Li et al., 2003), (2) mix-and-match (MM) product image (Fiore et al., 2005; Fiore & Jin, 2003), and (3) try-on technology interface (e.g., VFR). Among these, all PV and MM are considered the more complicated traditional product visualization (Merle et al., 2012). Particularly, PV promotes the product in 3D as a replacement for 2D promotional images. While MM is used as an interactive tool that allows users to manage the product on the screen by choosing the images of the complimentary items (e.g., T-shirts, sandals, cosmetics, shorts; the images are often in 2D form.

Prior research emphasizes the value of media richness, vividness, and interactivity in the IIT systems, to view better the entire outfit. This kind of technology enriches users' understanding and perceived analytics of the website (Jiang & Benbasat, 2004, 2007; Suh & Lee, 2005). As a higher rank of IIT, VFR has the propensity to provide users with a realistic experience, where users can choose and personalize a 3D virtual model that reflects their actual looks and actual self can fit the cloth (Merle et al., 2012) In contrast, PV and MM do not have this feature. While using these the users can't choose the virtual model and fit the cloth on their actual figure. By using advanced TOT the users can go with thorough examination while trying on the blend of charted product images that are zoomable 360-degree views.

Previous studies examined the non-customized TOT (Fiore et al., 2005; Lee et al., 2006) with standardized virtual models. And it is suggested that, for consumers, the non-personalized TOT is more enjoyable and useful than zoomable 2D product representation. Most recent studies are examining personalized TOT, where users can create customized models based on their faces and body figures. The studies emphasize entertainment, usefulness, and ease of use of TOT (Kim & Forsythe, 2007, 2008, 2009) while another study focuses on the consumer's positive perceptions about personalized as compared to non-personalized because personalized TOT there is higher self-congruity of the virtual model (Merle et al., 2012). Virtual models share particular similarities to avatars in the virtual world (e.g. second life). For example, a 3D virtual world environment has a positive and negative impact on brand equity as compared to a 2D environment (Nah et al., 2011).

### **Data and Initial Results**

#### Literature search

A systematic literature review SLR broadly recognize, assess, and synthesize all the related studies that meet pre-determined requirements and method, to answer research questions (Antman et al., 1992; Klassen & Alejandro, 1998). This study adopts the SLR approach recommended by Tranfield et al. (2003). This kind of study must follow a replicable, scientific, and vibrant process, to reduce bias in field coverage (Mulrow et al., 1997; Nightingale, 2009). This study commences with a comprehensive review of the try-on technology using a concise cataloging system.

To conduct the review stage first, we searched for the published research papers using the keywords (try-on technology OR virtual fitting room) on Scopus and Science Direct databases. Only two keywords were used to specifically capture the publications that is based on try-on technology just in the fashion context. Because when these keywords were used for searching. It produced more relevant results as per requirements than using other keywords. Particularly VFR keyword contributed more effectively to searching the relevant results.

Limited research studies were found based on try-on technology, particularly in the fashion context. The publication time frame was selected from 2005 to 2022. Because the technologies transform with high speed and try-on technology was introduced in 2005 for the first time and it was not widely studied until 2010 (Lee et al., 2021). Therefore, the start year 2005 is chosen and there have been limited studies up to

now, particularly in the fashion context. The publications in which the participants were younger between 18 to 35 were selected because in the fashion context the mentioned participants are more involved in and using TOT for shopping for fashion products. So, their preference and evaluation can be more useful for examining the concept.

Inclusion Criteria	Exclusion Criteria	
Review and research articles are written in English.	Published review or research articles that are not written in English or other types of articles such as conference, theoretical papers, book chapters, Ph.D. or master's thesis, or other types of literature review	
Published articles between the years January 2005 to May 2022.	Published review or research articles before January 2005 and after May 2022.	
Empirical studies (qualitative, quantitative, or mixed methods).	Research articles in which participants are above 35 years old.	
The studies in which participants are younger adults aged between 18 to 35).	The articles where try-on technology is mentioned but the focus was on other areas (e.g. learning/education/medical/health care/engineering etc.).	
Research articles only from MIS and marketing fields.		
The research articles (W and X category) on HJRS (HEC Journal Recognition System).		
Research articles based on try-on technology in the context of fashion.		
Table 1. Inclusion and Exclusion Criteria		

The final search was performed on 28<sup>th</sup> July 2022 followed by the review protocol, which includes preliminary inclusion and exclusion search criteria. To characterize relevant studies, conduct an assessment and critical analysis of each study (Marikyan et al., 2019). Finally, 32 publications met all our requirements, were confined, and reviewed. Fig.1 illustrates the summary of the article identifying and selecting process. The reporting and diffusion stage includes each study's details. For example, year and region, research methods, theories, antecedents, moderators/mediators, and consequences of TOT.



Figure 1. Article Selection and Retention Process

### **Initial Findings**

#### **Years and Regions**

The number of try-on technology (VFR) studies grew from 2017 onwards as shown in Figure 2. This shows that this is an emerging research area. Out of 32 retained studies, only 1 study has conducted cross-countries research. Among these 11 papers are conducted in the USA, 2 in India, 1, in Jordan, 5 in Europe, 5 in China, 3 in South Korea, 3 in Turkey, and 1 in Taiwan.

