

# Research on Second-Hand Bicycle Purchase Intention——Taking the Second-Hand Bicycle Trade of Shanghai Institute of Electrical Engineering as an Example

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**Abstract:** Because of its convenience, bicycle has become one of the most popular means of transportation in universities. With the accumulation of students' purchase from one session to another, the number of idle bicycles in colleges and universities is increasing, and the disposal of these second-hand bicycles has become a thorny problem. This paper collects data through interview and investigation, analyses the second-hand bicycle trading market with the above electrical engineering college as the sample, explores the path of building a second-hand bicycle trading platform, and solves the disposal problem of idle and abandoned second-hand bicycles. It provides some feasible suggestions for solving the problem of second-hand bicycle idleness in the future.

**Keywords:** Used Bicycle; Willingness to Buy Full; Resource Recovery; PMS Test

## 1. Introduction

The emergence of shared bicycles has led to the continuous expansion of the bicycle market and the influx of a large number of shared bicycles, while the original private bicycles have increasingly become "zombie bicycles". With the continuous development of the Internet in China, information is gathering more and more in the third party - the Internet platform. Both the b-end and the C-end cannot obtain information without the Internet platform. The establishment of the platform makes B2B, B2C, C2C and other business model transactions easier, safer and more secure.

## 2. Market Status of Second-Hand Bicycles [1]

After visiting and observing, it is found that the school bicycle parking lot is crowded with abandoned second-hand bicycles, and most bicycles are covered with a layer of dust. Some bicycles are even dilapidated and unusable, which seriously affects the beauty of the school. The school bicycle parking place has thus become a gathering place for "zombie bicycles". [2]

According to the official statistics of the security office, nearly 500 bicycles are unclaimed every year and piled up in the corner of the school waiting for waste recycling. Through the field visit and observation of professional masters, it is found that many parts of these discarded bicycles are intact and can be reused after professional treatment. These "zombie bicycles" have been piling up, which not only causes a serious waste of resources, but also affects the beauty of the school.

With the introduction of "shared bicycles" into colleges and universities, "zombie bicycles" occupy most of the area of bicycles parked in schools, resulting in the phenomenon of "shared bicycles" being unable to park and parked at random. Waste bicycles can not be disposed of. They are idle in every corner of the campus. Coupled with the influx of new cars, school bicycles are in a "saturated" state, which has a certain impact on the school environment.

### **3. Analysis of Bicycle Characteristics**

#### ***3.1 Ease of Assembly of Bicycle***

According to the description of the professional bicycle assembly master, the assembly process can complete the assembly of a bicycle in seven steps: 1 Install tire 2 Bowl group 3 Installation of front and rear wheels 4 Install crank 5 Install seat 6 7. Commissioning details antirust. The technical requirements for bicycle assembly are not very high, but in order to ensure the quality, the assembly link will be strictly implemented. The wrenches used for assembly are torque wrenches to ensure that the quality of each part is not damaged and the safety of use is also guaranteed. In addition, the assembly speed is very fast. According to the calculation of practical experience, it takes only half an hour for professional technicians to assemble a bicycle with appropriate size and complete tools, and only 1.5 hours for trained personnel at most, so the productivity is very high. When the parts are classified and screened well, customers can assemble it immediately with one click. This can greatly improve efficiency and save the cost of human resources. At the same time, the safety of the assembled second-hand bicycle is also a major focus of consideration. In order to ensure the quality, quality management professionals will be invited to test, and the corresponding cooperation will be tested with professional torsion and strength test to ensure the product quality.

#### ***3.2 Interchangeability of Bicycle Parts***

The core of the second-hand bicycle market lies in the process of assembly, which is divided into parts exchange, cleaning, assembly technology and process, and quality inspection. For parts exchange, the adaptability of parts exchange must be considered. Therefore, the following is an analysis from the mainstream suppliers of parts.

