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## An Empirical Analysis of Consumer Impulse Purchases

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### ABSTRACT

In China, shopping festivals such as T-mall Double Eleven, Double Twelve, and JD 618 are the best times for merchants to sell their products. In this paper, to help sellers in shopping festivals, we do an empirical study to identify the main factors that stimulate consumers to make impulsive purchases. Our research results show: (1) logistics services, product praise rate, and product sales volume indirectly affect impulse buying through perceived value as an intermediary; (2) source reliability, pre-sales service, and after-sales service indirectly affect impulse purchase through perceived risk as an intermediary; and (3) commodity prices and product discounts directly affect impulse purchase.

*Keywords:* Behavioural model, e-commerce impulse purchase, transaction utility.

### INTRODUCTION

Nowadays, the rapid growth of Internet penetration and the rise of e-commerce have made online shopping one of the mainstream consumption methods worldwide. In particular, according to the 48th Statistical Report on Internet Development in China in June 2021, the size of China's Internet users reached 1.011 billion, the Internet penetration rate reached 71.6%, and the size of online shopping users reached 812 million, accounting for 80.3% of Internet users. On the double 11, 2021, the single-day turnover of T-mall exceeded RMB 540.3 billion, setting another record high. Furthermore, in the 2021 618 Mid-Year Shopping Festival, Jingdong's cumulative order volume reached a record high of RMB 305.6 billion.

Consumers buy goods in online festivals because buying brings a bigger utility than not buying. However, almost everyone shops impulsively in these shopping festivals characterized by discounted sales. More notably, for consumers who seek more shopping value than practical value, it is unnecessary to have a significant discount to stimulate impulse buying behavior. Thus, studying what factors impact the customers' impulsive purchases in these online shopping festivals is necessary. The study can help merchants correctly understand consumers' psychological activities during online shopping and formulate reasonable marketing strategies, rather than just making discounts. On the other hand, the study may tell consumers which aspects of product information are worthy of their attention to reducing perceived risks and the uncertainty of online shopping.

To this end, in this paper, we first empirically analyze the hypothetical factors that stimulate impulse purchases in online shopping festivals, focusing on young shoppers (the main driving force behind online shopping). Then, we develop a theoretical framework of the factors that influence consumers' desire to shop and validate the model with a questionnaire survey of the study participants. Finally, we discuss how merchants can use our findings to develop marketing strategies to maximize their utility in the face of different consumer needs. This paper considers consumer needs in two types: (1) the need to obtain the utility value of goods and (2) the need to obtain the shopping value of goods.

The remainder of this paper is structured as follows. Section 2 discusses the hypotheses and model of impulse buying behavior of young online shoppers in the context of shopping festivals. Section 3 presents the questionnaire and statistically analyses the data collected from the questionnaire to verify our hypotheses and model. Section 4 discusses how the sellers can use the results of our empirical analysis in practice. Section 5 compares our work with related work. Finally, Section 6 concludes this paper with future work.

### HYPOTHESES AND RESEARCH MODELS

The section will discuss the hypotheses and model of impulse buying behavior of young online shoppers in the context of shopping festivals.

#### Theoretical Hypothesis

In commodity trading, logistics can be considered an ancillary service product for purchasing commodities, and its essence is to meet customer needs within the time required by customers. Logistics services have multiple dimensions, including delivery time, transportation costs, cargo damage rate, delivery reliability, returns and exchanges, and attitudes of service personnel (Rajendran et al. 2018). On the Taobao shopping platform, consumers' online evaluations of purchased goods mainly include three scoring items: description matching, logistics services, and service attitudes, which indicate that logistics services have an important impact on product satisfaction. Choi (2019) defined customer satisfaction as evaluating the online shopping

experience based on purchasing products or services and showed that the higher the customer satisfaction, the greater the possibility of repeated purchase behavior. If the satisfaction of a product is higher, all aspects of the product are more reliable. Therefore, the higher the evaluation of logistics services, the higher the customer's perceived product value. The current era is an era of competition by providing logistics and distribution. Chou (2014) found that the quality of logistics services has a significant impact on consumers' brand attitudes, and the brand image of a company directly affects consumers' perceived value of the company's products. Therefore, the quality of logistics services will directly affect the experience of consumers and the competitiveness of enterprises. During the raging period of the Covid-19 epidemic, fresh food e-commerce ushered in new development. In fresh food e-commerce, logistics service quality is a key factor in product marketing and maintaining market competitiveness, and the logistics service level will directly affect consumers' purchasing tendency. So, we have:

