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Design Of Innovative Alarm Clock Made From Bamboo With Kansei Engineering Approach

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Abstract

Formerly, “Othok-othok” bamboo traditional toy and alarm clock have high sales, but as the impact of modern product development, both of the sales was decrease. The innovation of alarm clock that made from bamboo and use othok-othok as the source of sound is the one alternative solution of a declining both product. Kansei Engineering method was used to convert the feeling and the imagination of customers into design parameters. The result of this research is an innovative alarm clock that satisfying psychological customer feeling.

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1. Introduction

“Othok-othok” traditional toy is the one of the creative industries which is founded in Java especially in Yogyakarta. “Othok-othok” is made from assembled bamboo that will produce sound if it is rotated. Semin Village, Gunungkidul, Yogyakarta is an area of “othok-othok” production. Previously, “othok-othok” was not only a children’s favourite toy and it had higher sales. However, due to the impact of the modern toys development, the traditional toys was declined. Meanwhile, declining sales was also happened in the clock seller industry, especially alarm clock. Alarm clock is equipped with a device that could produce sounds at a desired time. The current trends gadget that add a alarm clocks feature tends to decrease interest people to buy alarm clock because the function of alarm clock have existed at any kind of gadgets.

Basically, any product has a life cycle (Product Life Cycle), so the observation is needed by every manufacturer to have a exact product strategy. Othok-othok toys and alarm clock currently are in the declining phase of sales. In facing declining phase, the producers should make some strategies among others by creating products innovation,

looking for new benefit of products and looking for emerging. Therefore, innovation of bamboo alarm clock was created as the alternative solution of a declining both product.

Kansei engineering is a method that can be used to interpret feeling and impression of consumers into parameters the product. There are other methods that used to design a product, but this research used method of Kansei Engineering because this method can specifically dig feelings from users so that will be produced products who represented feeling consumers.

2. Method Of Research

2.1 Survey

Survey was conducted to identify “kansei” words until 25 respondents who agree with this innovation. Questionnaire was developed into three parts, which were: identification of kansei words, physical design specification, and validate the physical design parameters.

2.2 Kansei Engineering Methods

Method used in this research was kansei engineering approach type 1 with stage as follows:

- Gathered data of consumer advocacy to know kansei words through a questionnaire open
- Kansei word acquired was converted into a differential semantic questionnaire to get a feeling and image of products from customers numerically.
- Conducted reliability and validity data.
- Performed factor analysis for grouping kansei words.
- Result of factor analysis was elaborated into physical design parameter by using mapping process
- Done validation test by using Stuart Maxwell method to validate the design to the customer desire.
- Discussed the result.

3.1 Kansei Word

Kansei words were collected from 25 respondents who agree with the alarm clock innovation, which has been valid and reliable then it was founded as much as eight kansei words. The kansei words were grouped into two factor by using factor analysis as shown in table 1.

Table 1. Extracted factor and factor loading of Kansei Word

Factor 1		Factor 2	
Traditional	.840	Clear	.821
Creative	.789	Exclusive	.806
Unique	.783	Artistic	.675
Natural	.615	Interesting	.669

Kansei word with largest loading factor can be named of factor because have bigger contribution. Factor 1, Traditional design selected because has the larger factor loading than creative, unique, and natural. In Factor 2, Clear and Exclusive have almost the same factor loading so in this factor we can name elegant because clear and exclusive included on cluster elegant Lokman and Kamaruddin (2010). These important kansei should be selected as design specifications in the final design.

3.2 The Proposed Design

Table 2 and table 3 show the result of mapping process to determine the physical design of innovative alarm clock based on factor of kansei words.

Table 2. Mapping Concept 1 : Traditional Design

Level 1	Level 2	Level 3	Level 4	Level 5	Physical Design Specification
Traditional Design	Traditional	Old View	Accessories	Alarm	<i>Othok-othok</i>
			Shape	Font Number	Hanacaraka (Aksara Jawa)
	Natural	Natural View	Material	Casing	Bamboo
				<i>Othok-othok</i>	Bamboo
				Button Lamp	Bamboo
				Background	Plywood
	Creaive	New Idea	Accessories	Alarm	<i>Othok-othok</i>
	Unique	Different	Shape	Font Number	Hanacaraka (Aksara Jawa)

Table 3. Mapping Concept 2 : Elegant Design

Level 1	Level 2	Level 3	Level 4	Level 5	Physical Design Specification
Elegant Design	Clear	Distinct	Color	Font Number	Black
				Clockwise	Black
		Bright	Color	Lamp	Black
	Exclusive	Selected	Shape	Casing	Beams
				Lower part of casing	Rectangle
				Background	Square
				Button Lamp	Circle
				Clockwise	Nectie Model

