

Analysis of Ceramic Product Attributes in a Ceramic Industrial Center in Purwakarta, Indonesia

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ABSTRACT

One way to improve a product and to retain the demand for it is to pay attention to its quality. This study aims to analyze various quality attributes of ceramic products at a ceramic industry center in Purwakarta, Indonesia. The study employed qualitative research and in-depth interviews for the collection of data. Results corroborate that, although the quality attributes of the products had been applied, in line with the increasingly scarce quantity of raw materials, the differences in the handling exploration processes and clay raw materials and composition engineering resulted in the decrease of the elasticity levels and in the cracking and breaking of the final products. This research suggests that the following be carried out: (1) intensive training to maintain the quality of products produced by craftsmen, (2) handling of clay exploration with the good socialisation of the guarantee of raw materials by providers such that it can give benefits for craftsmen and raw material providers and (3) training in material composition engineering for craftsmen.

Keywords: quality attribute, ceramic industry, Purwakarta.

1. INTRODUCTION

The ceramics industry, especially those made traditionally, is one of the economic drivers for many families in various regions in Indonesia. Ceramic crafts play a role in preserving local wisdom and culture. Lately, an increase in demand for ceramics in Indonesia has come forth. In line with that, since 2012, many imported ceramics have emerged, especially ceramic products from China that are being offered at low prices. This scenario greatly affects the sale of ceramics in Indonesia (Wijaya. 2013)

One of the centers of the ceramic handicraft industry that still strives to survive is the Purwakarta Ceramic Center that was once victorious in the 1980s. In 1985, the ceramic industry rose and improved its quality, quantity and model from conventional to the decorative ceramics industry. This victory was marked by the United Nations award and the President (Lestari, Tocharman and Rukmayadi. 2013). Currently, the day ceramics has experienced a setback due to the many obstacles that occur, thereby indirectly disrupting the smooth operation of the ceramics industry.

Although some craftsmen began to enter the export market, the development of the center of ceramics was not too good and even tended to stagnate, which can be seen from the constant number of workers and craftsmen. The data from the Ceramic Research and Development Unit or *UPTD* in 2018 affirm that, currently, the total number of craftsmen is 221. This number has never increased because the younger generation lacks the interest in becoming ceramic artisans. The reduced number of reliable human resources in this industry further reduces the emergence of innovation and creativity in the development of ceramic

products. Meanwhile, the center itself has natural resources of raw materials in the form of good quality clay to produce ceramics that have a high selling value (Wahyu, 2018). Moreover, the prospect of a promising international market is marked by increasing the international market demand. Even in 2017, the ceramic craftsmen in Purwakarta cannot obtain all the export market demands.

Table 1 Development of Ceramics Exports in 2014–2017

Year	Amount of export
2014	75 containers
2015	80 containers
2016	112 containers
2017	120 containers

Source: Interview with the Head of *UPTD* Ceramics Research and Development (2018)

This development will further encourage fierce competition between the local ceramic industry and foreign ceramic crafts that offer imported ceramic products of good quality but at lower prices. Currently, 75 percent of the ceramic market share in Indonesia is still dominated by the domestic industry, but, with the continued flooding of ceramic products from foreign industries, it requires that every local company be able to increase its competitiveness to survive. Suitable strategies are needed to compete abroad. One of them is by improving the quality of ceramic handicraft products.

In the present study, the function of operation production is part of the competencies required by entrepreneurs as organisational competencies, namely, technical capabilities and business of product developers, obtaining and managing knowledge and product development process. These components belong to the operation management area. As a source of competitive advantage, operation strategy will affect the optimisation of resources (Muftiadi and Raharja, 2018)

Function of production must be supported by distribution. Distribution is an aspect in ceramic processing activities. This process applies to large and small companies. Notably, the Plered ceramics industry is a component of the household industry, which must be developed optimally given its vast potential to support the regional economy in the future (Arifianti and Raharja, 2018)

Product quality must be sought by every company to be able compete and thrive in the market for the satisfaction of the needs and desires of consumers (Kurriwati. 2017). Customer expectations can be met or even be exceeded by providing high-quality products (Wibowo. 2009).

