



THE PHYSIOGNOMY OF CUSTOMER ARCHETYPE TOWARDS THE PRODUCT DESIGN PREFERENCE

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

By

TOO YI WEI

B051310062

930107-02-5090

FACULTY OF MANUFACTURING ENGINEERING

2017

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

Tajuk: **THE PHYSIOGNOMY OF CUSTOMER ARCHETYPE TOWARDS THE PRODUCT DESIGN PREFERENCE**

Sesi Pengajian: **2016/2017 Semester 2**

Saya **TOO YI WEI (930107-02-5090)**

mengaku membenarkan Laporan Projek Sarjana Muda (PSM) ini disimpan di Perpustakaan Universiti Teknikal Malaysia Melaka (UTeM) dengan syarat-syarat kegunaan seperti berikut:

1. Laporan PSM adalah hak milik Universiti Teknikal Malaysia Melaka dan penulis.
2. Perpustakaan Universiti Teknikal Malaysia Melaka dibenarkan membuat salinan untuk tujuan pengajian sahaja dengan izin penulis.
3. Perpustakaan dibenarkan membuat salinan laporan PSM ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. *Sila tandakan (√)

SULIT (Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysiasebagaimana yang termaktub dalam AKTA RAHSIA RASMI 1972)

TERHAD (Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/ badan di mana penyelidikan dijalankan)

TIDAK TERHAD

Disahkan oleh:

Alamat Tetap:
2982-B, LORONG SYED MOHD,
JALAN SULTANAH, 05350,
ALOR STAR, KEDAH

Cop Rasmi:

Tarikh: 15 JUN 2017

Tarikh: _____

*Jika Laporan PSM ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa/organisasi berkenaan dengan menyatakan sekali sebab dan tempoh laporan PSM ini perlu dikelaskan sebagai SULIT atau TERHAD.

DECLARATION

I hereby declared this report entitled “The Physiognomy of Customer Archetype towards The Product Design Preference” is the result of my own research except as cited reference.

Signature :
Author's Name : TOO YI WEI
Date : 30th Jun 2017

APPROVAL

This report is submitted to the Faculty of Manufacturing Engineering of Universiti Teknikal Malaysia Melaka as partial fulfilment of the requirements for the degree of Bachelor of Manufacturing Engineering (Manufacturing Management) (Hons.).

.....
NOR AKRAMIN BIN MOHAMAD

ABSTRAK

Kajian ini adalah mengenai mengenalpasti perasaan pelanggan terhadap keutamaan reka bentuk produk dengan menggunakan kaedah Kejuruteraan Kansei. Objektif kajian ini adalah untuk, pertama, mengenalpasti keutamaan reka bentuk produk berdasarkan kaedah Kejuruteraan Kansei. Yang kedua adalah untuk menganalisis kolerasi antara keutamaan reka bentuk produk dengan ciri-ciri fisiognomi dan ketiga, untuk menilai kolerasi antara keutamaan reka bentuk dan Nisbah Keemasan muka. Kajian ini juga adalah untuk mengenalpasti kolerasi antara reka bentuk produk terhadap fisiognomi dan juga nisbah keemasan muka. Dalam kajian ini, reka bentuk produk yang dirujuk adalah reka bentuk botol air. Terdapat seramai 550 orang responden yang terlibat dalam kajian ini. Semua responden merupakan pelajar yang kini masih menuntut di Universiti Teknikal Malaysia Melaka (UTeM). Soalan kajian yang diedarkan kepada responden terdiri daripada 6 soalan dibina dengan 5 perkataan Kansei dengan 10 reka bentuk dari 9 kategori. Soalan kajian tersebut adalah disahkan melalui ujian kebolehpercayaan dimana angka *Cronbach Alpha* tersebut adalah melebihi 0.7. Semua data statistik dan aspek kolerasi yang dinyatakan dianalisis dengan *Statistical Package for the Social Sciences* (SPSS v.15). Untuk pemprosesan fisiognomi, perisian *Face Edu* telah digunakan untuk mengenalpasti kod ciri muka. Pengukuran Nisbah keemasan muka telah dinilai melalui penggunaan perisian *Phi Matrix*. Ujian post telah dilakukan pada akhir kajian untuk memastikan ketepatan dan mengesahkan keputusan yang diperolehi. Melalui kajian adalah didapati bahawa pengguna lebih suka botol air yang dapat memenuhi perasaan 'Mudah' yang didapati dalam perkataan Kansei. Kesimpulannya, kajian ini menghasilkan hubungan antara reka bentuk terhadap perkataan Kansei, fisiognomi dan Nisbah Keemasan yang dapat membantu dalam pembangunan reka bentuk pada masa depan.

