An empirical research on the influencing factors of consumers' intention to use "onehour e-commerce": Taking JD Daojia as an example

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(Work-in-Progress)

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ABSTRACT
The era of "One-hour E-commerce" has arrived, which is of positive significance to meet consumers' needs and enhance their shopping experience. This paper constructs a structural model of the factors influencing consumers' willingness to use "One-hour E-commerce" by using a Technology Acceptance Model with two additional factors: subjective norm and perceived risk. The model was validated through 347 valid questionnaires and analysis. The results showed that perceived usefulness, perceived ease of use and subjective norm positively affects consumers' willingness to use "One-hour E-commerce"; perceived ease of use positively affects consumers' perceived usefulness; perceived risk does not negatively affect consumers' willingness to use "One-hour E-commerce". Based on the above findings, the following recommendations are made: accelerate integration improve the ecosystem; optimize the platform to enhance ease of use; improve delivery to strengthen user satisfaction; improve image to enhance customer service efficiency; focus on quality to improve risk awareness.

Keywords: One-hour E-commerce, Technology Acceptance Model, Perceived risk, Subjective norm, Use intention.

INTRODUCTION
With the fast pace of urban life and the improvement of people's living standards, people's demand for commodity logistics and delivery is getting higher and higher, and increasingly consumers have started to join the "One-hour E-commerce" shopping, so that they can receive goods within one hour. The era of "One-hour E-commerce" has been coming. In this context, it is very necessary to study the factors influencing consumers' willingness to use "One-hour E-commerce", which is of positive significance to meet consumers' needs and improve their shopping experience. According to current studies, there is a lack of research on "One-hour E-commerce", and consumers' willingness to use is the basis of their usage behavior. In the process of "One-hour E-commerce" operation, what factors affect consumers' willingness to use? How should the "One-hour E-commerce" operators improve their service efficiency? In order to discuss and answer these questions, this paper takes "JD Daojia" as the research object. "JD Daojia" has launched the "One Hour E-Commerce" business, which has huge potential for the development of the e-commerce market and is achieving continuous growth in active users. In November 2020, JD united "JD Daojia" launching a super partner program with Walmart, Yonghui, Bubugao, Sam, Seven Fresh, JD Convenience Store and Jianfu. Until November 4, JD had created an one-hour living circle in 328 cities through "JD Daojia", and had reached cooperation with over 570 chain merchants. By the end of first quarter of 2021, "JD Daojia" business had covered more than 1,500 counties and cities nationwide. On January 7, 2022, "JD Daojia" opened One-hour Shopping festival for the Spring Festival. Therefore, it is representative to choose "JD Daojia" as the research object. Based on the Technology Acceptance Model, the theory of planned behavior, and the theory of perceived risk, this paper constructs a hypothetical model of factors influencing consumers' willingness to use "One-hour E-commerce" and verifies the validity of the hypothesis based on the data from the survey questionnaire. The study will provide suggestions to improve the effectiveness of the "One-hour E-commerce" operation service.

THEORETICAL FOUNDATIONS AND RESEARCH MODEL
Technology Acceptance Model (TAM)
The Technology Acceptance Model (TAM) is a computer model developed by Davis in 1989 that was originally dedicated to explaining computer usage behavior and provides a theoretical basis for explaining the effect of external variables on intrinsic willingness to use. In TAM external variables affect use intention (UI) through perceived usefulness (PU) and perceived ease of use (PEU), and users' actual actions are predicted by intention to use With the development of information technology, the TAM model has been widely used in the study of users' willingness to use in the fields of online e-learning, e-commerce, and online user behavior. Moreover, the adaptability and reliability of the model have been widely recognized. The "One-hour E-commerce" has brought impact to traditional e-commerce, and the issue of users' willingness to use belongs to the research field of shopping method adoption, thus the research framework of the technology acceptance model can help us explore the

factors affecting users' willingness to use to the shopping method of "One-hour E-commerce". Therefore, the following hypotheses are proposed.

H1: Perceived usefulness (PU) positively affects the willingness to use of "One-hour E-commerce" consumers(UI).
H2: Perceived ease of use (PEU) positively affects the willingness to use of One-hour E-commerce consumers(UI).
H3: Perceived ease of use (PEU) positively affects consumers' perceived usefulness (PU).