Among these papers, the high percentage of papers published is in the USA and the starting year of the

study in the USA is 2014, showing a growing trend gradually. Most of the published papers are from 2019 to 2022. In general, most of the studies are conducted in the USA. The other Asian countries (e.g. China, South Korea, etc.), and the European countries are minimal (see Table 2).



Country	Number of articles (32)	
USA	11	
China	5	
South Korea	3	
Turkey	3	
France	2	
Sweden	2	
India	2	
Italy	1	
Canada	1	
Jordan	1	
Taiwan	1	
Table 3. List of Countries and Number of Studies		

#### **Methodologies Employed**

After categorization, qualitative and quantitative studies were identified. In the literature on try-on technology quantitative studies are predominant. The common approaches used by these studies were surveys and experiments. Cross-sectional surveys were a commonly used approach compared to longitudinal studies. Hence, cross-sectional studies can examine better the engagement with try-on technology. Some studies have been carried out in non-English speaking countries and applied a backward translation approach without reporting the translated version of the measurement scale. Reporting translation is essential to establish construct validity and enables the comparison between different studies. Lacking standardization of translated measurement scales can cause issues of construct validity.

Research method	Number of articles (32)	
Survey	18	
Experiment	9	
Quasi-experiment	1	
Interview	2	
Survey and Interview	1	
Field Experiment	1	
Table 4. List of Research Methods Used		

#### Theories of Try-on Technology

Table 3 shows the core theories that have been implemented in the studies. Among the wide range of theoretical lenses, the stimuli, organism response (S-O-R), and TAM were commonly adopted. TAM was originally developed by Davis et al. (1992) to evaluate the adoption of novel information technology within an organization or group of people, hypothesizing the constructs (perceived ease of use, perceived usefulness) on technology adoption attitude. The (S-O-R) framework was proposed by Mehrabian & Russell (1974) According to this, the environmental stimulus (S) can have an impact on the consumer's internal evaluation processing organism (O) that leads to behavioral responses (R). The S-O-R framework has widely been used in studies that aimed to investigate the influence of environmental factors on cognition and emotions, affecting behavioral approaches (e.g. adoption, and purchase decisions).

Core Theory Applied	Authors	Examination of studies (Publication Venues)
S-O-R	(Lee et al., 2022)	Consumer's evaluations of technology attributes for the adoption of virtual try- on technology
	(Shin & Baytar, 2014)	Consumer's apparel fit and size concerns and Intentions to Use Virtual Try-On
	(Merle et al., 2012)	How and why consumers use virtual try- on technology on a retail website.
	(Animesh et al., 2011)	Impact of technological and spatial environments on purchase intension of virtual products
	(Baytar et al., 2020)	Garments Evaluation in AR when online shopping
Uses and gratification theory	(Zhang et al., 2019)	From utilitarian, hedonic, and risk perspectives, how the use of try-on technology affects consumers' purchase intension
	(Yaoyuneyong et al., 2018)	AR dressing room media, purchase intention, and mediation
Signaling theory,	(Tandon et al., 2021)	Pay on delivery (MOP), return policies, and virtual try-on technology as influencers of trust and repurchase intension
	(Tandon et al., 2020)	Impact of intangible product features and e-commerce institutional mechanics on consumer trust and repurchase intention
UTAUT2 (unified theory of acceptance and use of technology 2)	(Qasem, 2021)	Influence of personality traits on consumer adoption behavior toward the virtual fitting room
TR (Technology readiness)	(Qasem, 2021)	Influence of personality traits on consumer adoption behavior toward the virtual fitting room
The theory of interactive media effects	(Lee et al., 2021)	Adoption of AR-Virtual fitting room based on interactive media effects theory
TAM (Technology acceptance model)	(Han et al., 2020)	Telepresence, time distortion, and consumer traits of virtual reality shopping
	(Lee et al., 2020)	Technology visibility, consumer perceptions, and adoption intentions between Chinese and Korean consumers.
	(Li & Xu, 2020)	The influence of two relevant personality traits, fashion leadership, and technology anxiety, on consumers' VFRs adoption.
	(Plotkina & Saurel, 2019)	The role of TOT and physical appearance in M-retailing apparel
Flow theory	(Han et al., 2020)	Telepresence, time distortion, and consumer traits of virtual reality shopping
Utilitarian, hedonic, and risk	(Zhang et al., 2019)	Virtual try-on technology affects online consumers' purchase decision process towards purchase intention, especially from the integration of utilitarian, hedonic, and risk perspectives
Virtual liminoid theory	(Huang & Liao, 2017)	Generating e-shopping multisensory flow experience by AR interactive technology
Tab	le 5. Theories/Models/Framewo	

**Antecedents of Try-on Technology** Previous studies have identified a total of 32 antecedents of try-on technology that we have characterized

into two main groups namely technological and psychological factors. We come about a conceptual model of antecedents, mediators, moderators, and consequences of try-on technology (TOT). An enormous number of antecedents are found in the previous studies. This section only prioritizes the antecedents that have been discussed often. Figure.3 consists of the list of antecedents and consequences of try-on technology.