ABSTRACT

This study is about identifying customer emotional feeling toward the product design preferences using the tool of Kansei Engineering. The objective of the study is to first, identify the product design preferences based on Kansei Engineering approach. Secondly is to analyze the correlation between the design preference and Physiognomy features and third to evaluate the correlation between the design preferences and face Golden Ratio. This study also identified the correlation of product design towards Physiognomy features and also faces Golden Ratio. In this study, the product design is referred to water bottle design. There are a total of 550 respondents that are included in this study. All the respondents are students currently studying in Universiti Teknikal Malaysia Melaka (UTeM). The survey distributed to the respondents consists of 6 pairwise questions made up from 5 Kansei words and 10 designs from 9 categories. The questions were validated using the reliability test where the Cronbach Alpha value exceeds 0.7. All statistical data and correlation of the aspect mentioned are analyzed using the Statistical Package for the Social Sciences (SPSS v.15). For the processing of the Physiognomy, the Face Edu Software is use to identified the facial features coding. The measurement of face Golden Ratio is evaluated through the implication of Phi Matrix software. Post test is done at the end of the study to ensure the accuracy and validation of the results obtained. From the results obtained, it is found that customer would prefer water bottle that is able to satisfy the Kansei word of Simple. In conclusion this study produces the relationship of the design toward the Kansei word, Physiognomy features and Golden Ratio measurement which can help in future design development.

DEDICATION

To my parents,

Too Beng Hooi

Yeap Aye Ngoh

My beloved siblings and friends,

Without whom none of my success would be possible

ACKNOWLEDGEMENT

This study is completed with a lot of help from my surrounding people. First, deserving the special mention is my supervisor, Mr. Nor Akramin Bin Mohamad for guiding me with his knowledge and patience throughout my study. The guidance provided is truly appreciated and remembered.

I would also like to express deep thanks and gratitude to all my friends that had supported me during my weakest time. Their support had given me strength to survive from the stress throughout the study.

Last but not least, I thank for my family's love and care for me in every situation throughout the year. They are always my motivation to complete this study.

Finally, I would like to thank for everyone who had helped and involved in my survey. Without them, this study will be impossible to be completed.

TABLE OF CONTENT

Abstrak	i
Abstract	ii
Dedication	iii
Acknowledgement	iv
Table of Content	v
List of Table	x
List of Figures	xii
List of Abbreviations	xv
List of Symbols	xvi

CHAPTER 1:INTRODUCTION **1**

1.1	Project Background	1
1.2	Problem Statements	4
1.3	Objectives	7
1.4	Scope of Project	7
1.5	Framework of Study	8

CHAPTER 2:LITERATURE REVIEW **9**

2.1	Kansei Engineering	9
2.1.1	Definition of Kansei Engineering	9
2.1.2	Principle of Kansei Engineering	11
2.1.3	Types of Kansei Engineering (KE)	12
2.1.4	Kansei Words	15
2.1.5	Application of Kansei Engineering	16
2.2	Physiognomy	17
2.2.1	Defining Physiognomy	17
2.2.2	Physiological Challenge	18
2.2.3	Face Recognition	18
2.2.3.1	Geometric approach for face recognition	19

