

Research on the Consumers' Purchasing Demand on Electric Bicycles in Chinese Market

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Abstract—The analysis is performed on the current industry status of electric bicycles as well as the advantages and disadvantages of the similarly competitive products in current market in order to research Chinese consumers' purchasing demand on electric bicycles; the investigation and analysis is conducted on the consumption demand of the young users' through questionnaire so as to summarize the young users' demand of electric bicycles and present suggestions for the electric bicycle enterprises to develop new products.

Keywords—Market Investigation, Electric Bicycles, User Demand, Questionnaire

I. INDUSTRIAL PROFILE AND RESEARCH STATUS

A. Development Situation of Electric Bicycle Industry

Electric bicycle is a kind of vehicle that's driven by electrical energy, which is eco-friendly and convenient. Along with the increase of China's population with higher education, the consumption capability is strengthened [1-3]. With the merits of low noise, no pollution, simple structure, low cost, convenient maintenance and so on, the electric bicycles become important vehicles for young groups.

Thanks to each country's higher and higher requirements on environment protection and the progress of new materials and techniques, the electric bicycles enter into rapid development stage. As green vehicles, electric vehicles will bring in giant change for the travel of the human society in the new period [4-5]. Electric vehicles are used as Chinese users' main vehicles in conformity with the currently international sci-tech development trend, which is not only the strategic choice to realize the leapfrog development of China's auto industry, but also the important selection to achieve the sustainable development of China's auto industry. Lots of electric bicycle brands exist in the current market, different brands create different brand concepts and product emphasis, but they have similar appearance design and identical styles, so they can't meet consumers' personalized demands [6-10]. Some electric bicycles are with bad user experience due to heavy and inconvenient design. Most of electric bicycles are lack of GPS units, anti-theft function and orderly charging devices [11]. Therefore, the market research is performed on the design and development of China's electric bicycles; on one hand, it can provide strategic guidance to further improve the design of electric bicycles; on the other hand, it can

promote the market development of electric bicycles so as to further stimulate economic and social development.

B. Product Analysis

During the style design of electric bicycles, the position and size of control units shall be confirmed according to the human dimensions, physiological angle under comfortable riding gesture as well as the movement scope of arms and legs 8-10. The design size of operation system will be limited due to the smaller volume of small size electric vehicles, so the movement scope and angle change of each human body part shall be sufficiently considered during the design, which can make human feel natural and portable and reduce fatigue strength during the manipulation.

The influence of the following aspects shall be considered during the design of electric bicycles:

- 1) *The strength and speed of manipulator shall be designed according to the lower limitation ability of manipulator, which is easier for most of people.*
- 2) *The comfort shall be increased as possible during the seat design, the structure shall be flexible, the seat height can be modulated and the usage angle shall be easy to regulate. The structure of flexible rotation is adopted for seats that can realize valid space utilization so as to make up for the deficient size of electric bicycles.*
- 3) *The handle design shall be with elegant appearance and convenient operation. Well-designed handle can realize flexible operation so as to improve the comfort and safety.*

II. RESEARCH PREPARATION AND QUESTIONNAIRE DESIGN

A. Competitive Product Analysis

Taking Yadi electric bicycles for example, Yadi has started to research electric bicycles since 1980; with more than 30 years of history, Yadi is the first enterprise who sells the electric bicycles in the world and it has obtained lots of impressive achievements. Based on many years of electric bicycle manufacturing experience, Yadi provides "the electric bicycles with happy driving, high quality and advanced appearance design" for Chinese customers. The product development roadmap of Yadi electric bicycles is summarized through the analysis on 11 types of Yadi appearance design

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plans. The product development roadmap of Yadi electric bicycles refers to the Fig. 1.



Fig. 1. Product Development Roadmap of Yadi Electric Bicycle

Equipped with 800W motor, the Yadi electric bicycle is with sufficient energy, fast acceleration, powerful climbing torque and continuously strong power. The adjustable hydraulic rear cushion is with better effect of shock absorption so as to provide comfortable riding. The seamless waterproof cushion is adopted for the seats and the use experience of seat cushion is upgraded. Meanwhile, the seat cushion color of this brand can be matched according to different bicycle color so as to further meet consumers' personalized requirements.

