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Development of QCDSM-Based Products for Increasing Competitive Advantage Case Study of Tenun Ikat SME Kota Kediri

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Abstract: Economic development in Indonesia will not be separated from the role of Small and Medium Enterprises (SME's). The development of SMEs is one of the solutions to sustain the rate of economic growth in Indonesia, because the development of SMEs tends to be stable and not affected by the massive economic crisis. Tenun Ikat SME is one of a collection of ikat weaving craftsmen in Kediri City, East Java. In the center of the weaving industry there are 10 weavers which can cover 270 workers. Products produced by Tenun Ikat SME are less able to compete with other products because they do not meet customer expectations. On the basis of the problems that often occur in SMEs, related to the fulfillment of customer satisfaction researchers provide solutions to the method of selecting product development strategies based on competitive advantage criteria including quality, cost, delivery, service, and morale. Thus, the purpose of research is to be able to know the priority of market competition criteria and be able to determine the right product development strategy in business competition and SMEs in Indonesia. Methods of collecting data with questionnaires for customers about the criteria for competitive advantage for Tenun Ikat Kediri. The method to be used is Quality Function Deployment (QFD) based on the criteria of competitive advantage for Tenun Ikat Kediri.
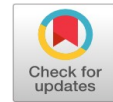
INTRODUCTION

The development of a dynamic industrial environment in the global era as it is today has become a trigger for many companies to explore their potential, and identify key success factors to excel in increasingly competitive competition as well as SME. Technology that is also growing rapidly into a force to be applied in a competitive climate. The efforts made are ultimately directed at providing the best products to consumers. The product context offered by the company to consumers in terms of production and operations management is a combination of goods and services. SME will not be able to compete if the products offered are purely goods, otherwise the service company cannot compete if the product offered does not care about the service factor. The success of SME in providing the best products to consumers includes a combination of goods and services in each ideal portion according to the company. The presentation of products in a broad sense is a challenge as well as an opportunity for operating production systems that must be carried out by SME. Starting from identifying consumer tastes to seeking all input requirements from suppliers to produce and distribute these products in accordance with the tastes of targeted consumers. Basically consumers expect to be able to obtain products that have benefits at an acceptable price level. To realize the desires of these consumers, each company strives optimally to use all its assets and capabilities to provide added value to consumer expectations. The implementation of this effort certainly has different cost consequences in each SME including its competitors.

In the beginning, the company only paid attention to the quality aspects of its products, but due to the development of the era and the tight competition of the business aspects of costs, delivery accuracy, and service from the company needed to be further studied. Therefore the criteria for Quality, Cost, Delivery, and Services are known or commonly called QCDS (Anggadwita & Dhewanto, 2016; Boonvut,

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2017; Fahey, 1999; Kokanuch, 2018). As time goes on and the demands of global business competition, companies need other criteria to support their competitive advantage. Consumer awareness regarding aspects of safety and green manufacturing requires companies to change the paradigm of competitive advantage criteria by adding aspects of safety and morale that are closely related to the company's obligation to maintain the environment in each of its business processes (Kokanuch, 2018; Sayoko, 1989). Because of these demands, the competitive advantage criteria that are relevant to be used are QCDSM.

Tenun Ikat SME is one of a group of Tenun Ikat craftsmen in the City of Kediri, East Java, which has carried out business processes since 1989. In the center of the weaving industry there are 10 weaving craftsmen who can cover 270 workers, each of whom comes from residents surrounding area. Production capacity of 139 ATBM (Non-Machine Weaving Equipment) operating in Bandar Kidul Kediri environment is approximately 8,340 meters per month or Rp 1,167,600,000.00 per month. Therefore the development of this potential industry is very important to do. In general, the attitude of each stakeholder of the weaving industry is a mutually supportive relationship for the growth and development of weaving SME.

Efforts to be able to compete with existing industries are very important for every company to do, therefore it is necessary for efforts to improve quality so that they can produce quality products and products that are in demand by consumers. Companies can choose how to compete, namely through the lowest prices or the most quality products. If a company has difficulty competing in prices, the company is better off using product quality or service quality in winning competition (Piyachat, 2017; Zeithaml & Bitner, 1990).

