WRISTWATCH DEVELOPMENT BASED ON KANSEI ENGINEERING

THESIS

Submitted to International Program Industrial Engineering Department in Partial Fulfillment of Requirement for Bachelor Degree of Industrial Engineering Universitas Islam Indonesia

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AUTHENTICITY STATEMENT

For the sake of Allah SWT, I confess this work is on my own work except for the excerpts and the summaries that each of their sources has already been cited and mentioned. If in the future my confession is proved to be wrong and dishonest resulting the violence of the legal regulation of the papers and the intellectual property rights, then I would have the will to return my degree to be drawn back to Universitas Islam Indonesia.

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DEDICATION PAGE

To my beloved familiy, Father, Mother & Sister

My thesis supervisor, Dr. Drs. Imam Djati Widodo, M.Eng. Sc

IP FTI UII batch 2013

And All my dearest friends

And International Program Industrial Engineering Univeristas Islam Indonesia

Thank you for everything.

MOTIVATION PAGE

"If the pains of this world tire you, do not grieve. For it may be that Allah wishes to hear your voice by way of duaa. So pour out your desires in prostaration and forget about it and know; that verily Allah does not forget it."
(Ibn al Qayyim)

"For indeed, with hardship will be ease. Indeed, with hardship will be ease."
(QS. Al-Insyirah: 5-6)

"Allah does not burden a soul more than it can bear."
(Qs. Al Baqarah: 286)

"It always seems impossible until it's done."
(Nelson Mandeola)

PREFACE

Assalamualaikum Wr. Wb.

Alhamdulillahi Rabbil'alamin, gratitude and praise to Allah SWT for the strength, grace, and guidance, to help the Author in completing this thesis. During arranging this thesis, Author had faced so many challenges and problems. However, Author had obtained so many helps and supports, either directly or indirectly, from some parties involved. On this occasion, Author would like to appreciate and thank to all the parties below:

a. Dr. Drs. Imam Djati Widodo, M.Eng. Sc as the supervisor who always guidance and provide knowledge to assist Author in completing this Thesis
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c. All my dearest friends who give support and help for the Author to finish this Thesis
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Author realize that this thesis is still not perfect and still have some weaknesses so that Author really expect any criticism and suggestions from readers for the perfection of this report. Hopefully this report and information included will be useful for Author and give benefit to other parties who read this.

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Yogyakarta, March 2018

Heavy Zerry Novibrilliawan

ABSTRACT

Nowadays, Wristwatch is not only to wear only to see time. the person wearing the watch also has various purposes. Some peoples buy wristwatch are just to see the time, some wear it for the needs of fashion, and there are also buying watches for investment. From that prespective, the consumer's desire to wristwatch different based on their needs. Therefore, to design a wristwatch that oriented on costumer's desire then it is necessary to collect *Kansei* word that fit with costumer's desire. One of method that can be applied to gain costumer's psychological desire is *Kansei* Engineering. The *Kansei* words collected that passed the validity and reliability test namely Strong, Fit size, Comfortable, Safe, Multifunction.The *Kansei* words available will be integrated with item design and category for wristwatch then spread it in semantic differential form and calculate the conjoint analysist. For *Kansei* word Strong can be desribed with combination of 4 cm for Body Diameter, Rubber for Strap Material, Bright for Color, Number for Dial, None for Feature and Round for Shape. For *Kansei* word Fit size the combination is 3.5 cm for Body Diameter, Nylon for Strap Material, Dark for Color, Number for Dial, None for Feature, and Square for Shape. For *Kansei* word Comfortable, the combiantion is 3.5 cm for Body Diameter, Bracelet for Strap Material, Dark for Color, Digital timer for Feature, and Squarre for Shape. For *Kansei* word Safe the design combination are 3.5 cm for Body Diameter, Bracelet for Strap Material, Bright for Color, Number for Dial, Digital timer for Feature, and Square for Shape. For the fifth *Kansei* word which is multifunction, the design combination are 4 cm for Body Diameter, Rubber for Strap Material, Bright for Color, Needle for Dial, None for Feature, and Round for Shape. The Pearson's R and Kendall's tau output also shown that the corelation number is high with the significant level below 0.05 which means that these sample can represent the majority of consumer's desire. The database also developed to make combination of Two *Kansei* words item design.

Key words: Wristwatch, *kansei engineering, conjoint analysis*, database

TABLE OF CONTENT

LIST OF TABLE

LIST OF FIGURE

CHAPTER I

INTRODUCTION

1.1 Background

Consumer satisfaction is defined as attitudes, research and emotional response of consumers after the purchase process derived from the comparison of the actual performance impression of a product with the hope and evaluation experience consuming a product or service (Widyastuti, 2013).While brand loyalty a positive attitude and customer attachment based on feelings of fun, familiar and proud to be a brand user where consumers buy brands consistently as a form of commitment. Consumer's need on technical aspect of product desing is becoming a trend in product development to determine their success in the market (Lokman, 2010). What's difficult in here is that implicit needs such as consumer's emotional experience are hard to calculate than explicit needs which way clearer and easier to describe (Lokman, 2010). Evolution in product design have resulted on equally good products in the market with many inventions. Because of that, broader choices of product can be offered to cunsomers to make it more advanced. To fullfill market demand, producers pursue to design a product that interest consumer's satsifaction and technical aspects. According to the development of techniques, the difference in the basic functionality of the product getting less attention, but on the other hand the supporting function of the product has become an important factor in attracting the consumer's attention. Generally, consumer's don't have access to the product's designers they associate with. Thus, consumer's opinion of the design is based on their interaction with the product itself (Clarkson, 2004). Factors that involve the psychological side of the consumer or also called human *Kansei* are very important to note.

The company in the field of fashion business is one company that always make various models of products and emerge every year that makes market share always excited, including models for watches. The models of a product are very important if it really matches the specifications desired by consumers. Today the manufacturing industry is beginning to use the principles or marketing concept strategies associated with new products. The marketing concept strategy embraces the principle of production based on customer preferences and conformity. The definition of marketing cocnept is that an organization strive on satisfying its consumers at a profit (Houston, 2012). In the business world, companies observe how consumers behave in using their products or services. Every consumer has a different tendency. They convey their desires with abstract words. Therefore, product development will be very profitable for the company if they can capture the minds of consumers and can show them the models that are very suited to their wishes.

In this study, researchers chose watches as objects for the Kansei Engineering method. This is reinforced by vastly growth of wristwatch in market and community. Wristwatch matches with peoples with lots of activity so that it can remind the time they have practically. In big cities many peoples feel lack of time to do their activities. Watch by itself are becoming an inseparable accessory of fashion that use to exploitation color schemes, material and manufacturing differentness of these composed products. Many companies offer watch products with their own advantages. In this era of globalization, many want to improve the appearance, especially among men. Many are styled with watches. Because humans have different tastes, thus brands and forms of watches are also diverse. This situation also provides many advantages. In the watch business is so widespread because of the opportunities among small children, adolescents, adults to parents can use it according to age. Therefore, to design a watch oriented for costumer affective side then it is necessary *Kansei* word to fit with the wish costumer. One of the methods that can be used is with *Kansei* engineering that is used in seeking the consumer's desire from the psychological side. *Kansei* Engineering was introduced in Japan to combine emotional factors (aesthetics or "*Kansei*") on product design (Schutte, 2002). With that become as the main motive of research in order to get consumer's satisfaction by help them to give precise specification of wristwatch.

Based on existing literature, so far has not found the design of unisex watch with *Kansei* engineering method. Therefore, in this research will be done research on the design of the watches by aligning the affective desires of users.

1.2 Problem Formulation

Based on the description in the background above, the problem that come up in the research would be formulate and generate a research question as follow:

1. How to implement *Kansei* engineering method to develop the design of desired wristwatch?
2. How to make wristwatch recommendation according to *Kansei* word with conjoint method?

1.3 Objectives of Research

1. Able to implement *Kansei* engineering method to develop the design of deisred wristwatch.
2. Able to make wristwatch recommendation according to *Kansei* word with conjoint method.

1.4 Scope of Problem

Every research that done requires the scope and focus of the study is directed. Therefore, this research should be given the restriction, so it can be focused and produce good research. Restrictions on the problem as follows:

1. In this research only study about *Kansei* Engineering as a product design.
2. The object that will be examined is Wristwatch.
3. Validity and Reliability Test calculation do not use software other than IBM SPSS version 16.

4. Conjoint analysist calculation do not use software other than IBM SPSS version 16.
5. The processed of making the database do not use software other than using Microsoft Access 2012.
6. The design of wristwatch do not use software other than using Paint Tool SAI.

1.5 Benefit of Research

The benefits that expected in this research are:

1. For researcher

   To add insight and knowledge about product design by using *Kansei* engineering method and get real picture between theory obtained with facts in field.
2. For Society

   It is hoped that this research can be used as a reading reference to increase knowledge for the readers. In addition, it can be used as a reference for further research either for students or other society.

1.6 Systematic Writing

Writing this study was based on the rules of scientific writing in accordance with the systematics as follows:

CHAPTER I INTRODUCTION

This chapter contains a preliminary description of research activities, on the background of the problem, formulation of the problem, the objectives to be achieved, the benefits of research and systematic writing

CHAPTER II LITERATURE

In this chapter elaborated on the theories of reference books and journals as well as the results of previous research related to the research problem which is used as reference for problem solving

CHAPTER III RESEARCH METHODOLOGY

Contains the description of the framework and lines of inquiry, the research object to be studied and the methods used in the study.

CHAPTER IV COLLECTION AND PROCESSING DATA

Contains the data obtained during the research and how to analyze the data. Data processing result is displayed either in the form of tables and graphs. What is meant by processing the data also includes analysis of the results obtained. In this section is a reference to the discussion of the results to be written in Chapter V.

CHAPTER V DISCUSSION

Contains discussion of the results of data processing that has been done in research. Compatibility with the objectives of research so as to produce a recommendation.

CHAPTER VI CONCLUSIONS AND RECOMMENDATIONS

Contains the conclusion of the analysis made and any recommendations or suggestions on the results achieved in the problems identified during the study, so it needs to be done on assessed in future studies.

REFERENCES

ATTACHMENT

CHAPTER II

LITERATURE REVIEW

In this chapter, will be explaining the literature review studies which divided into two, inductive and deductive. Inductive study is a study from previous research that already has reputation. Besides, deductive study is study that would be explain about the basic theory that has relation with research that would be conducted from the text books, etc. Inductive and deductive study need to be done to find out the gap between previous study and the research that would be conducted and also to be done to avoid the plagiarism. This literature review will be divided in to several sub chapters.

2.1 Inductive Study

Based on previous literatures. The studies related to designing a product by using *Kansei* Engineering methods have already existed, but not for Watches selection. The previous research only doing study about product design using *Kansei* Engineering. There at least 11 study that can be assesed about the implementation of *Kansei* Engineering.

Hadiana (2016) asses Design of *Kansei* Engineering support system using Fuzzy Multiple Attribute Decision Making. This research objective is to develop an *Kansei* Engineering system to support customer's decision for customer in online shopping, so consumer could choose the desired product. The research tried to adopt Fuzzy Multi Attribute Decision Method (FMADM) into *Kansei* Engineering method especially in order to make a decision to select one from many alternatives.

Hassan et al. (2011) asses the *Kansei* Engineering and Ergonomic Design of products. This research mainly aims to explain the cocnept of *kansei* and it's psition in ergonomics especially on safety, industrial engineering and specifically on ergonomic

product design and industrial designers. The output of this research is the adoption of neurological consideration on *Kansei* with the definition of ergonomics emphasizing in health and productivity. This concept also run as recitification of Maslow hierarchy of needs, since in Maslow prespective only answer the basic of human needs in the pyramid form become disadvantaged to achieve higher levels, while in the current model needs are not in hierarchical order, but in conjuction, which means that the evolution is the broaden growth in aswering all aspects of human needs.

Mu'alim et al. (2014) have done research about package redesign using *Kansei* Engineering Method. In that research, they got 11 *Kansei* words that can be implement to make new package design of soybean package which are X1 Good (nice colors, cool, color is attractive), X2 light (bright), X3 plastic material good (thick plastic), X4 is no brand, X5 is no code kosher, X6 is different from the others, X7 is no composition, composition, X8 logo, X9 manufacturer's phone number, there is no expiration X10, X11 food origin. The result of the elimination phase that has been obtained is the result of the interest rate to make the design concept madura's otok nut packaging is then performed on the nut packing design application according to the words which came from elimination stagem.

Mei et al. (2014) made a research about concept design of footwear product with *Kansei* Engineering and Kano Model integration. Based on *Kansei* Engineering approach, the image or the expectations of consumers for products such as footwear sandals men's emotional and psychological feelings can be known through words *Kansei* . *Kansei* words are: comfortable, soft, unique, smooth, luxurious, color, light, safe, strong, modern, durable, patterned, casual, elegant, cheap, sporty, attractive, usable, not slippery, and proportionate.

Nurfathia et al. (2015) asses the package design of loose powder using *Kansei* Engineering method. This research help to redesign the package of loose powder that perviously has too big packaging, the lid easy to come off, the powder easy to sccatter, no puff, and easy to break. The research provides new design of loose powder package using Hayashi's Quantification Theory Type-I. The design has small size with diameter

of 65mm and thickness of 25mm, has a glass and filter. The lid is open by flip similar with the filter and the filter has many holes so that the powder that came out is alot. For the package design, transparent pot is given so that the powder can be seen easily and the flower motive application on the lid so that it gives feminime impression.

Ratih et al. (2014) asses the *Kansei* word for culture based product to fullfill the maslow demand. This research purpose is to identify culture products and *Kansei* words based on Maslow needs. Based on the analysis above, conclusions were obtained, namely Product-oriented culture is determined based on four aspects, namely the material culture, behavior, language, and the idea of ideas. *Kansei* word Classification is determined by selecting the cultural products that are at the level of Maslow is then combined with the predecessor research so that it can be mapped according *Kansei* appropriate levels of Maslow's hierarchy. Product mobile phones and clothing dominated the psychological level of need, the car and the seat on the level of safety needs, the food at the level of love and belongness. Development of products based on the level of Maslow's needs is one strategy to attract consumers. This was done in view of the human tendency towards a higher level in order to fulfill their needs.

Yang et al. (2011) done research about constructing a Multiple Affective Responses (MAR) Hybrid *Kansei* Engineering System (HKES) to facilitate the development of product form design. HKES is divided into two sub system, which are Forward *Kansei* Engineering System (FKES) and Backward *Kansei* Engineering System (BKES) . FKES is used to yield product alternatives and BKES used to predict affective response of new product designs. The result of this research is in the BKES for modeling consumer's Affective Response, the SVR model of every affective dimension was trained using the product sample's form features and the AR evaluation data collected from the questionnaires. In the FKES for utilizing design alternatives, the Multi Objective Genetic Algorithm (MOGA) based searching is able to make Pareto - optimal front solutions which completed with the input MARs specified by a product deisgner.

Pham et al. (2015) create a model using *Kansei* evaluation integrated with Fuzzy rules and Self-Organizing Map for Bio-Food product Evaluation. The output of

simulation showed that customer behaviors, added with expert preferences matched with bio-food products. The simulation can dynamically evaluate properties of bio-food on map outputs as well as the optimal decisions. These approach using Kansei evaluation is to quantify expert sensibilities and emotions regarding with bio-food quality in market and it's research environments.

