



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**THE IMPROVED DESIGN OF HEADPHONE USING
INTEGRATION OF KANO MODEL AND QFD FOR
INCREASING CUSTOMER SATISFACTION**

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree of Manufacturing Engineering (Manufacturing Design) (Hons.)

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DECLARATION

I hereby, declared this report entitled “The Improvised Design Of Headphone Using Integration Of Kano Model And Qfd For Increasing Customer Satisfaction” is the result of my own research except as cited in references.

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APPROVAL

This report is submitted to the Faculty of Manufacturing Engineering of UTeM as a partial fulfilment of the requirements for the degree of Bachelor of Manufacturing Engineering (Manufacturing Design) (Hons.). The member of the supervisory is as follow:

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ABSTRAK

Kepuasan pelanggan adalah istilah pemasaran yang mengukur bagaimana produk atau perkhidmatan yang dibekalkan oleh syarikat yang memenuhi atau melebihi jangkaan pelanggan. Kepuasan pelanggan adalah penting kerana ia menyediakan pereka dengan metrik yang mereka boleh gunakan untuk mengurus dan meningkatkan kepuasan pelanggan mereka. Kepuasan pelanggan adalah penunjuk terbaik bagaimana mungkin pelanggan akan membuat pembelian pada masa akan datang. Skala kepuasan ialah cara untuk mengetahui sama ada pelanggan akan membeli semula dan membina kesetiaan pelanggan. Biasanya, kaedah tradisional kajian digunakan untuk meminta pengguna mengenai kepuasan. Walau bagaimanapun, hanya meninjau tanpa apa-apa kaedah lain yang menjadikan pereka menghadapi kesukaran untuk mengetahui unsur-unsur reka bentuk yang boleh meningkatkan kepuasan pelanggan. Oleh itu kajian ini mencadangkan penggunaan model Kano yang mengintegrasikan dengan kaedah kualiti fungsi penggunaan (QFD) untuk mengenal pasti kepuasan pelanggan. Bagi tujuan ini, soal selidik berdasarkan kano-kepada reka bentuk fon kepala telah diedarkan kepada 400 responden Gen-Y. Pendekatan yang disyorkan menyumbang kepada pengenalan unsur-unsur reka bentuk yang menarik yang mempunyai potensi yang besar untuk meningkatkan kepuasan pelanggan dengan mudah. Hasil kajian ini menunjukkan bahawa model Kano memberitahu pereka yang empat elemen mesti menjadi keperluan (butang kelantangan, tali boleh ditanggalkan, ikat kepala laras, dan cahaya), yang wajib diperlukan pada produk yang boleh meningkatkan kepuasan pelanggan. Juga, dua keperluan satu dimensi (petak tali dan earpads turnable) dan tiga keperluan menarik (menguruskan butang lagu, butang bisu dan bentuk pad telinga adalah serenjang) mempengaruhi kepuasan pelanggan. Selain itu, lima keperluan teknikal diperolehi oleh approach integrasi di mana penampilan menguasai keperluan teknikal lebih daripada yang lain. Pendekatan integrasi dicadangkan dalam kajian ini menunjukkan

bahawa unsur-unsur reka bentuk dan rupa menyediakan asas untuk mereka bentuk fon kepala yang meningkatkan kepuasan pelanggan.

ABSTRACT

Customer satisfaction is a marketing term that measures how products or services supplied by a company meet or surpass a customer's expectation. Customer satisfaction is important because it provides designers with a metric that they can use to manage and improve their customer satisfaction. The customer satisfaction is the best indicator of how likely a customer will make a purchase in the future. The scale of satisfaction is a way to know either customer will repurchase and build customer loyalty. Usually, a traditional method of survey is used to ask consumer about satisfaction. However, only survey without any other method makes designer facing difficulties to know the design elements that can increase the customer satisfaction. Therefore this study proposes the use of Kano model that integrates with quality functional deployment (QFD) method to identify the customer satisfaction. For this purpose, a kano-based questionnaire on headphone design was distributed to 400 respondents of Gen-Y. The proposed approach contributes to the identification of attractive design elements that have enormous potential to further increase customer satisfaction easily. The result of this study shows that Kano model informs designer that four elements of must-be requirement (volume button, detachable cord, adjustable headband, and light), which is compulsory needed on the product that can increase customer satisfaction. Also, two one-dimensional requirement (cord compartment and turnable earpads) and three attractive requirements (manage song button, mute button and shape of ear pad is perpendicular) influence the customer satisfaction. Moreover, five technical requirements are obtained by the integration approach in which appearance dominates technical requirement more than others. The integration approach proposed in this study show that the design elements and appearance provides the basis to design the headphone that increase customer satisfaction.

