Analysis of Consumer Preferences on Aceh Songket Product Using Conjoint Analysis (Case of Study: Banda Aceh City and Aceh Besar District)

Ilyas¹, S Zuhri¹, E Yusra¹, CM Maydini¹, F Erwan¹
¹Industrial Engineering Department, Universitas Syiah Kuala, Darussalam, Banda Aceh, Indonesia

E-mail: ilyasishak@unsyiah.ac.id

Abstract. Indonesia as the country rich in cultural heritage, has a variety of characteristics including woven fabric. Songket fabric is one form of woven fabric that is owned by almost every region. Aceh is one of the best producing areas for songket because of its quality. However, the limitations of the songket design made songket fabric not develop as the expectation. Therefore, the innovation is needed based on the consumer preferences by combining songket with other products. This research aims to identify the consumer preferences toward the product. The method that was used to analyze consumer preferences was conjoint analysis. The results showed that there were five attributes that influenced consumers in choosing songket products based on the highest level of importance for each attributes which were basic color at 35,381%, type of motive at 26,650%, type of product at 16,195%, materials at 11,718% and motive color at 10,057% while the most preferred combination product based on the highest utility level results from the level of each attributes were clothing product at 0,089, with black as basic color at 0,110, gold color as color motive at 0,012, using polyester and embroidery as materials at 0,059 and pinto aceh as a motive 0,089.

1. Introduction
As a country which has a long history in trading, Indonesia is a country with a strategic region in Southeast Asia. With this trade relationship, a craft of art in a number of regions in Indonesia is created, especially weaving [1].

Traditional woven cloth is a masterpiece which has been passed down for generations made by weaving weft and warp threads on a loom. Woven cloth consists of several types including, double tie weaving, weft weaving, warp weaving, simple weaving and songket weaving. Songket woven fabric is a woven fabric using a non-machine loom [2]. Songket is a famous type of woven fabric in Indonesia, although there are differences in the motives and ways of weaving between one region and another [3].

Aceh is one of the regions which has a special craft in the form of woven cloth, namely songket fabric. The difference between Aceh songket and other regions is the tight texture of the thread, namely bounded warp threads instead of the weft thread, as in songket fabric from other regions [4].

Until now, the market share for songket is quite extensive and developing in the local and national regions which are in demand by consumers from the middle to upper levels. Songket products on the market are still in the form of fabric while consumers want songket fabric combined with products which can be used daily, producing a variety of products. This phenomenon makes songket requires a touch of innovation in accordance with consumer needs that can be known through consumer desires.
In this case, the method that can be used to obtain consumer preferences is conjoint analysis. Conjoint Analysis produces a design of the product which most consumers want. Conjoint analysis aims to determine consumer perceptions of objects consisting of several parts [5]. Based on the background, the research was conducted on the analysis of consumer preferences for songket Aceh products with a conjoint analysis approach to help consumers in realizing their preferences for interested products.

2. Methods
This research was conducted around Banda Aceh city and Aceh Besar district. Researcher visited public places, community gathering and songket gallery. In the preliminary stage, problem identification was carried out by conducting a literature study and field study then formulating the problem and determining the objectives and benefits of the research.

Data collection was done by determining the initial factors and levels. There are 6 factors with each level, namely the product factor consisting of 6 levels, namely clothes, bags, wallets, sandals, caps and souvenirs. Then the motive factor consists of 2 levels, namely plain and mixed. Furthermore the basic color factor consists of 10 levels namely blue, black, brown, pink, green, red, orange, yellow, gray and purple. For the color factor motive consists of 3 levels, namely gold, silver and white. The material factor consists of 5 levels, namely embroidery polyester, rayon polyester, cotton embroidery, cotton rayon and silk. Finally, the last factor is the type of Aceh unique motive consisting of 15 levels, namely ake mira pati, awan meutalo, bukulah, bungong campi, bungong kupula, bungong mulu, bungong pucok reubong, halua reuteuk, Laalilahailallah sentence, kertah canden, pinto aceh, pucok aron, pucok geulima, pucok meuinya and reubong aceh (utom). Furthermore, the first stage questionnaire was made using the initial data, then the 50 people of respondents were determined. This first stage questionnaire was distributed to the 50 respondents and finally the questionnaires were collected for data recapitulation.