Yan et al. (2008) conduct the research on *Kansei* evaluation upon on Multi-Attribute Fuzzy Targer Oriented Decision Analysis prioritation. Because of the vagueness and unpredictable cunsomer's preferences, three types of Fuzzy targets are explained to represent the consumer's need. In their research, they concerened with *Kansei* evaluation narrowing on consumer's psychological needs and feelings based on so-called *Kansei* attributes, which reflect aesthetic aspects of human perception on products.

Chou (2014) simulate the Fuzzy Linguistic Preferences to Kansei Evaluation. This study explains a fuzzy linguistic preference approach for *Kansei* evaluation. The conducted approach is based on fuzzy linguistic variables related with the fuzzy weighted average techniques for combining *Kansei* preference information. It matches human cognitive processes to improve solving processes of problems dealing with lack of certainty, precision, and subjective vagueness. Even, the preference variables ar combined by means of the FWA methodology. The use of FWA allows the evaluators to incorporate unaccounted information, incomplete information, non-obtainable information, and partially ignorant facts into decision simulation. Hence, this method is able of capturing evaluator's appraisals of abiguity and is valid for take care of *Kansei* evaluation problems.

Frans et al. (2015) developed analog watches design with percentage as timepiece. The final design was made using the clock base Raketa 2623H which has a 24-hour mechanism. The typeface on the dial uses the DIN-Regular typeface, which is the typeface used for traffic signs in Germany. This use takes into consideration the visibility of this typeface which is high on even small sizes. The clock has two ends to show the time in hours and the percentage of days. The shape of the circle on one end of the needle and the light dark area on the dial is a representation of the sun's journey that day, so that

the user can find out during the day even though the day is indoors. In the middle of the clock there is also a second indicator for the user to keep a reference to the time that keeps running. In this model the clock case is made using ABS plastic materials, while the dial and needle use stainless steel. For the back of the clock glass is used in order to display the inside of the clock mechanism.

Mohamed (2014) asses the study about *Kansei* Engineering implementation on Car Center Stack Design. In this research, *Kansei* engineering was conducted to determine tangible design needs of Malaysian young adults for car center stacks. Ten car center stack design samples from B segment cars and 12 *Kansei* words were applied in this case. 30 respondents between 18 to 30 years old took part in the Kansei evaluation study. The data were analyzed using Partial Least Squares using MATLAB software. For Chevrolet Aveo center stack design was reported to be the most emotionally appealing for both male and female respondents. Honda Fit and Volkswagen Polo center stack designs were found to be the most unappealing to respondents. Highest rank *Kansei* words for the Chevrolet Aveo design were "exclusive","elegant" and "high tech". For all these Kansei words, design elements such as "Black" and small rectangular LCD screens were unlikely associated with the same *Kansei* words.

Table 2.1 Previous Literature Study

No	Researchers	Object of Research/Title of Study	Method(s)
1	Hadiana (2016)	*Design of Kansei Engineering support system using Fuzzy Multiple Attribute Decision Making.*	Kansei Engineering, Fuzzy Multi Attribute Decision Method
2	Hassan et al (2011)	*Kansei Engineering and Ergonomic Design of products.*	Kansei Engineering, Ergonomic, Literature Review
3	Mu'alim et al (2014)	*package redesign using Kansei Engineering Method.*	Kansei Engineering
4	Mei et al (2014)	*about concept design of footwear product with Kansei Engineering and Kano Model integration.*	Kansei Engineering, Kano Model
5	Nurfathia et al (2015)	*package design of loose powder using Kansei Engineering method.*	Kansei Engineering
6	Ratih et al (2014)	*the kansei word for culture based product to fullfill the maslow demand.*	Kansei Method, Literature Review
7	Yang et al (2011)	*constructing a Hybrid Kansei Engineering System (HKES) Based on Multiple Affective Responses (MARs)to facilitate the development of product form design.*	Hybrid Kansei Engineering System
8	Pham et al (2015)	*Kansei evaluation intehrated with Fuzzy rules and Self- Organizing Map for Evaluation of Bio-Food Products.*	Kansei Evaluation, Fuzzy rules, Self-Organizing Map (SOM)
9	Yan et al (2008)	*Kansei evaluation based on prioritized Multi – Attribute Fuzzy Target- Oriented Decision Analysis*	Kansei Evaluation, Fuzzy rules
10	Chou (2014)	*Fuzzy Linguistic Preferences to Kansei Evaluation.*	Kansei Evaluation, Fuzzy rules
11	Frans et al (2015)	*Development of analog watches design with timepiece as percentage*	Product Design
12	Mohamed (2014)	*Kansei Engineering implementation on Car Center Stack Design. In this study.*	Kansei Engineering

From the inductive study that already done, finally found the state of the art that would be use in this research, which is develop database of watches specification based on *Kansei* Engineering. This research will be conduct to give option of wristwatch design based on *Kansei* word.

2.2 Deductive Study

2.2.1 Consumers Needs in Product Development

Consumers are the main key for developing new products, and understanding consumer needs is required to determine product success. In the other hand, consumer involvement in product development may not always result in expected result, interaction with consumers can reduce unpredictable and create foresight to meet better future of consumer's needs.(Majava et al., 2014) . Consumers orientation is crucial for a market orientation strategy, and various methods to identify consumer needs have been conducted. Even so, global market with high amount of consumers necessitate distinctive efforts to understand consumer desire for new product development.

New Product Development (NPD) includes the activities of firm that lead to a stream of new or changed product market offerings over time. This consists the development of opportunities, their selection and change into artifacts (manufactured products) and activities (services) offered to consumers, and improve institutuionalization in the NPD activities themselves (Loch et al., 2008). Successful new products are key element for growth and the strengthening of a company's competitiveness. Even so, not all new product will success on the market, for example the potential economic success is set against the risk of a new product failure (Merz, 2017).

In the last few years, the amount of new product introductions improve drastically as the industry became more aware of importancy of new products into business. Accordingly, managing the NPD process has become a challenge for companies as it needs extensive financial and human resources and is time sensitive (Bhuiyan, 2011). Although the extensive study on how to achieve success in NPD, companies continue to

deliiver products that fail and because of that NPD ranks among the riskiest and most confusing jobs for most firms. As the of NPD's dollar investment increased, the pressure to maximize the return on those investments also increase. It worsen as an estimated 46 percents of resources allocated on NPD are spent on products that are rejected or fail to generate an adequate financial return.

Even though the risk is embeded in NPD, it can be measured by applying a systematic framework for managing new products activities. One such framework for managing new product activities was generated by the management consulting firm of Booz, Allen, and Hamilton (currently popular as Booz and Company). Illustrated in figure 2.1, Booz, Allen, and Hamilton's New Product Process breaks down new product development into seven sequential stages: New Product Strategy Development, Idea Generation, Screening and Evaluation, Business Analysis, Development, Testing, and Commercialization (Fortenberry, 2013).

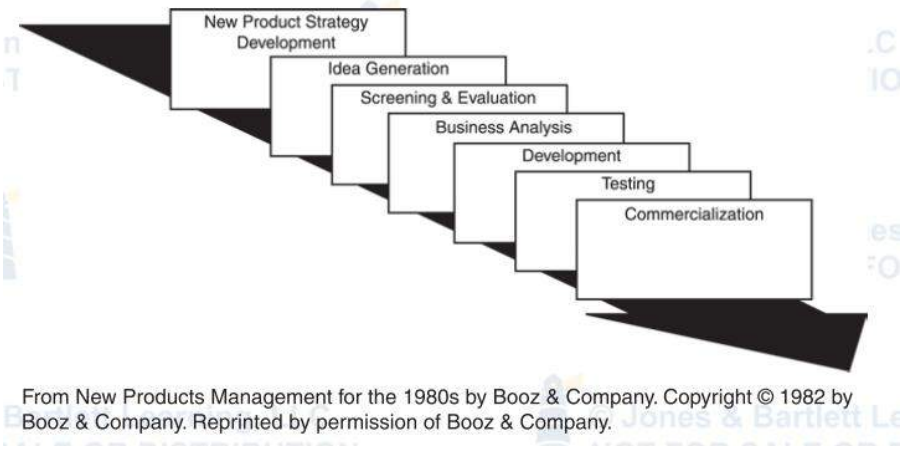


Figure 2.1 Booz et al. New Product Development sequence

a. Idea Generation

This is first step of New Product Ideas. A company generally has to develop many ideas in order to find a good and useful ones. Product idea generation could be come from either internally (R and D department, executives, scientists, engineers, manufacturing staff, sales) or externally (consumers, competitors, distributors and suppliers). Idea Generation, at individual or team level, emerges as an crucial component of creativity and consequently of the

innovation process. The most innovative firms moslty exploit various sources of ideas from new products as well as various menas to process those ideas. They also need to improve employee's imagination to work the pipeline that nourishes the design and development of new products.

b. Idea Screening

This is the first assessment of new product idea. It embroils filtering new product ideas in order to find good ideas and reject poor ones as soon as possible. In this step, only product ideas that will transform into beneficial products are applied.

c. Concept Development and Testing

In this stage, product idea is converted into verbal or visual form, further explaining the basic of the concept, with initial ideas of impediments, materials and technologies. Moreover, in concept testing, new product concepts has been tested with samples of target consumers to find out if the concept have strong impression to consumers.

d. Marketing Strategy Development

This includes designing of an initial marketing strategy for a new product based on the product concept. The marketing strategy statements divided into three parts; description of the target market, the planned product positioning, and the sales, market share, and profit goals for the starting years.

e. Business Analysis

This includes summary of the sales, costs, and profit projections for new product to evaluate whether these factors satisfy the firm objectives. Moreover, at this step, a decision is conducted to ascertain the technical

feasibility of the product, the products market potential and finally, the products financial contribution to the company.

f. Product Development

In this Part, the product concept is being developed into physical form and prototypes in order to make sure that the product idea can be transformed into a real product.

g. Test Marketing

This is the stage of new product development in which the product prototype and marketing division are simulated in more realistic and real time market scheme.

h. Commercialization

This part simply includes the introduction of new product into the market through any of the promotional tool of marketing. In promoting a product, such new product could be distributed rapidly, exclusively, or carefully.

Company and organizations need to maintain dynamic flow of ideas if they want to compete favorably and attract improved consmuer patronage. To maintan a head of competitors, company need to develop a high volume of ideas and transform them into commercial and technical success. This when efficienctly and competently carried out will resultantly attract different types of product adopters with innovate behavioral competencies. (Adiele, 2012).

2.2.2 Affective Product Design

Affective product design intention at incorporating consumer's affective desires into design variables of a new product so as to optimize consumer's affective pleasure (Chan

et al., 2011). The main obstacle for affective design is how to apply consumer's affective needs accurately and subsequently to develop products that match their desires. In many cases, it is difficult to capture consumer's affective desire due to their linguistic origins. Sometimes, without any technical experience, the consumers do not know what they really want untill their prespective preferences are violated. In real life, consumers, marketing folks and designers employ different sets of context to express their understanding of affect information (Jiao et al., 2006).

Evolution in product design have led to many developments, outputing equally good quality products overwhelming the market. rightly, consumers have broad choices of product and become more sphisticated. Prosecuted by the market demand, company pursue to design product that intereset consumers (Lokman, 2010).

Lokman stated that some methods have been proposed to improve the valuation of consumer's satisfaction in the way to understand the consumer's need and interest. Namely, there are Quality Function Deployment (QFD), Conjoint Analysis, Voice of Customer (VoC), *Kansei* Engineering (KE).

a. Quality Function Development (Akao, 1997) is a sequential approach to design based on a close awareness of consumer needs, coupled with the integration of coorporate fucntional groups. It includes in translating consumer desires (for example, the alleviate of writing for a pen) into design characteristics (pen ink thickness, pressure on ball point) for each step of the product development.

b. Conjoint Analysis (Green et al., 1990) is any dechiperment method that estimates the structure of consumer's prespectives (for example, estimates preference parameters such as part-worths, importance weights, ideal points), given their overal evaluations of a set of alternatives that are prespecified in terms of levels of different categories.

c. Voice of Customer (Gaskin et al., 1993) Is a product development method that creates a specific set of consumer needs and desire which are organized into hierarchical structure, and then prioritized in terms of relative importance and satisfaction with current options.

d. *Kansei* Engineering (Nagamachi, 1995) A methodology that combines Kansei and engineering realms in order to realize product that match consumer's desire and needs. This is conducted by analyzing consumer's Kansei and translates how the product design obtain this kansei. It gathers the consumer's Kansei experience and establishes mathematical prediction models of how Kansei is relevant to product physical characteristics. KE goals to improve human well-being by viewing into physiological and psycological aspects that affect on satsifaction.

In particular, the last methodology mentioned, Kansei engineering is on different interest. Since it is the specific tool especially designed for calculating emotional consumer needs and transform it into products. Kansei engineering has probability come furthest in the strive of introducing engineering methods into desired consumer needs.

2.2.3 *Kansei* Engineering

Kansei engineering is similar to psychology in form of capturing the view that exist in a consumer's mind. It has connection to humanity engineering in terms of transforming the image into understandable design characteristics based on Nagamachi (2011). From this point of view, *Kansei* engineering is known as "a mechanism that technologically translates consumers" *Kansei* into product's design elements. "It is a process in which the consumer's *Kansei* is first gathered, and then it's connection to the product design is determined. Next, a database or rule base is created that clearly explains the relationship, which enables product development to be conducted each time by referring to it. This has already been simulated in automotive industry, home electrical appliances, construction machinery, and costumes. It has even been conducted in landscaping.

The sequence of Kansei starts with collecting the sensory related functions such as feelings, emotions and intuition, which means of the fifth senses (hearing, taste, vision, smell,, and skin sensation). Figure 2.2 explains the process of Kansei and fifth senses within the structure of the brain.

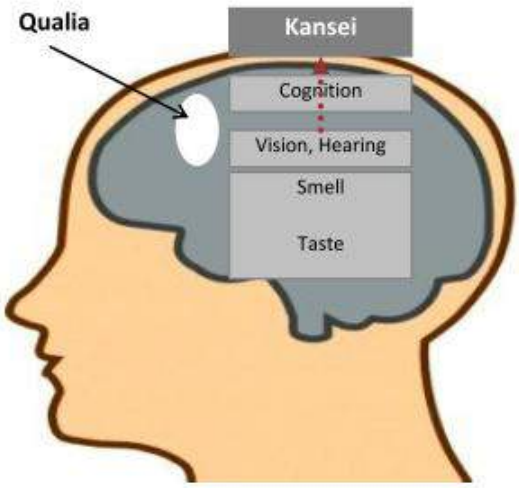


Figure 2.2 The process of Kansei on mental function

When these senses are activated, psychological cognition concerned with perception, judgement and memory will increase. in the scheme of going into an new restaurant, your vision, taste, smell, and cognition would judge whether the restauran is "very welcoming" and or provide "good service". These are "*Kansei*". The *Kansei* emerges from cognition with several contributing sensations in area.

Lokman (2010) also simulate the framework of KE to conclude the principles in applying KE hitherto practiced. The techniques used in each steps of KE implementation is subsequently reviewed.