2.2.3.2	Anthropometry	20
2.3	Aesthetic	22
2.3.1	Philosophy of Aesthetic	23
2.3.2	Judgment of Aesthetic	24
2.3.3	Measurement of Aesthetic	25
2.3.3.1	Combination of the Objective and Subjective Paradigms	25
2.3.4	Visual Aesthetic	26
2.3.5	Role of Aesthetic	26
2.3.6	Pragmatist Aesthetic	27
2.3.7	Approach to Aesthetics	27
2.4	Golden Ratio	28
2.4.1	Introduction to Golden Ratio	29
2.4.2	Specification	29
2.4.3	Fibonacci Numbers	30
2.4.4	Application of Golden ratio	31
 CHAPTER 3: METHODOLOGY		33
3.1	Introduction	33
3.2	Conformations with University	33
3.3	Determining Objective and Scope	34
3.4	Planning of Study	34
3.5	Literature Study	38
3.6	Data Collection	38
3.6.1	Interview	39
3.6.2	Questionnaire	39
3.7	Analysis Phase	40
3.8	Integration Phase	41
3.9	Final Phase	42
3.10	Gantt Chart	42
3.11	Summary	42
 CHAPTER 4: RESULTS AND DISCUSSIONS		44
4.1	Introduction	44

4.2	Preliminary Test	44
4.3	Evaluation of Preliminary Data	45
4.3.1	Demography	45
4.3.1.1	Gender	46
4.3.1.2	Age	46
4.3.1.3	Education	47
4.3.1.4	Years of Water Bottle Own	48
4.3.2	Attribute Preference	49
4.3.2.1	Volume of Water Bottle	49
4.3.2.2	Material of Water Bottle	50
4.3.2.3	Water Bottle Cap Type	51
4.3.3	Choice of Kansei Word	52
4.3.4	Kansei Word Meaning	53
4.3.5	Product Design Chosen	54
4.4	Main Survey	56
4.4.1	Sample Size	57
4.4.2	Reliability Test	58
4.5	Evaluation of Main Survey Data	58
4.5.1	Demography	58
4.5.1.1	Gender	59
4.5.1.2	Race	59
4.5.1.3	Age	60
4.5.1.4	Education	61
4.5.1.5	Years of Water Bottle Owned	62
4.5.2	Attributes Preferences	63
4.5.2.1	Volume of Water Bottle	63
4.5.2.2	Diameter of Water Bottle	64
4.5.2.3	Height of Water Bottle	64
4.5.2.4	Material of Water Bottle	65
4.5.2.5	Cap Cover Mechanism	66
4.5.2.6	Body Shape	67
4.5.2.7	Mouth Diameter	68
4.5.3	Kansei Engineering	69

4.5.3.1	Design 1 (Category A)	69
4.5.3.2	Design 2 (Category B)	70
4.5.3.3	Design 3 (Category C)	71
4.5.3.4	Design 4 (Category D)	71
4.5.3.5	Design 5 (Category E)	72
4.5.3.6	Design 6 (Category F)	72
4.5.3.7	Design 7 (Category G)	73
4.5.3.8	Design 8 (Category H1)	73
4.5.3.9	Design 9 (Category H2)	74
4.5.3.10	Design 10 (Category I)	74
4.5.3.11	Overall Water Bottle Design Preference	75
4.5.3.12	Overall Kansei Word Preference	75
4.5.4	Correlation Analysis	76
4.5.4.1	Correlation between Design, Demography and Attribute Preference	76
4.5.4.2	Correlation between Design and Physiognomy Features	77
4.5.4.3	Correlation of Design towards Golden Ratio	78
4.5.4.4	Correlation of Face Golden Ratio towards Physiognomy features	80
4.5.4.5	Correlation of Golden Ratio of Face towards Demography and Attribute Preferences	80
4.6	Post Test	81
4.6.1	Kansei Engineering	82
4.6.1.1	Design 1 Post Test	82
4.6.1.2	Design 2 Post Test	82
4.6.1.3	Design 5 Post Test	83
4.6.1.4	Design 6 Post Test	84
4.6.1.5	Design 7 Post Test	84
4.6.1.6	Overall Design Preference (Post Test)	85
4.6.1.7	Overall Kansei Word (Post Test)	85
4.6.2	Post Correlation Analysis between Design and Physiognomy Features	86
4.6.3	Post Correlation Analysis between Design and Face Golden Ratio	87

4.7	Summary	87
CHAPTER 5: CONCLUSION AND RECOMMENDATIONS		90
5.1	Introduction	90
5.2	Conclusion	90
5.3	Recommendations	91
REFERENCE		93
APPENDICES		105