DEDICATION

Dedicated to my beloved parents, siblings, my dear self and to you.

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In the name of Allah, the Most Gracious and the Most Merciful.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Design can be used as a strong jumping-off point, particularly the aim of design in order to create a product-customer relationships. Recognizing the advantages of the designing toward the brand, the majority of the companies have been using and applying the design in product development (Brown, 2009). The growing of the role of design encourages the use of design has developed more than appearance.

To comprehend the specific significance of design, the aim of design in creating a product and customer concerns needs to be well-known. It depends on the product's attractiveness or unattractiveness (Chen, 2009). The design and presentation of a product advertisement are strongly graphical and users are known to make aesthetic judgments of a product without hesitating. The customer impression shows how the service can generate a users' sense of possession, or whether the product has attractiveness away from aesthetics as well as influences the rate of representative attractiveness.

The designer needs to know the customer needs to create a functional product that meets the customer requirements so it can increase customer satisfaction. Besides, to create a new product or to improve an existing product, the most

important thing is the feedback from customer. This due to the reason that any feedback or contact from a customer using any medium, is called brand contact in which it facilitates designer to understand the customer emotion. The emotion of customer can be good, bad, satisfied or not satisfied before, during and after purchasing a product.

The customer emotion is highly correlated to the customer preference specifically towards the aesthetic and functional value of a product (Creusen & Schoormans, 2005). Often, the customer preference on aesthetic value and function value are complex. As a result, the decision making process in product development process is becoming more challenging where the designer needs to balance the aesthetic value and functional value in order to meet complex customer preferences. For example, a customer is attracted to a product with bright and shining colour may be valued aesthetically, but these same aesthetic values may give the customer the idea that the product does not provide the expected functions to perform.

The functional value without aesthetic value will make the customer think twice to have it. This is because people nowadays consider more about aesthetic value than the function. This feature attribute of design has not gotten much consideration in the product progress literature. An exemption, (Hoegg, 2011) in his journal reported several experiments investigating the message effects of product form of sensible benefits, not tied to aesthetics. They discovered that product feature which can contribute to get the attention of the customer, such as shape, materials, design and other. This achieves the aim of finding the aspect the brand, signifying the product classification it should really be in, and impacts on potentials of how the product is to function.

However, a designer cannot simply depend on his own perception since there is no absolute make certain that they appear like the perception of the consumers.

Consequently, so as to create the required psychological fit, the engineer should be able to deliberate the psychological impact of his design with the customer who really need it. However, it appears to be bothersome to discuss emotional responses with others because they see it to be very difficult to reveal what they feel and why they feel it. A mutual language used by both designers and users looks like inadequate. In designing headphones; customer can easily said they want a little bit curve at every edge of headphones, but for designer, they need to know how many scales of radius need to use to get exactly the same curve like customer want. When the product is launched, but unfortunately it is not fulfilling the customer requirement, the product will fail to attract the customer and will consider as reject products.

If an engineer attempts to create products that satisfy the customer needs, the designer needs to know the intended users' specific. In future, to understand these concerns, the designer should communicate with the user. In completing his study, the techniques that can be used are focusing on the part that products play in the search of achieving goals. The colour, shape, material and other factors that contribute in attractive value need to identify. This theory shows that people purchase and use the products because they trust that these products will help them to achieve their aim.

According to (Mettler, 2014), the term hedonic is focused to give a few emotional or instrumental issues to the consumer. It is to build the relationship between customer and product. The effect of the design benefits related to customer buying behaviour which between satisfaction or dissatisfaction with the performance of product have not been fully studied, but to meet the expectations and requirements of the buyer in a long pattern of buyer behaviour cannot be ignored.