The price of a product or service is one of the determining factors in market demand. Price is a very important thing that is considered by consumers in buying a product. If consumers feel that they match the price offered, they tend to repurchase the same product. In the scope of business competition, every company must pay attention to aspects of the main concern of competition itself such as quality, features, functions, product reliability, services provided, product stock availability, company image and reputation, mastery of the marketing team's knowledge of its products and technology, and competitive prices (Fahey, 1999; Willy, 2017).

Competitive advantage basically grows from the value or benefits of the company to the buyers where the value is more than the cost that the company must incur to create it. It is this value or benefit that the buyer is willing to pay, and the superior value comes from offering a lower price than the competitor's price with equal benefits or unique benefits that exceed the price offered (Porter, 1998). Competitive advantage is the superiority of competitors that is obtained by offering lower value or by providing greater benefits because the price is higher (Kotler, 2003).

Based on the problems faced by these SMEs, this study will solve the problem of how a priority to meet consumer demand can be made using the QCDSM concept in choosing a product design strategy to maintain the competitive advantage that is right for the survival of Bandar Kidul City Kediri SME. measurement of customer needs in SMEs in Indonesia, the level of quality and customer loyalty has not been done much. However, research related to the development of new products that meet the market expectations of the SMEs industry in Indonesia, especially for textile SMEs, has never been done. This study aims to develop SME Tenun Ikat products to survive in the era of global industrialization in Indonesia.

With QCDSM attributes that are used as the basis for forming competitive advantage criteria which later become input for QFD, it is hoped that this research will be able to make a positive contribution to textile SMEs, especially for Tenun Ikat SME Kediri.

LITERATURE REVIEW

In this section, will be described the material regarding this research from literature about product attribute, consumer perspective, featured product, important-performance analysis, quality function deployment and review of previous research.

Product attribute

Kotler (2000) states that "product attributes are a component which are product characteristics that ensure that the product can meet the needs and desires applied by the buyer". With the attributes attached to a product that consumers use to assess and measure conformity product characteristics with needs and desires. For companies that know what attributes can influence purchasing decisions, strategies can be determined to develop and refine products to better satisfy consumers.

A product must have attributes that support it, for example the attribute is a price that functions as a purchase price that applies to consumers. According to Kotler (2000) the attributes that must exist in a product are as follows.

a. Price

b. Brand

c. Packaging

d. Quality

e. Size

In general terms there are several definitions of a quality product or service that are often defined as quality, including the following.

a) According to Wijaya (2011) defines quality as conformity with taste.

b) Whereas according to Wijaya (2011) perceives quality as zero defects, perfection and conformity with requirements.

Based on the above definitions, it can be concluded that quality is very dependent on the situation and conditions and the people involved in determining a quality.

To describe the suitability of the use of a product, where the product has characteristics that describe its relative performance against the expectations and needs of consumers. Each product has parameters that are the quality characteristics of the product. Furthermore these quality characteristics are classified as follows (De Felice & Petrillo, 2010):

1. Physical characteristics: length, weight, strength, and so on.

2. Sensory characteristics: taste, appearance, color.

3. Characteristics of time: can be treated, can be maintained within a certain period of time.

4. Ethical characteristics: honesty, friendliness, and so on.

In the implementation of quality control characteristics are grouped into two groups, namely quality characteristics expressed on a numerical scale are called variable quality control, for example resistor resistance can be expressed in ohms, diameter in mm and so on. And quality characteristics that are only stated as being eligible, accepted, good or not fulfilling the requirements, are rejected, this is called quality control attributes. For example: smell from perfume, stitches from clothes and so on.

Consumer perspective

Quality is something that is decided by customers, not by engineers, not by marketing or general management. Quality is based on the customer's actual experience of the product or service, measured by the customer's requirements and always represents a moving target in a competitive market. From the definitions there are several equations, namely the following elements.

a) Quality includes efforts to meet or exceed customer expectations.

b) Quality includes products, services, people, processes and the environment.

c) Quality is an ever-changing condition, for example what is considered to be the current quality may be considered to be of poor quality in the future.

The view of product quality is a consumer-based perspective arising from the concept of marketing. According to this view, consumers decide which products are the best in quality. In accordance with the basic philosophy of the marketing concept, high-quality products are the products that are best in meeting consumer needs. Therefore, it is important to show consumers' perspectives regarding product quality. Product quality according to consumers is largely determined by consumer perceptions. The perceived quality is almost the same as the consumer based view. The perceived quality arises from consumer experience, before, during, and after sales.