LIST OF TABLES

- 2.1 Description for Each Type of Kansei
- 2.2 Current List of Kansei Word
- 2.3 Application of Kansei Engineering
- 2.4 Soft Tissue Points
- 2.5 Upper face Action Unit and Some Combinations (Tian *et al.*, 2000)
- 2.6 Lower Face Action Units and Some Combinations(Tian *et al.*, 2000)
- 2.7 Aesthetic Philosophy by Different People
- 2.8 The Objective and Subjective Aesthetic Measurement
- 2.9 Fibonacci Ratio

- 3.1 The parameters of the six measurements
- 3.2 FYP I Gantt Chart
- 3.3 FYP II Gantt Chart

- 4.1 Result for Gender
- 4.2 Result for Age
- 4.3 Result for Education
- 4.4 Result for Years of Water Bottle Own
- 4.5 Result for Water Bottle Volume
- 4.6 Result for Water Bottle Material
- 4.7 Result for Water Bottle Cap Type
- 4.8 Result for Choice of Kansei Words
- 4.9 Choice of Meaning for Kansei Words
- 4.10 Function for Each Category of Water Bottle
- 4.11 Result for Water Bottle Preferred of Each Category
- 4.12 Most Preferred Design of Each Category
- 4.13 Reliability Test of Questionnaire
- 4.14 Result for Gender
- 4.15 Result for Race
- 4.16 Result for Age
- 4.17 Result for Education
- 4.18 Result for Years of Water Bottle Own

- 4.19 Result for Water Bottle Volume
- 4.20 Result of Diameter of Water Bottle
- 4.21 Result for Height of Water Bottle
- 4.22 Result for Water Bottle Material
- 4.23 Result for Cap Cover Mechanism
- 4.24 Result for Body Shape
- 4.25 Result for Mouth Diameter
- 4.26 Simplified Kansei words used in Table
- 4.27 Correlation Analysis of Design, Demography and Attribute Preference
- 4.28 Correlation Analysis of Design towards the Physiognomy Characteristic
- 4.29 Correlation Analysis of Design towards Face Golden Ratio
- 4.30 Correlation Analysis of Face Golden Ratio towards Physiognomy Features
- 4.31 Correlation Analysis of Face Golden Ratio towards Demography and Attribute Preferences
- 4.32 Top five Ranking Designs
- 4.33 Correlation Analysis of Design towards the Physiognomy Characteristic (Post Test)
- 4.34 Correlation Analysis between Design and Face Golden Ratio (Post Test)

LIST OF FIGURES

- 1.1 Framework of Study

- 2.1 Principle of Kansei Engineering System (Nagamachi, 1989)
- 2.2 The 8 Types of Kansei Engineering (Nagamachi, 2003; Ishihara *et al.*, 2005)
- 2.3 Normalization of Distance: a) Localization of Points, b) Angle Normalization, c) Distances Computed (Jarkiewicz *et al.*, 2009)
- 2.4 Anthropometric landmarks on the face (DeCarlo *et al.*, 1998)
- 2.5 Length of Face
- 2.6 The horizontal thirds of the face
- 2.7 Vertical fifths of the face
- 2.8 Golden Section
- 2.9 Golden Rectangle (Marquez, 2016)
- 2.10 Golden Ratio Example :(From left) Pentagram, Golden Spiral, Golden Triangle and Ptolemy Pentagon
- 2.11 Ideal Face Built By Mathematical Model (Page *et al.*, 2010)
- 2.12 The Golden Spiral Rule Found In Sunflower (Gendelman, 2015)

- 3.1 Flow Chart of Project Methodology
- 3.2 Framework of Flow Activities Related to Objective of This Study
- 3.3 Framework of Technical Activities Related to Objective of This Study
- 3.4 Measurement of Facial Features Using Phi-Matrix Software
- 3.5 Re-Modeling the Facial Feature Using Face Edu Plus Software

