

## Study on the Factors Affecting the Willingness of 3D fitting

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### Abstract

**With the advent of the 5G era, people's lives will be more and more connected to the Internet. The same is true for buying clothes. It takes time and effort to buy clothes in shopping malls. It is often inappropriate to buy clothes online, so 3D fitting came into being. The survey found that the popularity of 3D fitting is very low, indicating that there is still a lot of room for improvement. The customer's willingness to demand 3D fitting affects the future development of the field, so this article starts with the consumer's willingness to demand, combined with consumers. Innovative, exploring relevant influencing factors, aiming to improve 3D fitting service.**

### Keywords

**3D fitting; Demand willingness; Consumer innovation.**

### 1. Introduction

5G will definitely bring great changes to people's lives, and the importance of mobile phones is getting higher and higher. It is common to shop on the mobile phone side, but the biggest problem in buying clothes is that there is no way to try in advance. Determine the existing 3D fitting requirements survey, one is to directly survey consumers, investigate their functional requirements for 3D fitting, etc., but consider that consumers have no specific understanding before they experience the platform. Therefore, the research results need to be considered; on the other hand, in the research field of 3D fitting, there is no research on the platform as an innovative product, nor does it consider consumer innovation in research, so this article has launched a combination of consumers. Innovative, combined with the user experience, surveys the needs of 3D fitting, with the aim of obtaining more useful suggestions and more convincing conclusions.

The research object of this paper is the consumers who have experienced 3D fitting, so the first is to select the experimenter, and the second is to issue the questionnaire to the experimenter. The content of the questionnaire is to investigate the consumer's demand for 3D fitting, and the data is collected through the questionnaire, according to the purpose of this study is to conduct correlation analysis, to analyze the data, to carry out the hypothesis verification of this study, and finally to obtain the hypothesis of the relevant arguments in this paper. According to the research results, put forward relevant suggestions, and put forward the shortcomings of this paper, as well as the future prospects and will be carried out.

In the theoretical sense, the research in this paper enriches the relevant research theories of 3D fitting and consumer innovation. On the other hand, it has great practical significance for guiding the improvement of 3D fitting, which promotes the faster entry of 3D fitting. The market, entering the public's field of vision more quickly, can enter a wide range of uses, bringing great convenience to people's lives and having a huge impact.

The innovation of this paper lies in the consumer's innovative research on the willingness of 3D fitting, because 3D fitting is an innovative product, and consumer innovation is a very important factor. This research enriches the research of 3D fitting and enriches it. The related theory of consumer innovation and the universal use of perceived usefulness have also laid a solid foundation for this research. This paper can propose a low-cost, easy-to-implement 3D fitting improvement method with innovative consciousness. On the basis of the theory of technology acceptance, this paper has added consumer innovation, which not only greatly satisfies the conditions of this research, but also greatly improves the theoretical model. It is worthy of consideration and is a very important innovation.

## 2. Literature Review

### 2.1. 3D Fitting

3D fitting is a kind of network fitting method. Through the establishment of models and fitting on the Internet, there are mainly three types of research. One is about the realism of 3D fitting models. Many studies have proposed various improvement methods. In order to improve the realism of the model, Li Jiali (2018) [1] summarized four personalized human body model generation techniques in the paper, namely, 3D modeling software modeling, human body modeling based on 3D scanner, and human body based on image sequence. Four modeling methods of modeling and parametric human body modeling, and correspondingly put forward their own advantages and disadvantages. The 3DMorphing technology is used to adjust the size of the human body model, and the human body model height, arm length, waist circumference, chest circumference and other eight people are realized. The smooth adjustment effect of the body-related parts. At the same time, the skin color effect factor and the specular reflection parameter are added to the standard illumination model to smoothly and continuously adjust the overall skin color and skin smoothness of the human body model; one type is the clothing in the 3D fitting clothes, and the upper body effect is also affected by the material of the clothing. There will be great differences. Many studies focus on improving the clothing simulation program, fitting the clothing and improving the fit of the clothing on the model. For example, Chen Qingqing (2016) [2] is studying the existing 3D fitting. On the basis of technology, a garment deformation method based on the size parameters of each feature part of the garment number is proposed. Firstly, a 3D model of standard size clothing is established, and the model characteristic curve is extracted. According to the size correspondence of each type, the characteristic curve of the clothing model is parametrically deformed, the new position of the clothing control point is calculated, and other types of 3D clothing are generated. model. At the same time, the comparison of the feature size of each part of the human body with the size of the characteristic curve of the clothing model makes the try-on effect conform to the different characteristics of the human body. The method simplifies the fitting process of garments and can be better applied to the network of garment fitting. There is also a kind of research on the demand of 3D fitting, Ding Jialing (2015) [3] based on the comparative analysis of the 3D virtual fitting system, extracting the key factors affecting the buyer's will, based on the stimulus-response model, analysis The relationship between the key factors of the 3D virtual fitting system and the willingness of consumers to purchase. The independent variables in the model are the technical factors that generate consumer visual stimuli in the 3D virtual fitting system; the mediator variable is the perceived risk factor that affects the consumer's willingness to purchase; the dependent variable is the purchasing intention of the consumer after the 3D fitting experience. . The core of the research is how consumers can stimulate and form a risk assessment of consumer purchase perception through the virtual experience of the 3D fitting system, which in turn generates their purchasing behavior and response. The paper uses questionnaires and SPSS application software to process the survey data through descriptive statistics, reliability and validity analysis, correlation analysis and regression factor analysis