The recapitulated data was then processed using SPSS software using orthogonal arrays commands to produce a combination of factors and levels. Afterwards, the second stage questionnaire containing a combination of factors and levels selected was designed then continued by distributing it to the same respondents as the first stage. The results of the second phase questionnaire were collected to be recapitulated. The validation and reliable tests were conducted to the collected data to obtain valid and reliable data. If it invalid, then the questionnaire would be redistributed and if it was valid and reliable, it could be proceeded to data processing with conjoint analysis using SPSS software. Data processing was using the syntax command by using orthogonal design data and correspondent preference data.

3. Result and discussion
Determination of factors and initial levels is needed to obtain a combination of selected factors and levels which will be used as a stimulus card to be assessed by respondents through the second stage questionnaire. The selected factors and levels were determined based on the highest frequency results from the recapitulation results of all respondents in the first stage questionnaire that was up to a frequency limit of 5. The following is a summary of the factors and levels selected from the songket product.

| No. | Factor       | Level     |
|-----|-------------|-----------|
| 1.  | Product     | Clothes   |
|     |             | Bag       |
| 2.  | Basic Color | Black     |
Next to get a stimulation card combination in advance was to determine the presentation method. In the presentation method, the conjoint methodology used was traditional conjoint and the basic form model used was the additive model. The type of presentation method used was full profile because it is possible to reduce the number of factor comparisons using fractional factorial design.

Obtaining the results of this stimulation was done using SPSS software using the help of orthogonal arrays commands and resulting the orthoplan results which were 25 stimuli. Next is the display of stimuli cards (plan cards).

| No. | Card ID | Product Type | Basic Color | Motif Color | Material | Motive Type |
|-----|---------|---------------|-------------|-------------|----------|-------------|
| 1   | 1       | Clothes       | Red         | Silver      | Polyester Embroidery | Bungong Campi |
| 2   | 2       | Clothes       | Purple      | Gold        | Polyester Embroidery | Bungong Campi |
| 3   | 3       | Bag           | Black Pink  | Gold        | Polyester Embroidery | Pani Aron   |
| 4   | 4       | Bag           | Red         | Gold        | Polyester Embroidery | Pani Aron   |
| 5   | 5       | Clothes       | Black       | Gold        | Silk          | Bungong Meulu |
| 6   | 6       | Bag           | Purple      | Silver      | Silk          | Pucok Aron   |
| 7   | 7       | Bag           | Purple      | Gold        | Silk          | Pucok Aron   |
| 8   | 8       | Bag           | Red         | Gold        | Silk          | Bungong Meulu |
| 9   | 9       | Clothes       | Black       | Silver      | Silk          | Beleu Meulu  |
| 10  | 10      | Clothes       | Red         | Gold        | Polyester Embroidery | Pucok Aron   |
| 11  | 11      | Clothes       | Red         | Yellow Green| Silk          | Pucok Aron   |
| 12  | 12      | Clothes       | Red         | Silver      | Silk          | Pani Aron   |
| 13  | 13      | Clothes       | Red         | Yellow Green| Silk          | Pani Aron   |
| 14  | 14      | Bag           | Black       | Gold        | Polyester Embroidery | Bungong Campi |
| 15  | 15      | Bag           | Black       | Silver      | Polyester Embroidery | Bungong Campi |
| 16  | 16      | Bag           | Black Pink  | Silver      | Polyester Embroidery | Bungong Meulu |
| 17  | 17      | Clothes       | Black Pink  | Silver      | Silk          | Bungong Campi |
| 18  | 18      | Clothes       | Black       | Gold        | Polyester Embroidery | Pani Aron   |
| 19  | 19      | Clothes       | Purple      | Silver      | Polyester Embroidery | Bungong Meulu |
| 20  | 20      | Bag           | Red         | Yellow Green| Gold        | Silk          | Bungong Campi |
| 21  | 21      | Bag           | Red         | Yellow Green| Silver      | Polyester Embroidery | Pani Aron   |
| 22  | 22      | Clothes       | Black Pink  | Gold        | Silk          | Pani Aron   |
| 23  | 23      | Clothes       | Black Pink  | Gold        | Polyester Embroidery | Pani Aron   |

**Figure 1. Stimulation Card.**

The orthogonal design data was obtained from the results of the first stage questionnaire data processing, namely the data that showed a combination of factors and levels. This data was needed to be used as data contained in data processing syntax. Preference data was obtained from the results of respondents' answers on the second stage questionnaire. The data was in the form of rating choices on 25 stimuli cards (shown in Figure 1) by 50 respondents. This data was also needed to be used as data contained in data processing syntax. The syntax page on the SPSS application provides data
processing results, which contain the level of importance and the best combination of the second stage questionnaire. Following are the results of data processing syntax.