Antecedents	Psychological factors	Mediators	Consequences
Technological Factor		Performance expectancy	Behavioral Factors
Perceived usefulness	Body ownership	Effort expectancy	Intention to adopt
Perceived ease of use	Unfavorable body image	Hedonic motivation	Satisfaction
Innovativeness	Favorable body image	Price Value	Perceived assortment
Perceived product risk	Perceived enjoyment	Utilitarianism	Post-evaluation of virtual
Perceived privacy risk	Utilitarian shopping	Attitude towards	try-on
Perceived augmentation	orientation	VTO technology	Attitude toward VTO
Perceived socialization	Hedonic shopping	Intended use of virtual try	technology
Perceived interactivity	orientation	on	Purchase Intension
Technology visibility	Playfulness	Convenience to examine th	e Reuse SET for online
Telepresence	Media irritation	product	apparel purchase
Model's ideal bodies	Technology anxiety	Perceived ease of use	Revisit the site with SET for
Model's virtual bodies	Optimism	Perceived usefulness	online apparel purchases
Channel	Control	Actual use	Post-use evaluation
AR-based VTO (complete		Perceived enjoyment	Behavioral Intention
appearance fit)		Telepresence	Repurchase intension
Ethnic and body size fit with the			Adoption
model			
Ethnic fit with the model			
Body Size fit with the model			
No ethnic and no body size fit		oderators	
with the model	Gei	nder	
Level of IIT	Age		
Innovativeness		chnology anxiety	
Challenge		ovativeness	
	Per	ceived concentration	
	Fas	shion leadership	
		ly image	
		ly satisfaction	
		ne distortion	
	Tec	chnology readiness	

Figure 4. Conceptual Model of TOT's Antecedents, Moderatos/Mediators, and Consequences

#### Conclusion

#### **General Discussion**

Our study considers the empirical literature on try-on technology published between the years January 2005 to May 2022. Table 3 shows the publication venue of the reviewed survey studies related to try-on technology in the fashion context (e.g. clothing, glasses, shoes, and cosmetics). Unassumed empirical studies on try-on technology (TOT) are found between the years 2005 and 2016. Only since 2017 the empirical studies on try-on technology (TOT) been considered critically in the fashion context. Particularly, in recent years, this agenda has taken a significant and observable foothold for the upward trend since 2018 and to the year 2022 (the literature is considered until May, for the year 2022 and it can be expected that this trend will rise). This shows that the agenda of try-on technology in the fashion context is developing.

#### The Environment Try-on Technology is Used

Based on the primary finding, try-on technology is used for entertainment or online shopping purpose. Try-on technology benefits the consumers with similar or sometimes more unique, pleasurable experiences and detailed information as like physical stores. The main advantage is that it provides consumers with the experience of try-on products virtually when they are unable to access them physically. For example: At home, users can explore products in their intended surroundings, to get a better idea of the product features before making a purchase decision (Brengman et al., 2019; Pantano et al., 2017). In the physical stores, the users are provided the try-on possibilities and additional product information through VR. Among advantages, in-store solutions can attract the consumer's attention, raise curiosity, and more convenient experience, playfulness, and satisfaction (Javornik, 2016) TOT is more appropriate for the products that work at the consumer's body extension (e.g., tools) rather than body presentation such as clothes (Alzayat & Lee, 2021).

#### **Devices Used**

The hand-based mobile devices such as mobile phones and tablets (68.4%) are mostly employed to evaluate the effect of try-on technologies for shopping purposes. By desktop PCs (21.1%) with a combination of web cameras. Mobile devices are more favorable than desktop PCs due to their maneuverability. The core advantage of try-on technology is its capability to superimpose virtual objects and move and manipulate them via movement-based controls. Consequently, it seems credible that mobile devices are the most popular choice for entertainment and shopping purpose through try-on technologies. One of the features of try-on technology, users can view themselves virtually through virtual or magic mirrors. For instance, eyewear (Beck & Crié, 2018; Hilken et al., 2017; Pantano et al., 2017), makeup (Hilken et al., 2017; Javornik, 2016), and fashion-associated products (Beck & Crié, 2018). This feature can be practiced through a mobile device (e.g. by using built-in cameras) and desktop PCs (e.g. by using web cameras).

We encountered only one study that examined augmented reality hardware such as HoloLens (Heller et al., 2019), and another study examined product presentation via pseudo-holographic stereogram (Morillo et al., 2019) However, mobile devices with built-in AR features are increasingly equipped and rolled out than AR hardware. It is explicit that most of the literature reviews are on ubiquitous devices, such as tablets and smartphones. Mobile devices are preferable because of their advantages such as convenience, cost efficiency, and economic value compared to AR/VR hardware. Thus, a mobile device is the focus of the use of try-on technologies. But the AR/VR hardware has its importance and useability, and the device's importance can be examined in future research.

