A Study of Product Design Factors Effect on Customers Purchasing Intention

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Abstract—The high-tech industry had flourished in pace with the advent of 21st centuries, and is attracting more attentions. To confront with the intensely competitive market, the goal to advance competitive edge in high-tech industry has become what all countries desire for. Now is the era of customer orientation, and the goal of business managements is organization restructuring, as well as responding to various customer demands.

This research targets consumer of Guangdong Province, China as questionnaire analysis subject. 200 questionnaires were distributed, 166 valid questionnaires were returned, resulting in a return rate of 83%. Conclusion: from the evaluation aspects, "consumer" is the most valued, followed by "marketing" and "market." 2. From all 9 evaluation indexes, the top 5 most valued indexes in descending order are: design pattern, sales consultation, originality, pricing and corporate social responsibility. Finally, provide suggestions from the survey results; an objective and definite design guideline based on consumer demands is expected to be built, to assist high-tech industry in good decision making.

Keywords—Consumer, Purchase Intention, Product Design, Critical Success Factor.

I. INTRODUCTION

Now is the era of customer orientation, and the goal of business management is organization restructuring, as well as responding to various customer demands. In the recent years, corporations are affected by the rapid changes of internal and external environment, and competition has also become fierce. Countermeasures and renewal of thinking are essential for sustainable development and adaptation to the environment. Thus, the highest priority on formulating business strategy is to meet customer demands, it is also critical to corporate success. In pace with the rapid changing industry, wide variety of products is released in short period of time, along with imported products which cause more intensity to the competition, and companies have to face bigger challenge. Apart from constant product development, consumer preference needs to be acknowledged, and comprehension in market structure has also played a part in decision making. Cost

reduction in product development, and produce favorable products has become the main consideration for company survival.

In pace with the advent of 21st centuries and knowledge based economy era, the high-tech industry had flourished and is attracting more attentions. Thus, to confront with the intensely competitive market, the goal to advance competitive edge in high-tech industry has become what all countries desire for. Design projects of high-tech industry were created with numinous guidelines and decision making, but mostly ruled by the supervisors and designers, which is subjective and becomes too personal. Lack of objectivity along with unsystematic analysis could cause corporations in poor decision making and loss of profits. The key factor for new product design is to create an integrated and objective evaluation model. This research probes into essential factors which could affect consumer purchase intentions, and hope to build an objective and definite design guideline based on consumer demands, it is to assist high-tech industry in good decision making.

II. LITERATURE REVIEW

A. Product Design Factors

The research results of fashion design manufacturing by Hsiao & Chen (2018), has selected fashion acuity, material application, color sensitivity, fashion trend, news and media (advertisement, magazine and the internet), customer lifestyle, clothing market positioning, sales performance and management personnel (management ability) as factors which could affect the designs of textile industry, while customers value more on materials, styles, tailoring, workmanship, pricing, discount and other personal behaviors. Decer (2017) Therefore manufacturers need to place customer demands into design consideration, as well as fine design techniques, keen observation, abilities to market analysis and development; which by collaborate these factors to create high value products, and the advantage of design is to promote substantial benefit and brand image for companies. Arısal & Atalar (2016) stated, traditionally "market" is a place where sellers and buyers gathered for merchandising, but economists describe market as a aggregation of specific product

vendor and purchaser. A successful new product research and development model built by Wang et al. (2017) stated, in promoting car projects of joint engine technology, the key factor to a successful project is to inquire into three aspects, market, technical and manufacture. Chen (2016) believes the first step of product development and marketing is customer differentiation, creating value for the customers, maximizing benefits and minimizing costs. Thus Prakash & Pathak (2017) discussed affect between customer engagement with value creation, to satisfaction from the aspects of customers and employees. Moreover, Wang et al. (2017) constructed a performance measurement of hospital assessment with a new product research and development model, which experts suggest to utilize aspects based on "customer," "finance," "internal process," "learning and growth."

B. Consumer Purchase Intentions

Dey & Lee (2017) Decision on product design of corporations is mostly made by supervisors and designers, which customer suggestions are mostly ignored and increases the risks when product releases. Choi & Kim (2016) Product life cycle has shortened in the recent years, and the difference between products has become more undefined. Corporations have considered product design as the priority, which converting consumer suggestions to practical production has become an important issue. Xu (2018) consumer preference is certainly uneasy to grasp, sometimes it is difficult for consumers themselves to describe their own preferences, especially before seeing the product; users could only express the notion of "types of things that I want," but unable to make specific descriptions. Goh & Balaji (2016) Consideration on meeting customer demands should be the priority when corporations release new products, and create satisfying product based on customer demands. Theoretically, the process of product optimization should be based on consumers, and could also be evaluated by consumer feedback. Through research and design the development of product optimization can be achieved to meet most consumers' demands. Axon (2017) Customers' purchasing behavior is usually based on experience and research on related information, which were decided through comprehension and comparisons. Shao et al. (2017) Purchase intention is a potential buying behavior which has a subjective tendency, therefore purchase intention is a very important reference for corporations. Ceschin & Gaziulusoy (2016) Purchase intention creates the possibility for consumers to purchase product, it can be divided into three factors, personal, psychological and social. Among them social factor is the most direct, and the procedure which consumer process research information is psychological.