The design of Yadi electric bicycles is oriented to the positioning of fashion and movement through the analysis on 20 types of appearance design. The appearance design analysis of Yadi electric bicycles refers to the Fig. 2.

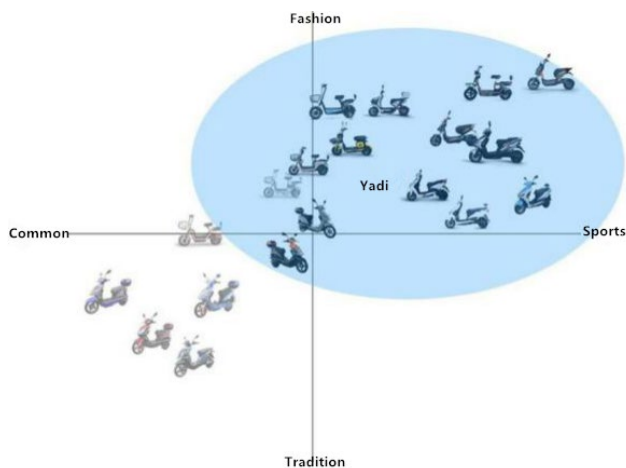


Fig. 2. Electric Bicycle Design Style Positioning Analysis

B. Questionnaire Preparation and Distribution

Totally 20 pieces of questionnaires are distributed in the market survey of this time, and the young groups' purchasing

conditions and product demands on electric bicycles are investigated. The questionnaires involve the following aspects: (1) The market conditions of electric bicycles among young groups. (2) Main factors for young people to choose electric bicycles. (3) Motivation to purchase electric bicycles. (4) Typical merits and defects of electric bicycles in current market. (5) Describe what features ideally electric bicycles shall obtain.

According to the survey results, the ratio of young groups who choose electric bicycles for travel is 45%, and there's broad market among the young groups. The aspiration of young groups to purchase vehicles is shown in the Fig. 3.

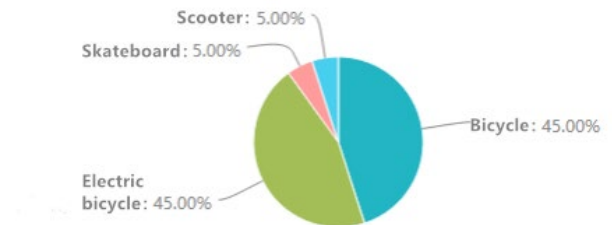


Fig. 3. Main vehicles for young users

C. Market Demand Analysis

In the reclaimed questionnaire, 70% young users pay much attention to the price factor during the purchasing, 55% care about the beautiful appearance and 55% of them focus on the convenient operation. Through the research it's also found that the young groups pay much attention to the cost performance, meanwhile they will consider the beautiful appearance and complete function. The user demand survey of electric bicycles is shown in the Fig. 4

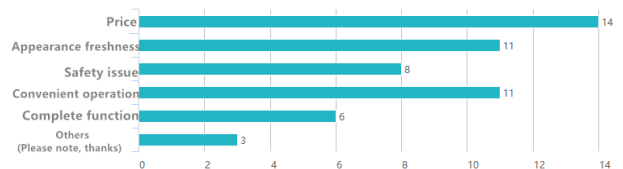


Fig. 4. Use Demands of Electric Bicycles

Aiming to the current defects of electric bicycles, the questionnaire survey is performed on the interviewees. According to the survey results, 60% of users reflect that most of electric bicycles in the market can't be used under adverse weather conditions. 55% of users feed back that the electric bicycles can't be well placed, which are easily stolen. 42% reflect that the electric bicycles are lack of facilities where personal items can be placed. 25% of users reflect that most of electric bicycles are with bad safety. The analysis of investigation results is shown in the Fig. 5.