#### **Technological Characteristics**

From the existing literature on try-on technology (TOT) various studies are found with inconsistencies. The predictors which influence consumers to engage with try-on technology TOT are not just consumer perception about the technology characteristics (e.g. Perceived interactivity, perceived augmentation, perceived concern, perceived enjoyment, perceived privacy risk, visibility, etc.), but also consumer

characteristics (optimism and innovativeness). Regarding technological characteristics, a study with its extended version was published in two separate journals. The first study by Lee et al. (2021) investigated the media characteristics (e.g. perceived interactivity and perceived augmentation) and revealed the positive effect on consumers' perception of telepresence and adoption intention of try-on technology. And an extended version

Lee et al. (2022) used a similar model, respondents' gender, and age but with the addition of two personality traits such as sensation-seeking tendencies and technology anxiety as moderators. As a result, derived the positive impact of media characteristics on telepresence and consumers' adoption intention of try-on technology and found the positive relation of moderators.

The impact of another technology characteristic such as technology visibility was examined with mediated variables for instance (perceived functional benefits, perceived functional concern, perceived control, perceived concentration, and perceived enjoyment) on consumers' VFR adoption behavior in the online shopping context. The result of the study is based on the cross-cultural comparison between Chinese and Korean markets. The study represented the conclusion based on a dimension of national cultural values (e.g. collectivism vs individualism). The Chinese consumers being more collectivist relied on technology visibility for the adoption of VFR as compared to Korean consumers. And the perceived concerns have a negative influence. In contrast, for Korean consumers, enjoyment, perceived benefits, and perceived concentration have a significant influence on adoption intentions (Lee et al., 2020).

StudY by Zhang et al. (2019) suggests that perceived usefulness has a positive effect on consumers adopting a new system. In contrast to these other studies suggest that among the three variables of TAM perceived usefulness is found least influential on Chinese consumers the explanation behind this result is that TOT is yet in the development process, as the avatars and the virtual models are not built accurately yet. That appears like it is not fully capable to meet the consumers' needs and solve their problems completely. The other reason can be the consumers' usage experience. As most Chinese consumers are not confident enough yet to use TOT. Due to a lack of experience in using TOT consumers are not confident enough whether this tool can be useful to improve their online experience (Li & Xu, 2020; Jiang et al., 2022).

#### **Consumer Characteristics**

Individual characteristics (optimism and innovativeness) have a positive influence on performance expectancy and price value when using try-on technology in the fashion context (Qasem, 2021). A consumer's body image can impact the consumer's intention to adopt try-on technology. An evaluation based on a comparison of virtual try-on technology websites vs traditional web-based product presentations suggested that consumers who are not satisfied with their body image have a favorable evaluation of Virtual try-on compared to traditional web-based product presentations. In contrast, consumers who are satisfied with their body image report no variance in the evaluation of both types of representation (Yim & Park, 2019). Another study used a randomized field experiment method. They provided the customers with two treatment conditions. 1<sup>st</sup> one is where the virtual fit information is available. The second is where virtual fit information isn't available. The result revealed that virtual fit information increases the order value and conversion rate on other hand reduces the fulfillment costs that arise from home try-on behavior (consumers order different sizes at home) and return. Virtual fit information helps consumers and retailers both regard to consumers it helps them for making better choice sets and reduces uncertainty about the size (Gallino & Moreno, 2018). The effect of the model's body on female consumers' concern about their clothing size and fitness was investigated by two mock websites (MVBs or MIBs) to simulate realistic online shopping. The result revealed that female consumers who were more exposed to MVB's experience had greater concern about the garment's fit and size than MIBs. And the female consumers who expressed less anxiety about apparel fit and size viewed MIBs. And females who view their virtual models get negative thoughts about apparel fit and size.

Another study also tested the impact of body satisfaction levels (high vs low) on participants' concerns about apparel fit and size. The result revealed that females who are with a low level of body satisfaction have greater anxiety about apparel fit and size than females who express a high level of body satisfaction (Shin & Baytar, 2014).

#### The Website with Try-on Technology VS the Website without it

Some studies compare the website with and without try-on technology. For instance, website browsing

with VR TOT was more effective than AR to increase purchase intentions. Both websites with VR/AR were more effective compared to regular websites with no technology (Park & Kim, 2021). TOT on a website effect positively the consumers' curiosity, offline/ online patronage, and purchase intentions. This study considered the new TOT as an environmental new sales aid on a website. That helps the consumers to develop exploratory behavior. It has used curiosity as a motivational variable. The increase in curiosity increases the desires that motivate the consumers to get interested and attention to the product. The mediation test also shows that when consumers become curious due to the TOT on the website, they are more likely to patronage and purchase from the real store and website (Beck & Crié, 2018).

