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Kansei Factors of Table Lamp from Oil Palm Tree Branch Waste Materials

Dita Andansari[1], Ratna Wulaningrum[2]
[1]Product Design, Politeknik Negeri Samarinda, Samarinday, East Kalimantan, Indonesia-75131
[2]Accounting, Politeknik Negeri Samarinda, Samarinday, East Kalimantan, Indonesia-75131
Email address: ditaandansari(at)polnes.ac.id

Abstract— *The national creative industries are experiencing increasing growth every year. The growth of the national creative industry reached an increase of 7%. There are creative industry sub-sectors at the rank of the most contributors to national GDP are craft subsectors, followed by fashion subsectors and furthermore are advertising subsectors. In East Kalimantan, the sub-sectors of crafts that penetrate the export market include stone, wood processing, bead accessories, rattan crafts and mandau. In order for SME craft products to excel in the midst of very intense competition, there needs to be innovation or product development in order to have more value compared to competitors. The results of research that has been conducted by other parties on the development of handicraft products typical of East Kalimantan have begun to be developed. Development of Application of Oil palm tree branch waste Materials for Interior Accessories Products. Although not widely applied to a variety of other functional craft products, it is necessary to know the factors that determine public interest in table lamp craft products made from oil palm tree branch waste for further development. The methods carried out in the study are kansei engineering with the stages of making differential semantic questionnaire I, the dissemination of differential semantic questionnaire I and the analysis of differential semantic questionnaire I. The results obtained from this study are kansei words that represent table lamps of oil palm tree branch waste materials are strong, characterful, attractive, qualified and proud, as well as people's preference for table lamps from the most palm oil sewage materials. The main factor is influenced by strong factors or in other words is influenced by the material.*

Keywords— *Kansei factors, table lamp, oil palm tree branch.*

I. INTRODUCTION

Typical crafts in East Kalimantan, Indonesia, consist of a wide variety of products, such as samarinda sheath woven fabric, ulap doyo woven fabric, wood craft, bead craft, craft embroidery tumpar and others. The national creative industries are experiencing increasing growth every year. The growth of the national creative industry reached an increase of 7% (Ministerof Industry SalehHusin, 2021). Industri creative industry hasemerged in 2007 until now, has a large contribution to the national gross domestic product (GDP) especially in 2015 until now shows an increase. In 2015, the contribution of creative industries to national gross domestic product (GDP) amounted to Rp. 852 trillion and in 2020 reached Rp. 1,100 trillion.

There are subcreative industries sectors at the highest level of national GDP is the craft subsector, followed by the fashion subsector and furthermore is the advertising subsector. The craft sub-sector has survived in recent years as the largest contributor to national GDP because there are still many supporting natural resources available. There are 4 subsectors of creative industries that are the mainstay in the future will develop and grow in East Kalimantan, namely architecture because there will be many buildings, especially office buildings, interior design as fillers from buildings that will be made, culinary as food needs are increasing because of the planned move of the capital and the last subsector is craft. The total export value of East Kalimantan SMEs in 2020 reached Rp. 428.2 billion.

In East Kalimantan, the craft sector that penetrates the export market includes stone, wood processed, bead accessories, rattan crafts and mandau. Industry kriya in East Kalimantan that has the potential to be developed is a craft based on textiles, woven, leather, wood, paper, glass, metal, furniture / furniture business, jewelry and valuables (Noor, 2021). In addition to venturing into exports, in the domestic market, SME craft products in East Kalimantan are also successful including bead woven, bead accessories, stones, Samarinda sarongs, wicker webbing, ulap doyo and mandau.

In order for SME craft products to excel in the midst of very intense competition, there needs to be innovation or product development in order to have more value compared to competitors. The results of research that has been conducted by other parties on the development of craft products Typical of East Kalimantan craft products have begun to be developed including Samarinda batik produced factors that influence people's choice of Samarinda batik [1], ulap doyo woven fabric developed in the form of women's bags made based on people's preferences [2] made to support ulap doyo craft products as well as the Development of Application of Oil palm tree branch waste for Interior Accessories Products [4] with the result that palm oil can be developed into the basic material of making functional products by nyam.