Consumers usually have opinions about product quality before purchase. Their opinions are based on the name, brand, and image of the company, previous experience with the same product, word of mouth communication with friends and neighbors or people around them, and informal assessments collected from reports or general media. After sales experience can also influence the perception of the quality. Target criteria such as reliability, speed of service, can all influence opinion. Likewise, more subjective criteria such as friends or neighbors' reactions and discrepancies after their purchase.

The main difference between a marketing outlook and a production view of quality is about the scope, conformance to specifications that focuses on a narrow view of which only reduces product defects or weaknesses. Superior fulfillment of needs looks at broader issues about long-term customer satisfaction through higher product quality.

Featured product

A superior product has elements that must be fulfilled as a response to meeting consumer needs. The elements that must be met to have a superior product according to Wijaya (2011) are as follows.
a. Good design
Design must be original and captivate the taste of consumers
b. Excellence in competition
Products must be superior, both in function and design compared to other similar products
c. Physical attraction
Products must attract the five senses (interesting to be touched or felt), must be labeled well, and must be beautiful.
d. Different and Original
For many products, consumers want to know that no one else has a product that exactly matches the product he uses, or for art objects consumers want to buy the original.

Products that lack one of the quality elements are classified as low quality or defective. The absence of certain elements can reduce the value of product quality, or not guarantee that the product will win the competition. These elements can be called negative quality factors.

From several theories that have been mentioned the factors used in this study are the theories of Kotler (2000) and Wijaya (2011) because they are in accordance with the objects in this study and in line with the quality dimensions used to adhere to the aspects of Quality, Cost, Delivery, Safety, and Morale and using the QFD method as an analytical tool. So that later the company can map and categorize their products in a position with the aim to get the design of new products in accordance with the products desired by consumers.

Important performance analysis

Initially, Important-Performance Analysis (IPA) by Martilla and James (1977) was used to evaluating consumer acceptance of a marketing program.
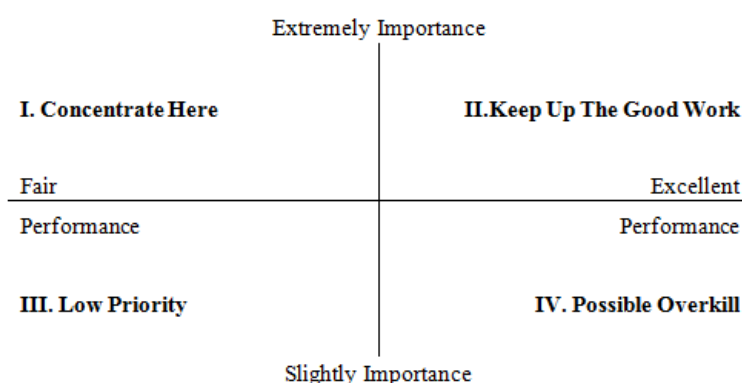

Figure 1. Importance performance grid (reproduced from Martilla and James (1977))

But its appliation expands such as for customer satisfaction analysis. That is because IPA has performance component indicated the measure of result or outcome of process or work.

Beside that IPA has importance component indicated the measure of significance or value. Importance and performance are assessed by customer or user who go through the process. IPA result is shown in 4 quadrants looked like on Figure 1, those are

a). Quadrant I (Concentrate Here) The factors located in this quadrant are considered to be very important factors by consumers but the conditions at the moment are in low performance.

b). Quadrant II (Keep Up The Good Work)
The factors located in this quadrant are considered in high performance so that the management is obliged to ensure that the performance of the institutions can maintain the achievements.

c). Quadrant III (Low Priority)
The factors located in this quadrant have a low performance and at the same time are considered not too important for consumers. d). Quadrant IV (Possible Overkill)
The factors located in this quadrant are considered not too important but in high performance so that the management needs to allocate resources related to these factors to other factors that have a higher priority of treatment that still need improvement.