methods. After two software studies, the Stimulus-Organism-Response theoretical model was used to analyze the data through questionnaires, but did not present the specific process of the experiment.

Wang Mengying et al. (2016) [4] used the questionnaire survey method to investigate consumers' online shopping habits, the ability to accept new things, the cognition of 3D virtual fitting, the attitude of use and the actual functional requirements, and using SPSS statistical software. data analysis. The study found that more than 95% of consumers have a strong desire to try 3D virtual fitting, 80% of consumers support the establishment of virtual fitting rooms in physical stores, and more than 60% of respondents expressed their willingness to upload their own Photo or human body data to build a personalized model of their own, and consumers have high requirements on the style, quantity and 3D simulation of the try-on clothing. The most worrying thing is that the virtual model and the body shape are too different. In addition, all the respondents hope that the virtual fitting room has certain practicability, and 54.9% of the respondents hope that the virtual fitting room is both practical and entertaining.

The survey on consumer usage mainly focuses on the willingness and demand of the demand, based on the individual's cognition, and the consumer has not used it, so the answer to the question is based on their own preferences. The item settings are not clear and are not shown. Willingness does not represent real willingness to demand.

## 2.2. Technology Acceptance Model

The technology acceptance model was proposed by Davis et al. in 1989 [5]. They applied the rational behavior theory (TRA) in social psychology to the management information system, with internal beliefs, subjective attitudes, behavioral intentions, and external variables. To explain and predict people's acceptance of information technology. The structure of TAM; TAM has two important concepts: perceived usefulness and perceived ease of use [6], which constitute the main indicators of information technology acceptance behavior. Perceived usefulness is the degree to which information technology users subjectively believe that a particular information technology improves performance. Perceived usability is the degree to which a user is subjectively considered to be using a particular information technology.

A summary of the theory of technology acceptance is not difficult to find. TAM has undergone four types of modifications and improvements as the core of the evolutionary structure:

- 1 For the total of external factors, such as the previous system use experience , and individual computer performance [7].
- 2 In order to increase the predictive power of TAM, it has been introduced from other theories, including expectations , task technology matching [8], risk and trust.
- 3 adjustment factors under specific scenarios, such as gender [9], culture [10] and technical characteristics.
- 4 results of measurement, such as attitude [11], and actual use behavior [12].

Lee et al (2003) divided information technology into communication, general purpose, office system and professional after analyzing more than 307 kinds of information technology [13]. William R. King (2006), by reviewing research accepted by information technology, divides it into four usage types, namely work-task applications, office applications, general use, and the Internet. Through meta-analysis, it is found that because work-related applications and office applications are very similar, they can be classified into one category [14]. Chun Hua Hsiao (2011) divided the research areas of technology acceptance models into task-related information systems, e-commerce, and entertainment-based systems through co-citation analysis [15]. It is not difficult to find that these classification methods Classification has in common, where the system related to the task is very similar to the work-related, office system.

In addition, entertainment systems have become a hot topic of research in recent years. Combining the information we have searched, this paper divides the technically accepted research areas into task-related systems, Internet and e-commerce, and entertainment-based systems.

Li Wu (2018) [16] explored their willingness to adopt such clients and their influencing factors in the future based on the integration of technology acceptance models and innovation diffusion theory for university users who have not used mobile news clients. The study found that content usefulness cognition, epidemic cognition and compatibility cognition positively affect college students' willingness to adopt mobile news clients, social usefulness cognition negatively affects willingness to adopt, and ease of use cognition and college students' There is no significant relationship with the willingness to adopt.

