

Redesign of Canting Cold Batik Using Nigel Cross Approach

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Abstract— Cold Batik is one example of environment friendly process batik and safe for children because it does not use a stove to heat the wax barrier during the process. The process of cold batik is the same as the process of hot batik but different in the canting. Canting is a tool to make a cross wax on the fabric so that the color will not be mixed. Cold batik canting is easy to use, just like writing with a pen. Craftsmen use of vinegar bottles or pipping bags as canting on a fabric. That is ineffective and efficient, and also not ergonomics. A redesign of the cold batik canting is required. In this study, an ergonomic cold wax canting based on hand anthropometry was designed. The eye canting made of aluminum pipe with a sharpened edge.

Keywords— cold batik, canting, ergonomics, nigel cross method

I. INTRODUCTION

Batik is a derivative heritage of the Indonesian nation. Batik is a special process on pictorial fabric by chalking up the wax so it has its own characteristics on the fabric [1]. Batik techniques that exist today are many varieties. We know batik with Hot wax technique, but nowadays, there is also batik with cold wax method process.

Batik concept is a barrier of color using wax or candles. Color barriers are made from a mixture of synthetic and non-synthetic materials such as gondorukem, parafin, microwax, resin tree sap, animal fat (gajih), coconut oil, bees wax (beeswax), and etc [2]. The wax is heated on the stove to melt and the liquid is used as a color barrier to the fabric. As technology advances, another method of batik is the cold wax method. The concept is the same as hot wax batik, but cold wax is more environmentally friendly and safer for beginners and children because there is no heating wax barrier[3].

Cold candles are made from environmentally friendly materials such as tamarind seed powder [4],

glutinous rice flour, wheat flour, and tapioca flour [5] and vegetable fats that are processed simply, and also have many advantages, including using materials that are more environmentally friendly than the hot wax method.

The canting used in the cold wax batik process at this time only uses a thin bottle with a pointed cap, which makes it easier to liquid wax, with a medium thickness, by pressing the bottle body. The obstacle that occurs is fatigue occurs when pressing the bottle to remove the wax liquid for a long time.

Design products are ideally designed according to consumers desires and consumers needs. Designers should have brainstorm their products design. Brainstorming is extracting creative ideas spontaneously based on the specifications of the needs of consumers[6]. Nigel Cross is one of the design method that involves the consumer in determining product design attributes. One of the tools used in the Nigel cross method is Quality Function Deployment (QFD) to determine product design characteristics [7],[8],[9]. One of the tools used in the Nigel cross method is Quality Function Deployment (QFD) to determine product design characteristics [7],[8],[9], which contains the stages of product design that ensure the quality of the final design [10] and also used as a process of redesigning a product in order to produce a quality product [11]. In this study will be designed specifically canting cold wax, which minimizes worker fatigue with problem definition is unchanged wax viscosity level and method perancanganya Nigel Cross in stages.

II. LITERATURE STUDY

2.1 Cold Wax Batik

arriers using cold wax made from flour porridge, added vegetable fat cooked until it resembles porridge. The variety of barrier fabrics are made from flour

tamarind seeds [4], tapioca flour, wheat flour, glutinous rice flour [5], porridge simbut [12], peel cassava [13], Gutta Percha [14] [15], and blue gel glue and acrylic paint [16].

Batik with cold barrier is quite safe in the process of batik especially for children and beginner. Lorod cold wax batik process is also safer than hot wax batik. Lorod cold wax proses just use plain water, thereby reducing environmental pollution by chemicals. Chemical waste is dangerous for humans, the environment and of course for the earth.



Figure 1. Simbut Pouridge as a wax batik [12]

2.2 Nigel Cross Theory

Nigel cross divided product design into seven steps, namely:

1. Clarifying object, this is the first step in product design concept. Clarifying object is a way of identifying the purpose of designing a product in a relationship diagram. The clarification stage are:
 - a) List design goals product.
 - b) Arrange the list in order of objectives from higher-level to lower-level
 - c) Draw a diagram of the destination tree, to show the relationships.
2. Defining Function. From the step before, there are many difference problem to reach the product goals. Defining function aims to establish the necessary functions and boundaries product design system. From that function the design was constrained.
3. Performance Specification. Product specifications must be limited and designed clearly and accurately. The goal at this stage is to create an accurate performance specification of a necessary design solution.
4. Determining Characteristic. Quality Function Development is used in determining product design characteristics with Nigel Cross's

approach. At this stage, it aims to set targets that will be achieved by the characteristics of product techniques so as to realize the needs of consumers.