Quality function deployment

QFD is one of the tools in Total Quality Management that uses customer needs in designing a product. The basic element of QFD is the quality defined by the customers. Historically, the QFD was developed in 1972 by Dr. Yoji Akao in Japan. Implementation of the QFD method in the process of designing products (goods/services) begins with the making of House of Quality (HoQ). According to Cohen (1995), House of Quality has 6 matrices/stages looked like in Figure 2, they are:
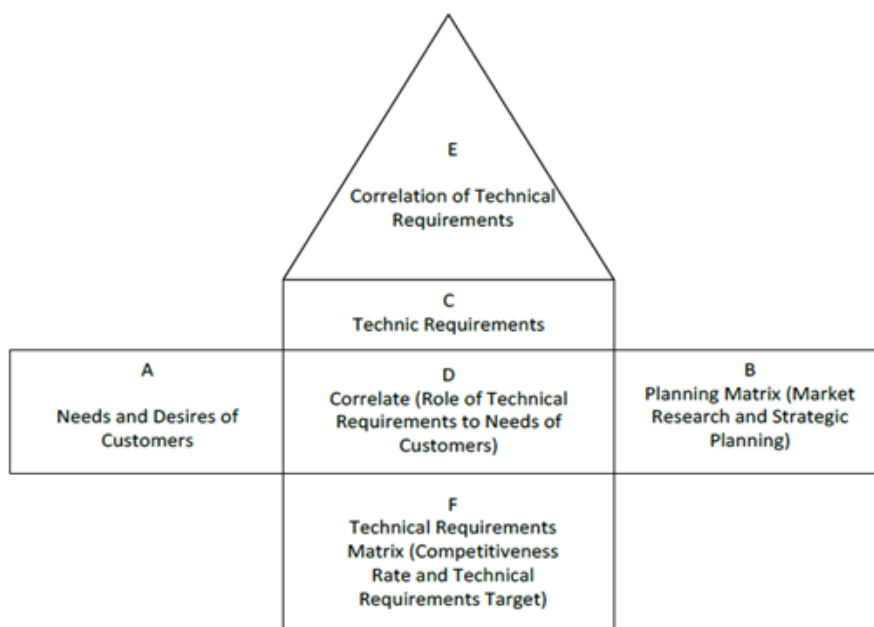

Figure 2. House of Quality in QFD Method (reproduced from (Akao, 1990; Cohen, 1995)

(a) Customer Needs and Wants (Voice of customer) extracting, developing, and categorizing customer requirements
(b) Planning Matrixset target levels (goal), improvement ratio, sales point and prioritizing customer requirements (weight) and comparing the performances with competitors.
(c) Technical Responsetranslate customer requirements to functional requiremen/design requirements by company or organization
(d) Relationship Matrixevaluating impact of functional/design requirements on customer requirements

(e) Technical Correlationdescribe the role of interdependence and interrelationship between functional/design requirements

(f) Technical Matrixspecifying target values and prioritizing functional/design requirements.

The QFD method is used by companies to anticipate and prioritize the needs and desires of customers, then process the needs and desires of the customer into a part of the product or service that returns to the customer (Eldin, 2002). from QFD are:

1. Contributing to the decrease in costs due to:

a. QFD increases the probability that the product design process does not need to be changed or reworked (because it matches the needs of the customer).

b. Work carried out based on QFD analysis is jobs that can produce something that is really needed by the customer.

2. Contribute to increasing income. Revenues will increase if the number of products sold is increasing. In order for the number of products sold more and more, then the product or service produced must be able to meet customer desires and needs.

3. Reducing the product development cycle time The faster an organization launches a new product or service, the greater the chance to win the competition. Generally the design of new products or services will begin as soon as possible after the previous product is launched and this will continue so that a closed cycle is formed, called the product development cycle, which consists of product planning processes, product manufacturing, and product sales. QFD is an important key in reducing cycle times because:

a. QFD helps reduce changes in the midst of the development process, such as supplier changes, changes in shift priorities, or technological changes.

b. QFD presents a way to meet customer needs systematically so there are no errors in interpreting customer needs.

c. QFD helps in determining which strategies should be prioritized to meet customer needs so that what is done is the things that are important to the customer, which makes the product competitive.

d. QFD prevents unmanufacturable and unserviceable risks because such risks have been taken into account from the start.

4. QFD can be referred to as a planning map that informs the designer team about what decisions must be made at each step and what information is needed to make those decisions.

5. QFD helps everyone involved in various stages of the development process to communicate with each other, so that a comprehensive flow of information is established.

Review of previous research

Research on the development of product quality from the company in order to meet customer needs has been carried out by several previous researchers. Here are some of the previous studies related to this research as stated in Table 1.