Customer behaviour and needs are really effecting a designer in designing a headphone. To identify the behaviour of customers, there are a few tools can be used. Tracking online customer behaviour has created an enormous volume of data to be dug and analysed. Nonetheless, when it comes to real world behaviour, researchers normally use contextual methods such as ethnographic studies and user interviews. These approaches are effective, but time-consuming. Moreover, observation is also one of the tools that can be used to recognize customer behaviour. But the weakness is, by only observe the customer, it will not help much. Since designer will never know what a customer think. The other tools that can be conducted is; survey using a questionnaire and interview. All this tool will be analyse using Kano model and Quality for Deployment (QFD).

1.2 Problem Statement

Currently, in this era of technology, there are lots of different designs of headphones that have all the aesthetic value which fulfil the customer needs. The variety of earpad shape, the design of the headband, the size of headphones and others aesthetic value could influence the customer satisfaction. But the headphone still does have disadvantages in term of its functions. The main function of it is for hearing the sound, but if the user wants to control the volume, another tool need to be used such as button from the mp3, iPod or others. Therefore, it shows that headphone cannot stand alone, it need another helper to make it operate well.

The main aim for this study was to identify the customer satisfaction of headphone design using the integration of Kano model and QFD. In a previous, there are lot of research on headphone has been discussed; such as the influences to purchase and repurchase the headphone, the effect of the attribute of headphone, the most application used in headphone and others. Usually, the traditional method is

only by using survey without any other method, but unfortunately, by only using survey without any other method makes designer difficult to know the element that can increase customer satisfaction. Therefore, in this paper, Kano model analysis and QFD is used to support the data. By using Kano model and QFD the designer can know the most features or element that can increase customer satisfaction. The paper of research chose to focus a group of youth in UTeM, Malacca, precisely generation Y.

To discuss about the both problem statements, Kano Model and QFD will be developed to solve it. In addition, by applying the Kano model, it can show the element of a product that the most important in the customer sight and give extraordinary level of satisfaction. The second method is QFD, QFD collects customer demands through various methods and transforms them into technical requirements, which allows the resources to be assigned in view of customer priorities. Therefore, QFD can be used to redesign new headphone following the customer needs.

1.3 Objectives

The main purpose of the study is to explore the customer's brand contact in headphone by applying the Kano Model and QFD. This objective is to make sure the designer alert to what the customer actually wants. The feedback from customer will be used as the customer requirement during generating the QFD. To explore the customer brand contact, Kano model is very suitable method to use. By using this method, the designer can reveal the truth of customer feeling. The main focused in this study is to know the effectiveness of customer satisfaction toward the action of a designer.

1. To explore the contact element that can increase customer satisfaction by using the integrated approach: Kano model and QFD.
 - The meaning of contact element is the attribute of the product. Contact element needs to be explored in order to fulfil the customer needs. It is the most important factor that needs to be considered before designing a product so the customer will satisfy.
2. To study the attractive contact element that has high potential for increasing customer satisfaction and understand the role of hedonic design in building a product without compromising the function.
 - All people are attracted to the beautiful product. Functional products without any aesthetic value make the customer feel doubt and choose another brand. Therefore, the designer is responsible to create products that can attract customer from their first impression of the design.
3. To interpret the customer expectation toward the design outcome.
 - The change in the way that designer acquire requirements from customers will change because the method of obtaining feedback from customers would be slightly different. For example, without the help of story boarding, a designer would usually obtain requirement feedback from the customer by using words or technical words. With the help of story boarding, visualization of a product could be used to gain feedback from the customer. It can be done by visualizing a rough design of the product and show it to the customer for feedback. For example, by creating a prototype model of a product which is then be introduced to the customers or users.

1.4 Scope Of Study

The scope of this study will be involves the literature review of customer satisfaction and customer expectation toward the design of the product. Two methods will be applied in this study, which are Kano model and QFD, this method is used to measure the customer satisfaction and the importance of each attribute. To rank the importance of each attribute, Importance Performance Analysis is developing. Moreover, this ranking will be used in the QFD according to customer analysis. Therefore, in order to get the information regarding the requirement and also the level of satisfaction of headphone from the user's perspective, survey method was used. This questionnaire required the involvement of 400respondents who is UTeM student and the range of age 18 to 30 years old.

CHAPTER 2

LITERATURE REVIEW

In constructing the research, this section consists of customer satisfaction and customer expectation toward the product and also the method used which is the Kano model method and QFD method.