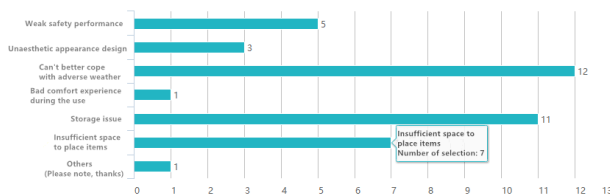


Fig. 5. Insufficiencies for the Current Electric Bicycles

71.43% of interviewees think that the current electric bicycles are easily lost and the quality is not reliable, most of the interviewees choose these two options during the survey on the defects of current electric bicycle. Most of interviewees believe that the current electric bicycles are with difficult manipulation and bad safety performances, this kind of users occupy 57.14% of the all interviewees. Besides, 42.86% of users choose the defects of bad cruising ability and exposure to weather and so on. The research analysis results are shown in the Fig. 6.

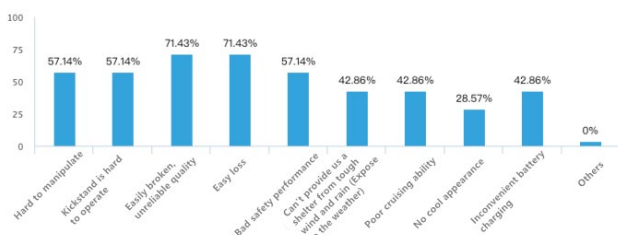


Fig. 6. Defects of Current Electric Vehicles

The survey is performed on the consumers' ideal electric bicycles; according to the survey results, 60% of interviewees choose the safety factors of electric bicycles. 50% choose cheap price. 45% choose endurance. 45% choose the anti-theft function and easy storage. 40% choose the function aiming to adverse weather. Through the research we can find that young users pay attention to the safety, anti-theft and convenient use. The users' consumption demands on the purchasing of electric bicycles is shown in the Fig. 7.

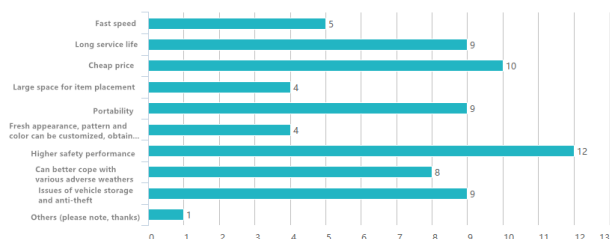


Fig. 7. Ideal Electric Bicycles for Consumers

III. SUGGESTIONS FOR CHINA'S ELECTRIC BICYCLE ENTERPRISES

The following development and design strategies for electric bicycles are summarized according to the survey and analysis.

1. Develop electric bicycles with higher cost performance. Most of young users are students or fresh workers and they have weak purchasing power, so they pay much attention to the price factors during the purchasing. The manufacturing enterprises of electric bicycles shall develop low-price products aiming to the target users so as to meet the young groups' demands.

2. Pay attention to humanized design of electric bicycles. Most of interviewees reflect that the current electric bicycles are lack of the space where personal items can be safely placed. The space shall be sufficiently used when the electric bicycle manufacturing enterprises are developing the products, and the storage facilities of personal items with convenient operation shall be designed.

3. Pay attention to the safety design of electric bicycles. Most of interviewees reflect that the current electric bicycles are with bad safety. The electric bicycle enterprises can strengthen the safety design during the development of new products, enforce the electric bicycles' abilities aiming to emergency situation and shorten the braking distance. The warning light or fluorescent strip shall be added to the electric bicycles so as to strengthen the identification of electric bicycles and improve the safety.

IV. CONCLUSION

To meet the young groups' demands is taken as the objective, the analysis is performed on the industry status of current electric bicycle as well as merits and defects of the similar competitive brands in the market, the target users' purchasing demands are investigated, online questionnaire survey and practical interview are conducted on the young groups so as to define the young groups' demands on the electric bicycles, extract the young groups' creative design factors on electric bicycles, present suggestions for the product innovation and design of China's electric bicycles and provide references for the young groups' innovative design on electric bicycles.

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