- 4.1 Preliminary Survey Flow Chart
- 4.2 Frequency of the gender
- 4.3 Frequency for Age
- 4.4 Frequency for Education
- 4.5 Frequency for Years of Water bottle own
- 4.6 Result for Water Bottle Volume
- 4.7 Frequency for Material of Water Bottle
- 4.8 Frequency for Water Bottle Cap Type
- 4.9 Frequency of Kansei Words
- 4.10 Sample Size Calculator

- 4.11 Result of Sample Size
- 4.12 Frequency of Gender
- 4.13 Frequency of Race
- 4.14 Frequency for Age
- 4.15 Frequency for Education
- 4.16 Frequency of Years of Water Bottle Own
- 4.17 Frequency of the Volume of Water Bottle
- 4.18 Frequency of Diameter of Water Bottle
- 4.19 Frequency for Height of Water Bottle
- 4.20 Frequency for Water Bottle Material
- 4.21 Frequency of Cap Cover Mechanism
- 4.22 Frequency for Body Shape
- 4.23 Frequency for Mouth Diameter
- 4.24 Most Preferred Kansei Word for Design 1
- 4.25 Most Preferred Kansei Word for Design 2
- 4.26 Most Preferred Kansei Word for Design 3
- 4.27 Most Preferred Kansei Word for Design 4
- 4.28 Most Preferred Kansei Word for Design 5
- 4.29 Most Preferred Kansei Word for Design 6
- 4.30 Most Preferred Kansei Word for Design 7
- 4.31 Most Preferred Kansei Word for Design 8
- 4.32 Most Preferred Kansei Word for Design
- 4.33 Most Preferred Kansei Word for Design 10
- 4.34 Overall Water Bottle Design Preference
- 4.35 Overall Kansei Word Preference
- 4.36 Most Kansei Word Preferred for Design 1 (Post Test)
- 4.37 Most Kansei Word Preferred for Design 2 (Post Test)
- 4.38 Most Kansei Word Preferred for Design 5 (Post Test)
- 4.39 Most Kansei Word Preferred for Design 6 (Post Test)
- 4.40 Most Kansei Word Preferred for Design 7 (Post Test)
- 4.41 Overall Water Bottle Design Preference (Post Test)
- 4.42 Overall Kansei Word Preference (Post Test)

LIST OF ABBREVIATIONS

KE	Kansei Engineering
KES	Kansei Engineering System
VR	Virtual Reality
AU	Action Unit
A	Trichion
B	Glabella
C	Subnasale
D	Menton
E	Stomion
F	Postaurale
G	Exocanthion
H	Endocanthion
I	Cheilion
J	Lateral canthus
K	Lateral nose
L	Lateral cheek
FA	Facial Action Coding System
FYP	Final Year Project

LIST OF SYMBOLS

% Percentage

Φ Phi

CHAPTER 1

INTRODUCTION

1.1 Project Background

To be successful in today's global market, the products looks and appearances became one of the most significant features that affect the customers' choice. According to Harold (2001), this is due to the quality of a product's appearance will determine the reception (or rejection) of products by potential purchasers because of psychologically background related to its expected performance and useful life of products. In this context, Venkatesh and Meamber (2008) stated many customers do incorporated aesthetics into their daily consumption experiences in their homes, product's option, and personal adornment. Creusen and Schoormans (2004) underlined that the appearance of products through aesthetic and symbolic values will influences a quality impression and characteristics against the customers refers to functional and ergonomic values¹. Anyhow, since nowadays' customers preferences have being influenced by their emotions and feelings toward a product, the producers or manufactures has no choice but to develop a new product strategy.²

Blijlevens, *et al.*, (2009) specifically classified the meaning of the product appearance attributes of modernity, simplicity, and playfulness in their research. Through the close communication carried out with the customers will help the companies to assess their product based on functional, aesthetic, symbolic or ergonomic motives. Garber *et al.*,

¹ Creusen and Schoormans (2005) classified six different roles of product appearance for consumers are identified: (1) communication of aesthetic, (2) symbolic, (3) functional, and (4) ergonomic information; (5) attention drawing; and (6) categorization.