Consumer will attract to the products that have attributes that can give them the benefit and fulfils their needs. Understanding the consumer consideration of choosing a product based its features and function helps the designer to understand the type of product that customer required.

2.1 Customer Satisfaction

(Kotler, 2000) has defined satisfaction as a person feeling resulting from using the product in relation of their expectation. The feeling by the influence by the performance of the product. Next is (Hoyer, 2001) said that satisfaction as an expression and can be associated with delight, happiness and all the feeling of acceptance. There are lots of factors that can affect customer satisfaction such as the price, the service quality, and employee behaviour (Hokanson, 1995).

In different view, some of the research said that, customer satisfaction will lead to customer loyalty. According to (Hansemark, 2005), he stated that the satisfaction is the customer approach towards a provider. Besides, they also said that

satisfaction is a reaction that consist of emotion to the difference between the customers expectation and what product deliver to them. It is regarding the fulfilment of customer need.

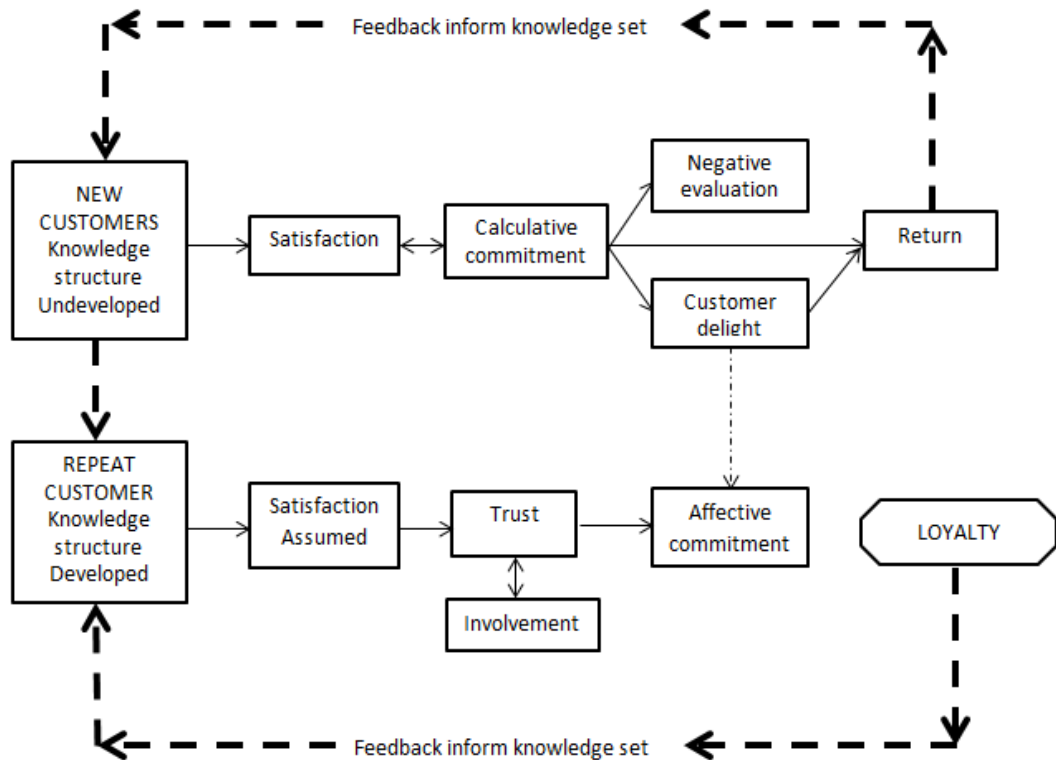


Figure 2.1: Customer Framework (Bowden, 2009)

Customer satisfaction is difficult to be measured, this is because most people prefer to keep silence when they feel satisfied and only spoke out when the service or product is not good enough for them. The measurement of customer satisfaction involves the data collection either using qualitative or quantitative techniques. The qualitative techniques can be used to get a better understanding of their feeling by exploring their experience after using the product provided. While, quantitative technique is using a scale or numerical measurement to analyse the level of satisfaction.

As in Figure 2.1, the customer framework shows that if the customer feel satisfied, it will return to the company as a good feedback. The good feedback will be spread to the other person and will lead to get a new customer, and the existing customer will put trust on the company and will create customer loyalty. It can also be considered as customer cycle, which customer will influenced by the experience either positive or negative.