Table 1: Previous research and study

No.	Author (Year)	Method	Objective
1	Sahal, Musadad, and Akhyar (2018)	AHP and QFD	Priority of consumer needs
2	Taufiqurrahman, Sujatmiko, and Utomo (2011)	Multi Criteriate Decision Making and SEM	Factors that influence the ability of product innovation and increase the ability of innovation in MSMEs prioritize consumer needs
3	Anwar, Rosyidah, Setiawan, Mahen, and Aisyah (2018)	QFD, AHP and Focus Group Discussion	Internal improvisation and selection of market competition strategies

Research on measuring customer needs in SME in Indonesia, the level of quality and customer loyalty has not been done much. However, research related to the development of new products that meet the market expectations of the SME industry in Indonesia, especially for textile SME, has never been done.This study aims to develop Tenun Ikat SME products in order to survive in the era of global industrialization in Indonesia. With QCDSM attributes that are used as the basis for forming market competition criteria which later become input for QFD, it is expected that this research can provide positive contributions to Tenun Ikat SME Kediri.

Research on measuring customer needs in SME, the level of quality and customer loyalty has not been done much. However, research in different products has been carried out by previous researchers such as (De Felice & Petrillo, 2010; Ocampo & Clark, 2014; Wang, Liu, & Ou, 2007). Some studies related to market competition strategies and customer satisfaction based on the AHP method include Lanndon. Ocampo and Clark (2014) in the An Approach on Prioritizing Competitive Strategic Towards Sustainable Business (Ocampo & Clark, 2014) and research conducted by Minghe Wang, Peide Liu, and Guoli Ou under the title The Evaluation Study of Customer Satisfaction Based on Gray (Wang et al., 2007). Ocampo and Clark examined the selection of strategies in their correlation with the triple bottom line where businesses do not only focus on profit, but need to pay attention to the environmental aspects and the supporting human business itself.

This study aims to develop Tenun Ikat SME products in order to survive in the era of global industrialization in Indonesia. With QCDSM attributes that are used as the basis for forming market competition criteria which later become input for QFD, it is expected that this research can provide positive contributions to textiles SME especially the Tenun Ikat SME.

CONCEPTUAL FRAMEWORK

Referring to the stages in the scientific method, each study requires a frame of mind as a basis or reference with the aim of the research process being carried out in a systematic and structured. The methodology of this research consists of the stages or steps that will be carried out in the research conducted and the framework models proposed in this study looked like in Figure 3.
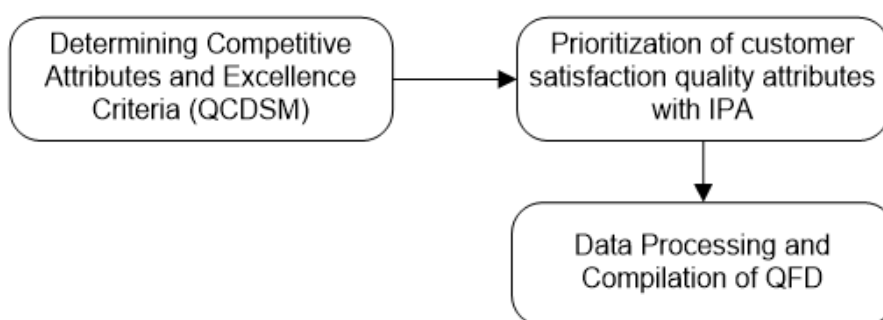

Figure 3. Research conceptual framework

Determining the competitive advantage attributes of in Tenun Ikats products refers to several existing theoretical frameworks, namely the theoretical framework presented by Kotler (2000) and Wijaya (2011). The selected attributes are based on the criteria of quality (q), cost (c), delivery (d), safety (s), and morale (m). In determining these indicators combine the basic quality criteria that Kotler (2000) has conveyed with the suitability of the paradigm and business market environment of the Tenun Ikats product.

Questionnaires were used for data collection tools to be analyzed, questionnaires on the level of consumer satisfaction were prepared using questionnaires on the level of customer satisfaction on the attributes underlying the selection of woven fabric products. Data collection is a stage to explore various information from sources that are part of the research. Data collection was obtained from the results of questionnaires to woven fabric users and woven fabric consumers and weaving entrepreneurs to get a technical response for QFD. Then the data is collected and processed in accordance with the steps set.