Firstly, analyze the disassembly and assembly of parts: the most important transmission components in mainstream mountain bikes are supplied by Shimano of Japan and SARM of the United States. Shimano transmission accounts for the largest market share, and the relevant parts have a wide range of application, and the parts of products of the same grade have good substitutability. This greatly improves the interchangeability and adaptability of bicycle transmission and reduces the difficulty of parts interchangeability; Brakes are mainly supplied by Shimano of Japan and Magura of Germany. Most of the brakes (mechanical disc brake, hydraulic disc brake) and front fork are supplied by SunTour in Taiwan, rock show in the United States and manito in the United States; The pedal is mostly provided by Taiwan wellGo company; Tires are mostly provided by Taiwan Kenda, China CST and its high-end tire brand Maxxis; The peripheral spare parts with high matching degree are provided by Taiwan Fourier. The interchangeability of bicycle parts is relatively high, and the supplier of each part that may be interchanged is relatively easy to find. The parts of the same manufacturer have one thing in common: regardless of the wear of the parts, the fixing screws and connecting parts of the same brand are of the same size. In addition, the transmission of Merida bicycle is also supplied by Shimano. To sum up, bicycle parts of the same grade have strong interchangeability, which provides a lot of convenience for the assembly of second-hand bicycles.

### **4. Analysis of Factors Affecting Consumers' Purchase of Second-Hand Bicycles**

#### ***4.1 Analysis of Consumers' Sensitivity to Price***

The market is highly dynamic and uncertain. Price is one of the important factors affecting consumers' purchase [3]. In economic theory, price sensitivity is the elasticity function of customer demand, that is, the change of product demand caused by price change. The study of consumers' price consumption psychology can make marketing decisions more scientific and reasonable.

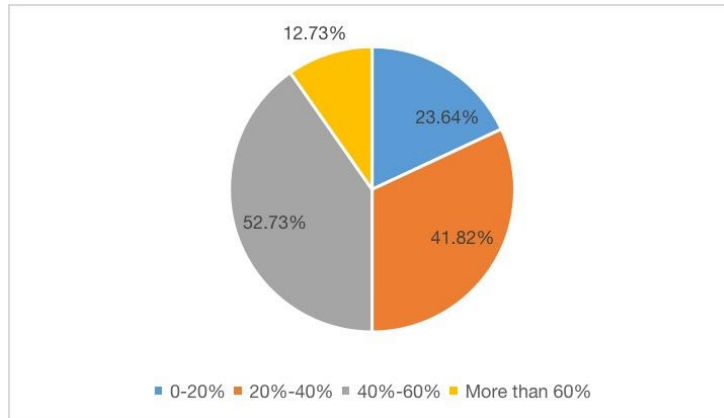


Figure 1: Survey results of College Students' willingness to buy second-hand bicycles as a percentage of the price of new cars

Through the questionnaire survey, the results (as shown in Figure 1) are as follows: 52.76% of consumers can accept the purchase of second-hand bicycles, and the price accounts for 40% ~ 60% of the price of new cars; Between 20% and 40% of new car prices, 41.82% of consumers are willing to buy second-hand bicycles; In the range of 0% - 20% of the new car price, 23.64% of consumers buy it, while only 12.73% of consumers are willing to buy second-hand bicycles, which account for more than 60% of the new car price. Therefore, according to the survey results, the pricing should be between 40% - 60% of the price of new cars purchased by consumers, which is more reasonable.

When designing the questionnaire, PMS test was designed for the pricing of second-hand bicycles to re quantify the price. The following is the table of test results and the test chart of price sensitivity of second-hand bicycles:

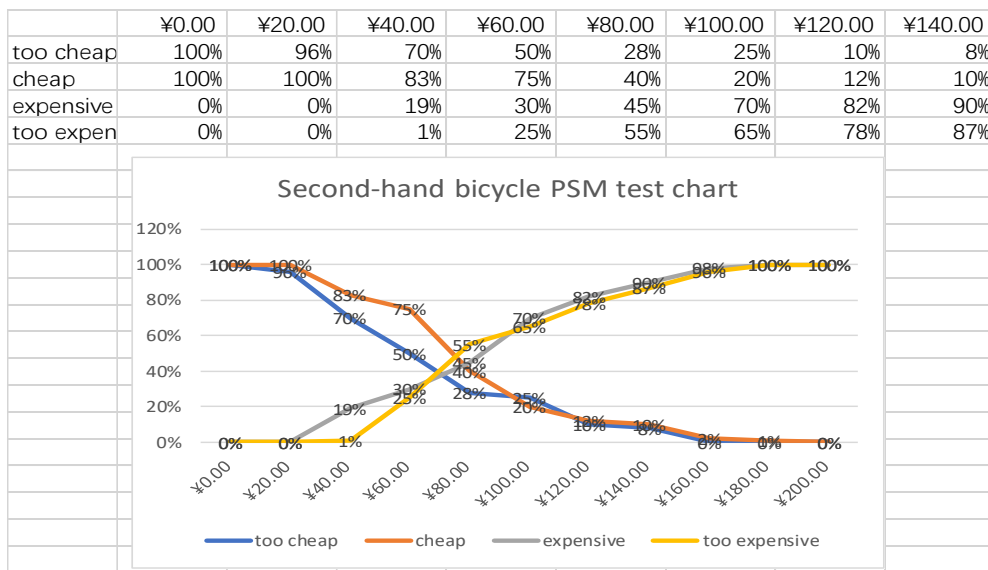


Figure 2: PSM test diagram of used bicycle

According to PSM test [4], if the intersection of the broken line "too cheap" and "expensive" is P1, the intersection of "too cheap" and "too expensive" is P2, the intersection of "cheap" and "too expensive" is P3, and the intersection of "expensive" and "cheap" is P4, then the optimal pricing price is P2, P4 is suboptimal, and P1 ~ P3 is the acceptable price range. Through the PMS test of second-hand bicycles for consumers, we will clearly understand the price range of consumers for buying second-hand bicycles, and provide a pricing range for ordinary second-hand bicycles in the market.

In order to make the price more reasonable, the factors that consumers think should be referred to in the quotation are deeply investigated, so as to manage the differential pricing of each second-hand bicycle.



Figure 3: Survey results of importance of quotation reference factors considered by consumers

Through market research, it is assumed that the quotation of second-hand bicycles should refer to factors such as the recycling price of second-hand bicycles, the current market price of goods, the degree of wear and tear of goods (including appearance and performance), handling charges during transaction (such as platform pumping and freight) and personal relations. 65.45% of consumers are more concerned about the degree of wear (including appearance and performance); 56.36% and 54.55% of consumers choose the recycling price of second-hand bicycles and the current price of goods respectively, and 27.27% of consumers choose personal relations and transaction fees (such as platform pumping and freight). The survey results show that consumers are more concerned about the wear degree of items. Therefore, in the pricing of bicycle parts, differential pricing management can be adopted according to the wear degree of the articles after quality inspection by professional technicians. The items with high wear and tear are sold at a low price, and the parts with relatively high wear and tear can appropriately increase the price.