Level 1	Level 2	Level 3	Level 4	Level 5	Physical Design Specification
			Layout	Background	Middle
				Font Number	Circle
				Button Lamp	Middle
				Lamp	Hidden
				Othok-othok	Left Side
Artistic	Art	Engrave	Font Number	Engraved Font Number	
Interesting	Glossy	Color	Casing	Natural Gloss	
			Lower part of casing	Natural Gloss	
			Background	Natural Gloss	
			Button Lamp	Natural Dark Gloss	
			Othok-othok	Natural Gloss	

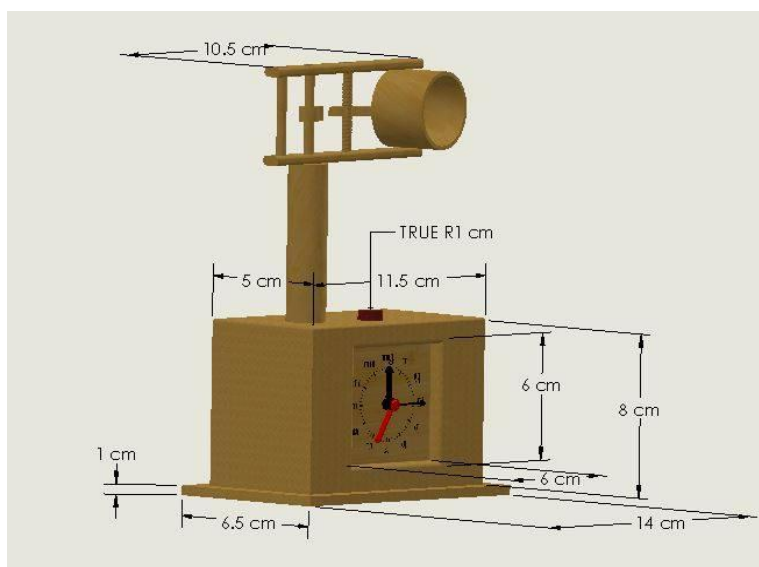


Fig. 1. Design of Innovative Alarm Clock

Table 2 obtained design parameters of innovative alarm clock based on traditional factor which has alarm othok-othok and Hancaraka Font. The material of casing, lower part of casing, lamp button, othok-othok toys is bamboo

and the material of background is plywood. The selected item according to the majority of respondents was the most it can represent traditional design (traditional, creative, unique, and natural).

While in Table 3 obtained parameters design innovative alarm clock based on group of elegant factor which has beam shape of casing, rectangle of lower part of casing, square-shaped of background clock, nectie model of clockwise shaped, circular shape of light switch, and standard shape for traditional toys othok-othok. The color of natural gloss selected in casings, lower part of casing, background of clock, and a toy othok-othok. Then color of natural dark brown was selected to the buttons and background of clock. Next based on the layout of consisting background of clock and lamp button positioned in the middle, Othok-othok toys positioned in the left side, the font composed of a circular, and hidden positioned of lamp. For artistically through carving font number. The selected item according to the majority of respondents was the most it can represent elegant design (clear, exclusive, artistic, and interesting). While for the determination of the size of all parts adapted from deformation by designer's idea.

3.3 Validating Design of Innovative Alarm Clock

Stuart Maxwell test of marginal homogeneity was conducted to validate the innovative alarm clock. This test was aimed to know whether it has significant differences between user needs and innovative alarm clock or no.

Tabel 4. Stuart Maxwell test of Marginal Homogeneity results

Kansei Word	Asym. Sig. (2-tailed)	Kansei Word	Asym. Sig. (2-tailed)
Natural	0.732	Clear	0.480
Interesting	0.683	Creative	0.705
Traditional	0.881	Exclusive	0.157
Unique	0.194	Artistic	0.590

Based on Table 4 z value was obtained range from 0.157 until 0.881. Since $z > 0.05$, the null hypothesis can be accepted. It means that innovative alarm clock design has been able to satisfy the feeling of consumers in the traditional and elegant design.

3. Conclusion

- The customer preferences obtained was innovative alarm clock concept, which was divided into two factors, were traditional design (which consist of traditional, creative, unique and natural) and elegant design (which consist of clear, exclusive, artistic, and interesting).
- Design innovative alarm clock was valid to satisfy customer criteria at 5 % of significant level.

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