



Faculty of Manufacturing Engineering

THE PROFILING OF CAR DESIGN PRODUCT USING BEZIER CURVE FOR CUSTOMER PRODUCT DESIGN PREFERENCES



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Master of Science in Manufacturing Engineering

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**THE PROFILING OF CAR DESIGN PRODUCT USING BEZIER CURVE FOR
CUSTOMER PRODUCT DESIGN PREFERENCES**

WAN NUR HIDAYAH BINTI WAN YAACOB

**A thesis submitted
in fulfillment of the requirements for the degree of Master of Science
in Manufacturing Engineering**




Faculty of Manufacturing Engineering

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2021

DECLARATION

I declare that this thesis entitled “The Profiling Of Car Design Product Using Bezier Curve For Customer Product Design Preferences” is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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APPROVAL

I hereby declare that I have read this thesis and in my opinion this thesis is sufficient in terms of scope and quality for the award of Master of Science in Manufacturing Engineering.

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Date	:



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DEDICATION

This thesis is dedicated to my family and many friends. A special feeling gratitude to my husband, Muhd Zulhilmi Farhan Bin Md Rosly who has been a constant source of support and encouragement during the challenges of study and life. I am thankful for having you. To my son, Muhammad Qaayed and my daughter, Nur Niliyyah, this achievement also for you. To my beloved mother, Tuan Minah Binti Tuan Mat, thank you for your moral support.

To my supervisor, thank you for guiding me well and sharing your knowledge,

Ts. Dr. Saifudin Hafiz Bin Yahaya.



ABSTRACT

This research discussed about the characteristics of product design based on customer emotions using the 'Kansei Engineering', 'Kansei Words', and 'mathematical approach'. Customers emotion are important in determined the product will successful in the market. However, it was difficult to interpreted customers emotion into verbal. The aims of this research are to identify and analyze the emotional product based on the customer preferences compared to the image of the product. The main survey is distributed to 220 students at Universiti Teknikal Malaysia Melaka. There are two categories of the car design used in the questionnaire of investigating the car design preferences towards the Kansei Words. 5 Kansei Words showed the semantic articulated the customer emotional design towards the cars such as 'stylish', 'comfortable', 'sporty', 'safety', and 'elegant'. Statistical Package for the Social Sciences (SPSS) is used to analyze the respondent's answers for statistical data. On this research, twenty cars in each category applied Bezier curves (Geogebra) including the segmentation of the design profile. The ranges in each category are identified from the value in Geogebra. After completing the preliminary test, there are only six cars for each category are selected. In the main survey using six cars in the questionnaire, there are only three cars are selected based on the respondents' preferences. For the Kansei preferences, the higher average of Kansei Words is determined. The most preferable Kansei Words of city car for front view and rear view was safety and side view result is stylish. For sedan car, the preferable Kansei Word for all view of sedan car was stylish. 3 preference car for city car front view was Toyota Etios Liva, Peugeot 108 and Toyota Aygo. Then for rear view was Peugeot 108, Toyota Etios Liva, and Toyota Aygo. While for side view, 3 car preference was Peugeot 108, Chevrolet Spark and VW Polo. 3 preference car for sedan car front view was BMW f80, Hyundai Sonata and Mercedes E class. Then for rear view was BMW f80, Mercedes E class, and Mitsubishi Lancer. While for side view, 3 car preference was Aston Martin, BMW f80 and Mercedes E class. Bezier curve 1 and 2 has high correlation in front view city car. While for rear view and side view, the high correlation occurs in Bezier curve 5. Sedan car front view has high correlation in Bezier curve 8. Then for rear view was Bezier curve 4 and for side view Bezier curve 3.