**H1:** Logistics services positively affect consumer impulse purchases.

The prevalence of social networks has prompted more and more people to express and share their subjective opinions on certain products through social networks. From eating, drinking, and playing to clothing, food, housing, and transportation, from material needs to spiritual needs, reviews of online shopping products have become an important source of information for consumers to understand the true situation of online products (Chakraborty, 2019). At the same time, most consumers obtain and analyze corresponding online reviews before purchasing products as an important reference for purchase (Zhao *et al.* 2019). Product praise rate is closely related to brand reputation and brand recommendations. Apps such as Xiaohongshu and Tanwu will launch ranking lists of the same type of products or services based on product praise rates. The ranking of the list can easily affect consumers' shopping preferences. The higher the product praise rate, the higher the credibility of the product description information provided by the merchant, and the easier it is for consumers to make impulse purchases. Zhao & Peng (2019) found that online reviews will significantly impact users' perceived value, affecting users' purchasing decisions. Deloitte (2012) found that online reviews affect more than 82% of people's purchasing decisions. Chevalier (2006) and others investigated the relative sales of books on Amazon.com and Barnesandnoble.com and found that consumer reviews positively impact product sales. When searching for a certain product type, the higher the sales volume, the easier it is to appear at the forefront of the search page. The easier it is to attract consumers' attention, the easier it is to stimulate blind trust emotions. The higher the historical sales volume, the more advantageous the product's packaging, appearance, performance, and quality, enhancing consumers' perceived value and inducing impulse purchases. For consumers looking for shopping value types, products with a beautiful appearance and exquisite packaging will bring extra pleasure, and people are more likely to make irrational decisions in a happy mood. As sales increase, product reviews will increase, and the authenticity and comprehensiveness of the reviews will increase. Therefore, we have:

**H2:** Product reviews and sale volume positively affect consumer impulse purchases.

With the rapid development of social commerce, consumers' online shopping methods are no longer limited to spontaneously browsing products on e-commerce platforms. E-commerce anchor live broadcasts with goods, overseas purchasing agents, etc., are all purchased through the recommendation of a third party. Chen *et al.* (2019) showed that the emotional trust of recommenders determines impulse buying. Since e-commerce transactions occur and are realized on the Internet, this increases the uncertainty of the transaction. Suppose it is a product recommended by an acquaintance, a trusted e-commerce anchor, or a procurement service out of emotional trust in the recommender. In that case, the buyer will subconsciously believe that the product comes from a guaranteed product from a formal channel, which greatly reduces the perceived risk and causes unplanned purchase behavior. The experiment of Farhadpoor *et al.* (2021) shows that the quality and credibility of information sources will significantly affect users' shopping attitudes and their use of information resources. During the shopping festival, consumers will be exposed to social media product recommendations and social interactions. And even the live broadcasts of well-known e-commerce anchors such as Ya Wei and Jiaqi Li have repeatedly rushed to Weibo hot searches, which maximizes the impact of shopping stimulation and is more likely to produce impulse purchases. The main characteristic of impulse buying is the lack of a deliberate process, a sudden emotion. Therefore, the simpler the purchase decision process, the more likely it is for consumers to make impulse purchases Stern (1962). When a trusted third-party issues product recommendation, consumers reduce the process of inspecting products due to the reduced perceived risk, greatly shortening the thinking time and ultimately leading to impulse purchases. Therefore, we have:

**H3:** Source reliability positively affects consumer impulse purchases.

Bauer (1960) believes that perceived risk includes two factors, the uncertainty of decision-making results and the severity of the consequences of wrong decisions. First of all, the virtual nature of online goods deprives consumers of the opportunity to experience the goods in person, making the goods they buy may be worse than the goods they are willing to pay (Liu, 2020). This information asymmetry in the transaction process increases the perceived risk of consumers. Secondly, even if consumers' awareness of rights has been greatly improved today, many buyers will give up their rights due to the long preparation time for returns, cumbersome procedures, and the need to pay for freight. These risks make more and more people more cautious when shopping online, and a sound customer service system is an excellent way to solve this problem (Skordoulis *et al.* 2018; Gao, 2020). Before the sale, customer service can display product details, introduce products more professionally, accept customer inquiries, and answer patiently to obtain a more authentic and enjoyable shopping experience. Especially in the face of customers who are pursuing shopping value, they may not be very careful about the product itself, but

more about the feeling of the process of purchasing the product. A good customer service attitude will make customers feel respected and have positive emotions. Positive emotions will make customers make decisions faster and more likely to have impulse buying behavior. Tversky & Kahneman (1992), Raman (2019) pointed out that customer service attitude is a key factor affecting female consumers' online shopping attitudes. In addition, the detailed and appropriate introduction of the product by the customer service staff will increase the product's perceived value. When consumers' perception of the product exceeds their initial expectations, their control over rational emotions will be greatly reduced, leading to impulsive purchases. Therefore, excellent pre-sale customer service plays an important role in sales promotion. In addition, the detailed introduction of the product by the customer service staff and the answer to the customer's questions can enable consumers to more clearly judge whether the product meets their needs and reduce the time risk (Ariffin et al. 2018) of returning the product due to dissatisfaction with the real product received. After-sales service protects the rights and interests of consumers through measures such as the seven-day unreasonable return of goods, one compensation for fakes, insured services, and provision of freight insurance. In addition, the customer service staff provide reasonable answers to various questions that consumers have after receiving the goods, reducing consumers' perceived risks when shopping online and allowing consumers to buy with confidence and boldness. So we have:

**H4:** Customer service positively affects consumer impulse purchases.

Data from the National Bureau of Statistics show that in the first half of 2021, the national per capita disposable income was 17,642 yuan. Hence, product price is critical in browsing and purchasing goods, both in the traditional consumer sector and e-commerce. Traditional theory suggests that shopping orientation greatly influences consumers' channel preferences, and shopping orientation can be divided into four categories: convenience, experience, entertainment, and price. Online shopping is attractive to price-oriented customers because they can find functionally identical or similar products at a lower price quickly and easily compared to traditional offline shopping. In addition, discount sales have the advantages of high operability and consumer stimulation, which can quickly increase short-term sales and are one of the most popular promotional tools businesses use during shopping festivals. Donovan *et al.* (1994) found that price discounts induce consumers to make unplanned purchases, and Seiler's transactional utility theory can explain this phenomenon well. The price difference between the discounted item and the reference price gives consumers perceived transactional utility, impulsively purchasing. The greater the perceived transactional utility, the more consumers tend to purchase. In behavioral economics, consumers think more about which goods bring them the most transactional utility when making purchasing decisions, and purchases occur when they receive satisfaction from the transactional utility. Thus, we have:

**H5:** Prices and discounts positively affect consumer impulse purchases.

### Structural Model

Based on the above discussion, this paper uses the Stimulus-Response-Organism (SOR) framework as the theoretical basis to establish a model to reveal how logistics services, product praise rates, product sales, source reliability, product prices, and discounts directly or indirectly affect impulse purchases. Fig. 1 shows the model.

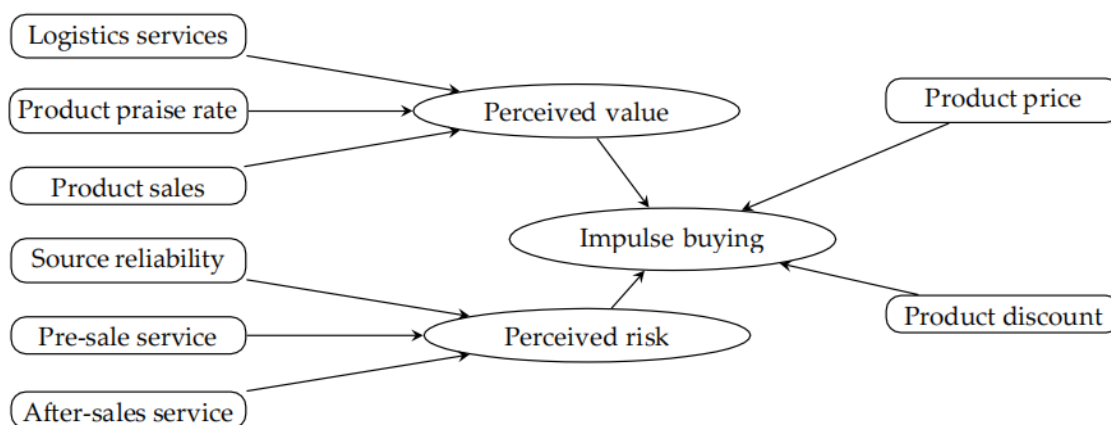


Figure 1: A taxonomy of learning methods used for the customer service system.