#### 4.2 Analysis of Consumers' Response to the Old and New Degree of Second-Hand Bicycles

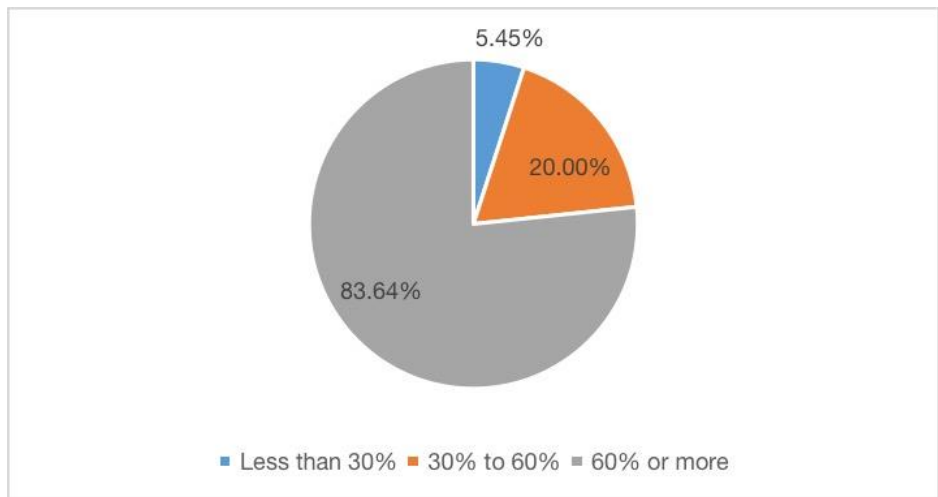


Figure 4: Survey results of consumers' willingness to buy second-hand bicycles

According to the survey results of consumers' willingness to buy second-hand bicycles, 83.64% of consumers want to buy 60% or more of second-hand bicycles, 30 ~ 60% of them only account for 20%, while only 5.45% of them want to buy 30% of second-hand bicycles. In order to make the refurbishment degree of second-hand bicycles reach 6 floors and above, there should be strict quality standards for the selection of available parts.

#### 4.3 Analysis of Consumers' Response to Platform Pumping

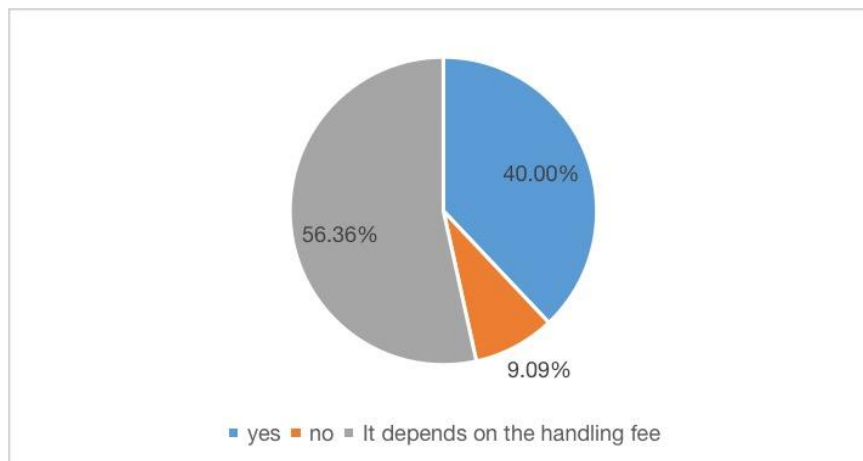


Figure 5: Consumers' willingness to draw on the platform

From the survey of consumers' willingness to draw on the platform, 56.36% of consumers do not exclude the platform draw, but it depends on the degree of platform draw, while only 9.09% of consumers do not affect their purchase decision, and 40% of consumers believe that the platform draw will affect their purchase decision. Therefore, the platform needs to be cautious about the extraction of second-hand bicycles.

#### 5. Conclusion

The second-hand bicycle trading market in Colleges and universities has good development potential. [5] However, there are still many problems in the second-hand bicycle trading market in Colleges and Universities: for example, the information asymmetry between buyers and sellers, the quality of second-hand bicycles can not be guaranteed, the price pricing of second-hand bicycles is irregular, and there is almost no after-sales service for second-hand bicycles. Through the price sensitivity test of second-hand bicycles, provide the basis for the pricing of second-hand bicycles; In the analysis of the factors affecting the purchase of second-hand bicycles, the old and new degree of second-hand bicycles, the wear degree of bicycles, the market price of second-hand bicycles, the proportion of purchase platform and the purchase price of bicycles all have a great impact on consumers' purchase. To sum up, through the sensitivity test of second-hand bicycles, the general pricing range of second-hand bicycles is determined. At the same time, through the study of purchase factors, each second-hand bicycle can be priced separately within the range of general pricing. This solves the problem of consumers' pricing of second-hand bicycles. At the same time, the following points should be paid attention to when using the second-hand bicycle platform: 1 Strictly control the platform pumping, and the pumping price is reasonable, open and transparent; 2. Provide high-quality after-sales service; 3. Improve the service awareness, and DIY customize the bicycle renovation requirements according to the buyer's requirements to meet the individual requirements of consumers.

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