² The new product strategy should be developed from "product out" to "market in" perspective, while the concept of their product design is turned-out from manufacturer oriented to customer-oriented. Aesthetic value will often be the important to consumers for durable products, as these products are often used for many years and are visible in consumer's homes or to other people. Symbolic value was mentioned as a choice reason by almost subjects mentioned refers to several associations, such as expensive, friendly, or businesslike. A modern or contemporary look was important to more than one-quarter of the subjects. Aesthetic and symbolic values often were intertwined (Creusen & Schoormans, 2005:75-76).

(1995) commented on appearance perspectives described the typicality and novelty of visual attributes that will indicate a greater likelihood of customers' attention and consideration in making their decision. Therefore, since visual aesthetics of products creates value for consumers, then visual aesthetics produce important value for product and allow it to be more unique (Mumcu and Kimzan, 2015). In this perspective, the aesthetic experiences contribute to the construction of identities towards motivation factors, hedonism, sensory experiences, and emotions that lead to taste formation (Venkatesh and Meamber, 2008). Based on this reason, Homburg *et al.*, (2015) proved in their research through measurement conducted on new product design where the purchase intentions were greater for the functional, the symbolic dimensions, and the aesthetic dimension. Also, they concluded that the understanding design in terms of aesthetics of product design could have a wide comprehension includes the functional and illustrative dimensions which give an impact on consumer behavior.

First, in the context of design of product, Yang (2011) discussed about the product development process where the designers and/or engineers of product need to manipulate the product attributes (PAs). Since an engineers' mission (towards the specific style of a product design) is to fulfill customers' expectation, therefore the designers and/or engineers are necessary to adapt many design studies conducted onto perception and human feelings in order to gather a better insight of customers' subjective perceptions (Guo *et al.*,2011). This is due to the final purchase behavior had been directly or indirectly determined where the direction of product design innovation based on the different factors which influences to the preference, texture and interface affects the customers' final purchase behavior. Specifically, this was as discussed by Steinberg *et al.*, (2015) where the products need to have their own special selling point in order to stand out from the wide variety of product goods³. This is because of the manufactures had exposed to the competitive and complex environment where they have to pay their effort to keep up with the pace in satisfying customers' taste of choice. Through, nowadays the development of production technology, Yan *et al.*,(2006) said that the products' physical such as function and quality are no longer the customers only consideration when purchasing goods

Second, in the perspective of new product strategy, Tamaa *et al.*, (2015) commented about the recent decade of production capacity where the numbers of production the consumer product has increased in a scale that has never been seen before. In order to

³ In this perspective, the manufacturers are not merely need to deal more regularly with their products' performance in terms of design, function, quality and cost

satisfy individual customers' requirement, there will be through mass customization strategy (Du *et al.*, 2006). This effort will be used as a countermeasure for the increasing flexibility of the manufacturing system and also the high speed of information exchange. By using customers' value analysis will enable customers to voice out their choices toward the wide variety of the product features and also help company to justify different customization solution. In this context, the factors that clearly influenced purchasing determination in the low-price era, according to Valls *et al.*, (2012) , were the quest for satisfaction, the structure of values, income, the economy, the intensity of competition, price presentation, the sales channel. This is because of many manufacturers were mostly designing their product based only on linear principles in which the complexity is avoided as much as possible. So, their designed product can be predictable and controllable by the competitor.

Third, in the context of packaging of products, Silayoi and Speece (2004) argued that the design of package should be considered as the “salesman on the shelf” to increase the point of sale by influencing consumer response (affects the consumer decision process). To improve the design of continuous packages and to stimulate customers' decision of the packages, Magnier and Schoormans (2015) argued that a new contribution needed to create the knowledge for consumer evaluations. In the case of ecological packages which influence consumers' evaluations in a multifaceted way, they suggested others design elements including color, shape, and materials reflected into the communicating elements of the eco-friendliness.

Hence, since in the present products' design are mostly related the customers' feeling and, thus consumers' aesthetic responds are an increasingly significant factor in competition among products, Cox and Cox (2002) found that marketers who tries to forecast the responds through premarket concept trial may occur misleading results⁴. On this context, Lei *et al.*, (2015) state that in order to analyze the bonding between the customers' emotion and the product designs are therefore requiring the emotion engineering that should be used in every aspect of product design. For an example, material used to manufacture a product is as one of the emotional design elements. This element of emotional design acquires a very significant position in product design and designers must pay attention in the way to use material for improving the product's emotion.

