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Research paper

The Big 5 Personality Towards Product Design In Kansei Engineering

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Abstract

This study discussed the features and the design preferences of the product in order to find the priority of the product towards the profile design of the car beside the correlation analysis of the Big 5 Theory. The purpose of this study is to find out what personal traits and originality of personal behavior of perception towards the understanding of human psychology related to the product design. Questionnaires that consist of each aspect of articulated customer expression in 5 Kansei words (stylish, comfortable, safe, sporty and luxury) towards 2 car design type (City and Sedan) were utilized. Statistical analysis was utilized to evaluate data from 171 respondents on their individual needs and behavior. The result shows that the preferences of product design were related to customer's emotional feelings in which customers' personality traits (Agreeableness) based on The Big 5 test is having significant correlation towards Safe and Sporty for City and Sedan Car respectively. Based on these finding, the customers' personality traits can use employed to predict what the customer expression towards the product design.

Keywords: *Personality, Emotional response, Product Design, Kansei Engineering*

1. Introduction

In today's dynamic business environment, an organization must always outperform their relevant business strategy to consistently deliver quality products/services to their customers. Specifically, to consumer loyalty programs as a key component in their future business prospects and the highest point of their concerned to their existence in the market [1-2]. On this case, the company should treat the consumer loyalty agenda is not only through the item's accessibility that is the best fit to the customers' need, however also to customer's full of feeling reactions to the presence of an item that enormously impact their acquiring choices [3]. Based on the perspective of a product, this is influenced by successful products development where the modeling of consumer's affective responses (CARs) should work in every company's plan related to their product design (product development) as competitive advantages [4]. Particularly, to the appearance of a product that will greatly influence the customer purchasing decision as the subjective feelings of customers [5]. By grouping the product design into adjustable item stage families (in which mass customization is not only to comply with whatever required by customers), they are also should be able to answer the question of who. Their customer related to market segmentation and target marketing, and towards the question of what the customer wants that depends on how to identify the product attributes and their importance to targeted market segment [6]. Therefore, to impart plans to the customers (through item or framework of product design) includes perception and its formal style needs to be conveyed through formal styles [7]. Here, a product identity should be formed as an arrangement of solid human identity components in order to recognize the customers associated with numerous choices on how the product looks and acts in the market by promoting the company's effort and messages in their products [8].

The way of the producer to ensure their product will be successful in the market, the producers have to carry out what the customer's need or desires. This plan is, actually, based on numerous items which are effective from an originator's point of view in the commercial centre that will imply the buyers' insight models [9]. In this perspective, the psychological need towards emotional satisfaction of product is an essential part of design process. Therefore, the company has to launch an attractive product that should fulfill the objectives of individual customer emotion and needs [10]. However, the emotions articulated through product appearance are, in facts, often intangible and impossible to predict or design for [11]. First, since individual customers subjective impressions need to be translated into verbal descriptions which are relatively short-lasting emotional states, it will, however, tend to be imprecise and ambiguous [12]. In this perspective (people-centered discipline towards industrial practices), it is also very hard to capture customers' affective needs through their linguistic origins. To guarantee customer satisfaction, therefore it needs calls for experiencing because every single a number of customers will probably correlate expressively (and also experience) to satisfy the demands involved either particular person or detailed.

Second, there is a space between consumer's subjective affectability (impression, picture, and feeling) degree and the comparing an incentive in the database [13]. This condition alludes to the subjective information of the product design delineation (*e.g.*, picture, words, film, sound, and so forth) refers to the memory's type (personality preferences) of customers that represent the circumstance of which judgments or choices are to be made so that have the

impacts on judgments and on trust in judgments [14]. On this reason, proposed the modeling of consumers' affective responses (CARs) for companies (manufacturers) to having the capacity that meets customers' satisfaction [4]. The application of consumers' affective responses towards the appearance of a product will greatly influence the purchasing decisions [5]. Basically, the model is focused on the qualitative evaluation scale (treated as linguistic term set of a linguistic variable) that considered about the multi-criteria decision- making the problem [15]. Kansei as the Japanese approach to this model is often interpreted as ''total emotions'' to represent the feelings, impressions, and emotions [16]. As the main philosophy that has been particularly created to measure or assess the enthusiastic needs of customers, Kansei Engineering is viewed and coordinated with the configuration of the time spent [17].

In addition, to achieve customers' satisfaction towards the product, the company also should know about the behavior of the customers [18]. Also, the customer behavior should be interpreted as individual customer behavior when they are looking for the product; purchasing, using, assessing and disposing of products [19]. However, due to the rapidly changing technology and innovation, to understand customers' behavior is unfortunately becoming an extremely tough task for manufacturers [18]. In this case, towards the market of products, the designers must frequently consider numerous combinations of product shapes by taking into account the customer tastes in order to reduce the risk of their products being rejected in the market [20].The aim of this research is to find out what personal traits and originality of personal behavior of perception towards the understanding of human psychology related to the product design.