#### **Moderators and Mediators**

Different studies have used different mediators and moderators to examine the relationship between technology, consumer characteristics, and engagement with try-on technology. For this reason, the studies using distinct mediators and moderators are with distinct conclusions. For example, the level of sensation seeking doesn't vary in the relation between telepresence and perceived value. But technology anxiety varies by level between technology attributes and telepresence. Perceived interactivity has a significant influence on telepresence when consumers with low technology anxiety (Lee et al., 2022). Hedonic motivation, performance expectancy, and price value significantly mediate between optimism and innovativeness, and behavioral intentions except for effort expectancy (Qasem, 2021).

#### **Knowledge Gap and Future Research**

#### **Existing Issues in the TOT**

Based on the findings of existing studies there are existing issues in try-on technology systems that are not considered yet. For example (limited try-on options for multiple products, Try-on product inconsistency, lack of look comparison and sharing functionality, etc.).

#### Limited try-on Options

The purpose of the try-on technology should incline to make users experience shopping the way they experience in a physical store. In other words, this process should have the eligibility to try-on various products simultaneously altogether. Currently, try-on technologies are providing limited options. For instance, Charlotte Tilbury's sets of makeup products can't be tried in different looks. F.Hinds users are unable to create a set of matching rings and try them on all fingers. Thus, the users should be able to utilize numerous products simultaneously as they do in a physical store or in actual situations to create complementary sets and compare products. For fashion brands, this feature can be technically challenging and costly its implement. The solution should have the propensity to users use any product anywhere on the body as they can in physical stores. For instance, try the ring on any finger.

#### **Try-on Products Inconsistency**

When any brand offers the try-on option. Customers expect the availability of virtual try-on to be present for all products. For instance, Charlotte Tilbury and F.Hinds users reviewed that the products they want to try on have no option of trying on. And the brands have no explanation as to why. Candere users can try on necklaces without bracelets.

#### Lack of look Comparison and Sharing Functionality

Try-on technology can compare and share different looks. But this feature is yet lacking in many regards. During the UX audit, it is found that it is difficult and frustrating for the users to narrow down their selections. For example, Ray-Ban and F.Hinds users reviewed that it isn't easy for them to compare products. Charlotte Tilbury's solution has no options to compare products. The brands should add the ability in the features so, users easily compare photos side-by-side, share the fitting room experience in real-time utilizing audio and video, and show a few looks on the scrolling list or on a screen.

#### New try-on Solutions

Empirical studies have investigated the influence of technology and consumer characteristics on engagement with try-on technology. Based on the evaluation of the paper conservative conclusions are found. And they have not considered the new try-on solutions in the market (e.g. bespoke solutions, technological flexibility, business alignment, holistic approach, etc).

Bespoke solutions are virtual try-on solutions tightly related to the needs of customers. It is customercentric and custom-made software that understands and meets the real needs of customers and endusers for an effective solution. It focuses on the customer's core needs, making sure the proposition alignment with business strategy and matches the enterprise architecture landscape. The benefits of bespoke software are that it only contains the features needed. And only used by a company for competitive advantage. This point in the thematic gap yet has not had enough knowledge in positions of how well bespoke solutions can stand up for the informativeness and purchase decisions of consumers.

Due to environmental pressure, the business needs to change continuously and discontinuously. Technological flexibility in the business process is the set of activities that is constructed to produce a specific output for certain customers or markets. Businesses should have the flexibility to choose the technology that meets their projects. The result may be greater cost-effectiveness and quicker delivery.

Fashion brands Alignment Business goals are the center of activities performed. Businesses can maximize the tangible advantages by adapting the try-on technology to suit a particular stage of the marketing funnel. Fashion brands should adopt a holistic approach. To understand the relationship of all parts of a whole. In this way, they can first identify the problems and then understand the situation to get a comprehensive approach. For example depicted ecosystem, service blueprint, customer value proposition, refreshing design, machine learning-backed suggestions, and data analytics.

## Dimensions of National Cultural Values that Impact the Usage of Try-on Technology

#### **Cultural Values**

Culture is the "belief system that an individual has towards human behavior, reality, truth, and relationship. Individuals' schemas about the world are built by belief systems. Culture plays a vital role in affecting people's social behavior (Leidner & kayworth, 2006). Cultural values distinguish one group from another. The most famous conceptualization of national cultures is Hofstede's (1980,1983) that is consist of five dimensions. Individualism/collectivism, masculinity/femininity, uncertainty avoidance, power distance, long-term presentation, and the context introduced by Hall (1976) Based on these taxonomies, every country persists in of different set of values based on its geographic regions (Leidner & kayworth, 2006). However, the national cultural values research focuses on a few. Cultural values are a critical variable to explain how a specific social group in a specific country interacts with information technology. Some studies focused on the technology or system-based characteristics and some other studies focused on individual/consumer traits perspectives. In this paper, we have considered national cultural values and try-on technology as a global phenomenon. And national cultural values have been studied widely in management and are IS kind of literature already.

Existing literature has already emphasized this aspect and has concluded how different nationality perceptions differ (Lee et al., 2020). Future studies can consider the national cultural values to consider the consumer's characteristics in a wider range. The consideration of national cultural values is more effective to evaluate the consumer's perception nationally concerning the use of try-on technology. In response, the try-on technology features can be customized based on the characteristics of the specific customer's national values. It can be used as a business strategy of customer value and meeting their needs and demands to attract them to get engaged in using try-on technology.