5. Generating Alternatif. Create design alternatives in the generation of characteristics to achieve optimal solutions to the problem
6. Evaluating Alternatif. Evaluating alternatives aims to compare the utility value of design alternatives based on different performance and weighting.
7. Improving Details aims to increase the value of a product that distinguishes it from other products [.

III. METHODOLOGY

3.1. Approach Nigel Cross

In this study, Nigel cross was used as a method to find recommendation design cold wax batik canting. Methodology research in the Nigel cross method are shown in Figure 2

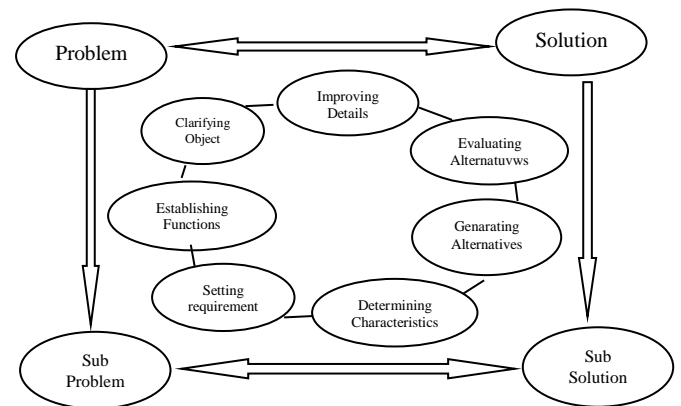


Figure 2. Methodology research

3.2. Descriptive Research

This method describes problems, looking at the situation and collecting data based on the facts that exist in the field.

3.3. Sampling Method

Sample is part of the population that represents all the characteristics of the population. In this reaseach used 50 respondents. Sampling is a method which describes problems, looking at the situation and collecting data based on the facts that exist in the field [17]. One of the sampling is simple random sampling. Simple random sampling is a sample technique that can be used to select sample data with no intentional choice or elimination of certain data.

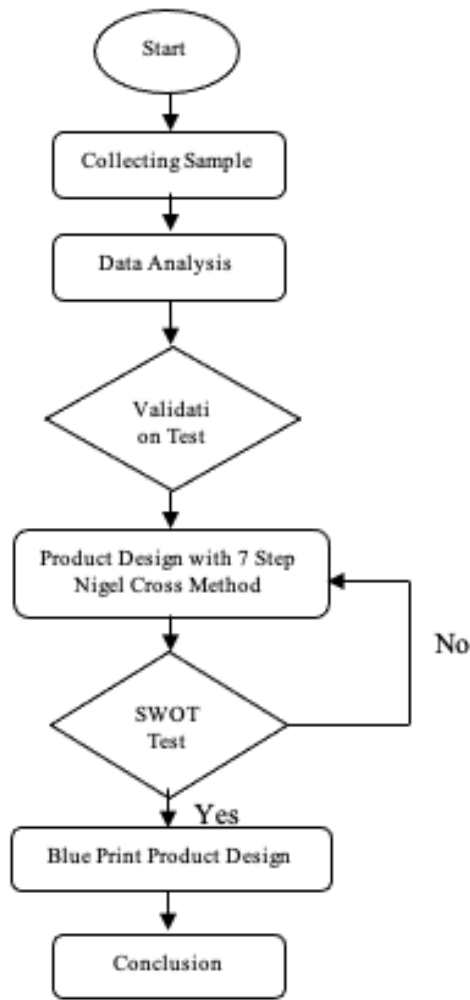


Figure 3 Design flowchart

IV. RESULT

1. Classification of Purpose, Function, and Determination of Needs.

The problem in this research is how make a new canting for cold wax batik which have an ergonomic body. The existing canting has uncomfortable shortcomings when operationalized, when a bottle filled with cold wax liquid is pressed for a long period of time, the hands will feel cramps, and fatigue.

Specifications of the results of brainstorming the design of cold wax batik canting are depicted in the purpose diagram tree as seen in figure 4.