High-quality products will be the target of consumers to meet their needs. Critical consumption continues to arise, especially in the era of the global market that considers product quality the main thing that consumers pay attention to in choosing the products that will meet their needs. The increasing intensity of competition also requires that every company invariably pay attention to the needs and desires of consumers and try to fulfill what they expect in a more

satisfying way than what the competitors do. This must be the companies' rationale for keeping customers' loyalty despite all the changes that might possibly occur (Ariadi Wibowo, 2009).

Now Iis and Simonson (in Wibowo (2009) deduced that consumers have many choices on many brands, but consumers can be interested in buying good quality products. Having low-quality products is one of the factors that inhibits companies from advancing and reducing their profits (Haransky, in Wibowo, 2009). In addition, product is very important in the industrial world, both in the goods and service industries. With increasing competition, companies must also be able to produce quality products with affordable production costs.

Product quality also refers to the state where a product has a high selling value that cannot be found in its competing products (Supriyadi et al, 2016). Consumers will be satisfied if the results of their evaluation validate that the products they use are of high quality (Lupiyoadi, 2001, Fure, Lapian, 2015).

Craftsmen must initially identify the attributes of the items they produce, which are then known as the dimensions of product quality, to be able to precisely improve the quality of their products. The dimensions of product quality describe aspects that consumers evaluate in the consumption process they do. Thus, craftsmen must focus on what consumers evaluate to face competition.

2. LITERATURE REVIEW

2.1 Concept of Product Quality

Quality is defined as a match for use or the extent to which a product successfully serves the purpose of consumers (Beverly et al., 2002). Asghar Afshar et al, 2011). Mowen and Minor (2002) defined product quality as a comprehensive evaluation of customers for the goodness of goods and services.

The main issue in assessing product performance is what dimensions consumers use to evaluate it. A part of product policy is about product quality. The quality of a product in the form of goods or services must be determined through its dimensions. Product quality can also be defined as 'fitness to use' or 'conformity to requirements' (Russell & Taylor, 2006). According to Goetdch and Davis (2002), product quality is a dynamic condition that relates to goods, services, people, products and environments that meet or exceed expectations.

2.2. Product Quality Dimensions

If a company wants to maintain a competitive advantage in the market, then it must understand what aspects or dimensions are used by consumers to differentiate the products that it sells from competing products (Boyd, Harper, W. Ovrille, C. Larreche, Jean Claude, Mullin, John, W., 2005). Garvin (2007) revealed the eight dimensions of product quality that are commonly used by marketers, namely, performance, feature, conformance, reliability, durability, serviceability, aesthetic and perceived quality.

a. Performance

The performance dimension is the main characteristic or function of a product. It also refers to the main benefits or properties of the products consumers buy, which is usually the first thing they consider.

b. Feature

The feature dimension refers to the additional characteristics or features that complement the basic benefits of a product. Features are options or options for consumers. If the main benefits are standard, then features are commonly added.

c. Reliability

The reliability dimension is the opportunity for a product to be free from failure when carrying out its functions.

d. Conformance

The conformance dimension is the suitability of product performance with the standards stated in a product. This is a 'promise' that must be fulfilled by the product. Products that have this dimension thus comply with the standards.

e. Durability

Endurance shows the age of a product, that is, the amount of use of a product before the product is replaced or damaged.

f. Serviceability

The quality of a product is determined on the basis of its ability to be repaired: easy, fast and competent. Products that can easily be repaired are of higher quality compared with those that are difficult to repair.

g. Aesthetic

Beauty concerns the appearance of products that can attract consumers. Aesthetic also refers to product design or packaging. Some brands improve their aesthetic to make their products appear more attractive in the eyes of consumers.

h. Perceived quality

The perceived quality dimension refers to consumers' determination of image, brand or advertisement. Famous branded products are usually perceived to be of higher quality compared with those that are not heard. Consumers want products that have high conformance quality. The quality of conformity is the level of conformity and the fulfilment of all the units produced against the specifications of the promised objectives (Kotler, 2005).