Description of value	Level National
Defines the degree of individuals who feel vulnerable and unpredictable in an unknown situation (e.g. to adopt new technology)	National
Originally defines biological gender differences. And the traditional sex-role stereotypes describe men as less emotional, more independent, and, more aggressive than women. But the current scenario refers to masculinity as the individual's degree of preference for accomplishments, assertiveness, and material success. Nations with a higher degree of masculinity can lead	National
	National
Refers to the degree of an individual's planning and contemplation for the future. Nations to compete in the world of technology in the future can have more favor for the adoption of novel technologies.	National
In high-context cultures, individuals prefer an implicit communication style. In contrast, individuals in low-context cultures prefer direct, explicit, and quantifiable details. Nations that have high context perception have more adoption of novelties.	National
	Defines the degree of individuals who feel vulnerable and unpredictable in an unknown situation (e.g. to adopt new technology)Originally defines biological gender differences. And the traditional sex-role stereotypes describe men as less emotional, more independent, and, more aggressive than women. But the current scenario refers to masculinity as the individual's degree of preference for accomplishments, assertiveness, and material success. Nations with a higher degree of masculinity can lead to more new technology adoption behavior.VsRefers to the individual's inclination toward a social framework. Individualistic individuals prioritize their own goals and preferences. While collectivistic individuals' decisions are based on group members' consideration and expect that the group members do good in return for their loyalty. Consequently, prioritize the needs of the collective group over their own. The scenario can impact the overall technology adoption behavior.Refers to the degree of an individual's planning and contemplation for the future. Nations to compete in the world of technology in the future can have more favor for the adoption of novel technologies.In high-context cultures, individuals prefer an implicit communication style. In contrast, individuals in low-context cultures prefer direct, explicit, and quantifiable details. Nations that have high context perception

#### **Dimensions of Social Influence**

Social Influence can also impact a target's behavior. It also changes the form of technology usage and continuous intention. Different models of social influence have equal constructs of social influence. Each construct indicates that people's behavior can be influenced by how others evaluate when they use a specific technology. Thus, a consumer can use TOT based on others' views. The social impact includes three dimensions. For example, internalization, identification, and compliance. These dimensions correlate with groups of norms, social identity, and subjective norms.

Forms of Social Influence	Description of value	Source
Internalization	The individual adopts beliefs or behavior that are consistent with their value system. For Example: Adopting TOT because it's convenient to experience the products with visualization.	(Kelman,1958)
Identification	The influence of other people on the individual in a social group. For Example, people may adopt TOT to establish and maintain a self-identity with another person or a group.	(Kelman,1958)
Compliance	The consent of an individual toward the views and behaviors of others. For example, individuals adopt TOT not because they believe in its content but because of avoiding disapproval.	(Kelman,1947)
Table 5. Kelman's Social Influence Dimensions		

#### Limitations and Future Research

This systematic literature review is based on 32 TOT-related articles published in marketing and information system articles. This study categorizes the literature in conditions of years, and regions. Theories, antecedents, moderators/mediators, consequences, and findings. After evaluation, a conceptual model for TOT is identified to contribute to future research. This study consists of several limitations. First, articles are accumulated just from two databases (Scopus and science direct). The research articles published in other databases are not covered. The research on the TOT agenda is growing rapidly, and the articles which are under review or preparation are not captured. Finally, the knowledge gap is addressed briefly. However, we expect that this SLR related to TOT provides a helpful summary of the current state and future directions.

#### References

- Alzayat, A., & Lee, S. H. M. 2021. "Virtual Products as an Extension of My Body: Exploring Hedonic and Utilitarian Shopping Value in a Virtual Reality Retail Environment," *Journal of Business Research*, (130), pp. 348–363.
- Animesh, A., Pinsonneault, A., Yang, S.-B., & Oh, W. 2011. "An Odyssey into Virtual Worlds: Exploring the Impacts of Technological and Spatial Environments on Intention to Purchase Virtual Products," *MIS Quarterly* (35:3), pp. 789-810
- Antman, E. M., Lau, J., Kupelnick, B., Mosteller, F., & Chalmers, T. C. 1992. "A Comparison of Results of Meta-Analyses of Randomized Control Trials and Recommendations of Clinical Experts: Treatments for Myocardial Infarction," *Jama*, (268:2), pp. 240–248.
- Baytar, F., Chung, T., & Shin, E. 2020. "Evaluating garments in augmented reality when shopping online," *Journal of Fashion Marketing and Management* (24:4), pp. 667–683.
- Beck, M., & Crié, D. 2018. "I Virtually try it ... I Want it! Virtual Fitting Room: A tool to Increase Online and Off-line Exploratory Behavior, Patronage and Purchase Intentions. *Journal of Retailing and Consumer Services* (40), pp. 279–286.
- Brengman, M., Willems, K., & van Kerrebroeck, H. 2019. "Can't Touch this: The Impact of Augmented Reality Versus Touch and non-touch Interfaces on Perceived Ownership," *Virtual Reality* (23:3), pp. 269–280.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. 1992. "Extrinsic and Intrinsic Motivation to Use Computers in the Workplace 1," *Journal of Applied Social Psychology* (22:14), pp. 1111–1132.