Theory of Perceived Risk
Perceived risk (PR) was first introduced by Bauer (1960) of Harvard University. According to him, consumers who make a purchase of a good in the market may not get the result they expect before they buy it. Therefore, when a consumer makes a decision to buy, he will not be able to determine the expected outcome of the purchase. Bauer emphasized that consumers' perceived risk is not objective, but their subjective risk, and that perceived risk links the undesirable outcome of buying a good or service with a perception of the possibility of failure. M. Lwin, J. Wirtz and D. Williams (2007) argued that in the electronic or online services domain, security risks are often associated with privacy and system security, which are aspects that users pay close attention to in their usage. A study by A. C. Elkins, N. Dunbar, and B. Adame, et al (2013) found that mobile payment systems with lower perceived risk of use tend to motivate users more. Internet security has become a major factor affecting users' consumption in the Internet economy, and Liang T. X. and Liu S. F. (2022) pointed out that perceived risk has a significant negative impact on intention to use. When consumers use the "One-hour E-commerce" shopping method, they need to provide their cell phone number, email address or other third-party accounts for registration or login, and they have concerns about privacy disclosure and payment security. These concerns fall under the category of perceived risk, and therefore, the following hypotheses are proposed.

H4: Perceived risk (PR) negatively affects the willingness to use One-hour E-commerce consumers (UI).

Theory of Planned Behavior
The Theory of Planned Behavior (TPB) was first proposed by Ajzen, who found that most people do not act voluntarily but are controlled by certain factors, so Ajzen and Fishbein added a "behavioral control cognition" to the jointly proposed concept of rational behavior (TRA), thus This led to the Theory of Planned Behavior (TPB). The definition of subjective norms (SN) in TPB refers to the influence and pressure from the surrounding people and society that any person must bear when deciding whether to carry out a certain plan or behavior. Y. K. Choi and J W. Totten (2012) found that subjective norms have a significant influence on individual users' technology acceptance and use. Hsu et al. (2006) suggested that subjective norms should include not only interpersonal but also media influences. Zhang R.H. et al. (2022) found that subjective norms directly affect travelers' willingness to use shared cars, and that the social pressure travelers feel about using shared cars includes both group influence and policy system influence. When users use or want to use "One-hour E-commerce" shopping, they are influenced by the opinions of their friends and family about "One-hour E-commerce", especially in the present time when media information is flooding people's lives and users' use of this shopping method is also influenced by media information. These are subjective norms, so the following hypotheses are proposed.

H5: The subjective norm (SN) positively influences the intention to use of consumers of "One-hour E-commerce"(UI).

Research Model
This research uses the Technology Acceptance Model as the theoretical basis and research framework, and adds two factors, subjective norm and perceived risk, to construct a research model of "One-hour E-commerce" consumers' willingness to use (as shown in Figure1) as well as to research the factors influencing "One-hour E-commerce" users' willingness to use.
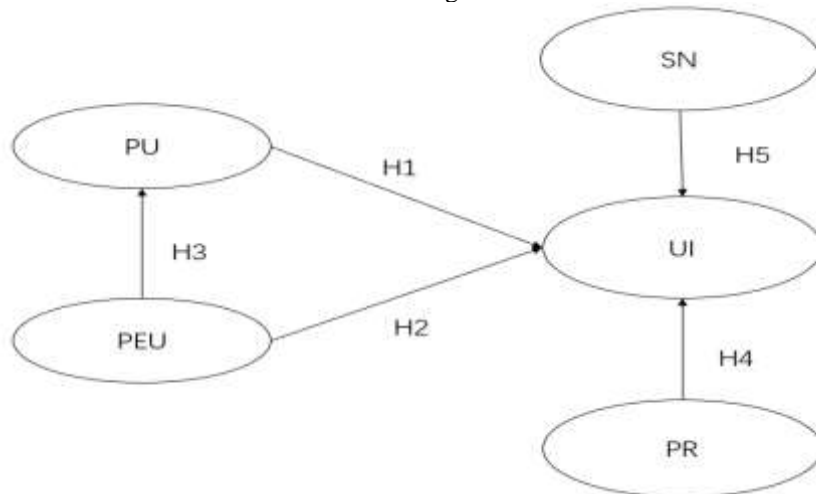

Figure 1 Research Model

RESEARCH DESIGN

Questionnaire design

In this paper, the data is obtained by questionnaire. In order to ensure that the survey results are consistent with the actual situation. The questionnaire was administered to the users of "JD Daojia", the market leader of "One-hour E-commerce". The theoretical basis of the questionnaire was firstly compiled from relevant literature, and the first draft of the questionnaire was designed on the basis of thorough discussions. Then, based on the suggestions from experts and users in related fields, some of the measurement indicators of the questionnaire were modified and improved to form a pre-survey questionnaire. The pre-survey samples were taken from 50 users of different levels of "JD Daojia", and the pre-survey data were analyzed by SPSS, and the questionnaire was modified again through reliability and validity tests to form the official questionnaire. There are 5 variables in the research model, 20 questions in the questionnaire, and the Likert 5-point scale was used to measure.