A divergence between customer's initial and subsequent reactions to new aesthetic design

In order to fit the products to each individual consumer and satisfy them through their feeling, Kansei Engineering related to emotional design has been proposed by Nagamichi *et al.*, (2008). Chen *et al.*, (2008) on the other hand expressed Kansei Engineering as a translating technology as the customer feeling and product images are converted into design elements. Since the view of the customer to a product's characteristic is normally different from a designer, it is the best to use Kansei to link the customer perception to the physical elements of the product. The reason to use Kansei Engineering, according to Tamaa *et al.*, (2015), is due to its ability and method to capture the impression of customer towards the product. Specifically, since these expressions are normally hidden and thus the method used is to translate them into a more detail product specification.

1.2 Problem Statements

According to Staich *et al.*, (2012), the increased of global competition forces the companies to shorten the lifecycle of their product. This is due to today's customers are very 'unfaithful' as they keep changing particular products and services (Hartono & Tan, 2011). Besides, the customers' loyalty toward a product brand has also been declining over the past decade (Riezeboz). The different from twenty to thirty years ago, people's today tend to switch their products from two to four different brands. This is because of the increasing choices of selection of the product has become too large and people have undergo blur value, lost of distinction towards the product. Young (2011) commented that the reason of the product variety increased is because of the unlimited source of demand for product variety from the customer. To meet customers' requirement and at the same time attract new customers, multi product firm will increase variety of a single product category. However the increases of productivity and variety product may not directly influence the consumers' decision of buying a product.

Furthermore, since customer has more demands when choosing their products, aforementioned condition will push-in and push-out the designer to face a problem to match their product for generic user (Djatnaa and Kurniatib, 2015). Cox and Cox (2002) commented that this progression force an up growing number of companies into the difficult and risky business of forecasting consumers' tastes. Companies and managers need to try to distinguish their products by using the product beauties to achieve successes in the market. As a result, this indirectly increased the customer preference, pleasure and

satisfactions. Thus, it is the key to increase the customers' acceptance towards the product constructed through the aspect of emotion, feelings, creativity, and innovative.

One of the way to influence customers' decision is on the customers' personal perception of the products, Ferrise *et al.*, (2013) argued about how the product will be as a winner (which can draw both the attention and match the expectation of the customer) when there is a large variety of product to be selected. Perception is a main factor as it is occurred at the first look in which the customer will interact with the product itself. Wang *et al.*, (2010) mentioned the society demand has changed from "functional value" to "emotional value" when it comes buying products. Due to this important value of perception, Huang *et al.*, (2012) has given a statement where it has become an important thing for designers to think of a method to investigate the customers feeling and preference and then utilize these information into their product design. This is however not an easy task for the designers as there aren't any suitable criteria available to do so and there is always difference in the customers' evaluation.

On the other hand, Barnes *et al* (2008) have revealed that engineering appealing product is a significant aspect to win in the competitive markets and be leading in the supermarket shelves. This situation is applied in the water bottle product. Why is that so? According to the Plastic Bottles and Caps Manufacturing Unit (PBCMU) (2016), plastic bottles are becoming a much more popular choice due to the ease of using it for transporting and preserving the quality the freshness of drinking water. In 2006, Wilk (2006) has mentioned that water bottle business is becoming a wide spread trend as the consumers are in an increasing amount. This statement was supported back in 2001 when Ferrier (2001) states that water bottle industry is a very competitive market and it is necessary for companies to develop their own unique marketing strategies which include developing new products. Therefore, to be outstanding among the manufacturers need to satisfy not only the functional requirement but also their emotional requirement.

Besides that, the demands of plastic water bottles have caused pollution. According to the European Commission (2011) the use of plastic including water bottle in 21st century is in a wide range. Plastic water bottle is an item with short cycle life where people will dispose it after the water in it is consumed. Thus, personalizing the water bottle product by tackling customer emotional feeling is a way to solve this problem. With an item that one favours, there is a high chance that the item can be use for a long time and this help to reduce the used to disposable plastic water bottle. To do so, it is essential to understand the