- Fiore, A. M., Jin, H. J., & Kim, J. 2005. "For Fun and Profit: Hedonic Value from Image Interactivity and Responses Toward an Online Store," *Psychology and Marketing* (22:8), pp. 669–694.
- Fiore, A. M., Kim, J., & Lee, H. H. 2005. "Effect of Image Interactivity Technology on Consumer Responses Toward the Online Retailer," *Journal of Interactive Marketing* (19:3), pp. 38–53.
- Fiore, A. M., & Jin, H. J. 2003. "Influence of Image Interactivity on Approach Responses towards an Online Retailer," *Internet Research* (13:1), pp. 38–48.
- Gallino, S., & Moreno, A. 2018. "The Value of Fit Information in Online Retail: Evidence from a Randomized Field Experiment," *Manufacturing and Service Operations Management* (20:4), pp. 767–787.
- Han, S. L., An, M., Han, J. J., & Lee, J. 2020. "Telepresence, Time Distortion, and Consumer Traits of Virtual Reality Shopping," *Journal of Business Research* (118) pp. 311–320.
- Heller, J., Chylinski, M., de Ruyter, K., Mahr, D., & Keeling, D. I. 2019. "Touching The Untouchable: Exploring Multi-Sensory Augmented Reality in The Context Of Online Retailing," *Journal of Retailing* (95:4), pp. 219–234.
- Hilken, T., de Ruyter, K., Chylinski, M., Mahr, D., & Keeling, D. I. 2017. "Augmenting the Eye of the Beholder: Exploring the Strategic Potential of Augmented Reality to Enhance Online Service Experiences," *Journal of the Academy of Marketing Science* (45:6), pp. 884–905.
- Huang, T. L., & Liao, S. L. 2017. "Creating E-Shopping Multisensory Flow Experience through Augmented-Reality Interactive Technology," *Internet Research* (*27*:2), pp. 449–475.
- Javornik, A. 2016. "It's an Illusion, but it Looks Real!' Consumer Affective, Cognitive and Behavioural Responses to Augmented Reality Applications," *Journal of Marketing Management* (32:9–10), pp. 987–1011.
- Jiang, Z., & Benbasat, I. 2004. "Virtual Product Experience: Effects of Visual and Functional Control of Products on Perceived Diagnosticity and Flow in Electronic Shopping," *Journal of Management Information Systems* (21:3), pp. 111–147.
- Jiang, Z., & Benbasat, I. 2007. "Investigating the Influence of the Functional Mechanisms of Online Product Presentations," *Information Systems Research* (18:4), pp. 454–470.
- Kim, J., & Forsythe, S. 2007. "Hedonic Usage of Product Virtualization Technologies in Online Apparel Shopping," *International Journal of Retail and Distribution Management* (35:6), pp. 502–514.
- Kim, J., & Forsythe, S. 2008a. "Adoption of Virtual Try-On Technology for Online Apparel Shopping," *Journal of Interactive Marketing* (22:2), pp. 45–59.
- Kim, J., & Forsythe, S. 2008b. "Sensory Enabling Technology Acceptance Model (SE-TAM): A Multiple-Group Structural Model Comparison," *Psychology and Marketing* (25:9), Pp. 901–922.
- Kim, J., & Forsythe, S. 2009. "Adoption of Sensory Enabling Technology for Online Apparel Shopping," *European Journal of Marketing* (43:9), pp. 1101–1120.
- Klassen, T. P., & Alejandro, R. 1998. "Guides for Reading and Interpreting Systematic Reviews. I Am getting Started," Archives of Pediatric & Adolescent Medicine (152:7), 700-704
- Lee, H. H., Fiore, A. M., & Kim, J. 2006. "The Role of the Technology Acceptance Model in Explaining Effects of Image Interactivity Technology on Consumer Responses," *International Journal of Retail and Distribution Management* (34:8), pp. 621–644.
- Lee, H., Xu, Y., & Li, A. 2020. "Technology Visibility and Consumer Adoption of Virtual Fitting Rooms (Vfrs): A Cross-Cultural Comparison of Chinese and Korean Consumers," *Journal of Fashion Marketing and Management* (24:2), pp. 175–194.
- Lee, H., Xu, Y., & Porterfield, A. 2021a. "Consumers' Adoption of AR-Based Virtual Fitting Rooms: From the Perspective of a Theory of Interactive Media Effects," *Journal of Fashion Marketing and Management* (25:1), pp. 45–62.