C. Critical Success Factor

Lee & Lee (2015) Critical Success Factor (CSF or Key Success Factor, KSF) is a analytical method which is promoted by Massachusetts Institute of technology, that could define the demands on organized information. Peker et al. (2016) Corporations' information system should go through the process of distinction and selection, and should focus on success factors of the industry, which most industry possess 3 to 6 success factors. The Critical Success Factor has more related research after 1979, and opinions gradually unified. Most scholars claim that the key factors to success are assets, technology, resources, management abilities and originality. These are requirements to success, which allows more competitiveness and lasting advantages comparing to other opponents. Lee & Seo (2016) When considering critical success factors, attention should be paid upon the characteristics of critical success factors, commonality of these characteristics analyzed by different scholars are listed below:

1. Critical success factors changes along with time.
2. Critical success factor is distinctive among different industries.
3. Critical success factor changes along with product life cycle.
4. Critical success factors should be considered with future developing trend.
5. When the critical success factors of the industry is not yet understood, rushing in could cause business failure.
6. Management personnel should focus on specific thing or critical work to determine critical success factors.
7. Management personnel should focus their main emphasis on critical success factors.
8. Management personnel should be committed to, and have in-depth knowledge on critical success factors, which could be used as the basis of strategy formulation.

III. RESEARCH DESIGN AND METHODS

A. Delphi Method

This research uses Delphi Method to build an AHP dimensional standard. Delphi Method is also known as the Expert Survey Method, which questionnaires are sent to experts individually for consultation, and suggestions are summarized and organized. Consensus of suggestions and prediction problems are then feedback to the experts for further consultation, where experts will revise their suggestions based on the consensus of suggestions by all experts. After repeating this process numerously, prediction on decision making gradually unified.

By utilizing system software, suggestions are replied anonymously, which experts are not allowed to make any discussion to each other, there are no horizontal

contact but to the investigator. Through numerous expert suggestions and repeated consultation, induction and revisions, expert opinions are finally summarized then unified.

B. Establishment of Evaluation Index

This research sent questionnaires to experts though email, and expert feedbacks are then organized statistically, classifying considerable factors crucial to the high-tech industry, which are then sent back to experts for further consultation. Numerous back and forth communication were made through email for maximize the results. Finally, a meeting was held gathering experts and formulated business growth, personnel growth, technological changes and capital applications. These key factors have become the AHP aspects, which are standardized to correspond to all classification, and assisted on the establishment of AHP questionnaire. Research guidelines revised through Delphi Method are listed as follows:

1. Customer: design pattern, quality, pricing.
2. Market: diversity in colors, originality, brand association.
3. Marketing: corporate social responsibility, consistency, sales consultation.

C. Research Subjects

The research subjects of questionnaire analysis are consumers of Guangdong Province, China, which 200 questionnaires were distributed, 166 valid questionnaires were returned, resulting in a return rate of 83%.

IV. DATA ANALYSIS RESULTS

After finishing hierarchy and weighting, allocation were made to each hierarchical evaluation index, based on the importance level and proportion. This indicates the importance of hierarchical index factors to the evaluation system, which overall weight evaluation is made on product design factors affecting consumer purchase intention. Data is consolidated as Table 1.

TABLE 1. CONSOLIDATED TABLE OF OVERALL WEIGHT EVALUATION MADE ON PRODUCT DESIGN FACTORS AFFECTING CONSUMER PURCHASE INTENTION.

Aspects	Second level Weight	Second level Order	Index	Overall weight	Overall order
Customer	0.397	1	Design pattern	0.150	1
			Quality	0.101	6
			Pricing	0.118	4
Market	0.266	2	Diversity in colors	0.072	9
			Originality	0.133	3
			Brand Association	0.091	7
Marketing	0.377	3	Corporate Social Responsibility	0.100	5
			Consistency	0.083	8
			Sales Consultations	0.142	2

V. CONCLUSION

Based on empirical research and analysis, this research concludes as follows:

For the second level evaluation aspects, "Customer" is the most valued, and the weight is 0.397, accounts for 39.7% of overall weight. Next in importance is "marketing" (weight 0.337) then "market" (weight 0.266). Thus it can be seen that "customer" is the most important aspect for product design factors affecting consumer purchase intention.

For the third level evaluation aspects, the hierarchy and weighting order is as follows:

1. Order of evaluation index from customer aspect: design pattern, pricing, quality.
2. Order of evaluation index from market aspect: originality, brand association, diversity in colors.
3. Order of evaluation index from marketing aspect: sales consultation, corporate social responsibility, consistency.

We have learned though the consolidation process that out of 9 evaluation indexes, the 5 most valued indexes in descending order are: design pattern, sales consultation, originality , pricing and corporate social responsibility

VI. RECOMMENDATIONS

This research expects to provide clear directions for the high-tech industry on the development of product design. Suggestions are made based on conclusion as follows:

1. Sale is to provide new marketing concepts. In the recent years, consumers begin to focus on the coexist relationship between corporations and the society, as well as corporate social responsibility which adds value and profit to corporations and brands. Thus, it is important for corporations to attach importance to environmental friendly and feedback to the supply chain.
2. High-tech industry must explore market response through customer thinking and marketing, which can be reflected on product improvement. Also, think through different perspectives and be familiar with the industry chain, this could help boosting profits for the corporations.

3. High-tech industry should apply existing culture and innovation from the industry, as well as manufacturing experience and smart service. Also, create high-tech branding through the ability of product design, logistics management and valuable innovation, which would promote global allocation for high-tech industry.

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