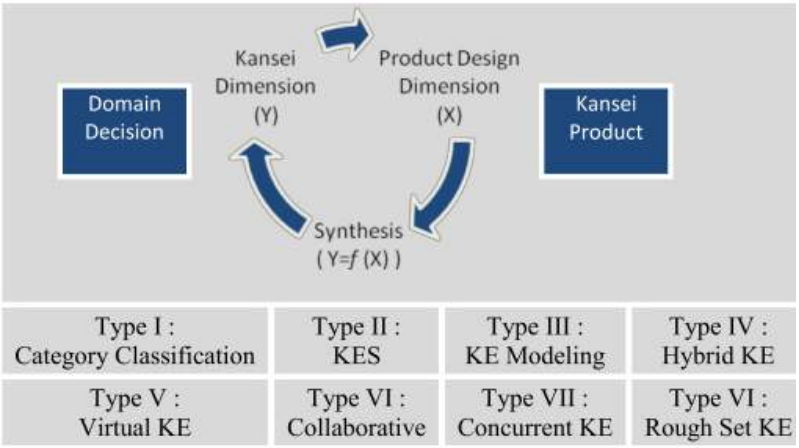


Figure 2.3 Kansei Engineering Framework

As illustrated in the principle, which are subject to expansion at any point of time even during the publication of this article. The types are briefly described as the following:

a. KE Type I: Category Classification. Category classification is a break down technique from a targeted concept of a new product to the associated subjective *Kansei* to the objective design parameters. The procedure involves qualitative research method with the use of KJ Method or alternatively called affinity diagram. Famous example of this category implementation is in the development of the most successful sports car the world has ever seen in the history by Mazda named Miata.

b. KE Type II: KE System. This is Computer Aided KE System (KES). The KES comprises databases and inference engine to support a computerized system that handles process of interpreting consumer‟s feeling and emotion to perceptual design element. Example of this type of KE implantation can be seen in house design support system, flower arrangement, and fashion image system.

c. KE Type III: KE Modeling. This type of KE utilizes mathematical modelling as logic in a computerized system. This is mainly used to handle fuzzy logic

to form machine intelligence. Word sound diagnostic system is an example of the implementation of this KE type.

d. KE Type IV: Hybrid KE. This is a type of KE System (KES) by Forward KES and Backward KES to form Hybrid KES. This type of KE enables iterative process from design element to *Kansei* evaluation. Hybrid KE implementation can be seen in the study of high heel design and in the work of Matsubara and Nagamachi.

e. KE Type V: Virtual KE. Virtual KE incorporates KE techniques into Virtual Reality, and enable consumer to examine *Kansei* product in a virtual world. Example of this type of KE implementation can be seen in the design of kitchen cabinet by Matsushita Electric Works.

f. KE Type VI: Collaborative KE. In this type of KE, designers and or consumers in different places utilize a mutual *Kansei* database and collaborate through a network to develop a new product design. Example of this type is the Internet Collaborative Design System.

g. KE Type VII: Concurrent KE. In Concurrent KE, representatives from different department in a company join together and perform *Kansei* evaluation and analysis. It can also be done by assembling experts in related discipline to perform Concurrent KE to develop a targeted concept of product design. The approach enables the holistic perspective of product design such as from the aspect of engineering to product quality to marketing. Example of the implementation can be seen in the research of shampoo container design.

h. KE Type VIII: Rough Sets KE.Rough Sets KE is claimed to be the best type to deal with ambiguous and uncertain *Kansei* data (Nagamachi et al., 2006). Using this type, *Kansei* that is in general has nonlinear characteristics can be treated independently and decision rules can be determined by group meaning

in If-Then style. Example of the type can be seen in the study of beer can design.

2.2.4 Data Adequacy Test

Questionnaire data distributed as many as 50 questionnaires to the respondents who have been determined. From the recap of the questionnaire results, the researcher performs the test of data adequacy. The amount of data is said enough if the value of $N \geq N'$. Below is the result of calculation of data adequacy test.

$$N' = \left[\frac{\frac{k}{s}\sqrt{N.\sum Xi^2 - (\sum Xi)^2}}{\sum Xi}\right]^2$$

Where:

N’ = Number of experiment needs to be done

k = Level of confidence of experiment. (k = 2, 1-α=95%)

s = Degree of acuracy of experiment (5% = 0,05)

N = Numbe rof experiment that has been done which are 50

Xi = Observation data

CHAPTER III

RESEARCH METHOD

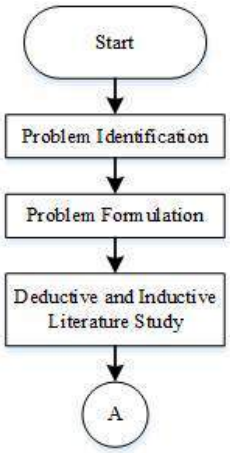
3.1 Research Object

This research object will be Male and Female at age of 17 to 60 years that know or used wristwatch.

3.2 Research Variable

Research variable that used in this research will be divided into two which are independent varable and dependent variable. Independent variable which are *Kansei* word will act as research input which is the base design of wristwatch based on orthogonal plan. While dependent variable which are element designs based on available item and category act as research output's base design in accordance to *Kansei* words psychological measurement on costumer demand.

3.3 Conceptual Model



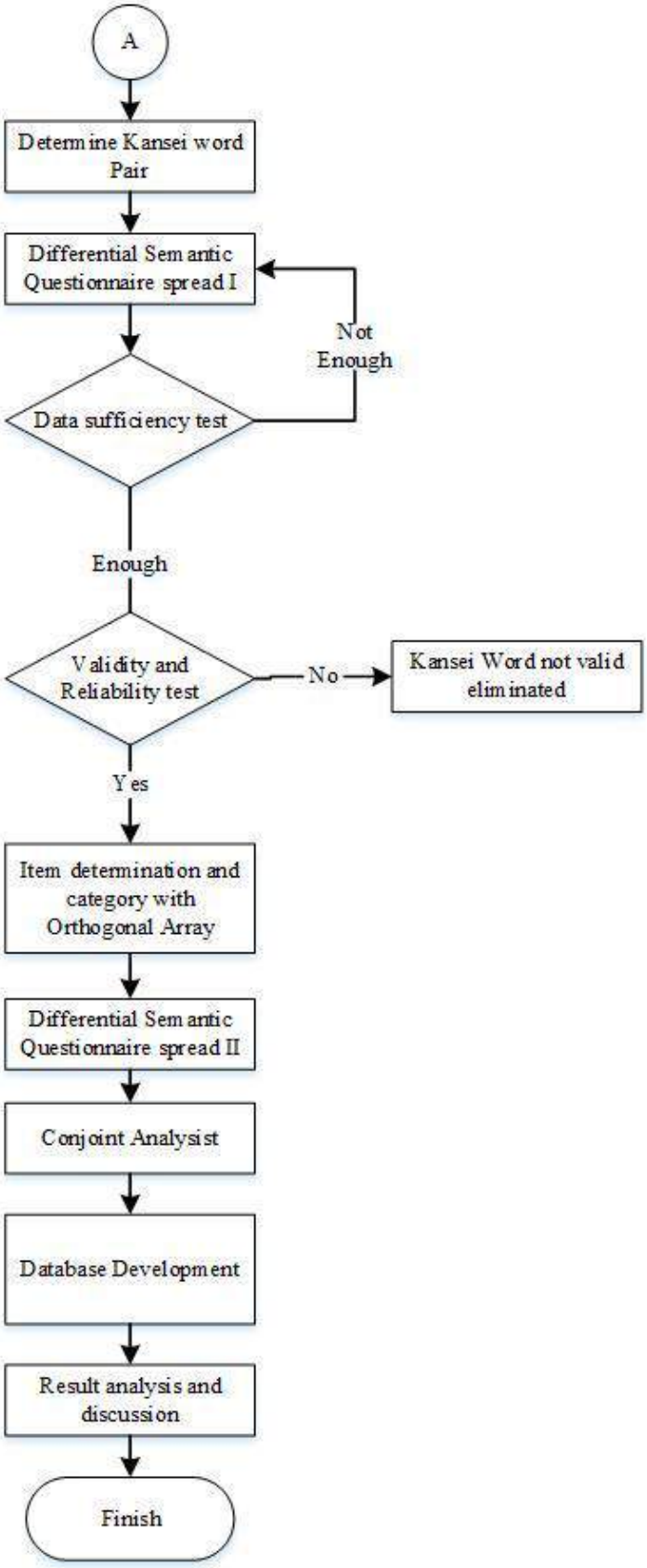


Figure 3.1 Flowchart of Research

3.4 Data Requirement

3.4.1 Primary Data

The primary data is the data that obtained from the observation. After doing the observation, the researchers doing interview with the owner. From the interview that has been done, the researchers found several data that might support the background, goal that want to achieve, clusters, nodes and also the alternatives.

Primary data in this study is data obtained through:

a. Interview, the methods used to obtain information related to the research by conducting question and answer directly to the speakers.
b. Observation, the methods used to collect data by direct observation with the object of research. It aim to see to know the physical items and categories of products to be designed.
c. The questionnaire, the methods used for data collection by providing a sheet of questions to objects of research are then filled in accordance with the actual situation. The research object is drawn at random by researchers.

Questionnaire in this study using questionnaires three stages, namely:

1. Questionnaire *Kansei* word
   Used to know the words *Kansei* based on the consumer desire wrist watch.
2. Evaluation Questionnaire Semantic Differential I
   Used to determine respondent rspond to *Kansei* Word given. Respondents choose points on each *Kansei* word of the number of the existing scale with expectations of respondents to the product images presented in front of them.
3. Evaluation of Semantic Differential Questionnaire II
   Used to determine the wishes of consumers or respondents to the relationship between *Kansei* word with product design elements.

Evaluation Questionnaire Semantic Differential I and II above using the Semantic Differential developed by Osgood. Where semantic differential a questionnaire to provide a numeric scale between words that are related. Both the questionnaire in this study using a scale of 5.

3.4.2 Secondary Data

Is data obtained by collecting articles, journals, books, and take advantage of the Internet media that can be used to support research or data collection were obtained from literature, and references that support the establishment of a basic theory in this study.

CHAPTER IV

DATA COLLECTING AND PROCESSING

4.1 *Kansei* Word determination

The first step of determining *Kansei* Word is by providing an open questionnaire about the question that contains what is desired from the Wristwatches to the respondent to be tested. Determination of *Kansei* Word is based on perceptions or views of testers or respondents to the product shown. From the initial research found 14 *Kansei* Word. Then this word is given to the respondents to be researched.

Table 4.1 *Kansei* word taken from observation

No	*Kansei word*
1	Attractive
2	Affordable
3	Strong
4	Fit size
5	Simple
6	Lightweight
7	Durable
8	Comfortable
9	Safe
10	Sporty
11	Elegant
12	Masculine
13	Casual
14	Multifucntion

4.2 *Semantic Differential* I Questionnaire Evaluation

Then a list of selectable *Kansei* words for focusing its development. Then create a semantic description, which is to make the opponent of the selected *Kansei* word which is then distributed to 50 respondents this is so that respondents more easily assess whether

the product image is on the positive side of the *Kansei* word or the negative side of *Kansei* word. The given scale is 1 to 5 explanations of 5 Semantic Differential scales are as follows:

1 = If the product image is very incompatible with the *Kansei* word on the left of the scale

2 = If the product image does not match the *Kansei* word on the left of the scale

3 = If the product image is average

4 = If the product image matches with *Kansei* word on right scale

5 = If the product image very matches with the *Kansei* word on the right scale

From the questionnaire that already shared, the summary recaitulation can be seen in attachment B.

4.2.1 Data Adequacy Test

Questionnaire data distributed as many as 50 questionnaires to the respondents who have been determined. From the recap of the questionnaire results, the researcher performs the test of data adequacy. Below is the result of calculation of data adequacy test. The amount of data is said enough if the value of $N \geq N'$, So the number of observations that must be done is as much as:

$$N' = \left[\frac{\frac{2}{0.05}\sqrt{50x509 - 19881}}{141}\right]^2 = 38.55$$

From the calculation is obtained that all *Kansei* word is $N \geq N'$ so that the sufficiency of data can be stated that the data is enough to be a sample.

4.2.2 Validity Test

After the data are sufficient, it will be continued with validity test. A data is considered as valid if the *Kansei* word being tested in the questionnaire can be describe to the propose product of wristwatch. Selected *Kansei* word must be relevant with the desire of

cunsomers, if the elimination of *Kansei* only based on research journal and expertise's opinion, may not fit the needs of today's consumers. Software that used in data processing is IBM SPSS Version 16. A data stated to be valid if the value of r calculation ≥ r table . The measurement using fault tolerance of 0.05 / 5% and the value of df = 50-2 = 48, so that the value r table is equal to 0.2787. The result from the initial interest test in semantic differential will used to knwo whether the data is valid or not. The result of the test for the first iteration can be shown on table below:

Table 4.2 First iteration of validity test

No	Kansei word	Corrected Item-Total Correlation	r Table	Explanation
1	Attractive	0.189	0.2787	Invalid
2	Affordable	0.207	0.2787	Invalid
3	Strong	0.510	0.2787	Valid
4	Fit size	0.280	0.2787	Valid
5	Simple	0.203	0.2787	Invalid
6	Lightweight	0.283	0.2787	Valid
7	Durable	0.149	0.2787	Invalid
8	Comfortable	0.295	0.2787	Valid
9	Safe	0.419	0.2787	Valid
10	Sporty	0.161	0.2787	Invalid
11	Elegant	0.281	0.2787	Valid
12	Masculine	0.241	0.2787	Invalid
13	Casual	0.436	0.2787	Valid
14	Multifunction	0.309	0.2787	Valid

On table found six word grouped invalid data which are Attractive, Affordable, Simple, Durable, Sporty, Masculine because the r calculation is under 0.2782. Invalid attribute removed from the initial list. While a valid attribute will tested for the second iteration of validity test, then the result can show on table.

Table 4.3 Second iteration of validity test

No	Kansei word	Corrected Item-Total Correlation	r Table	Explanation
1	Strong	0.488	0.2787	Valid
2	Fit size	0.334	0.2787	Valid
3	Lightweight	0.254	0.2787	Invalid
4	Comfortable	0.312	0.2787	Valid
5	Safe	0.455	0.2787	Valid
6	Elegant	0.208	0.2787	Invalid
7	Casual	0.349	0.2787	Valid
8	Multifunction	0.302	0.2787	Valid

Result based second iteration on table above can be stated that *Kansei* word Lightweight and elegant grouped into invalid data which lesser than 0.2787. The researcher conclude there are 6 variables that will continued to next iteration test. While a valid attribute will tested for the second iteration of validity test, then the result can show on table.

Table 4.4 Third iteration of validity test

No	Kansei word	Corrected Item-Total Correlation	r Table	Explanation
1	Strong	0.541	0.2787	Valid
2	Fit size	0.444	0.2787	Valid
3	Comfortable	0.288	0.2787	Valid
4	Safe	0.432	0.2787	Valid
5	Casual	0.264	0.2787	Invalid
6	Multifunction	0.344	0.2787	Valid

Result based third iteration on table above can be stated that *Kansei* word casual grouped into invalid data which lesser than 0.2787. The researcher conclude there are 5 variables that will continued to next iteration test. While a valid attribute will tested for the second iteration of validity test, then the result can show on table.

Table 4.5 fourth iteration of validity test

No	Kansei word	Corrected Item-Total Correlation	r Table	Explanation
1	Strong	0.516	0.2787	Valid
2	Fit size	0.462	0.2787	Valid
3	Comfortable	0.298	0.2787	Valid
4	Safe	0.420	0.2787	Valid
5	Multifunction	0.339	0.2787	Valid

Result based fourth iteration on table above can be stated that *Kansei* word casual grouped into invalid data which greater than 0.2787. The researcher conclude there are 5 variables that will continued to next reliability test.

4.2.3 Reliability Test

A reliability test conducted to know whether the data is stable and purposed to measure. Software that used in data processing is IBM SPSS Version 16. A data stated to be reliable

if the value of r alpha ≥ r table. Significance level is 5% with df = 50-2 = 48 is 0.2787. The result of reliability test can be shown on table and table below.