### **2.3. Consumer Innovation**

Consumer innovation refers to a tendency for consumers to adopt new products (Hauser et al, 2006; Tellis et al, 2009) [17-18], and Midgley and Dowling (1978) [19] consider consumer innovation to be a concept of individual traits that all members of society have more or less. Thus, each person is an innovative consumer to a certain extent, and will use products or concepts that he or she perceives as new in a particular context (Hirschman, 1980) [20]. After the study of Midgley and Dowling (1978), most researchers considered innovation as a trait concept (Roehrich, 2004) [21]. Hirschman (1980) argues that consumer innovation plays an important role in theories of brand loyalty, decision making, consumer preference and communication. Without this concept, consumer behavior becomes a series of consumer versus certain Regular purchase decisions for a stable product set. Therefore, consumer innovation makes the market environment more dynamic (Hirshman, 1980).

Many studies explore the relationship between innovation and sex from demographic variables and psychosocial variables, but few studies study innovative sources from the perspective of individual innovation (Hirshman, 1980). According to Hirschman (1980), innovation is mainly due to the needs of both individuals:

(1) Individuals' innovative tendencies are a way of self-protection. In order to deal with future unknown and unpredictable new product purchases, individuals will try to find and store more knowledge that can better cope with these new problem scenarios. The access to this knowledge includes the following innovative behaviors: a) searching for unfamiliar information about product concepts; b) searching for unfamiliar information about product purchase scenarios; c) actual purchase behavior of new products; d) proactively experiencing new Product purchase scenario;

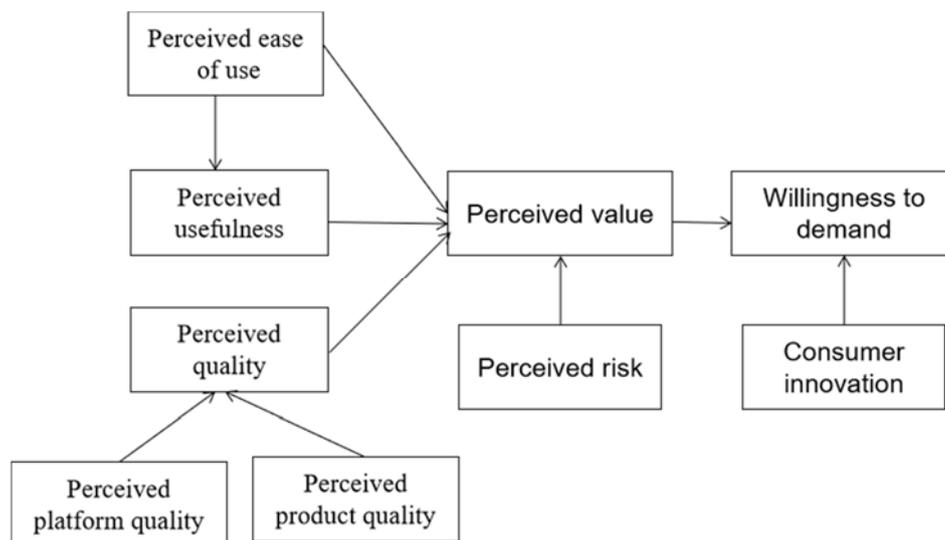
(2) Individuals' innovative tendencies are designed to help them improve their self-solving skills. For example, individuals subscribe to fashion magazines, and through the information provided by these fashion magazines, individuals can improve their ability to purchase new fashion apparel in the future, thereby avoiding possible risks. For other sources of intrinsic innovation, other explanations such as Roehrich (2004) argue that there are four basic drivers for consumer innovation: a) stimulus needs; b) novelty seeking needs; c) self-determination needs 4) Uniqueness needs.

## **3. Research Assumptions and Models**

### **3.1. Model Construction and Hypothesis Proposed**

On the basis of the theory of technology acceptance, the general parameters, the optional parameters and the fine tuning parameters determine the appearance of the human body model. The consumer observes the degree of similarity between the human body model and the human body model. According to the special nature of the clothing platform, according to

relevant literature and research, it is found that consumer innovation has a great influence on the demand of consumers in innovative products and services. Therefore, in the original theoretical model, the introduction of consumer innovation.