Recent product development trends have been a lot towards products designed based on *customer-oriented* needs. In this concept, the company will explore the needs and desires of customers to then turn it into a useful product. Kethics of choosing a product, it is believed that consumers not only choose because of the function of the product or price alone, but furthermore, other important factors in choosing The product is emotions and feelings. This important factor is expressed as an affective factor. F the customer affective actor was translated by Nagamachi with kansei engineering methods. *Kansei engineering* is a method of translating consumer emotions, feelings, and impressions on a desired product. According to Haryono and Bariyah[7] in a study

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entitled "Design of Footwear Product Concepts Using the Integration of Kansei Engineering Methods and Kano Models" concluded that Design that matches the image/ image and feelings of consumer psychology is the design of two categories of Canoe, namely one-dimensional and indifferent. In another study [8] in a study entitled "Design of Portable Cutlery Product Concept Using Kansei Engineering Method" concludedan that results Cutlery design can satisfy consumers when carrying and using the product. Other product development research related to using kansei engineering methods such as: table clock of bamboo material [9], coat design [10], furniture material [11], rattan dining chair design [12], development of affective design methodology [13], design of combination of rocking horse and child folding chair [14], Apparel product design [15], kansei engineering is associated with QFD [16],Indian textile tradition [17], Development of Jetis batik motif design[18], best position vehicle lever [19] and products for wrists [20].

Previous research [21], from the results of the study can be concluded that palm oil tree branch after undergoing processing so that the blades produced with a width of 5mm and a length of 1 meter can be woven then processed into interior accessories products such as blinds, fragrance and lights as typical products of East Kalimantan. There is also research on the utilization of palm oil waste in a nyam way. As already done by Rachmawati,2020 in a study entitled Development of Application of Palm Oil Waste Materials for Interior Accessories Products concluded that After exploration it is known that waste can also be nyam with certain patterns, ranging from simple patterns and circular patterns and has been applied into functional products such as table lamps. Although not widely applied to a variety of other functional craft products, it is necessary to know the factors that determine public interest in table lamp craft products. made from palm oil waste for further development.

II. METHOD

The method is kansei engineering method but only arrives at the analysis of differential semantic questionnaire I, where the stages are:

1. Questionnaire creation
   The creation of the Differential Semantics I questionnaire created contains a choice of adjectives that must be selected by respondents who represent the impression of Table Lamps from palm oil smelter expected by respondents.
2. Spread of Differential Semantic questionnaire I
   After the questionnaire was created Differential Semantics I, the questionnaire was distributed to respondents.
3. Statistical Analysis I
   After the results of the questionnaire answers are collected, it is processed using SPSS 15 software to obtain validity, reliability and factors formed from kansei word pairs that have been filled out by respondents. From the results of this analysis there will be a reduction in kansei words to be used in the next questionnaire.

III. RESULT AND DISCUSSION

Product Design

The product in this study is a table lamp product made from palm oil waste material combined with wood material. Previously designing the design of table lamp products made from palm oil sewage waste material, set in advance:

1. target group
   From the results of interviews with craft product designers and also wood craft MSMEs about table lamp products made from palm oil waste, the division of market segmentation is based on age; adolescents late 17-25 years, early adults 26-35 years, late adults 36-45 years and early elderly 46-55 years and gender; Women and men.
2. niche market
   Table lamps from palm oil waste material is made from materials that initially have no selling value and then applied into functional product materials that have value. Such an example is a table lamp. The design is made simple so that it can be used by teenagers to the elderly both inside Indonesia and outside Indonesia.

Kansei words

The collection of Kansei Words is carried out for ten days through:

1. interview and filling out questionnaires
   Interviews and discussions were conducted with craft product designers and MSMEs in the field of wood craft about table lamp products made from palm oil waste. This is done to get an adjective agreement that can represent the impression of the table lamp to then be conveyed to the respondent to get the most choices from respondents.
2. references from the designer's site
   To enrich the kansei words obtained, itis taken from the reference of words from social media related to craft products such as Facebook, Instagram and also craft sites.