After the assessment data of all attributes are collected, then priority analysis is carried out to get the attributes which are the priority for service improvement using the Importance-Performance Analysis method. Attributes that located in quadrant I (high importance, low performance) are priority attributes to be improved based on customer judgment. Attributes in quadrant I are the voice of customer as input from the house of quality part of the customer needs and wants matrix in the Quality Function Deployment method. After seeing all the necessary information has been obtained, then the next step is to make or arrange a quality house. The preparation of House of Quality is done by compiling customer needs, planning matrix, technical response, ship matrix relations, technical correlation, and technical matrix.

The next stage is the stage of data interpretation, interpretation will be carried out based on the results achieved in the study. Interpretation is a translator of each value obtained in processing data and a description of QFD visualization in the form of a quality house. Analysis is carried out so that the quality of home results can be more valuable and useful to explain the observed phenomena. this research is in the form of a proposal to improve the description of the technical response.

RESULTS AND DISCUSSION

Determination of Tenun Ikats product quality attributes refers to several existing theoretical frameworks, namely the theoretical framework presented by Kotler (2000) and Wijaya (2011). The selected attributes are based on the criteria of quality (q), cost (c), delivery (d), safety (s), and morale (m). In determining these indicators combine the basic criteria of quality that Kotler (2000) has conveyed with the suitability of the paradigm and business market environment of the products of the Tenun Ikat SME Kediri. Quality attribute comes from doing field observation too. Field observation aims to determine the actual condition of the object to be studied so that the researcher has a clear picture of the object of the research. In the field study researchers will collect the data needed to determine the quality of Tenun Ikats products that will be input for field studies and literature studies by identifying the attributes that will be used as a measure of product quality. Attributes are everything that is the object of research observation. Factors that are considered to affect the quality of weaving products are used to determine research attributes. Attributes in this study are woven attributes that are important to consumers to determine the quality characteristics of woven products. These attributes are obtained from several kinds of literatures, direct interviews with consumers, and distributors. Determination of product quality attributes is as follows in Table 2.

A company can choose how to compete, namely through the lowest price or the highest quality product. If a company has difficulty competing in prices, the company is better off using product quality or service quality in winning competition (Zeithaml & Bitner, 1990). Criteria for Quality (Q), Cost (C), Delivery (D), Safety (S) and Morale aspects (M) are factors that influence customer satisfaction and support in winning market competition. In the beginning, the company only paid attention to the quality aspects of its products, but due to the development of the era and the tight competition of the business aspects of costs, delivery accuracy, and service from the company needed to be further studied. Therefore the criteria for Quality, Cost, Delivery, and Services are known or commonly called QCDS (Fahey, 1999).

Table 2: Competitive advantage indicator

Indicator	Criteria	Explanation
Price Conformity	C+Q	Is the price offered is in accordance with the quality of the product
Endurance	Q	What is the durability of the product
Product Packaging	Q+D	Is the product packaging attractive to consumers
Trademark	D	What are the symbols and writing of SME's trademarks
Product Size	Q	What is the size of the product
Dyes	S	Is the dye harmful to consumers

Table 2. Contniue....

Indicator	Criteria	Explanation
Product Color	Q	Is the color of the product attractive to consumers
Packaging Material	M	Is the packaging material environmentally friendly plastic
Product availability	D	Are products always available at outlets
Product Safety	S	Are the products safe to use for consumers
Product Delivery	D	Is product delivery always on time
Dangerous waste	M	Does the production system produce dangerous waste
Environmentally friendly	M	Is the business system of SME's friendly to the environment

As time goes on and the demands of global business competition, companies need other criteria to support their competitive advantage. Consumer awareness regarding aspects of safety and green manufacturing requires companies to change the paradigm of competitive advantage criteria by adding aspects of safety and morale that are closely related to the company's obligation to maintain the environment in each of its business processes (Sayoko, 1989). Because of these demands, the competitive advantage criteria that are relevant to be used are QCDSM.

CONCLUSION

The main goal of this study is integrating customer satisfaction based on QCDSM attribute and importance-performance analysis into QFD to improve the quality of Tenun Ikats product. Importance-Performance Analysis is to determine the priority of those competitive advantage criteria. The priority attributes are become voice of customers in the Customer Needs and Wants stage of House of Quality in QFD method.

In improving the quality of weaving products, Tenun Ikat SME Management should focus more on product attributes that have a high level of importance in the eyes of consumers. Technical response that must be the priority of management in improving the quality of weaving products must be chosen in the technical response that has the highest value and has a positive and strong technical correlation with other technical responses so as to be able to support the attributes that are important to consumers.

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