Data Collection

The questionnaire was conducted in a randomized manner, mainly through online collection and offline distribution of questionnaires, and a total of 400 official questionnaires were distributed. After excluding invalid questionnaires, 347 valid questionnaires were left, with a recovery rate of 86.75%. Among the valid questionnaire respondents, the proportion of men and women are 45.53% and 54.47% respectively; from the age level, it is concentrated between 25-40 years old, most of the consumers in this range have a stable source of income; from the analysis of education, it is obvious that 89.63% of the consumers are concentrated in undergraduate and above, this group of people have a better understanding and acceptance ability for new things. In terms of consumer occupation, 53.6% of the users are white-collar workers and company management who have already started working, and their income is more stable; in terms of disposable family income, 54.75% of the consumers have disposable income of more than 5,000 yuan. After a comprehensive analysis of the above, it is obvious that most of the consumers who currently use the "JD Daojia" platform are young people who have received higher education, have much knowledge, ability and quality to accept new things, and have stable jobs and stable incomes.

DATA ANALYSIS AND RESULTS

Reliability Analysis

The questionnaire of this study was tested for all scales using Cronbach's alpha reliability and the results are shown in Table 1. The SPSS test concluded that: The overall reliability coefficient value of the scale is $\alpha=0.830$, indicating good internal consistency and stability of this questionnaire in general. At the same time, the coefficient of reliability value α of each subscale is greater than 0.8, indicating that each subscale had good stability. The final conclusion is that the reliability of the data reliability of this scale is good.

Table 1 Reliability

Construct	Cronbachα	Items
Perceived usefulness (PU)	.963	4
Perceived ease of use (PEU)	.826	4
Perceived risk (PR)	.854	4
Subjective norm (SN)	.810	4
Use Intention (UI)	.849	4
Total	.830	20

Validity Analysis

The structural validity of the scale was tested by exploratory factor analysis, and the test results are shown in table 2. The KOM value is 0.916, and the Bartlett's sphericity test showed P=0.000, indicating that the scale can be subjected to principal component analysis.

Table 2 KMO and Bartlett

KMO and Bartlett		
KMO		.916
Bartlett	Approx. Chi-square	4691.172
	df	190
	P	.000

A total of five principal components with eigen root values greater than 1 were extracted from the scale data through SPSS. The variance explained by these five components were 41.593%, 10.430%, 7.202%, 7.195%, and 5.655%, and the cumulative variance explained was 72.076%.

The results of factor analysis after factor loadings rotation show that the values of commonality (common factor variance) of all factors are higher than 0.6, indicating that there is a strong correlation between the components and factors, and information can be effectively extracted from the analysis. Meanwhile, the values of factor loading coefficients of each load factor

corresponding to this load component are all greater than 0.6, indicating that there is a relative relationship between this factor and this load component, and all factor measures can be fully retained in the analysis of this questionnaire. This also fully demonstrates the relatively good structural validity of the factor analysis of this questionnaire.

The validation factor analysis was used to test the discriminant validity of the scale, and the AVE values for all five factors were greater than 0.5 and the CR values were greater than 0.8, indicating that the data in this study had a good convergent effect. The minimum square root of AVE for each of the five factors was 0.719, which was greater than the maximum value of correlation coefficient of 0.639, indicating that the differential validity of the data used in this study was good.

Correlation Analysis
Correlation analysis was used to analyze the degree of correlation and significance between several different variables. Pearson correlations were performed on the scales and the results are shown in Table 3.

Table 3 Pearson Correlation (Detail)

		PU	PEU	PR	SN	UI
PU	Coefficient	1	.561**	-.383**	.536**	.639**
	P value		.000	.000	.000	.000
PEU	Coefficient	.561**	1	-.315**	.455**	.482**
	P value	.000		.000	.000	.000
PR	Coefficient	-.383**	-.315**	1	-.327**	-.352**
	P value	.000	.000		.000	.000
SN	Coefficient	.536**	.455**	-.327**	1	.498**
	P value	.000	.000	.000		.000
UI	Coefficient	.639**	.482**	-.352**	.498**	1
	P value	0.000	0.000	0.714	0.002	

*P＜0.05 **P＜0.01

Table3 shows that the correlation coefficient between perceived usefulness and willingness to use is 0.639, p<0.01, indicating that there is a positive and significant correlation between perceived usefulness and willingness to use. The correlation coefficient between perceived ease of use and willingness to use is 0.482, p<0.01, indicating that there is a positive and significant correlation between perceived ease of use and willingness to use. The correlation coefficient value between perceived risk and intention to use was -0.352, p>0.05, indicating that there is a negative but insignificant correlation between perceived risk and willingness to use. The value of the correlation coefficient between subjective norm and willingness to use is 0.498, p<0.01, indicating that there is a positive and significant correlation between subjective norm and willingness to use.