Table 1: Sample demographics.

Measure	Item	Frequency	Percentage
Gender	Male	532	44%
	Female	687	56%
Age	<20	274	22%
	20-30	764	63%
	>30	181	15%
Education level	Below university degree	222	18%
	Undergraduate	689	57%
	Master degree and above	308	25%
Income in RMB (monthly)	<1500	544	45%
	1500-3000	502	41%
	>3000	173	14%

### Questionnaire and Data Results

This section will present the questionnaire we use to check our hypotheses and mode and statistically analyses the data collected from the questionnaire to verify our hypotheses and model.

### Questionnaire Design and Data Collection

This study collected data in the form of online questionnaires, designed questionnaires with the help of the “Questionnaire Star” platform, and distributed the questionnaires in the form of links and QR codes through social platforms such as WeChat and QQ. The questionnaire consists of two parts. The first part is the basic information of the respondents, and the second part is all the hypothetical factors that attract and stimulate consumers to make impulse purchases. This questionnaire mainly focuses on the life of online shoppers as the research object; a total of 1,260 questionnaires were issued. By checking the length of time to fill out the questionnaire, judging whether the object of filling out the questionnaire is the same as the research object and setting trap questions, a total of 1,219 valid questionnaires were screened, with a valid recovery rate of 96.75%. Table 1 shows the basic information statistics of the respondent to the questionnaire.

### Common Method Bias

Since the data source of this study’s questionnaire was relatively homogeneous, and the number of respondents between the ages of 20 and 30 was 764, accounting for 60% of the total number of respondents, the data results may be subject to a common method bias. So, this paper uses the Harman one-way test to test for common method bias among the collected sample data. In this study, we use SPSSAU as the statistic analysis tool. The test results show that the commonality values corresponding to all the research items were higher than 0.4, implying that the research items’ information content could be effectively extracted. Furthermore, the results obtained through principal component analysis showed more than one factor with a characteristic root value greater than one, and the percentage of variance explained by the first common factor was less than 40%. From this, we can judge that no single factor controls the total variance in this survey study, and there is no serious common method bias.

Table 2: Results of reliability analysis.

Measurement items	cronbach’s $\alpha$ after deletion of terms
Source Reliability	.719
Logistics Services Rate	.730
Product Sales	.728
Product Praise	.723
Pre-Sales Services	.713
After-sales Service	.714
Product Price	.724
Product Discounts	.737
Overall	.750

Table 3: Results of validity analysis.

KMO		.803
Bartlett's Test	Approximate Chi-Square	1759.342
	Df.	28
	Sig.	.000

Table 4: ANOVA.

Model		Quadratic Sum	Df.	Mean-square	F	Sig.
1	Regression	255	.539 7	36.506	83.816	.000
	Residual	3713.461	8526	.436		
	Sum	3969.000	9751	.456		

## DIALOGUE MANAGEMENT

### Analysis of Data Results

We first conducted reliability and validity analyses on the collected questionnaire data. The results of the analyses are shown in Tables 2 and 3. we used Cronbach's alpha coefficient as the main measure for the reliability analysis of the scale data. After removing items for each measurement factor, the Cronbach's coefficient was greater than 0.7. There were no observations whose removal would increase the Cronbach's  $\alpha$  value. The overall reliability coefficient value was 0.751, indicating that the study data reliability quality is good and can be used for further analysis. The validity analysis of all the measures showed that the KMO value of the overall scale was greater than 0.8, and the significance of Bartlett's spherical test value was less than 0.001, indicating that the study data had good validity and reached a significant level. From Table 4, we can see that  $F = 83.816$ ,  $P = 0.000 < 0.05$ , implying that our model is statistically significant and worth being further analyzed.