PEMROFILAN PRODUK REKABENTUK KERETA MENGGUNAKAN LENGKUNG BEZIER BAGI KECENDERUNGAN REKABENTUK PRODUK PELANGGAN

ABSTRAK

Kajian ini membincangkan ciri-ciri reka bentuk produk berdasarkan emosi pelanggan menggunakan 'Kejuruteraan Kansei', 'Kata-Kata Kansei', dan 'pendekatan matematik'. Emosi pelanggan penting dalam menentukan produk akan berjaya di pasaran. Namun, sukar untuk menafsirkan emosi pelanggan dalam bentuk lisan. Tujuan kajian ini dijalankan ialah untuk mengenal pasti dan menganalisa produk emosi berdasarkan pilihan pelanggan berbanding dengan imej produk. Tinjauan utama kajian ini adalah diedarkan kepada 220 orang pelajar Universiti Teknikal Malaysia Melaka. Terdapat dua kategori rekabentuk kereta yang digunakan dalam soal selidik untuk mengetahui keinginan rekabentuk kereta terhadap Kata-Kata Kansei. Lima Kata-Kata Kansei menunjukkan semantik yang diartikulasikan kepada emosi pelanggan terhadap rekabentuk kereta seperti 'bergaya', 'selesa', 'sporty', 'keselamatan', dan 'elegan'. Pakej Statistik untuk Sains Sosial (SPSS) digunakan untuk menganalisa jawapan responden untuk data statistik. Dalam kajian ini, sebanyak dua puluh kereta bagi setiap kategori menggunakan lengkung Bezier (Geogebra), termasuk segmen profil rekabentuk. Julat bagi setiap kategori dikenalpasti daripada nilai yang diperolehi di Geogebra. Setelah ujian awal selesai, sebanyak enam kereta sahaja dipilih untuk setiap kategori. Dalam tinjauan utama dengan menggunakan enam buah kereta, hanya terdapat tiga kereta sahaja yang dipilih berdasarkan pilihan responden. Bagi kecenderungan Kansei, purata Kata-Kata Kansei yang lebih tinggi ditentukan. Kata Kansei yang paling disukai untuk setiap kategori dipilih berdasarkan kedudukan yang lebih tinggi. Kata-Kata Kansei untuk kereta jenis 'City', yang dipilih oleh pelanggan untuk kereta pandangan depan dan belakang adalah 'keselamatan', dan untuk pandangan sisi adalah 'bergaya'. Manakala untuk kereta jenis 'Sedan' pelanggan memilih 'bergaya' untuk semua jenis pandangan. 3 pilihan kereta untuk pandangan depan kereta jenis 'City' adalah Toyota Etios Liva, Peugeot 108 dan Toyota Aygo. Kemudian untuk kereta pandangan belakang adalah Peugeot 108, Toyota Etios Liva, dan Toyota Aygo. Manakala pandangan sisi adalah Peugeot 108, Chevrolet Spark dan VW Polo. 3 pilihan kereta untuk pandangan depan kereta jenis 'Sedan' adalah BMW f80, Hyundai Sonata dan Mercedes E class. Kemudian untuk kereta pandangan belakang adalah BMW f80, Mercedes E class, dan Mitsubishi Lancer. Sementara untuk kereta pandangan sisi, 3 pilihan kereta adalah Aston Martin, BMW f80 and Mercedes E class. Lengkungan Bezier 1 dan 2 mempunyai kolerasi tinggi untuk pandangan hadapan kereta jenis 'City'. Manakala pandangan belakang dan sisi, kolerasi tinggi berlaku dalam lengkungan Bezier 5. Pandangan hadapan kereta jenis 'Sedan' mempunyai kolerasi yang tinggi dalam lengkungan Bezier 8. Kemudian untuk pandangan belakang adalah lengkungan Bezier 4 dan untuk pandangan sisi lengkungan Bezier 3.

