

Developing a Hippie style chopper bike based on user's preference and perceptual needs

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Abstract: In recent years, individual styles are getting more and more popular and the consumption trend of customization tends to emphasize the expression of individual styles. In addition, an individual style sometimes serves as a kind of fun. This is the case for the Hippie style chopper bike. The purpose of this study is triple fold: (1) to explore the market needs of the Hippie bikes, (2) to develop the design specification of Hippie bikes based on user's preferences and style perceptions, and (3) to design a new Hippie chopper bike through the quantitative data. In the study, the authors explored and described the form features of Hippie bikes, especially the choppers. Furthermore, these guidelines were used as design specification for the construction of a new Hippie bike. The marketing data, especially the user's preferences and perceptions towards product form, were analyzed for design references. The quantitative database provided in this study serves as an important reference model enabling designers to transfer the user's needs into design specifications.

Key words: user's preference, styling benchmark, hippie style, product form design.

1. Introduction

In the consumerism era, user preference and product style perceptions are important requirements. However, it is a challenging task for designers to transfer the user's implicit preference and perceptions into specific design specifications [1]. The present study emphasized the analysis of the form features of hippie bikes. It aimed to explore the market needs of hippie bike potential users. Based upon the user's preferences and style perceptions towards hippie bikes, the design specification of a hippie chopper was developed. Finally, a new hippie chopper bike was developed and evaluated through the quantitative data.

A new product design and development cannot do without marketing study. A market-oriented design approach starts from marketing research in which related information about products and target users is gathered to build up the product image database. Designers can develop new product form under the design specification. Finally, design solutions will be evaluated to verify the feasibility, thus reducing the risk in new product development.

To apply user's preference and perceptions regarding product form, a procedure similar to the styling benchmark searching method proposed by Chuang et al. [2] was adopted in this study. The major steps are listed below:

- (1) Build up product image database: to identify user's needs and extract design elements and image words.
- (2) Build up user's preference and image perception database: to identify the product design trends and product form features of the samples with strong preference and image perceptions.
- (3) Build up benchmark of product form: to identify relative utilities of design factor levels in terms of user's preference and design trends to develop the design reference model and product styling benchmarks.
- (4) Develop new product form: to generate ideas from the styling benchmarks obtained from previous stage.

(5) Design evaluation: to verify the design specifications derived from the styling benchmarks. From the evaluation data, the optimal solution, the most feasible design alternative will be obtained.

(6) Design implementation: reviews or feedbacks from users are integrated in the final design from which a prototype of new product will be constructed.

In this study, a hippie style bike design was used to illustrate the market-oriented design approach.

2. Exploring form features and images of hippie bikes

2.1 Opinions from expert interview

To understand the properties of hippie bikes and characteristics of the special target population, an expert interview was conducted. Two hippie bike dealers and one senior bike designer in Taiwan Giant were interviewed in a structured survey. The survey was made up of 11 open-ended questions covering profile of the hippie bike target population, product form features of hippie bike operation of hippie bike, marketing position of hippie bike, as well as styles and design trends of hippie bike: Styling images and future trends for hippie bikes. Results of the expert interview are listed below.

(1) Profile of the hippie bike target population: Most of the users that prefer hippie bikes belong to middle-to-high-ranked office workers. The age range of hippie bike players is 28 to 35. Most of them are freelancers, doctors, engineers, and the like high income white collar employees.

(2) Product form features of hippie bike: Hippie bikes can be divided into three major categories: Chopper, Cruiser, and Low Rider, among which choppers are the favorite type in Taiwan.

(3) Operation of hippie bike: The front fork angle (the wheel base) will influence the ease of riding a chopper bike. There is no hand brake gear in a chopper bike. It is controlled by the crank and backward pedaling.

(4) Marketing position of hippie bike: The acceptable price range of a chopper is NT\$ 6500-19000 (200-600 US dollars). But there is no limit in the selling price for a customized chopper bike.

(5) Styles and design trends of hippie bikes: Hippie bikes have been a fad since 2004 and they are getting popular in Taiwan. Typical images of hippie bikes are futuristic, rebellious, creative, rough, and individualized.

2.2 Build up user's preference and image perception database

Through an expert evaluation, representative samples and images for hippie bikes were selected for SD test. From the interview of two hippie bike dealers and six hippie bike riders, 13 pairs of image words and 20 color chopper images of chopper bicycles were selected for the SD test.