2.1.1 Important Of Customer Satisfaction

There are lots of importance of customers has been highlighted by many researchers. The main purpose inventor to invent new product is because of the customers. They depend on the inventor to create the product that can fulfil their needs (Zairi, 2000).

The feedback from the customer is the best indicator to know the rate of the customer satisfaction toward the product. Usually, the scale one to five will be will be used to know the rating of the product. The scale four to five will lead to customer satisfaction and customer repurchase. Whereas the scale of three and below means the customer is not satisfied and unhappy. It will lead to customer go to the other company. If the customer gives them high score, the element that has been existing in the product need to be maintained or improve in the future to ensure the best service is provided.

2.2 Customer Expectation

Customer expectation lets engineer know the levels of service that are expected to maintain for keeping customers happy and achieve high level of customer satisfaction. When the level is exposed, it enables the provider to focus on

fulfilling customers' expectations. Customer satisfaction reflects the expectations from the customer after experiences with a product or service. Expectations reflect both past and current product evaluation and use experiences. To evaluate the customer expectation and perception, the first thing need to explore is customer satisfaction. This is because customer satisfaction will lead to customer expectation. Both of that are linked to each other.

According to (Mittal, 2001), the key factor that leads to the formation of the customer desire for next purchasing is customer satisfaction. Furthermore, the satisfied customers will probably tell another about their good experiences. This fact, occurs especially in the Middle Eastern cultures, this is because their social life has been shaped which the social communication with other people is important to enhance the society (Jamal, 2002).

Customer experience is a respond and behaviour shows by the customer when meet the product. A few experience may well have a short impact, in which some experience remains for quite a while. However, there is an argument from (Brakus, 2009) who said, experience is an overall estimation from the customer. The experience will result in emotion and feelings after using the product.

2.3 Proposed Integrated Approach In Exploring Brand Contact Element

2.3.1 Kano Model

To approach the aim of this study, the Kano model is used. In1984, Noriaki Kano developed Kano model. Kano model comes with six requirement which is must-be requirement, one-dimension requirement, attractive requirement, indifferent requirement, reverse requirement and questionable requirement. In this method, there are only three types of requirements that can influence to increase consumer

satisfaction. The three requirements for it are must-be, one-dimensional, and attractive.

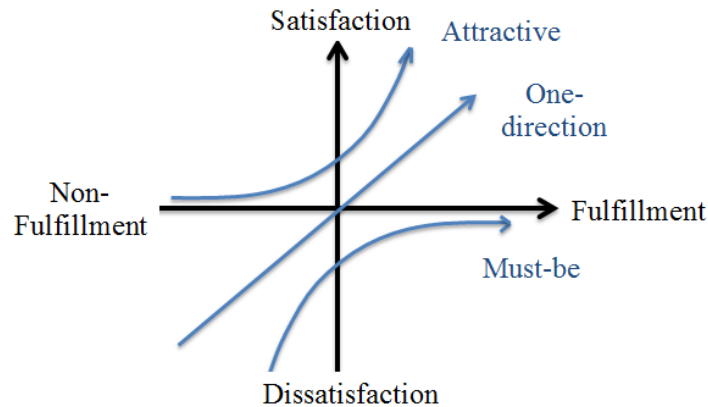


Figure 2.2: Kano Model (Sauerwein, 1996, February)

Must-be requirement refers to minimal criteria that a product or service needs to meet. If the requirements are not met or fulfilled, the consumer will not be satisfied. It also referred as the basic requirement because their presence won't affect consumer satisfaction. By fulfil the must-be requirements, it will avoid customer dissatisfaction, that means must be requirement should have in all products or else consumers will not be interested at all.

The second requirement is one-dimensional. This requirement can be concluded as higher the fulfilment, higher the consumer satisfaction. This is because as in Figure 2.2, the line of one-dimension is directly proportional. Therefore, if the requirement is fulfil it will make customers happy or else, customer will dissatisfied (Qiting, 2013).

Last but not least is attractive requirement. These requirements are an antonym for must-be requirement. In the figure, curve of attractive designates an area where the consumer is more pleased when the product or service is better in term of functionality. This requirement is neither explicitly expressed nor expected by the