**Figure 1.** Conceptual diagram of questionnaire related variables

- (1) Perceived ease of use has a positive impact on perceived usefulness;
- (2) Perceived platform quality and perceived product quality have a positive impact on perceived quality;
- (3) Perceived usefulness has a positive impact on perceived value;
- (4) Perceived ease of use has a positive impact on perceived value;
- (5) Perceived quality has a positive impact on perceived value;
- (6) Perceived risk has a negative impact on perceived value;
- (7) Perceived value has a positive impact on the willingness to demand;
- (8) Consumer innovation has a positive impact on demand willingness.

### 3.2. Basic Content of the Questionnaire

The survey object of this paper is the consumer of the virtual fitting platform. The first condition is to scientifically design the questionnaire. Based on the research purpose of this paper, the content of the questionnaire is determined. There are six levels of content:

- (1) Basic information survey. Including whether you have participated in online shopping, this questionnaire only needs to be filled out by female users who have had online shopping experience, in addition to the educational level of the respondent, disposable income and the use of the virtual fitting platform.
- (2) The current situation in which consumers purchase clothing online. Mainly to understand the pain points of the current consumer.
- (3) Consumers perceive the product. It mainly includes perceived usefulness, perceived ease of use, and perceived risk.
- (4) Consumers perceive product quality. Includes virtual fitting platform service quality and fitting model quality.
- (5) Consumer innovation survey. Investigate consumer innovation through consumer innovation scales.

(6) The willingness of consumers to adopt innovative products.

### 3.3. Variable Measure

The variables involved in this paper are perceived usefulness, perceived ease of use, perceived platform quality, perceived product quality, perceived risk, perceived value, consumer innovation, and willingness to demand. By referring to existing literature and face-to-face interviews with users, and seeking expert opinions, the operational definitions and measurement items of each variable in this study were obtained through appropriate modifications. The participation level and participation level are measured in the form of single-choice questions. The problems involved in the other variables are represented by the Likert five-point scale. From 1 to 5, they respectively express completely disagree, disagree, general, More agree and agree completely.

#### 1. Measurement of consumer perceived product conditions

##### (1) Measurement of perceived usefulness

Consumer perceived usefulness in this study refers to the extent to which consumers believe that using the product/service to help themselves directly affects the consumer's willingness to use. The specific scale is shown in Table 1.

**Table 1.** Measurement items for perceived usefulness

Variable	Item description
Perceived usefulness	PU1: I think the mannequins I built are very similar to myself.
	PU2: I think the model I created is useful for me to buy clothes online.
	PU3: I think this fitting platform is very useful to me.

##### (2) Measurement of perceived ease of use

Consumer perceived ease of use in this study refers to how easy it is for consumers to use the product/service. The measurement scale for sensing the ease of use of innovative products mainly refers to the relevant research by Davis (1989) and Venkatesh (2003). The specific scales are shown in Table 2.

**Table 2.** Measurement items for perceived ease of use

Variable	Item description
Perceived ease of use	PEOU1: I think the platform entrance is easy to find.
	PEOU2: I think the platform operation button is very easy to find.
	PEOU3: I think the platform is very simple to create model input parameters.

##### (3) Measurement of perceived risk

In this study, consumers perceive the risk of innovative products refers to the economic and security risks that consumers believe in using innovative products. The specific scale is shown in Table 3.

**Table 3.** Measurement items for perceived risk

Variable	Item description
Perceived risk	PR1: I am concerned about the privacy risks of this platform operation.
	PR2: I am worried that the operating cost of the platform exceeds the benefits it brings.

## 2. Consumer innovation measurement

There are many researches related to consumer innovation. This article draws on the existing mature scales[22].

**Table 4.** Measurement items for consumer innovativeness

Variable	Item description
Consumer innovativeness	CI1: I like to buy new and innovative products before others.
	CI2: Compared with friends, I have more innovative products.
	CI3: If I heard that there are innovative products on the market, I am very interested in buying.
	CI4: Even if I don't try it, I will buy new products that are new to the market.
	CI5: I am the first to know about the launch of innovative products in my circle of friends.

## 3. Consumers use willingness to measure

The willingness to adopt consumer innovation products in this study refers to consumers' willingness to search for innovative product information and adopt innovative products. The measurement of consumer willingness to adopt innovative products includes four questions, mainly based on Baker and Churchill's (1977) study, which measures consumers' potential search for product information, trial products, and intention to purchase products. The specific scales are shown in Table5. is shown.