Stepwise Regression
Stepwise regression analysis was performed. It is to show the relationship between perceived usefulness, perceived ease of use, perceived risk, subjective norms and use intention. The result is shown in Table4.

Table 4 Parameter Estimates

	UI					
	Ustd. Coe.		Std. Coe.	t	P	VIF
	B	Std. Error	Beta			
Constant	5.954	1.214		4.906	.000	
PU	.396	.048	.439	8.304	.000	1.776
PEU	.136	.052	.129	2.604	.010	1.548
PR	-.079	.040	-.086	-1.961	.051	1.213
SN	.177	.049	.176	3.621	.000	1.500

A specific analysis of the above stepwise regression analysis shows that the regression coefficient of perceived usefulness is 0.396 (t= 8.304, p = 0.000<0.01), which indicates that perceived usefulness has a positive and significant effect on willingness to use. The regression coefficient value of perceived ease of use is 0.136 (t=2.604, p=0.010<0.01), indicating that there is a positive and significant effect of perceived ease of use on willingness to use. The regression coefficient value of perceived risk was -0.079 (t=-1.961, p=0.051>0.05), indicating that perceived risk has a negative but insignificant effect on willingness to use; the regression coefficient value of subjective norm is 0.177 (t=3.621, p=0.000<0.01), indicating that subjective norm has a positive and significant effect on willingness to use.

Structural Model

The hypotheses testing was conducted by using SPSS, to produce coefficients, statistical significance of the relationship. The significance and the path coefficients present evidences to the nomological validity of the constructs in the conceptual model (As shown in Figure2).
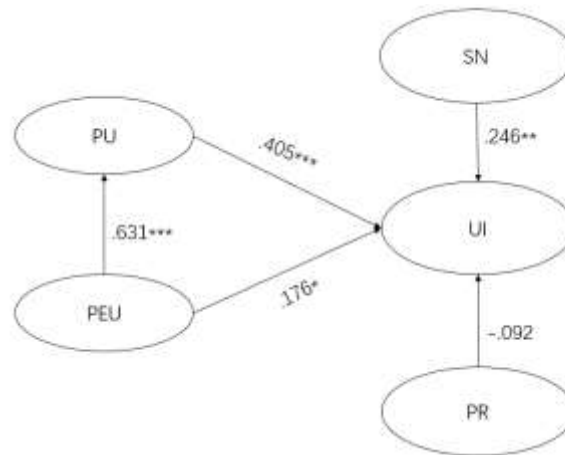
*: P＜0.05 **: P＜0.01 ***: P＜0.001
Figure 2 Structural Model

The research results support the following hypotheses: H1(β= 0.405, p<0.001), H2(β= 0.176, p < 0.05), H3(β =0.631, p < 0.001), H5 (β= 0.246, p < 0.01), are supported by the research results. However, H4 is not supported. In other words, Perceived usefulness (PU), Perceived ease of use (PEU) and subjective norm (SN) positively affect the willingness to use of "One-hour E-commerce" consumers (UI). Perceived risk (PR) negatively affects the willingness to use One-hour E-commerce consumers (UI) is not supported.

RESEARCH FINDINGS AND IMPLICATION

Research Findings

(1)   Perceived usefulness positively affects the willingness to use of "One-hour E-commerce" consumers

Consumers will use "One-hour E-commerce" when they get a better experience in using it. In some remote areas, there are too few merchants to conduct "One-hour E-commerce", and consumers can receive too few useful products from it, which will lead to the low willingness of consumers to use "One-hour E-commerce".

(2) Perceived ease of use positively affects the willingness to use of "One-hour E-commerce" consumers

The easier it is for consumers to understand or use the "One-hour E-commerce", the more likely they are to use it when making purchases. "One-hour E-commerce is designed to serve consumers better, and when it is too cumbersome to use, consumers will be less interested and less willing to use it.

(3) Perceived ease of use positively affects the perceived usefulness of "One-hour E-commerce" consumers

Perceived ease of use improves how easy consumers understand or use "One-hour E-commerce"; perceived usefulness is the degree of consumer experience consumers receive. The higher the ease of understanding or use to "One-hour E-commerce", the better the consumer experience. Therefore, when consumers can quickly understand and operate the "One-hour E-commerce", they are more likely to browse and purchase on the "One-hour E-commerce" platform.