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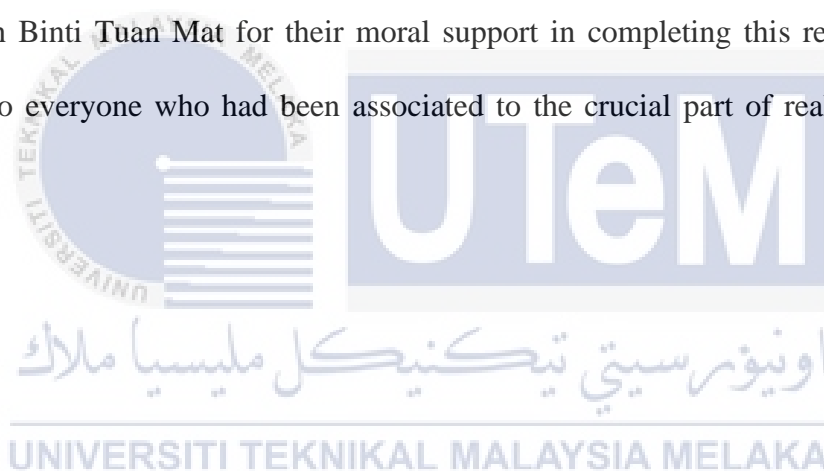


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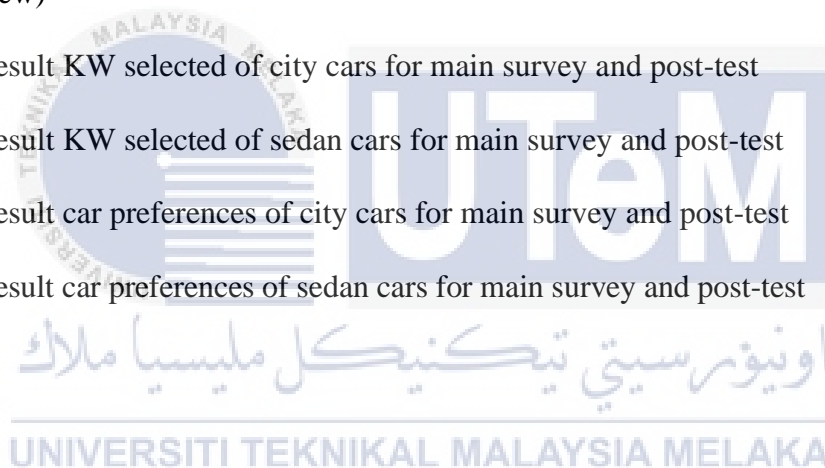
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LIST OF ABBREVIATIONS

KE	- Kansei Engineering
KW	- Kansei Words
SD	- Semantic Differential
SPSS	- Statistical Package for the Social Science
STY	- Stylish
CO	- Comfortable
SAF	- Safety
SPO	- Sporty
EL	- Elegant
BVP	- Blood Volume Beat
EMG	- Electromyography
EEG	- Electroencephalography
CA	- Conjoint analysis



LIST OF PUBLICATIONS

List of journal:

1. Yuhazri, M.Y., Hidayah, W.N., Kamarul, A.M., Haery, S., Tahkims, M.S., and Shamsudin, S., 2019. The Profiling of Design Product using Bezier Curve for Customer Product Design Preferences. *International Journal of Advanced Trends in Computer Science and Engineering*, 8(13), pp. 214-218.
2. Hidayah, W.N., Yahaya, S.H., Sihombing, H., Salleh, M.S., and Abdullah, A., 2018. Customer Preferences in Car Design using Kansei Engineering and Cubic Bezier Curve. *International Journal of Engineering and Technology*, 7(4), pp. 4170-4173.
3. Sihombing, H., Hidayah, W.N., Shamsuddin, S., and Yuhazri, M.Y., 2017. The Analysis of Design Product Preferences using Curve Fitted Profiling (CFP). Proceedings of Mechanical Engineering Research Day, Melaka, Malaysia, March 2017, pp. 1-2.

List of conference:

4. Yuhazri, M.Y., Hidayah, W.N., Sihombing, H., Yahaya, S.H., Sulaiman, S., and Kamarul, A.M., 2018. Kansei Engineering Approach for the Customers Preferences of Car Design. In: Lokman A., Yamanaka, T., Levy, P., Chen, K., and Koyama, S., *Proceedings of the 7th International Conference on Kansei Engineering and Emotion Research 2018, KEER 2018*. Advances in Intelligent Systems and Computing, 739. Springer, Singapore.