Table 4.6 cronbach's score

Cronbach's Alpha	N of items
0.639	5

With score of Cronbach's Alpha is 0.634 which $0.6 \leq \alpha \leq 0.8$ then categorized that data is accepted. Then continued the measurement for each attribute on following table.

Table 4.7 Reliability test result

No	*Kansei word*	Cronbach's Alpha if Item Deleted	r Table	Explanation
1	Strong	0.639	0.2787	Reliable
2	Fit size	0.639	0.2787	Reliable
3	Comfortable	0.639	0.2787	Reliable
4	Safe	0.639	0.2787	Reliable
5	Multifunction	0.639	0.2787	Reliable

Table describes the result of reliability test, which obtained that all of the data are reliable with alpha value greater than 0.2787. After conducted the validity and reliability test showed that there are 8 *Kansei* Words to use as a research instrument.

4.3 Item and Category Determination

Before undergo the semantic differential 2 questionnaire spread, we need to make item and category determination for wristwatch.These also include the variation category of each item design. These item design and category are taken from the booklet, magazine, and commercial wristwatch's website. After collecting the reference data, we decide to use 6 design items, namely body diameter, material strap, color, dial, feature and shape. Of the six items, researcher decide to use total of 13 categories. The item design and categories will be put in one table and be seen in the table below.

Table 4.8 Wrist watch item and category

No.	Item	No.	Kategori	Notasi
1	Body Diameter	1	3 cm	X11
		2	3.5 cm	X12
		3	4 cm	X13
2	Strap Material	1	Bracelet	X21
		2	Leather	X22
		3	Nylon	X23
		4	Rubber	X24
3	Color	1	Bright	X31
		2	Dark	X32
4	Dial	1	Number	X41
		2	Needle	X42
5	Feature	1	Calendar	X51
		2	Digital Timer	X52
		3	Combined	X53
		4	None	X54
6	Shape	1	Round	X61
		2	Square	X62

The next step is to determine the sample based on predetermined items and categories. Samples that have been determined by item and category are samples of the wristwatch to be designed. The samples can be seen in Table below:

Table 4.9 Categories and items for each sample

Card ID	Body Diameter	Strap Material	Color	Dial	Feature	Shape
1	4 cm	Nylon	Dark	Needle	Combined	Round
2	4 cm	Bracelet	Dark	Number	Digital Timer	Square
3	4 cm	Leather	Bright	Number	None	Square
4	3.5 cm	Bracelet	Dark	Needle	None	Round
5	3.5 cm	Rubber	Bright	Number	Combined	Square
6	4 cm	Rubber	Bright	Needle	Calendar	Round
7	3 cm	Leather	Dark	Needle	Calendar	Square
8	3 cm	Nylon	Bright	Number	Digital Timer	Round
9	3 cm	Bracelet	Bright	Number	Calendar	Round
10	3 cm	Nylon	Bright	Needle	None	Square
11	3 cm	Rubber	Dark	Number	None	Round
12	3.5 cm	Nylon	Dark	Number	Calendar	Square
13	3 cm	Bracelet	Bright	Needle	Combined	Square
14	3.5 cm	Leather	Bright	Needle	Digital Timer	Round
15	3 cm	Leather	Dark	Number	Combined	Round
16	3 cm	Rubber	Dark	Needle	Digital Timer	Square

4.4 *Semantic Differential* II Questionnaire evaluation

The Semantic Differential Questionnaire II is a continuation of the Semantic Differential I quiz given to the same respondents. Respondents evaluated each *Kansei* word for each given sample. Samples given to the respondents are a number of 16 samples, samples are given in the form of images in accordance with the specifications of each sample. The Semantic Differential II questionnaire also uses a semantic scale with scale 5 and the command is the same as the Semantic Differential I questionnaire. The purpose of the second evaluation of Semantic Differential II is to analyze the relationship between each *Kansei* word and the samples according to the respondent's image. The second questionnaire form can be seen in Attachment A. After the questionnaire was distributed, the questionnaire result was captured, then calculated the average value of each *Kansei* Word in each sample. The average value of the results of the Semantic Differential II questionnaire data is used as input in the conjoint analysis process. The average value of the Semantic Differential II questionnaire data can be seen in Attachment B.

4.5 *Kansei* engineering

The average value of each *Kansei* word in each sample was processed using IBM SPSS version 16 software using conjoint analysis. Conjoint analysis is used to find out the relationship between design elements with *Kansei* word in accordance with the second questionnaire.

4.5.1 Minimum sample determination

Minimum sample determination based on prepared items and categories, which consist of 17 categories with 6 items. So, the minimum sample required is calculated by equation (3.3) in this study: Minimum sample = (17-6) + 1 = 12. The number of samples given is 12, so the number of samples is sufficient according to the minimum sample size.

4.5.2 Conjoint Analysis

From the calculation of conjoint analysis can be known the deviation value of each *Kansei* word on each sample. The output of SPSS calculation results and the result of conjoint analysis of each *Kansei* word can be seen can be seen in Attachment C.

From the deviation calculation results can be seen the value of each category located on the positive side of the *Kansei* Word or negative side of the *Kansei* Word. The negative value on the *Kansei* Word indicates that the design category is more inclined towards the left side of the *Kansei* word. The value of each of these categories is used as an approach of the design elements. If in one side *Kansei* Word there are two categories then selected category with the biggest deviation value. In Table 4.10 shows conjoint analysis output for strong *Kansei* word based on the deviation value of each category on the *Kansei* Word:

Table 4.10 Conjoint Analysis Output for Strong Kansei word

Item	Category	Utility Estimate	Std Error
Body	3 cm	0.067	0.239
Diameter	3.5 cm	-0.164	0.281
	4 cm	0.097	0.281
Strap	Bracelet	-0.053	0.311
Material	Leather	-0.266	0.311
	Nylon	0.0.85	0.311
	Rubber	0.234	0.311
Color	Bright	0.082	0.179
	Dark	-0.082	0.179
Dial	Number	0.080	0.179
	Needle	-0.080	0.179
Feature	Calendar	-0.080	0.311
	Digital Timer	-0.117	0.311
	Combined	-0.037	0.311
	None	0.234	0.311
Shape	Round	0.056	0.179
	Square	-0.056	0.179

For the complete output of the conjoint analysis, it can be seen on attachment C. This Table 4.11 will show the summary of design element approach for each *Kansei* word.

Table 4.11 Design Element Approach

Kansei Word	Strong	Fit Size	Comfortable	Safe	Multifunction
Body Diameter	4 cm	3.5 cm	3.5 cm	3.5 cm	4 cm
Strap Material	Rubber	Nylon	Braceelet	Bracelet	Rubber
Color	Bright	Dark	Dark	Bright	Bright
Dial	Number	Number	Number	Number	Needle
Feature	None	None	Digital timer	Digital timer	None
Shape	Round	Square	Square	Square	Round

4.5.3 Importance Factor Analysis

Calculating the importance of factors used to determine the percentage (%) factors in the contribution of *Kansei* word. Percentage of the importance of factors can describe the image or image of consumers and respondents to a product based on *Kansei* word. In the calculation of the significance factor analysis is obtained from the processing of conjoint analysis and the result can be seen in Attachment C. The results of the analysis of the importance of factors can be seen in the table 4.12.

The biggest important factor for Strong *Kansei* word is the Strap material with 28. 523% and the least important for strong *Kansei* word is Dial with 7.999%. This shows, strap material is a factor that affects the addition of strong image than other factors. The biggest important factor for Fit size *Kansei* word is the Strap material with 25.863% and the lowest importance for fit size *Kansei* word is Dial with 10.313%. This shows, Strap material is a factor that affects the addition of Fit size image than other factors. The biggest important factor for Comfortable *Kansei* word is the Strap material with 25.863% and the least importance is Dial with 10.313%. This shows, Strap material is a factor that affects the addition of Comfortable image than other factors. The biggest important factor for Safe *Kansei* word is the Strap material with 25.624% and the least for Safe *Kansei* word is Color with 10.526%. This shows, Strap material is a factor that affects the addition of strong image than other factors. The biggest important factor for Multifunction *Kansei* word is the Feature with 26.554% and the lowest is Color is 9.773%. This shows, Feature is a factor that affects the addition of Multifunction image than other factors. For overal, Starp Material has the biggest importance factor because its affect the most on four out of five *Kansei* words which are Strong, Fit size, Comfortable, Safe. For the least importance factor , Dial affect the least on three *Kansei* words which are Strong, Fit size, Comfortable, and Color affect the least on Safe and Multifunction *Kansei* words. These output table basically will help consumer to get information of what specification of wristwatch should have if consumer want wristwatch based on *Kansei* word available.

Table 4.12 Importance Factor Analysis

	Strong	*Fit size*	*Comfortable*	*Safe*	*Multifunction*
Body Diameter	17,597%	18,105%	19,047%	18,931%	15,985%
Strap Material	28,523%	25,863%	25,863%	25,624%	26,266%
Color	8,743%	10,335%	10,335%	10,526%	9,773%
Dial	7,999%	10,313%	10,313%	11,203%	11,403%
Feature	26,485%	24,186%	24,186%	22,496%	26,554%
Shape	10,653%	11,199%	11,199%	11,220%	10,019%

4.6 Database Management System development

The making of database system is used to simplify consumers to choose wristwatch based on element design on every *Kansei* word. When we click on one *Kansei* words and Two *Kansei* words in this application, it will show all the design elements wristwatch need to have completed with images form product. The making of this database application is using Microsoft Acces 2012. The steps of application showed below:

1. Start Microsoft Access 2012

To run Microsoft Access 2012 can be done by selecting the Start button on the taskbar, select All Programs, then select Microsoft Office and click Microsoft Office Access 2012 option.

2. Create *Database*

There are various options for creating databases. To create a new database, click on the Blank Database icon. Then name the database in the text box to the right of the display. To put the database file directory, click on the icon  and place it as desired. Then click Create to create the database.

3. Creating and Filling Data Table

The tables created in this database are the Available *Kansei* word table, one *Kansei* word, two *Kansei* and Product Image table. To create a Available *Kansei* table, click create bar and then click table after that will show empty table view. To fill the table field then click on the table then go to home bar click View select Design View. Fill the name field with *Kansei* _Word_Tersedia and select Short Text on Data Type then right click save and name this table with *Kansei* Word Tersedia. Then right click on table head then select Datasheet View, then fill all available *Kansei* word that is Safe, Strong, Multifunction, Comfortable, and Fit size then right click table head and click save.

Next create a table of One *Kansei* Word and Two *Kansei* Word. Click the create menu and then click the table after it will look blank table view. To fill the table field then right click on table head then select Design View. Fill the field name with *Kansei* Word and select Short Text on Data Type then right click save and name this table with Satu Kata *Kansei.* Next create a table of Two *Kansei* Words in the same way, click the create menu and then click the table after it will look empty table view. To fill the table field then right click on table head then select Design View. Fill the field name with *Kansei* _Word_1 and select Short Text on Data Type then fill in the next field with *Kansei* _Word_2 and select Short Text on the Data Type then right click save and name this table with Dua Kata *Kansei* .

Next create a Product Image table, click the create menu and then click the table after it will look empty table view. To fill the table field then right click on the table head then select Design View. Fill the field name with *Kansei* _Word_Tersedia and choose Short Text in Data Type, fill in the next field of watch item design that is Body Diameter, Strap Material, Color, Dial, Feature, Shape and then select Short Text on Data Type, fill the next field again with Image and select Attachment in Data Type then right click save and give the name of this table with Product Image. Product Image table filled with data in accordance with the combination that occurs between One *Kansei* Word and Two *Kansei* Words.

4. Create *Query*

Query function in this application is to Automatically search the data of design elements in accordance with the desired *Kansei* word. By creating an if-then rule, you will get the desired product design element. In Microsoft Access the if-then rule uses the IIF function with the rules of writing IIF ([field name as key] / [condition], <true result / true condition>, <incorrect result / wrong condition>). Queries created in this database are Query One *Kansei* Word, Query Two *Kansei* Word, Query Product Image One *Kansei* Word, Query Product Image Two *Kansei* Word. To create a One *Kansei* Word Query, click the create menu and click Query Design. Select Table Satu Kata *Kansei* then click add and close. In the table under the first column fill with the table select Satu Kata *Kansei*

and select the field *Kansei* _Word. In the next column is filled with if-then formula of each item so that in the second column filled with the if-then formula for *Kansei* word Body Diameter, the third column filled with the if-then formula for *Kansei* word Strap Material until the seventh column filled with the if-then formula for Shape.

To enter the if-then formula then right-click on the second column field then click Build so it looks like this:

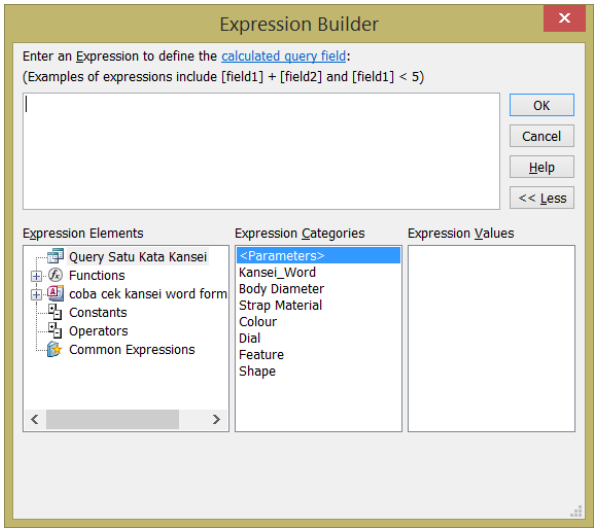


Figure 4.1 Expression Builder

Enter the function formula in attachment D and then click OK. Do the same for other items. If all rules if-then formula has been filled then save the query with the name "Query Satu Kata *Kansei* ".

Next make a Query of Two *Kansei* Words do the same way click menu create and click Query Design. Select Table Dua Kata *Kansei* then click add and close. In the table under the first column fill with the table select Dua Kata *Kansei* and select the field *Kansei* _Word_1. In the second column fill with the table select Dua kata *Kansei* then select field *Kansei* _Word_2. In the next column is filled with if-then formula of each One *Kansei* Word item in the third column until the eighth column. In the next column is filled with if-then formula of each Two *Kansei* Word item in the ninth column until the fourteenth column. In the fifteenth to the twentieth column filled with the if-then formula for the item combination. The if-then Query Dua Kata *Kansei* formula can be seen in attachement

E. Later, the same actions will be performed for other items. If all rules if-then formula has been filled then save the query with the name "Query Dua Kata *Kansei* ".

5. Create Form

The function of form in DBMS is to make it easier for consumers in choosing watch based on *Kansei* word. In this DBMS there are several forms which are: Main Menu Form, One *Kansei* Word form, and Two *Kansei* Word Form.