- Lee, H., Xu, Y., & Porterfield, A. 2022. "Antecedents and Moderators of Consumer Adoption toward AR-Enhanced Virtual Try-On Technology: A Stimulus-Organism-Response Approach," *International Journal of Consumer Studies* (46:4), pp 1319–1338.
- Li, A., & Xu, Y. 2020. "A Study of Chinese Consumers' Adoption Behavior toward Virtual Fitting Rooms," International Journal of Fashion Design, Technology and Education (13:2), pp. 40–149.
- Li, H., Daugherty, T., & Biocca, F. 2003. "The Role of Virtual Experience in Consumer Learning," Journal of Consumer Psychology (13:4), pp. 395-407.
- Leidner, D. E., & Kayworth, T. 2006. "A Review of Culture in Information Systems Research: Toward a Theory of Information Technology Culture Conflict," *MIS Quarterly* (30:2), pp. 357-399.
- Marikyan, D., Papagiannidis, S., & Alamanos, E. 2019. "A Systematic Review of the Smart Home Literature: A User Perspective," *Technological Forecasting and Social Change* (138), pp. 139–154.
- Mehrabian, A., & Russell, J. A. 1974. "An Approach to Environmental Psychology," MIT Press.
- Merle, A., Senecal, S., & St-Onge, A. 2012. "Whether and How Virtual Try-On Influences Consumer Responses to an Apparel Web Site," *International Journal of Electronic Commerce* (16:3), pp. 41– 64.
- Morillo, P., Orduña, J. M., Casas, S., & Fernández, M. 2019. "A Comparison Study of AR Applications Versus Pseudo-Holographic Systems as Virtual Exhibitors for Luxury Watch Retail Stores," *Multimedia Systems* (25:4), pp. 307–321.
- Mulrow, C., Cook, D., & Haynes, R. B. 1997. "Systematic Reviews: Synthesis of best Evidence for Clinical Decisions," *Annals of Internal Medicine* (126:5), pp. 376–380.
- Nightingale, A. 2009. "A Guide to Systematic Literature Reviews," *Surgery (Oxford)* (27:9), pp. 381–384.
- Nah, F. F. H., Eschenbrenner, B., & DeWester, D. 2011. "Enhancing Brand Equity Through Flow and Telepresence: A Comparison of 2D And 3D Virtual Worlds" *MIS Quarterly* (35:3), pp. 731-747.
- Pantano, E., Rese, A., & Baier, D. 2017. "Enhancing the Online Decision-Making Process by Using Augmented Reality: A Two-Country Comparison of Youth Markets," *Journal of Retailing and Consumer Services* (38), pp. 81–95.
- Plotkina, D., & Saurel, H. 2019. "Me Or Just Like Me? The Role of Virtual Try-on and Physical Appearance in Apparel M-Retailing," *Journal of Retailing and Consumer Services* (51), pp. 362–377.
- Qasem, Z. 2021. "The Effect of Positive TRI Traits on Centennials Adoption of Try-on Technology in the Context of E-Fashion Retailing," *International Journal of Information Management (56)*, pp. 102–254
- Rese, A., Baier, D., Geyer-Schulz, A., & Schreiber, S. 2017. "How Augmented Reality Apps are Accepted by Consumers: A Comparative Analysis Using Scales and Opinions," *Technological Forecasting and Social Change* (124), 306–319.
- Shin, E., & Baytar, F. 2014. "Apparel Fit and Size Concerns and Intentions to Use Virtual Try-On: Impacts of Body Satisfaction and Images of Models' Bodies," *Clothing and Textiles Research Journal* (32:1), pp. 20–33.
- Suh, K.-S., & Lee, Y. E. 2005. "The Effects of Virtual Reality on Consumer Learning: An Empirical Investigation," *MIS Quarterly* (29:4), pp. 673–697
- Tandon, U., Ertz, M., & Sakshi, K. 2021. "POD Mode of Payment, Return Policies and Virtual-Try-On Technology as Predictors of Trust: An Emerging Economy Case" Journal of Promotion Management (27:6), 832–855.
- Tandon, U., Mittal, A., & Manohar, S. 2020. "Examining the Impact of Intangible Product Features and E-Commerce Institutional Mechanics on Consumer Trust and Repurchase Intention," *Electronic Markets* (11), pp. 1-20

- Torok, G. 2020. "Pandemic Potential: Four App Development Trends in a Post-Covid-19 World," https://www.forbes.com/sites/forbestechcouncil/2020/09/10/pandemic-potential-four-appdevelopment-trends-in-a-post-covid-19-world/?sh=7b61f905492f
- Tranfield, D., Denyer, D., & Smart, P. 2003. "Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review," *British journal of management (14*:3), pp. 207-222.
- Yaoyuneyong, G. S., Pollitte, W. A., Foster, J. K., & Flynn, L. R. 2018. "Virtual Dressing Room Media, Buying Intention and Mediation," *Journal of Research in Interactive Marketing* (12:1), pp. 125–144.
- Yim, M. Y. C., & Park, S. Y. 2019. "I amnot Satisfied with My Body, So I Like Augmented Reality (AR): Consumer Responses to AR-Based Product Presentations," *Journal of Business Research (100)*, pp. 581–589.
- Zhang, T., Wang, W. Y. C., Cao, L., & Wang, Y. 2019). "The role of virtual try-on technology in online purchase decision from consumers' aspect," *Internet Research* (29:3), pp. 529–551.