### Structural Model Verification

We use SPSSAU to verify the structure model proposed in this paper, and the test results of the structure model are shown in Fig. 2. The test includes the coefficients and their significance, which verifies all the hypotheses we make.

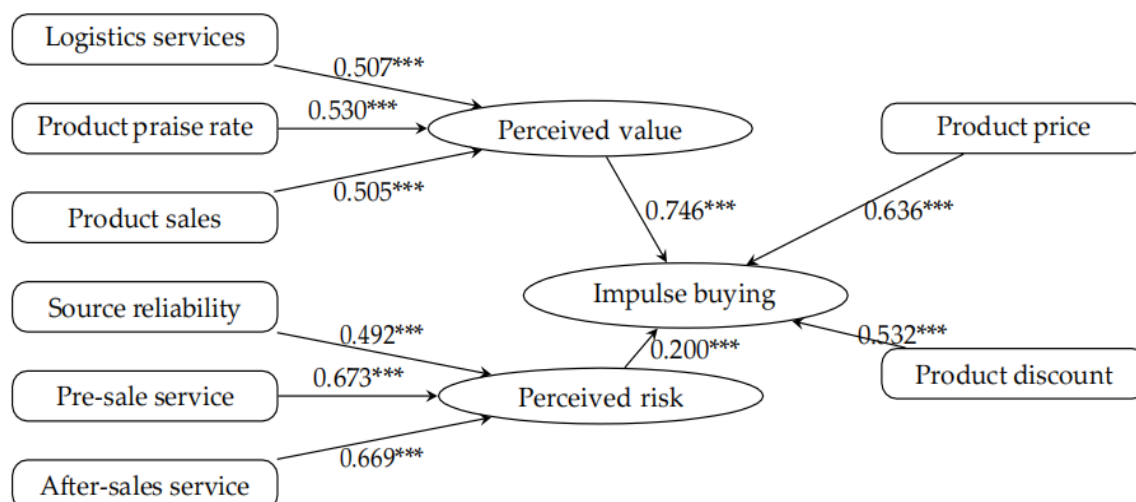
Table 5 shows the results of the hypothesis verification.

## DISCUSSION

This section will discuss how the sellers can use the result of our analysis above.

This study investigates the impact of external factors stimulating consumer impulse purchases by developing a structural equation based on the S-O-R model, and the experimental results show that all of our hypothesis factors are supported by validation.

First of all, the results of this study show that logistics services, good ratings of goods, and sales of goods are mediated by the perceived value, which will all have a positive impact on impulsive buying behavior. The distribution channels of e-commerce platform merchants generally cooperate with outsourcing logistics companies. When choosing a partner company, merchants should consider the company's average logistics delivery time, the damage rate of goods, ratings of delivery personnel, last-mile logistics, etc. The last mile in the city includes issues such as door-to-door delivery and delivery to the delivery point closest to the receiving location(Wang, 2020;Viu-Roig, 2020), which have become one of the main factors in evaluating the quality of logistics.



Note:\*\*\* $p < 0.001$ ,\*\* $p < 0.01$ ,\* $p < 0.05$ . ns: non-significant at the level of 0.05

Figure 2: The Research model text result.

Table 5: Hypothetical research.

Items	Hypothesis	Results
H1	Logistics services positively affect consumer impulse purchases	✓
H2	Product praise rate positively affects consumer impulsive purchases	✓
H3	Product sales positively affect consumer impulse purchases	✓
H4	Source reliability positively affects consumer impulse purchases	✓
H5	Pre-sales service positively affects consumer impulse purchases	✓
H6	After-sales service positively affects consumer impulse purchases	✓
H7	Product prices positively affect consumer impulse purchases	✓
H8	Product discounts positively affect consumer impulse purchases	✓

Merchants need to improve the quality of logistics services to enhance customers' willingness to repeat purchases, gain a stable customer base, and achieve longer-term development. It has become popular for companies to conduct sentiment analysis of online reviews on e-commerce sites to understand consumer perceptions of products and services in the business world (Changchit, 2020). Merchants and manufacturers can learn which aspects of the product are inadequate and the deficiencies based on consumers' good and bad reviews. And which aspects are favored by consumers and adjust product performance based on sentiment analysis of online reviews to improve product competition Strength, increase product sales and praise rate.