To create One *Kansei* Word Form we need to close all table and query except Query One *Kansei* Word. Later, the create menu can be clicked followed by Form Design. We can costumize and arrange tables as interesting as possible. To make it easier to move the position of the tables, we can select all followed by clicking the arrange menu and then *remove layout*. To make the text box for *Kansei* word avaliable selection, followed by clicked on design menu bar on form design tools, then on Text Box on controls then left click on the form. *Kansei* _Word will be named for the text box. We need to show the unbound box with the selection of *Kansei* Word that available. To make sure that consumer will not find *Kansei* Word that is unavailable, we need to change the text box into the combo box by right click on the text box then click *Change To*, followed by click on *Combo Box*. Next we need to make text box to show item design for every *Kansei* Word. Similar with make text box for *Kansei* Word, the same action will be performed by click on Design in Form Design Tools, click on Text Box on Controls. Create Text Box for every Item Design which are for Body Diameter, Strap Material, Color, Dial Feature, Shape. Next we need to show the Product Image for every *Kansei* ord by click on Design on Form Design Tools then click image on Controls. Drag to the form to make how big the picture we want then click cancel when the Insert Picture menu shows up. Finally, we need to put Record source for the Satu Kata *Kansei* form and Control Source for every text box and image box. First click on Design on Form Design Tools. Click Property Sheet in Tools. To put control source on the Satu Kata *Kansei* Form, left click outside the form then click on the property sheet, then click on data tab. On the Record source, click on the drop-down tab on the right, click on Query Satu Kata *Kansei*. Then for *Kansei* Word text box, click on Property Sheet click on the Data tab, choose *Kansei*

Word for the Control Source and choose *Kansei* Word Tersedia for Row Source. Similar for Body Diameter through Shape Text box, click on the Body Diameter text box then click on Property Sheet, click on the Data tab then choose Body Diameter as Control Source. For Image Box we used Expression Builder to put the Control Source by click the image box then click on Property Sheet, click on the Data tab and click the three dots on the right of Control Source bar then the Expression Builder will show up. Fill the Expression Builder with the if-then formula in Attachment D. Save form with name "Satu Kata *Kansei* ".

These steps are similar to make Dua Kata *Kansei* Form. Start from clicking the create menu then Form Design. Arrange tables as interesting as possible, to make it easier to move the position of the tables do select all then click the arrange menu and click *remove layout*. To make the text box for *Kansei* word avaliable selection, click on design menu bar on form design tools, click on Text Box on controls then left click on the form. Change the box text to *Kansei* _Word_1. Do the same step to make *Kansei* _Word_2 text box. We need to show the unbound box for *Kansei* _Word_1 and *Kansei* _Word_2 with the selection of *Kansei* Word that available. To make sure that consumer will not find *Kansei* Word that is unavailable, we need to change the text box into the combo box by right click on the text box then click *Change To*, then click on *Combo Box* Next, we need to make text box to show item design for every *Kansei* Word. Similar with make text box for *Kansei* Word, click on Design in Form Design Tools, click on Text Box on Controls. Create Text Box for every Item Design which are for Body Diameter, Strap Material, Color, Dial Feature, Shape. Next, we need to show the Product Image for every *Kansei* Word by click on Design on Form Design Tools then click image on Controls. Drag to the form to make how big the picture we want then click cancel when the Insert Picture menu shows up. Finally, we need to put Record source for the Satu Kata *Kansei* form and Control Source for every text box and image box. First click on Design on Form Design Tools. Click Property Sheet in Tools. To put control source on the Satu Kata *Kansei* Form, left click outside the form then click on the property sheet, then click on data tab. On the Record source, click on the drop-down tab on the right, click on Query Dua Kata *Kansei* . Then for *Kansei* _Word_1 and *Kansei* _Word_2 text box, click on Property Sheet click on the Data tab, choose *Kansei* _Word_1 for the *Kansei* _Word_1

Control Source and *Kansei* _Word_2 for the *Kansei* _Word_2 Control Source then choose *Kansei* Word Tersedia for Row Source. Similar for Body Diameter through Shape Text box, click on the Body Diameter text box then click on Property Sheet, click on the Data tab then choose Body Diameter as Control Source. For Image Box we used Expression Builder to put the Control Source by click the image box then click on Property Sheet, click on the Data tab and click the three dots on the right of Control Source bar then the Expression Builder will show up. Fill the Expression Builder with the if-then formula in Attachment D. Save the form with name "Dua Kata *Kansei* ".

To create a Form Main Menu, close all the tables or queries then click create menu and click Form Design. In this form it takes images and buttons to connect One *Kansei* Word Form and Two *Kansei* Word Form. To insert image, click menu design then click insert image then choose picture then arrange picture. To create *Button*, click menu design then *Button* and set into form. *Button* that is set will appear *Comment Button Wizard* window then select categories with form operations and select open form action and select Satu Kata *Kansei* then click finish. And use the same steps to create a *Button* that connect to Dua Kata *Kansei* Form. Save the form with name Main Menu. To make the button to directly back to main menu for Satu Kata *Kansei* and Dua Kata *Kansei* form, open the Form Satu Kata *Kansei* , click on Design then click Button on Control, then Comment Button Wizard window will show up then select categories with form operations and select open form action then click next and select Main Menu. Do the same step to make button for Dua Kata *Kansei* Form.

Figure 4.2 *Tables*

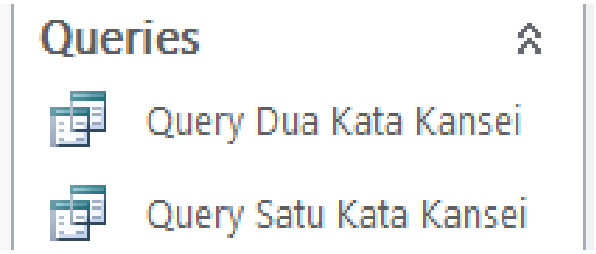


Figure 4.3 *Queries*

Figure 4.4 *Forms*

CHAPTER V

DISCUSSION

5.1 *Kansei* Engineering

The first step is to determine the *Kansei* Word is by providing an open questionnaire about the question that contains what is desired from the wristwatch to the respondents who will be tested. Determination of *Kansei* Word is based on perceptions or views of testers or respondents to the product shown. From the initial research obtained 14 *Kansei* Word. Then this word is given to the respondents to be researched. From the election results *Kansei* word got 9 *Kansei* word relevant and in accordance with the wishes of consumers. The relevant word *Kansei* then made a semantic description, giving the word opponent to the selected word *Kansei*. After conducting questionnaires to 50 respondents, the validity and reliability test was done to obtain the data that the respondents chose the elegant, attractive, practical, lightweight and neat product.

5.1.1 Orthogonal Array

In this research, watch design is divided into 6 design items, namely Body Diameter, Strap material, Color, Dial, Feature, and Shape. Of the six items, a category is defined for each item. category of each item is Body Diameter item consist of category 3 cm, 3.5 cm, and 4 cm, Strap Material item consist of category Bracelet, Leather, Nylon, and Rubber, Color item consist of dark and light, Dial item consist of category Number and Needle, Feature items consist of Calendar, Digital Timer, Combined, and None, Shape items consist of Round and Square categories. These item design are considered not too detail because it only represent 6 parts of wristwatch.

Then the items and categories were made orthogonal arrays with IBM SPSS version 16 to get 16 combinations. The first combination produced is 4 cm, nylon, dark, needle, combined, round. The second combination generated is 4 cm, bracelet, dark, number, digital timer, square. The third combination produced 4 cm, leather, bright, number, none, square. The fourth combination of sheep skin, 3.5 cm, bracelet, dark, needle, none, round. The fifth combination generated 3.5 cm, rubber, bright, number, combined, square. The sixth combination generated 4 cm, rubber, bright, needle, calendar, round. The seventh combination produced 3 cm, leather, dark, needle, calendar, square. The eighth combination produced 3 cm, nylon, bright, number, digital timer, round. The ninth combination produced 3 cm, bracelet, bright, number, calendar, round. The resulting tenth combination of 3 cm, nylon, bright, needle, none, square. The eleven combinations are 3 cm, rubber, dark, number, none, round. The combined twelve generated 3.5 cm, nylon, dark, number, calendar, square. The resulting thirteenth combination of 3 cm, bracelet, bright, needle, combined, square. Fourteenth-generated combinations of 3.5 cm, leather, bright, needle, digital timer, round. The fifteenth combination produced 3 cm, leather, dark, number, combined, round. The sixteenth combination produced 3 cm, rubber, dark, needle, digital timer, square. To make visual of these samples, researcher use Paint Tool SAI because it easy too use. The weakness of Paint Tool SAI is because that it works like drawing than 3D design, so the result more likely a 2D design

5.1.2 Conjoint Analysis

After creating an orthogonal array combination then spreading the questionnaire on the sixteen combinations with the eight pairs of *Kansei* word. The calculation of conjoint analysis is done with IBM SPSS software version 16. The calculation results show that for strong word *Kansei* can be described with combination of 4 cm diameter body, rubber material strap, bright color, dial number, feature none and shape round. While for strong opposite the weaker combination consists of 3.5 cm diameter body, leather material strap, dark color, dial needle, digital timer feature, square shape. For word *Kansei* word fitting size can be described with a combination of body diameter 3.5 cm, strap material nylon, dark color, dial number, feature none, shape square. While for the opposite of the word

fitting size is narrow / loose consists of 3 cm diameter body, leather material strap, bright color, dial needle, feature calendar, round shape. For word *Kansei* word mild combination consists of 3.5 cm diameter body, leather material strap, dark color, dial number, digital timer feature, square shape. As for the opposite of lightweight words that consist of weight of 3 cm diameter body, rubber material strap, bright color, dial needle, feature none, shape round. For word *Kansei* word comfortable consisting of body diameter 3.5 cm, strap material bracelet, dark color, dial number, digital timer feature, and square shape. As for the opposite said comfortable is discomfortable consisting of 3 cm diameter body, rubber material strap, bright color, dial needle, feature none, shape round. For safe word *Kansei* word consists of body diameter 3.5 cm, strap material bracelet, bright color, dial number, digital timer feature, square shape. As for safe harmful opponent consists of 3 cm diameter body, leather material strap, dark color, dial needle, feature combined, round shape. For word elegant word *Kansei* consists of body diameter 3.5 cm, strap material bracelet, bright color, dial number, digital timer feature, square shape. As for safe harmful opponent consists of 3 cm diameter body, leather material strap, dark color, dial needle, feature combined, round shape.

Importance Factor is how important factor to the word *Kansei* pair in this case. In the strong-weak pair found that the most influential factor is the material strap of 28.523%, then the weakest factor affecting the strong-weak pair is the dial of 7.999%. In the narrow / loose-sized pair, the most influential factor is the heel height of 25.863%, then the weakest factor affecting the fitting-loose / narrow size pair is the 10.313% dial. In the light-weight pair found that the most influential factor is the feature of 25.875%, then the weakest factor affecting the light-weight pair is the dial of 9.581%. In the uncomfortable pair it is found that the most influential factor is the material strap of 25.437%, then the weakest factor affecting the uncomfortable-comfortable pair is the dial of 9.818%. In the safe-dangerous pair found that the most influential factor is the material strap of 25.624%, then the weakest factor affecting the safe-dangerous pair is the color of 10.526%. In the elegant-tacky pair found that the most influential factor is the material strap of 27.516%, then the weakest factor affecting the safe-dangerous pair is the color of 10.481%. In the casual-formal pair it was found that the most influential factor was the material strap of 25.180%, then the weakest factor affecting the casual-formal pair was

the 10,400% dial. In the usual multifunctional pair found that the most influential factor is the feature of 26.554%, then the weakest factor affecting the ordinary-multifunction pair is the color of 9.773%. In the masculine-feminine couple found that the most influential factor is the feature of 29.304%, then the weakest factor affecting the ordinary-multifunctional pair is the dial of 6.954%.

On the correlation output Pearson's test results R and Kendall's tau show that the correlation rate is high with a significance level below 0.05. It shows that all samples can describe the population's desires.

5.1.3 Database Management System

There are three form that made in the DBMS which are Main menu form, Satu Kata *Kansei* Form, and Dua Kata *Kansei* Form. On the Main Menu Form, there are two buttons that used to connect to One *Kansei* Word and Two *Kansei* Word Form. The Main Menu form display is shown below.

Figure 5.1 Main Menu Form display

One *Kansei* Word Form is used to dsiplay item category on One *Kansei* Word. Same function also applied on Two *Kansei* Word Form that used to display item category on Two *Kansei* Word. Consumers will choose the *Kansei* word available on the drop down box. Drop down box is used to avoid consumers to choose or input the *Kansei* word aside from the available one. The One *Kansei* Word and Two *Kansei* Word form display is shown below.