Subjects: 30 chopper riders ranging from 26 to 38 years were invited for the evaluation of hippie bike samples.

Experimental materials: 12 representative samples (Fig. 1) and 9 image words (Table 1) obtained from pilot test.

Semantic scale: A 7-pointed Likert scale was used in the experiment.

Procedures: Subjects were asked to evaluate the hippie bike sample images according to their first impressions.

Table 1. 9 image words and preference for hippie bikes

Unappealing -- Appealing	Common -- Individual	Economical -- Luxurious
Rough -- Delicate	Unimaginative -- Creative	Dislike -- Like
Traditional -- Futuristic	Obedient -- Rebellious	
Low-priced -- High class	Static -- Dynamic	



Fig.1. Hippie bike samples used in SD test

3. Analyze user's preferences and image perceptions

To analyze design elements of the hippie bike samples, a morphological analysis was performed. Eight items of hippie bike components defined as the design factors, including the frame, saddle, handle bar, front fork, mudguard, frame color, back rest, and tire (denoted as Factors A to H), were decided. Each item was then divided into two to four factor levels, different ways of form treatments. The preference data obtained from the experiment demonstrated that hippie bike samples of high and low preferences are different in the composition of design elements. Three hippie choppers, S8 (5.00), S7 (4.83), S1 (4.53), give designers helpful insights of the types of product form users prefer. The extraction of the design elements of these more preferred hippie choppers reflected the following common form features: (1) Frame: traditional chopper or blade type; (2) Saddle: triangle leather or banana leather; (3) Handle bar: new moon type, seagull wing type or long monkey arm; (4) Front fork: regular or extra long; (5) Mudguard: without mudguard; (6) Frame color: red, dark grey metallic or blue; (7) Back rest: without back rest or long back rest; (8) Tire: same-sized black & white tires or tires of two sizes.

These features serve as references for new hippie bike design and development. Moreover, styles of luxurious, futuristic, and creative were chosen as the goals for the new hippie chopper bike. Similar ways can be used to extract the form features of the hippie bike samples that have strong luxurious, creative, or futuristic images.

4. Build up benchmark and prototype of new Hippie bike

In this study, luxurious, creative, and futuristic were chosen as the design goals on the basis of high preference. Form treatments whose utilities are highly positive were selected as design specification for the new ideas. From the expert interview and statistical analyses of the perceptual data of hippie bike samples, specifications for hardware, ergonomics, and product form were set for a new hippie bike.

With these specifications as references, ideas of new hippie bikes (Fig 2) were developed and evaluated. From ANOVA, Idea 2 was better than Idea 1 in preference, luxurious, and futuristic evaluation, and chosen for further detailed design and development. In prototyping of the final idea (Fig 3), some detailed adjustments were made in the production process.

Overall, the final design kept the most important features of a hippie chopper by using an extra long front fork and backward pedaling braking system. For example, the diameter of front tire was shrunk from 24 to 20 inches for a better control of the bike. The arrangement of small front tire and big rear tire enlarges the wheel base, making the front fork look longer and adding the unique feature of the hippie bike. In the handle bar, a bending angle was added to the original long monkey arm design for the sake of comfort in riding and resting. The original 80 cm long two-piece front fork was made extra-longer, 110 cm in length, enhancing its special,

futuristic, and rebellious images. Moreover, multiple metal materials made the hippie bike strong, durable, and luxurious in appearance and texture. In the front fork, two head lights were added to enhance the creative and futuristic images. Moreover, a pair of shiny pegs was added in the front tire. For the head and tail lights, instead of batteries, two Dynamo lighting sets were added. In addition to the nostalgia image, they could be put into use whenever necessary without the trouble of replacing or recharging batteries.



Fig 2. The front view and side view of Idea 1 and Idea 2



Fig 3. The prototype of the hippie style chopper bike

4. Conclusions

To apply user's preference and image perceptions towards product form to the practical design, a hippie bike design was used as an example to illustrate the market-oriented process. Important design elements and design trends related to the user's preference for hippie choppers were extracted from the study. The results indicated that the users prefer hippie bike designs with styles of luxurious, futuristic and creative images. More importantly, the determining factors of the user preferences were explored to build up the design reference models for hippie bike design. The results feature efficiency and variety for generating design ideas.

5. Acknowledgment

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6. References

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