Secondly, source reliability, pre-sales service, and after-sales service, mediated by perceived risk, all have a significant positive impact on impulse buying. There is a dazzling array of online products, and the same types of products abound. It is impossible for consumers to see all the product information and therefore miss the opportunity to purchase products. Enterprises and merchants should establish their official accounts on popular apps among online users, such as Xiaohongshu, Weibo, Douyin, and WeChat official accounts, to upload product information and preferential activities. At the same time, merchants and businesses can invite reputable e-commerce anchors for promotional sales when they can afford to do so, increasing consumer trust in their goods and making more consumers aware of their brands and products. With the increase in online consumers, especially in shopping festivals, there are too many online inquiries, and many merchants cannot respond in time. Generally, automatic response functions such as "service assistants" are set up. However, "service assistants" can only make fixed responses to regular questions (such as when to ship and return), which may cause negative emotions for customers who want to quickly solve the specific problem, which is not conducive to the development of the online shopping market. E-commerce platforms or companies should choose a more intelligent human-machine dialogue system (Angelov & Lazarova, 2019) such as a human-machine dialogue system based on big data, reinforcement learning, and sentiment analysis. Which can respond to customer messages in time and have a more comprehensive understanding of customer preferences, emotions, and Demands, etc., give high-quality responses to improve customer satisfaction.

Third, in the period of a discount promotion, merchants can learn from Pinduoduo's group buying model. Under the condition of ensuring that each product can at least obtain a certain profit, the greater the quantity, the greater the discount. This can encourage consumers to invite more people with the same needs to join the purchase. Thus, not only can consumers get more discounts, but businesses will also get more benefits.

### RELATED WORK

Other work also investigates what factors may impact customers' online shopping behaviors, but our work is different from them. Chen *et al.* (2019) use signal theory to study how information cues affect online buyers' perception of trust, product attitudes, and impulse purchases. Our work is different from them in the following aspects: 1) we use questionnaires to study how external environmental stimuli directly or indirectly affect consumers' impulsive purchases; 2) we believe that trust and product attitudes will pass through perceived value and perceived risk to affect impulse buying indirectly. Akintan (2019) added the effect of transaction utility when explaining impulse buying behavior in real life. Sinha (2004) proposed that transaction utility is closely related to purchase or sales, indicating the pleasure of financial transactions itself. This paper believes that pleasure will increase the transaction utility of products and stimulate impulse purchases. Audrain *et al.* (2013) believe that each type of product involves a specific purchase strategy in the online environment. According to the game model we constructed, buyers and sellers can better choose purchase strategies and sales. Strategy. The experimental results of Muehlbacher *et al.* (2011) prove that if the product's actual value is more considered when purchasing the product, the transaction utility will become less important. Which can prove that we divide consumers into more concerned about use value and more concerned about purchase. The rationality of value. Companies can analyze their big data on e-commerce websites, such as historical order analysis, overall consumption level analysis, browsing record analysis, etc., to obtain a set of consumer preferences for a product. Combined with the structural model, we proposed appropriately adjusting the weights of environmental factors that stimulate impulse buying in the marketing strategy and making decisions that can achieve the greatest effect.

### SUMMARY

Nowadays, online shopping is one of the major shopping methods, which many factors impact. To help sellers make proper marketing strategies in online shopping festivals, in this paper, we empirically study what factors may impact customers' impulsive purchases. We also construct a structural model for stimulating consumer impulse purchases. The model can help online sellers to obtain a collection of consumer preferences for a particular product through big data analysis of e-commerce websites, such as historical order analysis, overall consumption level analysis, and browsing history analysis.

However, it is worth improving our work in many aspects in the future. For example, it is necessary to consider consumer regret behavior after impulse purchases and minimize consumer return behavior. It is essential because ignoring the results of impulse purchases may waste social resources and negatively affect the company's reputation. Besides, our study is based on e-commerce platforms in China only. We hope that our model can be tested in different cultures in the future. Furthermore, this study only uses an online questionnaire to collect data, which may have some bias. So, in the future, it is interesting to use multiple forms and channels to collect data to see whether our model is still valid. In addition, it is also interesting to study whether different factors may impact impulsive purchases of various consumer groups (e.g., different age groups, different incomes, different regions, and different social circles).

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