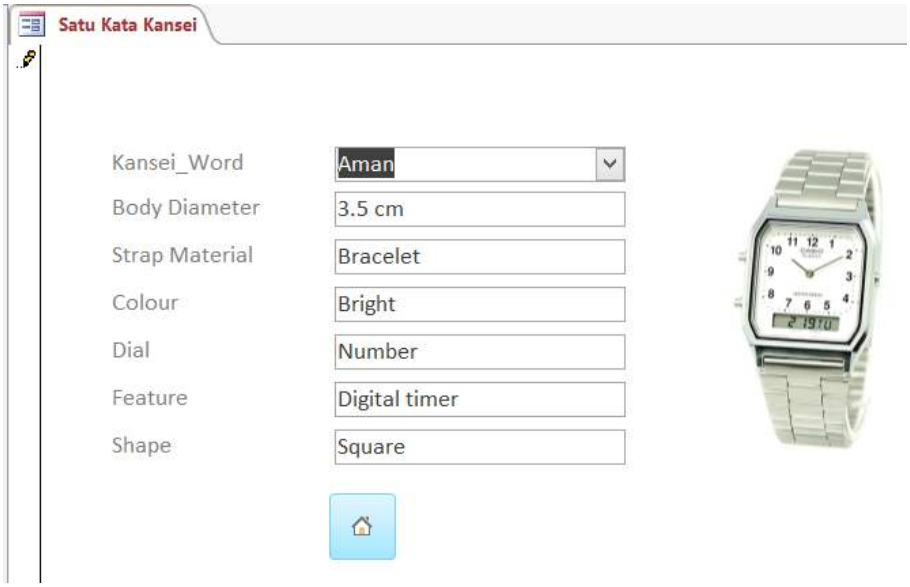


Figure 5.2 One Kansei Word Form display

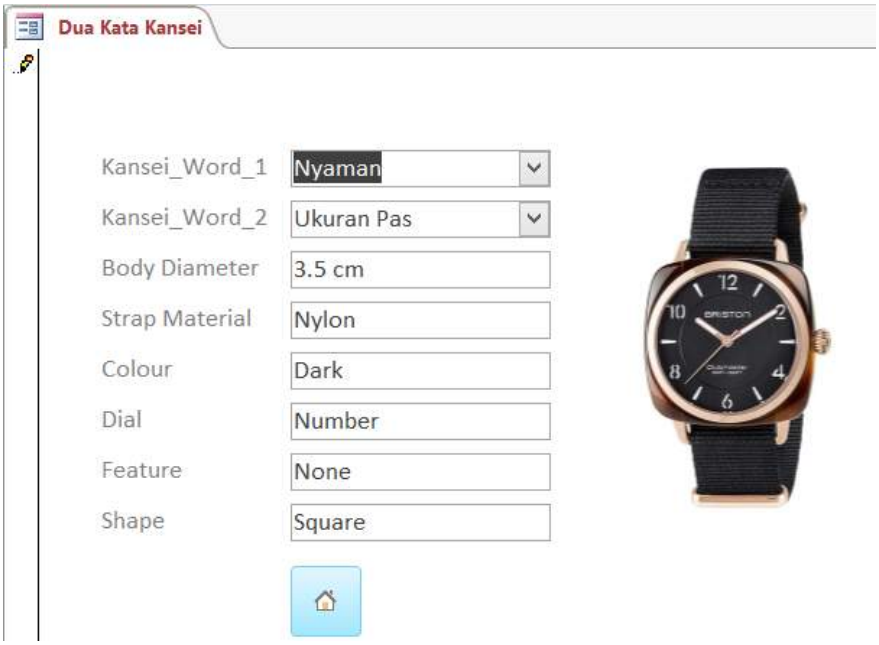


Figure 5.3 Two Kansei Word Form display

For Two *Kansei* Word Item Category determination, the item design displayed is based on the highest importance factor for each *Kansei* Word. For *Kansei* Word strong and Multfiunction combination, the item category display are from Strong for Body Diameter, Strong for Strap Material, Multifunction for color, Multifunction for Dial, Multifunction for Feature, and Multfunction for Shape.For *Kansei* Word Strong and Fit size combination, the item category display are from Fit size for Body Diameter, Strong for Starp Material, Fit size for Color, Same attribute for Dial and Feature, and Fit size for Shape. For *Kansei* Word Strong and Comfortable combination, the item category display are from Comfortable for Body Diameter, Strong for Starp Material, Comfortable for Color, Comfortable for Dial, Strong for Feature, and Comfortable for Shape. For *Kansei* Word Strong and Safe combination, the item category display are Safe for Body Diameter, Strong for Strap Material, Safe for Color, Safe for Dial, Strong for Feature, and safe for Shape. For *Kansei* Word Safe and Multifunction combination, the item category display are Safe for Body Diameter, Multifucntion for Starp Material, Safe for Color, Multifunction for Dial, Multifunction for Feature, and safe for Shape. For *Kansei* Word Comfortable and Multifunction combination, the item category display are Comfortable for Body Diameter, Multifucntion for Starp Material, Comfortable for Color, Multifunction for Dial, Multifucntion for Feature, Comfortable for Shape. For *Kansei* Word Comfortable and Safe combination, the item category display are Comfortable for Body Diameter, safe for Strap Material, Comfortable for color, Safe for Dial, Comfortable for Feature, and Comfortable for Shape. For *Kansei* Word Fit size and Safe combination, the displayed item category are Safe for Body Diameter, Fit size for Strap Material, Safe for Color, Safe for Dial, Fit size for Feature, and Safe for Shape. For *Kansei* Word Fit size and Comfortable combination, the displayed item category are Comfortable for Body Diameter, Fit size for Starp Material, Comfortable for Color, Fit size for Dial, Fit size for Feature, Comfortable for Shape. For *Kansei* Word Fit size and Multifucntion combination, the displayed item category are Fit size for Body Diameter, Multifucntion fo Strap Material,Fit size for Color, Multifucntion for Dial, Feature, and Shape. These forms can be added into Five Kansei Words form but it will add the time to work on additional if then syntax and the wristwatch design display.

CHAPTER VI

CONCLUSION AND SUGGESTION

6.1 Conclusion

1. 14 *Kansei* words found from open questionnaire that only 5 *Kansei* words surpass the validity test which are Strong, Fit Size, Comfortable, Safe, Multifunction. Those *Kansei* word will be integrated with item design and category orthogonal design to get conjoint analysist calculation.
2. The conjoint analysist result inserted in The Micorsoft Access to simplify the consumers to get the wristwatch recommendation according to *Kansei* words available. To see the specification based on Kansei words available, consumer can click on drop down menu of *Kansei* words form.

6.1.1 Suggestion

1. The item design can be added to get more detailed specification of wristwatch.
2. The Design of Wristwatch can be improve by using 3d design software such as solidwork or autocad to get more detail of the display.
3. The Kansei Word form combination on database can be added to get more specification and display combination.

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ATTACHMENT A

QUESTIONNAIRE

7.1 *Kansei* word Questionnaire

Kuesioner Kansei word

Nama	:	Umur	:
Jenis Kelamin	:	Pekerjaan	:
Alamat	:	No.Telp	:

Kuisioner ini merupakan salah satu alat yang saya gunakan dalam mengumpulkan data penelitian Tugas Akhir. Saya, **Heavy Zerry Novibrilliawan** adalah mahasiswa Teknik Industri angkatan 2013 Universitas Islam Indonesia. Saat ini saya sedang mengerjakan Tugas Akhir dengan judul "Pengembangan database spesifikasi jam tangan berasarkan pendekatan *Kansei* Engineering" sebagai salah satu syarat studi Strata (S1). Tujuan dari penelitian ini adalah untuk mengetahui desain jam tangan yang sesuai seperti yanag diinginkan oleh responden atau konsumen sesuai dengan kebutuhan psikologis dengan pendekatan Kansei Engineering. Maka dari itu, saya memohon kepada Bapak/Ibu/Sdr/I untuk berperan serta menjawab semua pertanyaan yang ada dengan petunjuk yang sudah tersedia. Atas kesediaannya saya ucapkan terima kasih.

Pertanyaan : Jam tangan seperti apa yang anda inginkan (Minimal enam kriteria) ?

Jawaban : ……..

……..

……..

……..

.....

7.2 Semantic Differential I Questionnaire

Kuesioner Semantic Differential I

Nama : Umur :

Jenis Kelamin : Pekerjaan :

Alamat : No.Telp :

Seberapa pentingkah kata kansei tersebut terhadap jam tangan diatas?

	1	2	3	4	5	
Membosankan (Boring)						Menarik (Attractive)

	1	2	3	4	5	
Mahal (Pricey)						terjangkau (Affordable)

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Rumit (Complex)						Simpel (Simple)
Berat (Heavyweight)						Ringan (Lightweight)
Sementara (Temporary)						Awet (Durable)
Risih (Uncomfortable)						Nyaman (Comfortable)
berbahaya (Dangerous)						Aman (Safe)
Kuno (Dowdy)						Sporty (Sporty)
Kusam (Dull)						Elegan (Elegant)
Feminime (Feminime)						Maskulin (Masculine)
Formal (Formal)						Kasual (Casual)

Biasa (Plain)	1	2	3	4	5	Multifungsi (Multifunction)

7.3 Semantic Differential II

Kuesioner Semantic Differential II

Nama	:	Umur	:
Jenis Kelamin	:	Pekerjaan	:
Alamat	:	No.Telp	:

Kuisioner ini merupakan salah satu alat yang saya gunakan dalam mengumpulkan data penelitian Tugas Akhir. Saya, **Heavy Zerry Novibrilliawan** adalah mahasiswa Teknik Industri angkatan 2013 Universitas Islam Indonesia. Saat ini saya sedang mengerjakan Tugas Akhir dengan judul "Pengembangan database spesifikasi jam tangan berasarkan pendekatan *Kansei* Engineering" sebagai salah satu syarat studi Strata (S1). Tujuan dari penelitian ini adalah untuk mengetahui desain jam tangan yang sesuai seperti yanag diinginkan oleh responden atau konsumen sesuai dengan kebutuhan psikologis dengan pendekatan Kansei Engineering. Maka dari itu, saya memohon kepada Bapak/Ibu/Sdr/I untuk berperan serta menjawab semua pertanyaan yang ada dengan petunjuk yang sudah tersedia. Atas kesediaannya saya ucapkan terima kasih.

Skala yang diberikan adalah 1 sampai dengan 7 penjelasan dari 7 skala semantic defferential adalah sebagai berikut:

1 = Jika citra produk sangat sesuai dengan dengan *Kansei word* di kiri skala

2 = Jika citra produk sesuai dengan dengan *Kansei word* di kiri skala

3 = Jika citra produk agak sesuai dengan dengan *Kansei word* di kiri skala

4 = Jika citra produk rata-rata

5 = Jika citra produk sangat sesuai dengan dengan *Kansei word* di kanan skala

Sampel 1

Pertanyaan : Bagaimana pendapat anda dengan sampel model 1 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

	1	2	3	4	5	
Biasa (Plain)						Multifungsi (Multifunction)

Sampel 2

Pertanyaan : Bagaimana pendapat anda dengan sampel model 2 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

1	2	3	4	5

Biasa (Plain)						Multifungsi (Multifunction)

Sampel 3

Pertanyaan : Bagaimana pendapat anda dengan sampel model 3 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

	1	2	3	4	5	
Biasa (Plain)						Multifungsi (Multifunction)

Sampel 4

Pertanyaan : Bagaimana pendapat anda dengan sampel model 4 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

berbahaya (Dangerous)	1	2	3	4	5	Aman (Safe)

Biasa (Plain)	1	2	3	4	5	Multifungsi (Multifunction)

Sampel 5

Pertanyaan : Bagaimana pendapat anda dengan sampel model 5 dengan kesesuain kansei word ?

Lemah (Fragile)	1	2	3	4	5	Kuat (Strong)

Longgar/Sempit (Loose/Narrow)	1	2	3	4	5	Ukuran Pas (Fit size)

1	2	3	4	5

Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

	1	2	3	4	5	
Biasa (Plain)						Multifungsi (Multifunction)

Sampel 6

Pertanyaan : Bagaimana pendapat anda dengan sampel model 6 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

	1	2	3	4	5	
Biasa (Plain)						Multifungsi (Multifunction)

Sampel 7

Pertanyaan : Bagaimana pendapat anda dengan sampel model 7 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

1	2	3	4	5

Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

	1	2	3	4	5	
Biasa (Plain)						Multifungsi (Multifunction)

Sampel 8

Pertanyaan : Bagaimana pendapat anda dengan sampel model 8 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

	1	2	3	4	5	
Biasa (Plain)						Multifungsi (Multifunction)

Sampel 9

Pertanyaan : Bagaimana pendapat anda dengan sampel model 9 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

	1	2	3	4	5	
Biasa (Plain)						Multifungsi (Multifunction)

Sampel 10

Pertanyaan : Bagaimana pendapat anda dengan sampel model 10 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

	1	2	3	4	5	
Biasa (Plain)						Multifungsi (Multifunction)

Sampel 11

Pertanyaan : Bagaimana pendapat anda dengan sampel model 11 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

	1	2	3	4	5	
Biasa (Plain)						Multifungsi (Multifunction)

Sampel 12

Pertanyaan : Bagaimana pendapat anda dengan sampel model 12 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

	1	2	3	4	5	
Biasa (Plain)						Multifungsi (Multifunction)

Sampel 13

Pertanyaan : Bagaimana pendapat anda dengan sampel model 13 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)
Risih (Uncomfortable)						Nyaman (Comfortable)
berbahaya (Dangerous)						Aman (Safe)
Biasa (Plain)						Multifungsi (Multifunction)

Sampel 14

Pertanyaan : Bagaimana pendapat anda dengan sampel model 14 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

1	2	3	4	5

Biasa (Plain)						Multifungsi (Multifunction)

Sampel 15

Pertanyaan : Bagaimana pendapat anda dengan sampel model 15 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

	1	2	3	4	5	
Biasa (Plain)						Multifungsi (Multifunction)

Sampel 16

Pertanyaan : Bagaimana pendapat anda dengan sampel model 16 dengan kesesuain kansei word ?

	1	2	3	4	5	
Lemah (Fragile)						Kuat (Strong)

	1	2	3	4	5	
Longgar/Sempit (Loose/Narrow)						Ukuran Pas (Fit size)

	1	2	3	4	5	
Risih (Uncomfortable)						Nyaman (Comfortable)

	1	2	3	4	5	
berbahaya (Dangerous)						Aman (Safe)

	1	2	3	4	5	
Biasa (Plain)						Multifungsi (Multifunction)

ATTACHMENT B

QUESTIONNAIRE RECAPITULATION

8.1 Kansei Word Questionnaire

No	*Kansei word*	Total
1	Attractive	9
2	Affordable	34
3	Strong	1
4	Fit size	11
5	Simple	15
6	Lightweight	1
7	Durable	11
8	Comfortable	7
9	Safe	19
10	Sporty	2
11	Elegant	4
12	Masculine	1
13	Casual	1
14	Multifucntion	14

8.2 Semantic Differential I Questionnair

no	Attractive	Affordable	Strong	Fit size	Simple	Lightweight	Durable	Comfortable	Safe	Sporty	Elegant	Masculine	Casual	Multifunction
1	1	5	5	5	3	4	5	5	3	4	4	4	4	4
2	5	5	4	3	4	4	4	4	3	3	4	3	3	5
3	3	5	5	5	5	5	5	5	5	5	5	3	5	5
4	5	5	5	5	3	5	5	5	5	3	3	3	5	5
5	4	5	5	5	3	4	5	5	4	2	4	2	4	4
6	5	5	5	5	5	4	5	5	5	3	4	3	3	4
7	4	4	4	4	4	4	4	4	4	3	4	3	3	4
8	3	4	4	4	4	4	4	4	3	5	3	3	4	4
9	4	5	4	4	4	4	4	4	4	4	4	2	4	4
10	4	4	4	5	4	5	5	5	4	2	4	3	4	3
11	3	4	4	4	4	4	4	4	4	4	3	4	4	4
12	3	4	3	2	4	3	5	4	4	3	5	4	4	3
13	5	4	4	3	5	3	5	5	4	4	4	4	4	4
14	4	5	5	2	5	5	5	5	5	3	4	3	5	4
15	4	4	4	4	4	4	5	5	4	3	3	3	4	4
16	4	4	4	4	4	4	4	4	4	4	4	3	3	4
17	4	4	4	3	3	4	5	5	5	3	5	2	4	5
18	4	4	4	4	4	4	5	5	5	3	4	3	3	4

19	5	4	5	5	4	4	5	5	5	3	5	3	4	4
20	4	3	5	4	4	4	5	3	5	3	4	3	3	4
21	5	5	5	5	5	5	5	5	5	4	5	3	4	4
22	5	5	4	4	4	3	3	3	4	3	3	3	3	2
23	5	5	5	4	4	5	5	5	4	3	4	4	4	4
24	4	4	4	4	4	4	4	4	4	4	4	4	4	4
25	4	4	5	4	5	2	5	4	4	2	2	4	5	5
26	4	4	5	2	4	5	5	5	4	3	4	3	4	5
27	4	5	4	2	2	4	5	4	4	4	5	4	4	4
28	5	5	5	3	4	4	4	3	4	3	5	3	5	5
29	4	4	4	3	3	4	5	5	4	4	4	4	4	2
30	4	5	5	4	5	5	5	4	3	3	4	2	4	5
31	4	4	4	2	4	5	5	5	4	2	4	2	2	4
32	5	4	5	5	3	3	5	5	5	3	3	3	4	5
33	4	4	4	4	4	4	4	5	4	4	4	3	3	5
34	5	4	5	5	3	3	5	5	5	3	5	5	4	5
35	5	5	5	5	3	4	5	5	5	3	3	3	3	5
36	4	4	4	4	4	4	4	4	4	3	3	3	3	4
37	5	5	4	4	3	3	4	5	5	3	4	4	4	5

38	4	4	4	5	3	5	4	5	5	3	4	4	4	5
39	5	5	5	5	5	5	5	5	5	5	5	5	5	5
40	5	4	4	4	4	4	4	5	5	5	5	5	5	5
41	5	5	5	5	5	5	5	5	5	3	4	4	4	5
42	3	4	5	5	3	3	5	5	4	3	3	4	3	5
43	5	4	5	3	4	4	5	5	5	3	4	3	4	3
44	4	5	4	2	3	4	5	5	1	3	3	3	3	4
45	5	4	4	3	3	3	5	5	5	3	4	3	2	4
46	5	5	5	4	4	5	4	4	5	4	4	4	4	5
47	4	4	4	4	3	4	5	4	4	5	4	3	3	4
48	5	3	5	5	3	3	5	5	5	3	3	3	3	5
49	5	4	5	4	4	4	5	5	4	5	4	5	4	4
50	3	4	4	5	4	4	5	5	5	2	5	3	5	3