CHAPTER 1

INTRODUCTION

1.1 Project background

In develop market competitions, the assessments of customer on item configuration are altogether subject to the impression of item forms. The perceptual experience of items has steadily turned into the conclusive factor for customer to buy or not. Companies also need to prioritize their 'actual extraordinary' consciousness to catch customer design preferences before to produce a certain product since customer design has become the primary concern of the companies' strategy. Theoretically, a good design constitutes factors of users' satisfaction assimilation requirements and technical implementation (Bano et al., 2017). Reimann et al. (2010) demonstrated that outlining and showcasing appealing items is of developing significance in business sectors where numerous fundamental needs of customers' have been fulfilled. According to Hsiao et al. (2010) this is due to product designs have to move from the production-oriented approach to a marketing-oriented approach, and finally to a customer-oriented approach. Since the customers are not only to demand the quality of product but also their satisfaction in emotion conditions about the product to be purchased, therefore it is important for producer to employ the improvement approaches in their product development in order to satisfy their customer needs and feelings. Kansei Engineering originated in Japan in the 1970s to convert feelings into visible design requirements to link the affective interaction of consumers to the development phase of products (Vieira et al., 2017). Such another worldview empowers higher overall revenues for designers and producers, better and enhanced consumer loyalty, and in addition high-esteem included business openings. Lokman (2010) address these issues, several methods

have been developed to support the valuation of customer's satisfaction in the effort to understand the customer's needs and desire.

Customers' preferences evaluation of items is identified with whether an item configuration incorporates certain plan properties, for example, shading, shape, and so forth (Blijlevens et al., 2012). First, the companies are necessary to have the key component in their business strategy that impacts to their achievement, especially on the way how to catch the "customers' voice" (VOC) (Chen et al., 2008). Kansei Engineering and text mining were once used to catch consumer interest in an item through consumer comments on the item (Wang et al., 2018). This is due to customers are now, to ultimately strict their requests as representation of their expectations. Specifically, on how to build a suitable product that fitted to the models of products, such as support models and shopper situated innovations. Nagamachi (1996) has previously discussed this issue with the approach of Kansei Engineering towards the fundamental test for feeling outline related to the clients' emotional needs, especially to the relevant items that match the needs created of an extensive buyer situated innovation for new item improvement.

In the context of the design product, Esra et al. (2020) said product designers are searching effective approaches for catching customer satisfaction to increase the merchandisable of the product with catching emotion in this way. Then the learning substance structure can be vertically sorted out based on four perspectives of learning associated that fit as a fiddle investigation in which the elucidation of shape will get to be obvious, less entangled, and less demanding to arrange. They built an experimental and quantifiable model for investigating shapes (is as an imperative device) for a planner who is included in the modern configuration improvement forms. The nature of identified items (through experimental and quantifiable model) is a fundamental piece of the outline process that connected to the mental needs of the individual developing enthusiastic fulfillment.

Vladik et al. (2015) stated that graphic design, material, colour and shape are the most important factors taken into consideration when judging a product. Based on numerous studies, the people who visually impressed to the shading are more delighted than others. The shading has more impact towards emotional because it can act on one person in many ways and to accomplish these, the shading component cannot be merely ignored since the shading and shape are most important elements in design and development. In some cases, Kansei Engineering is as passionate outline (Mamaghani et al., 2010). While there are different clients' needs, Khalid (2001) stated the usefulness of products (that is fulfilling of feeling needs) should be perceived as an essential significance for consumer loyalty. This is because of the item innovations developed through plan for execution (example, useful plan) and outline for ease of use (example, ergonomic outline) are, now, not becoming the only things to trigger the contenders raising rapidly to speed up their competitiveness (Khalid, 2004). By conducting an experimental study towards the clients' feelings or influences against the shapes configuration related to the perceived and received system, therefore, will require the suitable measurement towards purchaser recognitions in order to precisely distinguish the interrelations of emotion and shapes (Wang, 2004). The shapes of design that meet the customers' emotions is the most hard to handle if there are as the plan parameters passionate perspective (Su, 2004). According to recent study by Hartono (2020), KE study should cover sustainable service design and development.