From the results of the collection of a total of 31 *kansei words* for table lamps from palm oil waste materials that were finally grouped in category *classification* and designed into Semantic questionnaires. Differential 1.

Category Classification

Data reduction is done by category *classification* by creating levels from the main concept to the sub-level concept. Table lamp products from palm oil waste materials from 31 kansei words are classified into 8 groups where each group contains about 2 to 8 *kansei words.* The classification of these categories is determined based on the grouping of similar words. In the following table is shown the grouping of 8 groups of kansei words.

PROUD	CHARACTERISTIC	QUALITY	NATURAL
Proud	Characteristic	Ready for production	Environmentally friendly
Identity	Brave	Good	Sustainable
Distinctive	Confident		
Regional image	Strong		
Unifying	Trusted		
	Charismatic		

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	Religious		
SHINY	**STRONG**	**SIMPLE**	**PULL**
Bright	Durable	There are no accessories.	Beautiful
Refreshing	Weatherproof	Geometric	Good
	Not easily damaged	Easy to make	Comfortable to see
			Beautiful
			Matching
			Attract
			Sensual

Differential Semantic Questionnaire 1

In this questionnaire, respondents of 68 people were asked to provide a value on the criteria of table lamp products from palm oil waste materials in accordance with the expected impression with give an assessment of the word pair provided. Here are the pairs of words used in the questionnaire Semantic Differential I.

Left Adjectives	Scale					Right Adjectives
Proud	5	4	3	2	1	Not proud
Characteristic	5	4	3	2	1	Out of character
Quality	5	4	3	2	1	Not Qualified
Alami	5	4	3	2	1	Unnatural
Shiny	5	4	3	2	1	Not Shiny
Strong						Not strong
Simple	5	4	3	2	1	Not Simple
Pull	5	4	3	2	1	Unattractive

Differential Semantic Questionnaire Analysis I

Validity Test

The initial stage of analysis is a validity test and is calculated using SPSS software, of the 8 proposed variables, all variables are valid and can be further processed. The results of the validity test as seen as follows.

Kansei Words	Pearson Correlation	R table	Sig. (2-tailed)	Note
Proud-Not Proud	0.780	0.244	0.00	Valid
Character -Out of character	0.796		0.000	Valid
Quality- Not Qualified	0.736		0.000	Valid
Natural-No Alami	0.414		0.000	Valid
Shiny-Not Shiny	0.573		0.000	Valid
Strong-Not Strong	0.781		0.000	Valid
Simple-Not Simple	0.610		0.00	Valid
Interesting -Unattractive	0.735		0.00	Valid

Reliability Test

The consistency and stability of a score (measurement scale) is indicated by a reliability test. Reliability is a matter of consistency as well as a matter of accuracy. The reliability test stage is to look at the value of crobach alpha. It is said to be reliable if the value of cronbach alpha ≥ 0.6(Ghozali,2002). After being inserted into the SPSS, the result of calculating the reliable value for table lamps from palm oil waste material is 0. 819. Thus showing that the variables on the questionnaire are said to be reliable.

Cronbach's Alpha	N of Items
.819	8

Factor Analysis

Factor analysis is one step in data reduction in multivariate statistical techniques. Analysis of these factors focuses on the goal of determining product design items and categories according to the image of customer feelings in the kansei.

Kmo value is considered sufficient when it exceeds 0.5. From the calculations that have been done in this study qualified because the value is above 0.5 which reaches 0.827. Since the KMO value is above 0.5, the KMO requirements are met.

With SPSS software, it can be calculated the value of Barlett Test of Sphericity of 205,364 with a significance of 0.000. Thus, the Barlett Test of Sphericity is considered as a condition because the significance value is below 0.05 (5%), so the variable of kansei words is considered feasible and can be used for the analysis stage. Next.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.827
Bartlett's Test of Sphericity	Approx. Chi-Square	205.364
	Df	28
	Sig.	.000

Data tables for anti image matrix are used to find out and determine which variables can be used for factor analysis. In the factor analysis, the requirement that must be met is the MSA value > 0.50. From the results below the following MSA values for all variables studied > 0.50, so that the second requirement in factor analysis is met.