8.3 Semantic Differential II questionnaire average score

Sampel	Strong	Fit Size	Comfortable	Safe	Multifunction
1	3,76	3,86	4,04	4,3	3,22
2	4,22	4	3,88	4,2	3,74
3	3,32	3,92	4,14	4,2	2,94
4	4,54	3,98	3,92	4,3	3,7
5	3,26	3,7	3,84	4,2	3,8
6	3,62	4,16	4,36	5,3	3,36
7	3,34	3,68	3,88	4,2	2,96
8	3,64	3,58	3,86	4,2	3,12
9	4,6	3,82	3,8	4,3	4,02
10	4,14	4,16	4,2	4,4	3,6
11	3,52	3,48	3,72	4,1	2,7
12	3,5	3,86	4,1	4,4	3,18
13	4,3	3,6	3,56	4,1	4
14	3,92	4,04	4,12	4,4	3,14
15	3,82	3,94	3,98	4,2	3,78
16	3,3	3,54	3,88	4,2	2,96

ATTACHMENT C

CALCULATION OUTPUT

9.1 Semantic Differential I first iteration validity test

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Menarik	52.9400	17.323	.189	.354	.652
Terjangkau	52.8200	17.987	.207	.366	.647
Kuat	52.7200	16.736	.510	.607	.613
Ukuran_Pas	53.2200	16.093	.280	.393	.640
Simpel	53.3400	17.494	.203	.190	.649
Ringan	53.1400	17.062	.283	.374	.636
Awet	52.5000	18.378	.149	.590	.653
Nyaman	52.5800	17.432	.295	.491	.636
Aman	52.8800	16.026	.419	.511	.614
Sporty	53.8200	17.498	.161	.315	.657
Elegan	53.2200	17.073	.281	.386	.637
Masculine	53.8400	17.158	.241	.378	.643
Casual	53.3800	16.077	.436	.373	.612
Multifungsi	52.9400	16.751	.309	.243	.632

9.2 Semantic Differential I second iteration validity test

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Kuat	28.90	8.255	.488	.365	.574
UKuran_pas	29.40	7.306	.334	.285	.607
RIngan	29.32	8.467	.254	.185	.621
Nyaman	28.76	8.594	.312	.116	.608
Aman	29.06	7.486	.455	.317	.565
Elegan	29.40	8.653	.208	.303	.633
Casual	29.56	8.007	.349	.175	.596
Multifugsi	29.12	8.149	.302	.184	.610

9.3 Semantic Differential I third iteration validity test

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Kuat	20.9000	5.684	.541	.322	.561
Ukuran_pas	21.4000	4.531	.444	.254	.574
Nyaman	20.7600	6.145	.288	.095	.627
Aman	21.0600	5.200	.432	.207	.576
Casual	21.5600	5.843	.264	.096	.639
Multifungsi	21.1200	5.536	.344	.183	.610

9.4 Semantic Differential I fourth iteration validity test

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Kuat	17.1000	4.378	.516	.295	.553
Ukuran_pas	17.6000	3.224	.462	.254	.557
Nyaman	16.9600	4.692	.298	.095	.626
Aman	17.2600	3.911	.420	.195	.572
Multifungsi	17.3200	4.181	.339	.182	.612

9.5 Conjoint analysis

Lemah (Weak) Kuat (Strong)

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Differential 2\orthogonal design terbaru syntax.sav'
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2\Conjoint Analysis\Conjoint kuat\rekap input semantic 2 kuat.sav'

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    /SUBJECT=ID

    /FACTORS=

Body_diameter 'Diameter' (1'3 cm' 2'3.5 cm' 3'4 cm')

Strap_material 'Material' (1'Bracelet' 2'Leather' 3'Nylon' 4'Rubber')

Colour 'Watch_colour' (1'Bright' 2'Dark')

Dial 'Dial_shape' (1'Number' 2'Needle')

Feature 'Watch_feature' (1'Calendar' 2'Digital Timer' 3'Combined'
4'None')

Shape 'Watch_shape' (1'Round' 2'Square')

    /PRINT=SUMMARYONLY
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Utilities

		Utility Estimate	Std. Error
Body_diameter	3 cm	.067	.239
	3.5 cm	-.164	.281
	4 cm	.097	.281
Strap_material	Bracelet	-.053	.311
	Leather	-.266	.311
	Nylon	.085	.311
	Rubber	.234	.311
Colour	Bright	.082	.179
	Dark	-.082	.179
Dial	Number	.080	.179
	Needle	-.080	.179
Feature	Calendar	-.080	.311
	Digital Timer	-.117	.311
	Combined	-.037	.311
	None	.234	.311
Shape	Round	.056	.179
	Square	-.056	.179
(Constant)		3.707	.189

Importance Values

Body_diameter	17.597
Strap_material	28.523
Colour	8.743
Dial	7.999
Feature	26.485
Shape	10.653

Averaged Importance Score

Correlations[a]

	Value	Sig.
Pearson's R	.620	.005
Kendall's tau	.450	.008

a. Correlations between observed and estimated preferences

Longgar/Sempit(Loose/Narrow) Ukuran Pas (fit size)

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Differential 2\orthogonal design terbaru syntax.sav'

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2\Conjoint Analysis\Conjoint Ukuran Pas\rekap input semantic 2 ukuran
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    /SUBJECT=ID

    /FACTORS=

Body_diameter 'Diameter' (1'3 cm' 2'3.5 cm' 3'4 cm')

Strap_material 'Material' (1'Bracelet' 2'Leather' 3'Nylon' 4'Rubber')

Colour 'Watch_colour' (1'Bright' 2'Dark')

Dial 'Dial_shape' (1'Number' 2'Needle')

Feature 'Watch_feature' (1'Calendar' 2'Digital Timer' 3'Combined'
4'None')

Shape 'Watch_shape' (1'Round' 2'Square')

    /PRINT=SUMMARYONLY.
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Utilities

		Utility Estimate	Std. Error
Body_diameter	3 cm	-.123	.093
	3.5 cm	.119	.109
	4 cm	.004	.109
Strap_material	Bracelet	.009	.121
	Leather	-.095	.121
	Nylon	.124	.121
	Rubber	-.038	.121
Colour	Bright	-.004	.070
	Dark	.004	.070
Dial	Number	.082	.070
	Needle	-.082	.070
Feature	Calendar	-.048	.121
	Digital Timer	.004	.121
	Combined	-.022	.121
	None	.066	.121
Shape	Round	-.053	.070
	Square	.053	.070
(Constant)		3.850	.074

Importance Values

Body_diameter	18.105
Strap_material	25.863
Colour	10.335
Dial	10.313
Feature	24.186
Shape	11.199

Averaged Importance Score

Correlations[a]

	Value	Sig.
Pearson's R	.768	.000
Kendall's tau	.544	.002

a. Correlations between observed and estimated preferences

Risih (Discomfortable) Nyaman (Comfortable)

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Differential 2\orthogonal design terbaru syntax.sav'

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2\Conjoint Analysis\Conjoint Nyaman\rekap input semantic 2 nyaman.sav'

    /SCORE=SAMPLE1 TO SAMPLE16

    /SUBJECT=ID

    /FACTORS=

Body_diameter 'Diameter' (1'3 cm' 2'3.5 cm' 3'4 cm')

Strap_material 'Material' (1'Bracelet' 2'Leather' 3'Nylon' 4'Rubber')

Colour 'Watch_colour' (1'Bright' 2'Dark')

Dial 'Dial_shape' (1'Number' 2'Needle')

Feature 'Watch_feature' (1'Calendar' 2'Digital Timer' 3'Combined'
4'None')

Shape 'Watch_shape' (1'Round' 2'Square')

    /PRINT=SUMMARYONLY.
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Utilities

		Utility Estimate	Std. Error
Body_diameter	3 cm	-.142	.073
	3.5 cm	.141	.085
	4 cm	.001	.085
Strap_material	Bracelet	.052	.094
	Leather	.047	.094
	Nylon	.031	.094
	Rubber	-.130	.094
Colour	Bright	-.021	.054
	Dark	.021	.054
Dial	Number	.065	.054
	Needle	-.065	.054
Feature	Calendar	-.036	.094
	Digital Timer	.026	.094
	Combined	-.010	.094
	None	.021	.094
Shape	Round	-.057	.054
	Square	.057	.054
(Constant)		3.947	.057

Importance Values

Body_diameter	19.047
Strap_material	25.437
Colour	10.639
Dial	9.818
Feature	22.770
Shape	12.290

Averaged Importance Score

Correlations[a]

	Value	Sig.
Pearson's R	.839	.000
Kendall's tau	.525	.003

a. Correlations between observed and estimated preferences

Berbahaya (Dangerous) Aman (Safe)

```
CONJOINT PLAN='D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic
Differential 2\orthogonal design terbaru syntax.sav'

    /DATA='D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential
2\Conjoint Analysis\Conjoint Aman\rekap input semantic 2 Aman.sav'

    /SCORE=SAMPLE1 TO SAMPLE16

    /SUBJECT=ID

    /FACTORS=

Body_diameter 'Diameter' (1'3 cm' 2'3.5 cm' 3'4 cm')

Strap_material 'Material' (1'Bracelet' 2'Leather' 3'Nylon' 4'Rubber')

Colour 'Watch_colour' (1'Bright' 2'Dark')

Dial 'Dial_shape' (1'Number' 2'Needle')

Feature 'Watch_feature' (1'Calendar' 2'Digital Timer' 3'Combined'
4'None')

Shape 'Watch_shape' (1'Round' 2'Square')

    /PRINT=SUMMARYONLY.
```

Utilities

		Utility Estimate	Std. Error
Body_diameter	3 cm	-.103	.062
	3.5 cm	.112	.072
	4 cm	-.010	.072
Strap_material	Bracelet	.035	.080
	Leather	-.035	.080
	Nylon	-.003	.080
	Rubber	.003	.080
Colour	Bright	.010	.046
	Dark	-.010	.046
Dial	Number	.038	.046
	Needle	-.038	.046
Feature	Calendar	-.003	.080
	Digital Timer	.035	.080
	Combined	-.048	.080
	None	.016	.080
Shape	Round	-.003	.046
	Square	.003	.046
(Constant)		4.157	.049

Importance Values

Body_diameter	18.931
Strap_material	25.624
Colour	10.526
Dial	11.203
Feature	22.496
Shape	11.220

Averaged Importance Score

Correlations[a]

	Value	Sig.
Pearson's R	.749	.000
Kendall's tau	.593	.001

a. Correlations between observed and estimated preferences

Biasa (Plain) Multifungsi (Multifunction)

```
CONJOINT PLAN='D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic
Differential 2\orthogonal design terbaru syntax.sav'

    /DATA='D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential
2\Conjoint Analysis\Conjoint Multifungsi\rekap input semantic 2
multifungsi.sav'

    /SCORE=SAMPLE1 TO SAMPLE16

    /SUBJECT=ID

    /FACTORS=

Body_diameter 'Diameter' (1'3 cm' 2'3.5 cm' 3'4 cm')

Strap_material 'Material' (1'Bracelet' 2'Leather' 3'Nylon' 4'Rubber')

Colour 'Watch_colour' (1'Bright' 2'Dark')

Dial 'Dial_shape' (1'Number' 2'Needle')

Feature 'Watch_feature' (1'Calendar' 2'Digital Timer' 3'Combined'
4'None')

Shape 'Watch_shape' (1'Round' 2'Square')

    /PRINT=SUMMARYONLY.
```

Utilities

		Utility Estimate	Std. Error
Body_diameter	3 cm	-.132	.141
	3.5 cm	.063	.166
	4 cm	.068	.166
Strap_material	Bracelet	-.154	.184
	Leather	-.329	.184
	Nylon	.131	.184
	Rubber	.351	.184
Colour	Bright	.106	.106
	Dark	-.106	.106
Dial	Number	-.086	.106
	Needle	.086	.106
Feature	Calendar	.031	.184
	Digital Timer	-.189	.184
	Combined	-.014	.184
	None	.171	.184
Shape	Round	.071	.106
	Square	-.071	.106
(Constant)		3.422	.112

Importance Values

Body_diameter	15.985
Strap_material	26.266
Colour	9.773
Dial	11.403
Feature	26.554
Shape	10.019

Averaged Importance Score

Correlations[a]

	Value	Sig.
Pearson's R	.851	.000
Kendall's tau	.678	.000

a. Correlations between observed and estimated preferences

ATTACHMENT D

IF THEN FORMULA

1. One Kansei Word

Body Diameter:

IIf([Kansei_Word]="Kuat";"4 cm";IIf([Kansei_Word]="Lemah";"3.5 cm";
IIf([Kansei_Word]="Ukuran Pas";"3.5 cm";IIf([Kansei_Word]="Longgar/Sempit";"3 cm";
IIf([Kansei_Word]="Nyaman";"3.5 cm";IIf([Kansei_Word]="Risih";"3 cm";
IIf([Kansei_Word]="Aman";"3.5 cm";IIf([Kansei_Word]="Berbahaya";"3 cm";
IIf([Kansei_Word]="Multifungsi";"4 cm";IIf([Kansei_Word]="Biasa";"3 cm";"Kansei word belum tersedia"))))))))))

Strap Material:

IIf([Kansei_Word]="Kuat";"Rubber";IIf([Kansei_Word]="Lemah";"Leather";IIf([Kansei_Word]="Ukuran Pas";"Nylon";
IIf([Kansei_Word]="Longgar/Sempit";"Leather";
IIf([Kansei_Word]="Nyaman";"Bracelet";IIf([Kansei_Word]="Risih";"Rubber";
IIf([Kansei_Word]="Aman";"Bracelet";
IIf([Kansei_Word]="Berbahaya";"Leather";
IIf([Kansei_Word]="Multifungsi";"Rubber";
IIf([Kansei_Word]="Biasa";"Leather";"Kansei word belum tersedia"))))))))))

Colour:

IIf([Kansei_Word]="Kuat";"Bright";
IIf([Kansei_Word]="Lemah";"Dark";
IIf([Kansei_Word]="Ukuran Pas";"Dark";

IIf([Kansei_Word]="Longgar/Sempit";"Bright";
IIf([Kansei_Word]="Nyaman";"Dark";
IIf([Kansei_Word]="Risih";"Bright";
IIf([Kansei_Word]="Aman";"Bright";
IIf([Kansei_Word]="Berbahaya";"Dark";
IIf([Kansei_Word]="Multifungsi";"Bright";
IIf([Kansei_Word]="Biasa";"Dark";"Kansei word belum tersedia"))))))))))

Dial:
IIf([Kansei_Word]="Kuat";"Number";
IIf([Kansei_Word]="Lemah";"Needle";
IIf([Kansei_Word]="Ukuran Pas";"Number";
IIf([Kansei_Word]="Longgar/Sempit";"Needle";
IIf([Kansei_Word]="Nyaman";"Number";
IIf([Kansei_Word]="Risih";"Needle";
IIf([Kansei_Word]="Aman";"Number";
IIf([Kansei_Word]="Berbahaya";"Needle";
IIf([Kansei_Word]="Multifungsi";"Needle";
IIf([Kansei_Word]="Biasa";"Number";"Kansei word belum tersedia"))))))))))