**Table 5.** Measurement items for consumers' willingness to adopt

Variable	Item description
Willingness to adopt innovative products	CIAI1: Through virtual fitting, I will pay more attention to virtual fitting.
	CIAI2: Through virtual fitting, I think this fitting platform is worth using.
	CIAI3: I am willing to use this platform to try on clothes.
	CIAI4: I am willing to buy clothes through this platform.

## 4. Data Collection and Analysis

### 4.1. Reliability and Validity Analysis

#### 1. Reliability analysis

**Table 6.** Scale data reliability analysis

Variable	Cronbach/ s $\alpha$
Perceived ease of use	0.898
Perceived usefulness	0.962
Perceived platform quality and perceived product quality	0.807
Perceived quality	0.813
Perceived risk	0.806
Perceived value	0.832
Consumer innovation	0.914
Demand willingness	0.875

It can be seen from the above table that the reliability coefficient values are all greater than 0.8, which indicates that the reliability of the research data is very high, and the reliability coefficient value after the deletion of the item is not significantly improved. The comprehensive description indicates that the data reliability is high and can be used for further analysis.

#### 2. Validity analysis

**Table 7.** Scale data validity analysis

Scale data	KMO
All variable	0.854

The KMO value is greater than 0.6, indicating that the design of the measurement items.

### 4.2. Related Analysis

#### 1. Correlation analysis

Correlation analysis is used to study the relationship between quantitative data, whether it has a relationship, the degree of closeness, etc.

**Table 8.** Pearson correlation analysis

Pearson correlation analysis	
	Perceived ease of use
Perceived usefulness	0.248*
Perceived value	0.312**
Pearson correlation analysis	
	Perceived platform quality and perceived product quality
Perceived quality	0.348**
Pearson correlation analysis	
	Perceived value
perceived usefulness	0.212**
Perceived quality	0.365*
Perceived risk	-0.112**
Pearson correlation analysis	
	Demand willingness
Perceived value	0.202*
Consumer innovation	0.337**
* p<0.05 ** p<0.01	

Pearson correlation coefficients are used to indicate the strength of the correlation. Specific analysis shows that:

The correlation coefficient between perceived ease of use and perceived usefulness is 0.248, and exhibits a significant level of 0.05, thus indicating a significant positive correlation between perceived ease of use and perceived usefulness.

The same reason, The correlation coefficient between perceived ease of use and perceived value is 0.312, and exhibits a significant level of 0.01, thus indicating a significant positive correlation between perceived ease of use and perceived value; the correlation coefficient between perceived platform quality, product quality and perceived quality is 0.348, and exhibits a significant level of 0.01, so there is a significant positive correlation between perceived platform quality, product quality and perceived quality; The correlation coefficient between perceived usefulness and perceived value is 0.212, and exhibits a significant level of 0.01, so there is a significant positive correlation between perceived usefulness and perceived value; The correlation coefficient between perceived quality and perceived value is 0.365, and exhibits a significant level of 0.01, thus indicating a significant positive correlation between perceived quality and perceived value; The correlation coefficient between perceived risk and perceived value is -0.112, and exhibits a significant level of 0.01, thus indicating a significant negative correlation between perceived risk and perceived value; The correlation coefficient between perceived value and willingness of demand is 0.202, and it shows a significant level of 0.05, which indicates that there is a significant positive correlation between perceived value and willingness to demand; The correlation coefficient between consumer innovation and willingness to demand is 0.337, and it shows a significant level of 0.01, thus indicating a significant positive correlation between consumer innovation and willingness to demand.

## 5. Conclusion

### 5.1. Experimental Result

Through data analysis, the following conclusions can be drawn:

- (1) Perceived ease of use has a positive impact on perceived usefulness;
- (2) Perceived platform quality and perceived product quality have a positive impact on perceived quality;
- (3) Perceived usefulness has a positive impact on perceived value;
- (4) Perceived ease of use has a positive impact on perceived value;
- (5) Perceived quality has a positive impact on perceived value;
- (6) Perceived risk has a negative impact on perceived value;
- (7) Perceived value has a positive impact on the willingness to demand;
- (8) Consumer innovation has a positive impact on demand willingness.

### 5.2. Discussion

Consumer perceived quality and perceived value have a positive impact on consumers' willingness, so 3D fitting should improve quality, improve the authenticity of 3D fitting models, and minimize the perceived risk of consumption, from consumer privacy and information security. To ensure the convenience and usefulness of the system; since the innovation of consumers has a positive impact on the willingness to consume, the products can be considered from the innovative consumers in the early stage of promotion, and then they will be promoted and promoted. Finally enter the vast market.

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