(4) Subjective norms positively affects the willingness to use of "One-hour E-commerce" consumers

Everyone has a herd mentality and is often influenced by their surroundings. This phenomenon is reflected in the "One-hour E-commerce" consumers can be understood as the evaluation of "One-hour E-commerce" by the society and their friends around them will affect the consumers themselves. People subjectively believe that the use of "One-hour E-commerce" will be threatened by risks, so the "One-hour E-commerce" platform should improve its own brand building, increase customer trust in "One-hour E-commerce".

(5) Perceived risk does not negatively affect the willingness to use of "One-hour E-commerce" consumers

Online consumers like to decide whether to purchase a product by viewing others' reviews of the product. Consumers' perceived risk of "One-hour E-commerce" is initially experienced through other people's evaluation of "One-hour E-commerce". Perhaps the perceived risk of One-hour E-commerce is mostly hidden in the subjective norms, which are reflected to consumers through subjective norms. The lower the perceived risk of One-hour E-commerce, the higher the subjective norm of consumers, and the stronger the willingness of consumers to use "One-hour E-commerce"

Research Implications

Based on the above results and findings, the following strategies are proposed to enhance the willingness of consumers to use "One-hour E-commerce" and to promote the development of the "One-hour E-commerce" market.

(1)   Accelerate the integration and improve its own ecosystem

First of all, the "One-hour E-commerce" platform should accelerate the speed and strength of the integration of online and offline. Seek more local area merchants to join the platform, as far as possible to meet the use of consumers in all areas.

Secondly, "one hour e-commerce" also need to provide high quality products and services, product quality control for merchants, so that consumers can use quality products, improve the consumer's user experience on the platform, enhance customer stickiness.

(2)　　Optimize the platform to enhance ease of use

First of all, frequently update and maintain the operating system of the "One-hour E-commerce" platform to make the program more smooth. Secondly, the interface design of the software should be simple, clear and easy to understand, so that consumers can use and operate the software quickly and well even if they are first-time users. Finally, the staff of "One Hour E-Commerce" should provide detailed guidance on the operation process to the first-time users of "One Hour E-Commerce", in order to further deepen their understanding of the "One Hour E-Commerce" platform operating system. The staff of "One Hour E-Commerce" should provide detailed instruction on the operation process to further deepen the knowledge and understanding of the operating system of the platform.

(3)　　Improve distribution and strengthening user satisfaction

The "One-hour E-commerce" model has strict requirements for logistics and distribution services. Therefore, the platform of "One-hour E-commerce" needs to optimize the logistics and distribution procedures, which should make the logistics service: timely order acceptance, fast delivery, and rapid delivery; at the same time, it should also optimize the positioning accuracy in the logistics and distribution process, not only to allow users to check the location of their goods at any time, but also to deliver the products to the exact location within the specified time. location within the specified time.

(4)　　Enhance image and customer service efficiency

"One-hour E-commerce" needs to strengthen its efforts to solve consumers' problems, obtain positive usage reviews, and improve the brand image, which will have a positive effect on consumers' willingness to use it. The "One-hour E-commerce" platform should improve the efficiency of customer service, to ensure that when consumer raises a question, there will be staff to solve his problem in time, so as to improve the consumer experience. In addition, "One-hour E-commerce" also needs to improve the visibility of the platform, such as looking for celebrity endorsement, through the webcast platform to improve the understanding of "One-hour E-commerce" by others.

(5)　　Focus on quality and improving risk awareness

The "One-hour E-commerce" platform should pay close attention to the quality of goods, and strictly check whether there is a lack of merchants and malicious competition to deliberately discredit other merchants. Raise risk awareness, for all the details that may damage the reputation of the platform should be given attention, through the optimization of the system, the quality of the goods, the merchants strict control, the logistics speed, the user responsibility and other aspects of the joint operation to reduce the user's distrust of "one hour e-commerce", to improve the user's willingness to use.

Research Limits

The hypothesis that "perceived risk negatively affects consumers' willingness to use One-hour E-commerce" was not tested in this research. Through analysis, it was found that the reason may be that this paper only analyzed perceived risk as a single dimension in general. If the perceived risk is broken down into multiple dimensions, the final result may be more standardized and the hypothesis may be proven. In addition, the factors influencing consumers' willingness to use "One-hour E-commerce" are wide-ranging. This paper only takes TAM theory as the basis, and adds two factors, subjective normality and perceived risk, to analyze the corresponding influencing factors. So, in the future study, it needs further exploration of the possible influencing factors based on other theoretical models and analyze the relationship between each influencing factor and willingness to use.

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