Feature:
IIf([Kansei_Word]="Kuat";"None";
IIf([Kansei_Word]="Lemah";"Digital timer";
IIf([Kansei_Word]="Ukuran Pas";"None";
IIf([Kansei_Word]="Longgar/Sempit";"Calendar";
IIf([Kansei_Word]="Nyaman";"Digital timer";
IIf([Kansei_Word]="Risih";"None";
IIf([Kansei_Word]="Aman";"Digital timer";
IIf([Kansei_Word]="Berbahaya";"Combined";
IIf([Kansei_Word]="Multifungsi";"None";
IIf([Kansei_Word]="Biasa";"Digital timer";"Kansei word belum tersedia"))))))))))

Shape:

IIf([Kansei_Word]="Kuat";"Round";
IIf([Kansei_Word]="Lemah";"Square";
IIf([Kansei_Word]="Ukuran Pas";"Square";
IIf([Kansei_Word]="Longgar/Sempit";"Round";
IIf([Kansei_Word]="Nyaman";"Square";
IIf([Kansei_Word]="Risih";"Round";
IIf([Kansei_Word]="Aman";"Square";
IIf([Kansei_Word]="Berbahaya";"Round";
IIf([Kansei_Word]="Multifungsi";"Round";
IIf([Kansei_Word]="Biasa";"Square";"Kansei word belum tersedia"))))))))))

Syntax Image

=IIf([Kansei_Word]="Kuat";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image kata kansei\Model kansei kuat.jpg";
IIf([Kansei_Word]="Ukuran Pas";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image kata kansei\Model kansei ukuran pas.jpg";
IIf([Kansei_Word]="Nyaman";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image kata kansei\Model kansei nyaman.jpg";
IIf([Kansei_Word]="Aman";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image kata kansei\Model kansei aman.jpg";
IIf([Kansei_Word]="Multifungsi";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image kata kansei\Model kansei multifungsi.jpg";"Gambar belum tersedia")))))

2. Two Kansei Word

Body Diameter1:

IIf([Kansei_Word_1]="Kuat";"4 cm";
IIf([Kansei_Word_1]="Lemah";"3.5 cm";
IIf([Kansei_Word_1]="Ukuran Pas";"3.5 cm";

IIf([Kansei_Word_1]="Longgar/Sempit";"3 cm";
IIf([Kansei_Word_1]="Nyaman";"3.5 cm";
IIf([Kansei_Word_1]="Risih";"3 cm";
IIf([Kansei_Word_1]="Aman";"3.5 cm";
IIf([Kansei_Word_1]="Berbahaya";
IIf([Kansei_Word_1]="Multifungsi";"4 cm";
IIf([Kansei_Word_1]="Biasa";"3 cm";"Kansei word belum tersedia"))))))))))

Strap Material1:
IIf([Kansei_Word_1]="Kuat";"Rubber";
IIf([Kansei_Word_1]="Lemah";"Leather";
IIf([Kansei_Word_1]="Ukuran Pas";"Nylon";
IIf([Kansei_Word_1]="Longgar/Sempit";"Leather";
IIf([Kansei_Word_1]="Nyaman";"Bracelet";
IIf([Kansei_Word_1]="Risih";"Rubber";
IIf([Kansei_Word_1]="Aman";"Bracelet";
IIf([Kansei_Word_1]="Berbahaya";"Leather";
IIf([Kansei_Word_1]="Multifungsi";"Rubber";
IIf([Kansei_Word_1]="Biasa";"Kansei word belum tersedia"))))))))))

Colour1:
IIf([Kansei_Word_1]="Kuat";"Bright";
IIf([Kansei_Word_1]="Lemah";"Dark";
IIf([Kansei_Word_1]="Ukuran Pas";"Dark";
IIf([Kansei_Word_1]="Longgar/Sempit";"Bright";
IIf([Kansei_Word_1]="Nyaman";"Dark";
IIf([Kansei_Word_1]="Risih";"Bright";
IIf([Kansei_Word_1]="Aman";"Bright";
IIf([Kansei_Word_1]="Berbahaya";"Dark";
IIf([Kansei_Word_1]="Multifungsi";"Bright";
IIf([Kansei_Word_1]="Biasa";"Dark";"Kansei word belum tersedia"))))))))))

Dial1:

IIf([Kansei_Word_1]="Kuat";"Number";

IIf([Kansei_Word_1]="Lemah";"Needle";

IIf([Kansei_Word_1]="Ukuran Pas";"Number";

IIf([Kansei_Word_1]="Longgar/Sempit";"Needle";

IIf([Kansei_Word_1]="Nyaman";"Number";

IIf([Kansei_Word_1]="Risih";"Needle";

IIf([Kansei_Word_1]="Aman";"Number";

IIf([Kansei_Word_1]="Berbahaya";"Needle";

IIf([Kansei_Word_1]="Multifungsi";"Needle";

IIf([Kansei_Word_1]="Biasa";"Number";"Kansei word belum tersedia"))))))))))

Feature1:

IIf([Kansei_Word_1]="Kuat";"None";

IIf([Kansei_Word_1]="Lemah";"Digital timer";

IIf([Kansei_Word_1]="Ukuran Pas";"None";

IIf([Kansei_Word_1]="Longgar/Sempit";"Calendar";

IIf([Kansei_Word_1]="Nyaman";"Digital timer";

IIf([Kansei_Word_1]="Risih";"None";

IIf([Kansei_Word_1]="Aman";"Digital timer";

IIf([Kansei_Word_1]="Berbahaya";"Combined";

IIf([Kansei_Word_1]="Multifungsi";"None";

IIf([Kansei_Word_1]="Biasa";"Digital timer";"Kansei word belum tersedia"))))))))))

Shape1:

IIf([Kansei_Word_1]="Kuat";"Round";

IIf([Kansei_Word_1]="Lemah";"Square";

IIf([Kansei_Word_1]="Ukuran Pas";"Square";

IIf([Kansei_Word_1]="Longgar/Sempit";"Round";

IIf([Kansei_Word_1]="Nyaman";"Square";

IIf([Kansei_Word_1]="Risih";"Round";

IIf([Kansei_Word_1]="Aman";"Square";

IIf([Kansei_Word_1]="Berbahaya";"Round";
IIf([Kansei_Word_1]="Multifungsi";"Round";
IIf([Kansei_Word_1]="Biasa";"Square";"Kansei word belum tersedia")))))))))

Body Diameter2:
IIf([Kansei_Word_2]="Kuat";"4 cm";
IIf([Kansei_Word_2]="Lemah";"3.5 cm";
IIf([Kansei_Word_2]="Ukuran Pas";"3.5 cm";
IIf([Kansei_Word_2]="Longgar/Sempit";"3 cm";
IIf([Kansei_Word_2]="Nyaman";"3.5 cm";
IIf([Kansei_Word_2]="Risih";"3 cm";
IIf([Kansei_Word_2]="Aman";"3.5 cm";
IIf([Kansei_Word_2]="Berbahaya";
IIf([Kansei_Word_2]="Multifungsi";"4 cm";
IIf([Kansei_Word_2]="Biasa";"3 cm";"Kansei word belum tersedia")))))))))

Strap Material2:
IIf([Kansei_Word_2]="Kuat";"Rubber";
IIf([Kansei_Word_2]="Lemah";"Leather";
IIf([Kansei_Word_2]="Ukuran Pas";"Nylon";
IIf([Kansei_Word_2]="Longgar/Sempit";"Leather";
IIf([Kansei_Word_2]="Nyaman";"Bracelet";
IIf([Kansei_Word_2]="Risih";"Rubber";
IIf([Kansei_Word_2]="Aman";"Bracelet";
IIf([Kansei_Word_2]="Berbahaya";"Leather";
IIf([Kansei_Word_2]="Multifungsi";"Rubber";
IIf([Kansei_Word_2]="Biasa";"Kansei word belum tersedia")))))))))

Colour2:
IIf([Kansei_Word_2]="Kuat";"Bright";
IIf([Kansei_Word_2]="Lemah";"Dark";
IIf([Kansei_Word_2]="Ukuran Pas";"Dark";

IIf([Kansei_Word_2]="Longgar/Sempit";"Bright";
IIf([Kansei_Word_2]="Nyaman";"Dark";
IIf([Kansei_Word_2]="Risih";"Bright";
IIf([Kansei_Word_2]="Aman";"Bright";
IIf([Kansei_Word_2]="Berbahaya";"Dark";
IIf([Kansei_Word_2]="Multifungsi";"Bright";
IIf([Kansei_Word_2]="Biasa";"Dark";"Kansei word belum tersedia"))))))))))

Dial2:
IIf([Kansei_Word_2]="Kuat";"Number";
IIf([Kansei_Word_2]="Lemah";"Needle";
IIf([Kansei_Word_2]="Ukuran Pas";"Number";
IIf([Kansei_Word_2]="Longgar/Sempit";"Needle";
IIf([Kansei_Word_2]="Nyaman";"Number";
IIf([Kansei_Word_2]="Risih";"Needle";
IIf([Kansei_Word_2]="Aman";"Number";
IIf([Kansei_Word_2]="Berbahaya";"Needle";
IIf([Kansei_Word_2]="Multifungsi";"Needle";
IIf([Kansei_Word_2]="Biasa";"Number";"Kansei word belum tersedia"))))))))))

Feature2:
IIf([Kansei_Word_2]="Kuat";"None";
IIf([Kansei_Word_2]="Lemah";"Digital timer";
IIf([Kansei_Word_2]="Ukuran Pas";"None";
IIf([Kansei_Word_2]="Longgar/Sempit";"Calendar";
IIf([Kansei_Word_2]="Nyaman";"Digital timer";
IIf([Kansei_Word_2]="Risih";"None";
IIf([Kansei_Word_2]="Aman";"Digital timer";
IIf([Kansei_Word_2]="Berbahaya";"Combined";
IIf([Kansei_Word_2]="Multifungsi";"None";
IIf([Kansei_Word_2]="Biasa";"Digital timer";"Kansei word belum tersedia"))))))))))

Shape2:

IIf([Kansei_Word_2]="Kuat";"Round";

IIf([Kansei_Word_2]="Lemah";"Square";

IIf([Kansei_Word_2]="Ukuran Pas";"Square";

IIf([Kansei_Word_2]="Longgar/Sempit";"Round";

IIf([Kansei_Word_2]="Nyaman";"Square";

IIf([Kansei_Word_2]="Risih";"Round";

IIf([Kansei_Word_2]="Aman";"Square";

IIf([Kansei_Word_2]="Berbahaya";"Round";

IIf([Kansei_Word_2]="Multifungsi";"Round";

IIf([Kansei_Word_2]="Biasa";"Square";"Kansei word belum tersedia")))))))))

Body Diameter:

IIf([Body Diameter1]="3 cm" And [Body Diameter2]="3 cm";"3 cm";

IIf([Body Diameter1]="3.5 cm" And [Body Diameter2]="3.5 cm";"3.5 cm";

IIf([Kansei_Word_1]="Kuat" And [Kansei_Word_2]="Multifungsi";"4 cm";

IIf([Kansei_Word_1]="Multifungsi" And [Kansei_Word_2]="Kuat";"4cm";"3.5 cm"))))

Strap Material:

IIf([Strap Material1]="Bracelet" And [Strap Material2]="Bracelet";"Bracelet";

IIf([Strap Material1]="Leather" And [Strap Material2]="Leather";"Leather";

IIf([Strap Material1]="Nylon" And [Strap Material2]="Nylon";"Nylon";

IIf([Kansei_Word_1]="Ukuran Pas" And [Kansei_Word_2]="Nyaman";"Nylon";

IIf([Kansei_Word_1]="Nyaman" And [Kansei_Word_2]="Ukuran Pas";"Nylon";

IIf([Kansei_Word_1]="Ukuran Pas" And [Kansei_Word_2]="Aman";"Nylon";

IIf([Kansei_Word_1]="Aman" And [Kansei_Word_2]="Ukuran

Pas";"Nylon";"Rubber")))))))

Colour:

IIf([Colour1]="Bright" And [Colour2]="Bright";"Bright";

IIf([Kansei_Word_1]="Ukuran Pas" And [Kansei_Word_2]="Aman";"Bright";

IIf([Kansei_Word_1]="Aman" And [Kansei_Word_2]="Ukuran Pas";"Bright";"Dark")))

Dial:
IIf([Dial1]="Number" And [Dial2]="Number";"Number";"Needle")

Feature:
IIf([Feature1]="Calendar" And [Feature2]="Calendar";"Calendar";
IIf([Feature1]="Digital Timer" And [Feature2]="Digital Timer";"Digital Timer";IIf([Feature1]="Combined" And [Feature2]="Combined";"Combined";"None")))

Shape:
IIf([Shape1]="Round" And [Shape2]="Round";"Round";"Square")

Syntax product image two kansei word

=IIf([Kansei_Word_1]="Kuat" And [Kansei_Word_2]="Nyaman";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei kuat nyaman.jpg"; IIf([Kansei_Word_1]="Kuat" And [Kansei_Word_2]="Aman";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei kuat aman.jpg"; IIf([Kansei_Word_1]="Kuat" And [Kansei_Word_2]="multifungsi";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei kuat multifungsi.jpg"; IIf([Kansei_Word_1]="Kuat" And [Kansei_Word_2]="Ukuran pas";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei kuat ukuran pas.png"; IIf([Kansei_Word_1]="Ukuran pas" And [Kansei_Word_2]="Nyaman";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei ukuran pas nyaman.jpg";"Gambar belum tersedia")))))

=IIf([Kansei_Word_1]="Nyaman" And [Kansei_Word_2]="Kuat";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei kuat nyaman.jpg"; IIf([Kansei_Word_1]="Aman" And [Kansei_Word_2]="Kuat";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei kuat aman.jpg"; IIf([Kansei_Word_1]="Multifungsi" And [Kansei_Word_2]="Kuat";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei kuat multifungsi.jpg"; IIf([Kansei_Word_1]="Ukuran pas" And [Kansei_Word_2]="Kuat";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei kuat ukuran pas.png"; IIf([Kansei_Word_1]="Nyaman" And [Kansei_Word_2]="Ukuran pas";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei ukuran pas nyaman.jpg";"Gambar belum tersedia")))))

=IIf([Kansei_Word_1]="Ukuran pas" And [Kansei_Word_2]="Aman";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei ukuran pas aman.jpg"; IIf([Kansei_Word_1]="Ukuran pas" And [Kansei_Word_2]="Multifungsi";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei ukuran pas multifungsi.jpg"; IIf([Kansei_Word_1]="Nyaman" And [Kansei_Word_2]="Aman";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei nyaman aman.jpg"; IIf([Kansei_Word_1]="Nyaman" And [Kansei_Word_2]="Multifungsi";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei nyaman multifungsi.jpg"; IIf([Kansei_Word_1]="Aman" And [Kansei_Word_2]="Multifungsi";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei aman multifungsi.jpg";"Gambar belum tersedia")))))

=IIf([Kansei_Word_1]="Aman" And [Kansei_Word_2]="Ukuran pas";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei ukuran pas aman.jpg"; IIf([Kansei_Word_1]="Multifungsi" And [Kansei_Word_2]="Ukuran pas";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei ukuran pas multifungsi.jpg"; IIf([Kansei_Word_1]="Aman" And [Kansei_Word_2]="Nyaman";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei nyaman aman.jpg"; IIf([Kansei_Word_1]="Multifungsi" And [Kansei_Word_2]="Nyaman";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei nyaman multifungsi.jpg"; IIf([Kansei_Word_1]="Multifungsi" And [Kansei_Word_2]="Aman";"D:\My Data\Tugas Kuliah\Semester 8\TA\Semantic Differential 2\Database\product image dua kata kansei\product image kansei aman multifungsi.jpg";"Gambar belum tersedia")))))