Figure 2 shows the number of factors and levels as well as the details of Songket products. The factors are product with clothes and bag as levels, basic color with black, red, purple and black pink as levels, motive color with gold and silver as levels, material with polyester and embroidery as levels and motive type with *Pinto Aceh*, *Bungong Campi*, *Bungong Meulu*, *Pucok Aron* as levels in sequence.

Figure 3 shows a description of the model of discrete value factors (product, basic color, motive color, material and motive type) meaning that the data was a qualitative data.
Figure 4. Utility Level.

Figure 4 shows the utility level of each level. The most preferred level is the highest positive value.

Figure 5. Importance Level.

Figure 5 shows the percentage of importance of the factors that most consumers pay attention in choosing songket products. It shows that color is the most preference factor for respondents in choosing songket product.

Figure 6. Research Correlation.
Figure 6 shows the correlation that the model obtained was accurate so the results of the data calculation were worthy of further analysis. This shows that the results of the model obtained were not much different from the actual opinions of respondents.

Based on the acquisition of utility level results, it could be known that the combination of the level factor of the songket product that was most preferred by consumers, was the highest level of utility of each level on each factor, then the combination of 18 cards which was the most desirable consumer were selected, namely clothing products with a black basic color, the color of the gold motive, made from polyester and embroidery and using aceh pinto motive. The following is an illustration of the preferences of selected consumers.

To discover the assessment of other combinations can be done by adding the value of each level contained at the utility level. The following is an assessment of consumer preferences for songket combination products from the most liked to the least preferred.

| Card | Value | Ranking |
|------|-------|---------|
| 1    | 0.154 | 6       |
| 2    | 0.062 | 12      |
| 3    | 0.061 | 13      |
| 4    | 0.125 | 9       |
| 5    | 0.108 | 11      |
| 6    | -0.231| 24      |
| 7    | -0.109| 22      |
| 8    | -0.126| 23      |
| 9    | 0.217 | 2       |
| 10   | 0.205 | 3       |
| 11   | -0.057| 20      |
| 12   | 0.161 | 5       |
| 13   | 0.026 | 17      |
| 14   | 0.056 | 15      |
| 15   | 0.059 | 14      |
| 16   | -0.096| 21      |
| 17   | -0.028| 18      |
| 18   | 0.359 | 1       |
To determine the consumer preferences against factors which are most desirable, can be seen based on the acquisition of importance, namely the level of importance. The following is a graph of the acquisition of the importance value of factors in songket products.

![Importance Value of Songket Product Attributes](image)

Based on Figure 8, the consumer preference results were obtained that the factor which most influences consumers in choosing songket products were the basic color then the type of motive, the type of product, the material and finally the color of the motive.

4. Conclusion
The conclusions of this research are:

a. Factors and levels selected based on the results of consumer preferences for Aceh songket products were factors of product type consisting of clothing and bag levels; basic color factors with levels of black, red, purple, red yellow green and black pink; color factor motives consisting of gold and silver color levels; material factors consisting of embroidery polyester and silk levels and factors of the type of motive with the levels of aceh pinto, bungong campi, bungong meulu, and aron pucok motives.

b. Factors that influence consumers in choosing songket products based on their level of importance were the basic color factor with the highest percentage of other factors in the amount of 35.381%. Then the next sequence was the type of motive at 26.650%, the type of product at 16.195%, songket material at 11.718% and the last was the color of the motive with the lowest percentage at 10.057%.

c. The best combination was obtained based on the highest utility value at the level of each factor so that 18 cards were selected to be the most preferred combination of consumers namely the clothing product type with black basic colors, gold motive colors, using polyester and embroidery material.
and finally with aceh pinto motive. The utility levels of each level were 0.089 for the clothing level, 0.110 for the black color level, 0.012 for the gold motive color level, 0.059 for the polyester and embroidery material level and 0.089 for the aceh pinto motive level.

5. References
[1] Viatra A W and Triyanto S 2014 Seni Kerajinan Songket Kampoeng Tenun Di Indralaya Ekspresi Seni 16 November (2) 168–183
[2] Marianti M M and Istiharini 2014 Analisis Karakteristik dan Perilaku Konsumen Tenun Songket Palembang
[3] Purwanto R and Siregar S M 2016 Sejarah Songket Berdasarkan Data Arkeologi Siddhayatra 21(2) 97–106
[4] Leigh B 1989 Tangan-Tangan Trampil, Seni Kerajinan Aceh (Hands of Time, the Crafts of Aceh) Djambatan
[5] Santoso S 2010 Statistik Multivariat Konsep dan Aplikasi dengan SPSS PT Elex Media Komputindo