Kansei Words	Anti-image Correlation
Proud-Not Proud	0. 854(a)
Character -Out of character	0. 853(a)
Quality- Not Qualified	0. 893(a)
Natural-No Alami	0. 585(a)
Shiny-Not Shiny	0. 735(a)
Strong-Not Strong	0. 803(a)
Simple-Not Simple	0. 816(a)
Interesting -Unattractive	0. 885(a)

Variable values can explain factors or cannot be seen from *communality values.* If *the extraction* value is greater than 0.50, then the variable is considered able to explain the factor. The *extraction* value in this study there is a variable that is less than 0.50, namely shiny and simple. Thus, variables that do not meet the requirements of communality must be issued and repeated the process.

	Initial	Extraction
Proud	1.000	.624
Characteristic	1.000	.704
Quality	1.000	.618
Natural	1.000	.829
Shiny	1.000	.405
Strong	1.000	.733
Simple	1.000	.468
Pull	1.000	.629

After being calculated again, the KMO value above 0.5 reaches 0.838. Since the KMO value is above 0.5, the KMO requirements are met.

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With SPSS software, it can be calculated the value of Barlett Test of Sphericity of 171. 543 with significance of 0.000. Thus, the Barlett Test of Sphericity is considered as a condition because the significance value is below 0.05 (5%), so the variable of kansei words is considered feasible and can be used for the analysis stage. Next.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.838
Bartlett's Test of Sphericity	Approx. Chi-Square	171.543
	Df	15
	Sig.	.000

Once the count is repeated, the MSA value for all variables studied > 0.50, so that the second requirement in factor analysis is met.

Kansei Words	Anti-image Correlation
Proud-Not Proud	0. 852(a)
Character -Out of character	0. 859(a)
Quality- Not Qualified	0. 882(a)
Natural-No Alami	0. 637(a)
Strong-Not Strong	0. 790(a)
Interesting -Unattractive	0. 876(a)

Once repeated, nilai *extraction* there is a variable that is less than 0.50, namely Natural. Thus, variables that do not meet the requirements of communality must be issued and repeated the process.

After being recalculated, the KMO value above 0.5 reached 0.864. Since the KMO value is above 0.5, the KMO requirements are met.

With SPSS software, it can be calculated the value of Barlett Test of Sphericity of 158,183 with a significance of 0.000. Thus, the Barlett Test of Sphericity is considered as a condition because the significance value is below 0.05 (5%), so the variable of kansei words is considered feasible and can be used for the analysis stage. Next.

	Initial	Extraction
Proud	1.000	.613
Characteristic	1.000	.695
Quality	1.000	.660
Natural	1.000	.158
Strong	1.000	.682
Pull	1.000	.674

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.864
Bartlett's Test of Sphericity	Approx. Chi-Square	158.183
	Df	10
	Sig.	.000

Once the count is repeated, the MSA value for all variables studied > 0.50, so that the second requirement in factor analysis is met.

Kansei Words	Anti-image Correlation
Proud-Not Proud	0. 864(a)
Character -Out of character	0. 848(a)
Quality- Not Qualified	0. 887(a)
Strong-Not Strong	0. 845(a)
Interesting -Unattractive	0. 884(a)

Once repeated, the extraction value *of* all variables is more than 0.50. Thus, all variables qualify for communality and can be further processed.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.364	67.288	67.288	3.364	67.288	67.288
2	.533	10.651	77.938			
3	.436	8.720	86.658			
4	.366	7.319	93.977			
5	.301	6.023	100.000			

	Initial	Extraction
Proud	1.000	.614
Characteristic	1.000	.707
Quality	1.000	.650
Strong	1.000	.726
Pull	1.000	.667

The total variance value explained with a value above 1 is only 1 component so it can be concluded that the factor formed is 1factor. Nilai loading factor sequentially is strong 0.726, character 0.707, attract 0,667, quality 0.650, and proud 0.614.

IV. CONCLUSION

1. The word kansei that represents the table lamp of palm oil waste material is strong, characterful, attractive, quality and proud.
2. People's preference for table lamps from palm oil waste materials is most primarily influenced by strong factor or in other words influenced by the material.

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