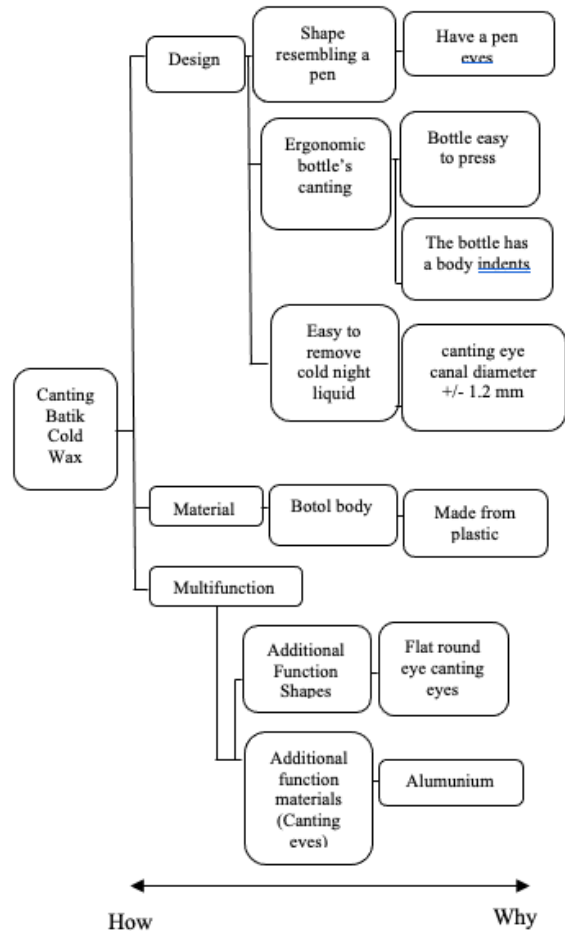


Figure 4. Clarifying Object

Consumer-based designs can be determined by their desired limits. D is consumer demand and W is accuracy with consumer expectations.

Table 1. Determination specification of Canting

No	Brainstroming Attribut	D or W	Questionnaire attribute
1	Shape resembling a pen	D	Shape resembling a pen
2	Ergonomic bottle canting	D	Thin plastic bottle material and easy to press
3	Canting eye canal diameter +/- 1.5 mm	W	Diameter canting eye canal +/- 1.2 mm
4	Made from plastic	W	Body canting made from plastic
5	Additional Function Shapes	W	Canting

2. Determination of characteristic

House of Quality (HoQ) is used by translating customer needs or requests, based on market research and data benchmarking, it must be met on new product design. HoQ is a frame work that applied on Quality Product Deployment (QFD). QFD is a method to capture requests from users to be applied into a product with good function. The result of quality function

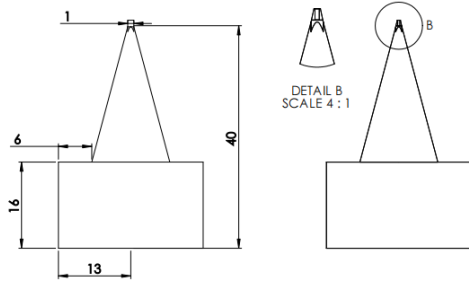


Figure 10. Canting eyes

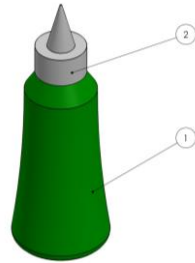


Figure 11. Final Design Canting

V. CONCLUSION

There are six attributes based on consumers desire and six technical characteristics in designed cold wax batik cantings. Based on the gap and expected improvement ratio value in QFD related with assessment of existing wax batik canting, the results the ease wax liquid comes out of the canting eye and the ergonomics of the bottle when held are priorities for design improvement.

The design of the cold wax batik canting is in the form of a bottle with a top diameter of 30 mm and a bottom diameter 50 mm, the canting eye is diameter 1.2 mm with sharpened edge. The shape of the bottle body adjusts to the user's comfort when applied wax on the patterned fabric.

ACKNOWLEDGMENT

For enthusiastically participating and supporting our study, we would like to heartily thank Politeknik Negeri Samarinda, Borneo Craft, and Atiqna Batics for their efforts and contributions in assisting us in this study.

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