2. Materials and Methods

2.1 Participants

One hundred and seventy-one participants aged range 19 45 above years and car owner took part in this study.

2.2 Procedures

The study was carried out using questionnaire form. The questionnaires were distributed to participants and they were told about the purpose of the study. The questionnaire was divided into 3 sections. An initial section was request-ing individuals to provide some demographic information regarding gender, age, profession, education, and other characteristics. For the second section, individuals have to make their preferences towards car product based on Kasei Engineering (Kansei word) that displayed their emotional or psychological preferences on the design of the car. Then, the third section was approximately on The Big 5 personality. The questionnaire was reviewed to ensure that no point was left unanswered. The participants filled out the questionnaire within six minutes. The whole session takes approximately 30 days to complete. Response rate in this study is 68% due to 171 questionnaires was accepted from 250 questionnaires that were distributed.

2.3 The Big 5 Measures

Forty-four questions used 5-point rating: (1) Disagree, (2) Disagree a little, (3) Neither agree nor disagree, (4) Agree a little and (5) Agree strongly. The participants were then grouped into the Big Five Personality Types of extroversion, agreeableness, conscientiousness, neuroticism and openness to experience.

2.4 Statistical analysis

Statistical analysis (SPSS v.16.0 programming) was carried out on the correlation between the emotional of the design profile (Kansei) and Personality traits. These correlations are to determine the strength of the assessment the variables [21]. To ensure that the statistical data acquired using the questionnaire in this study exhibited satisfactory reliability, a reliability analysis of the data was conducted to determine the Cronbach's α value. Recommended that a Cronbach's α accepted value of between 0.5 and 0.70 indicates moderate reliability, Cronbach's α of between 0.70 and 0.80 good reliability, Cronbach's α of between 0.80 and 0.90 entails great reliability and that a Cronbach's α >0.9 as superb [22].

3. Results and Discussion

Table 1 show the correlation between The Big 5 with City Car 5 correlate with Kansei Word Safe. This correlation was chosen because of the correlation have linked with all view front, side and rear with Car 5, Peugeot 108.

Table 1: Correlation between the Big 5 with City Car 5

	Typical characteristic		Typical characteristic		Typical characteristic
City F5Sty		**City S5Sty**	.164(*)	**City R5Sty**	
City F5Com	.228(**)	**City S5Com**	.241(**)	**City R5Com**	
City F5Safe	.255(**)	**City S5Safe**	.226(**)	**City R5Safe**	.177(*)
City F5Spo	.207(**)	**City S5Spo**	.198(**)	**City R5Spo**	
City F5Lux		**City S5Lux**		**City R5Lux**	

From the Table 2 show 82 out of 171 respondents classified as Agreeableness type which prefer to select the range value 2-4 to identify the Safe as for City 5 and for Extro- version and Neuroticism fair as the lowest value in prefer for identity the City Front 5.

Most of Agreeableness type in the Table 3 chooses range 3-5 to classify the City Side 5 is in the middle of Safe prefer-ences with highest frequencies 82 out of 171 respondents and for Extroversion and Neuroticism fair as the lowest value in prefer for identity the City Front 5.

From the Table 4 show 82 out of 171 of respondents are type of Agreeableness person which prefer to select the range value 2-4 to classified the Safe for City Rear 5.

Table 2: Cross Tabulation between the Big 5 with Safe City Front 5

		Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness	Total
	1	0	9	0	0	2	11
	2	0	15	5	0	10	30
City F5Safe	3	0	30	6	0	16	52
	4	0	18	4	0	21	43
	5	1	7	1	1	17	27
	6	0	3	0	0	5	8
Total		1	82	16	1	71	171

Table 3: Cross Tabulation between the Big 5 with Safe City Side 5

		Ex-trave rsion	Agreea-bleness	Conscien-tiousness	Neurot-icism	Open ness	Tot al
	1	0	9	0	0	3	12
	2	0	12	1	0	8	21
City S5Safe	3	0	26	6	0	16	48
	4	0	21	6	0	19	46
	5	1	14	3	1	18	37
	6	0	0	0	0	7	7
Total		1	82	16	1	71	17 1

Table 4: Cross Tabulation between the Big 5 with Safe City Rear 5

		Ex-traver sion	Agree-able-ness	Consci-entious-tious-ness	Neu-roti-cism	Open-ness	Total
	1	0	7	2	0	3	12
	2	0	20	3	0	16	39
City R5Safe	3	0	35	7	0	23	65
	4	0	14	3	1	14	32
	5	1	4	1	0	8	14
	6	0	2	0	0	7	9
Total		1	82	16	1	71	171

Table 5 show the correlation between The Big 5 with Sedan Car 1 correlate with Kansei Word Sporty. This correlation was chosen because of the correlation have linked with all view front, side and rear with Car 1, Audi S6 Avant.