Since the consumer needs and feeling are recognized as important value for producers, Kansei are required to test and evaluate the human emotional determined (that represent the hugeness of feeling, impression and/or sentiment) in which human brain process handle knowledge and information as Kansei process. Kansei Engineering as a sort of human ergonomic innovation indicates to the interpretation of the mental customers (shoppers) feeling around an item identified with discernment in configuration levels such

as instinctive (as when you call something lovely), behavioral (accentuates the utilization of articles), and intelligent (considers client's reasoning about item like glory, and so on) (Norman, 2004). In order to address this issue, there were a guidance (through Kansei Words) is employed to express their full of feeling needs, their sentiments, and their passionate states (Ishihara et al., 1995; Guan and Lin, 2001). The Kansei Engineering (KE) is characterized as "the deciphering innovation of a buyer's inclination and picture for an item into configuration components." According to Lee et al. (2002), it might be evoked by such traits as item frame, style, shading, capacity and value that influenced by customer feelings and individual faculties of qualities (to investigate the relationship between the customers' sentiments and the outline components of items).

The emotions are enrich of all our life moments (either a pleasant or an unpleasant quality), Diener and Lucas (2000) stated a person's general connection with well-being can be clearly influenced by means of their experiences. The configurations rehearse on the other hand, while feelings evoked by item appearance are frequently thought to be immaterial. So, in this way is difficult to anticipate the relentless assumption brought on by some common attributes of these item feelings. Each feeling (that is a pretty much stable inclination for specific conditions of the world) should be put in the centrality of an item for our wellbeing that is dictated by an assessment that concerns to the advantageous will be taken. Since an item characteristic is essential for customers towards quality influences his/her mentality against the product (Barone1 et al., 2007), the measuring systems to the relative significance of item properties need be created. Desmet (2003) argued that by revealing the cognitive basis of product emotions, the model can be used to explain the broad, personal and compound character of product emotions. According to Sakurai et al. (2012) added that by evaluating the impressions, humans can perceive a common sense meaning.

In conclusion, since the competition in global market between the enterprises way is

transformed by seller's market into a buyer's market, the focused on quality and price of the competition is therefore, 'the centre of consumer competition' which most important resource of enterprise (Hua et al., 2014). In this perspective, Kogut (2000) underlined the determination of a firm's value is as the result of the uniqueness factors towards their transferability and their resistance to imitation by competitors. Specifically, since engineering design faced the problems in their company operations towards competitive and mature markets (that increasingly characterize most industries) where there were several challenges existed, including commoditization of products, fragmentation of markets, and declining profit margins (Srinivasan et al., 2012). Moreover, Schutte and Eklund (2005) in their research (in vehicle industry) discussed about the intellectual ergonomics or specialized brain science connected to the drivers' mental anxiety. This is as a perspective of the examination process where the idea of feelings is wide and inconclusive (Frijda, 1986). As an example, the products that can bring out a wide range of sorts of feelings and feelings are close to heart, in which represent the people reaction as an impact in their feelings inspired by the grounds that are not as perceptible as they appear (Desmet, 2003). By uncovering the intellectual premise of item feelings, the model can be utilized to clarify the wide, individual, and compound character of item feelings. On such issues, the function of Kansei Engineering model can use to measure the sentiments and demonstrates the relationship to certain item properties.

1.2 Problem statements

The emotional configuration that has a capacity to make an interpretation of human affections into item plan details was generally acknowledged as a successful apparatus for item advancement. It empowers designers to distinguish the highlighted items to meet with customers feeling needs and to enhance customer emotional fulfillment with all more