Table 5: Correlation between the Big 5 with Sedan Car 1

	Typical characteristic		**Typical characteristic**		**Typical characteristic**
Sedan F1Sty		**Sedan S1Sty**		**Sedan R1Sty**	**.270(**)**
Sedan F1Com	.245(*)	**Sedan S1Com**		**Sedan R1Com**	**.233(*)**
Sedan F1Safe		**Sedan S1Safe**	.229(*)	**Sedan R1Safe**	**.379(**)**
Sedan F1Spo	.265(**)	**Sedan S1Spo**	.281(**)	**Sedan R1Spo**	**.232(*)**
Sedan F1Lux		**Sedan S1Lux**	.213(*)	**Sedan R1Lux**	**.309(**)**

From the Table 6 show 80 out of 171 respondents classified as Agreeableness type which prefer to select the range value 3-5 to identify the Sporty as for Sedan Front 1 and for Consciousness for the lowest value in prefer for identity the Sedan Front 1.

Table 6: Cross Tabulation between the Big 5 with Sporty Sedan Front 1

		Extra-version	Agreea-bleness	Conscien-tiousness	Neurot-icism	Open ness	Tot al
	1	0	0	1	0	0	1
	2	0	8	0	0	0	8
Sedan F1Spo	3	0	16	4	0	11	31
	4	0	32	8	0	18	58
	5	0	18	4	0	25	47
	6	0	6	2	0	18	26
Total		0	80	19	0	72	17 1

Most of Agreeableness types in the Table 7 choose range 3-5 to classify the Sedan Side 1 is in the middle of Sporty preferences with highest frequencies 80 out of 171 respondents and for Consciousness for the lowest value in prefer for identity the Sedan Side 1.

Table 7: Cross Tabulation between the Big 5 with Sporty Sedan Side 1

		Ex-traver sion	Agree-able-ness	Consci-entious-tious-ness	Neu-roti-cism	Open-ness	Total
	1	0	5	0	0	1	6
	2	0	6	1	0	3	10
Sedan S1Spo	3	0	10	2	0	5	17
	4	0	35	7	0	16	58
	5	0	18	7	0	33	58
	6	0	6	2	0	14	22
Total		0	80	19	0	72	171

From the Table 8 show 80 out of 171 of respondents are type of Agreeableness person which prefer to select the range value 3-5 to classify the Sporty for Sedan Rear 1 and for Conscientiousness type show the lowest value in prefer of Sporty for identity of Sedan Rear 1.

Table 8: Cross Tabulation between the Big 5 with Sporty Sedan Rear 1

		Ex-traver sion	Agree-able-ness	Consci-entious-tious-ness	Neu-roti-cism	Open-ness	Total
	1	0	2	0	0	2	4
	2	0	7	2	0	0	9
Sedan R1Spo	3	0	13	6	0	9	28
	4	0	32	5	0	15	52
	5	0	20	1	0	27	48
	6	0	6	5	0	19	30
Total		0	80	19	0	72	171

The result of reliability test showed the constructs attribute or variable from all dimension questions gives the Cronbach Alpha 0.913 or 91.3% see Table 9 can be totally reliable. Table 10 shows the value of Cronbach Alpha for each element of Kansei and The Big 5 personality traits Mostly, the values of Cronbach Alpha of questionnaires refer to this element are >0.60. This meant that all of the data are valid and reliable for all elements towards Kansei and personality traits,

Table 9: Statistic of reliability

Cronbach's alpha	**Number of items**
0.913	224

Table 10: Value of Cronbach Alpha for each element

KANSEI ENGINEERING			
No	**Product Criteria**	**Cronbah Alpha**	**N Number of item**
CITY CAR			
1	Design 1	0.943	15
2	Design 2	0.935	15
3	Design 3	0.921	15
4	Design 4	0.938	15
5	Design 5	0.943	15
6	Design 6	0,934	15
SEDAN CAR			
1	Design 1	0.922	15
2	Design 2	0.925	15
3	Design 3	0.922	15
4	Design 4	0.941	15
5	Design 5	0.923	15
6	Design 6	0.922	15
THE BIG 5 PERSONALITY			
1	0.776		44

3. Conclusion

Based on above information, the City Car with emotional design expression; Safe. Moreover, the Sedan Car with emotional design expression; Sporty is having the significant correlation towards customers' personality traits using The Big 5. Additionally, The Big 5 Personality in this research is Agreeableness. Agreeableness indicates keeping easy-going and harmonious interactions with others [23-24]. Agreeable people tend to be pleasant, amiable, equable, and cooperative; inclined to work harmoniously with others; avoid disagreements, arguments, conflict in interactions with other people. Thus, the results of this research suggest that the design approach helps designers to embody personality traits in product appearance. The Big 5 can be used as a tool for analysis between cognitive styles and product design according to customers' emotional feeling.

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