Customer satisfaction depends on how high the quality of the product offered. Consumers invariably evaluate the performance of a product, and consumer satisfaction indicates the loyalty of consumers to a product and can improve the reputation of the company.

3. RESEARCH METHODS

This study employed qualitative research that engenders descriptive data in the form of written or oral words from people and observable behaviour.

Data were collected through in-depth interviews, with craftsmen having been selected on the basis of the following criteria. (1) They must currently have the largest export volume.

This selection was based on the arguments about what makes the product attractive and qualify to be marketed in the international market, despite the high level of competition. (2) They must have previously exported products, but have currently stopped. This selection was based on the arguments about what causes a craftsman to stop his export activities. Interviews were also conducted with the *UPTD* staff to profoundly determine the factors that caused a decline in ceramics industry activities in Purwakarta.

4. RESULTS AND DISCUSSION

4.1 Performance

Consumers will invariably consider performance aspects every time they buy a product. Performance is basically related to the functional aspects of a product and is the main characteristic that customers consider. Performance usually includes faster (faster) aspects related to the time dimension that describes speed and convenience or how to obtain a product and cheaper (cheaper) aspects related to the cost dimension that describes the price or cost of a product to be paid (Laksana, 2008). Performance (performance) is the principal operating characteristic of the core product purchased (Tjiptono, 2009). Mowen and Minor (2008) argued that performance is the appearance or performance of the function or main characteristics of a product. Thus, performance is the basic operating characteristic of a product, such as the function of good use as it should be added to the advantages of speed in processing, ease and price paid.

Furthermore, the condition of ceramic raw materials in Purwakarta is actually fairly good and can even penetrate the export market. The characteristics of Purwakarta ceramic raw materials, especially those mined from the Citeko area, are more flexible. Constraints that occur in the performance of raw materials actually only revolve around the decreasing quantity. Clay mining, especially from the Citeko area, is estimated to have been going on since 1904. Hitherto, thousands of tons of land are explored to meet the craft needs of the craft daily such that the quantity decreases. Accordingly, the craftsmen engineered the composition of the soil by mixing with other ingredients to ensure that the production process could continue. This endeavour resulted in a decline in the quality of ceramics. Mixing other materials such as sand that is too much will result in the end of the ceramic being quickly cracked, high seepage, and easily broken.

4.2 Features

In marketing products, marketers commonly offer various features to attract consumers. Features are attributes that complement the basic performance of a product, such as smooth texture, attractive design and attractive product forms (Tjiptono, 2009: 93). In line with that, Mowen and Minor (in Setiawan and Sobari, 2008) revealed that features are additional attributes that complement the main function of a product. Therefore, features are attributes that complement the main function of a product.

The elastic properties that make the ceramic end result strong make the soil raw material for ceramic manufacturing in Purwakarta be categorised as good. Accordingly, clay is specifically used for crafts. Meanwhile, clay in other regions can rarely be used for crafts. The following are the advantages of easily formed clay raw materials that can help in the production process: (1) reduce the possibility of failure or defect products, (2) reduce the production time and (3) facilitate the development of more complicated ceramic designs.

4.3 Conformance to Specifications

Tjiptono (2009) inferred that conformity with specifications is the extent to which the product design characteristics of a product meet predetermined or not defective standards. In addition, conformity with specifications is defined as the level of conformity of the product to the specifications promised. Compliance with the specifications defined by Mowen and Minor in Setiawan and Sobari (2008) states that conformity with specifications is the level of conformity with the specifications promised.

The Purwakarta ceramic raw material known to craftsmen is having high elasticity properties. Given the diminishing quantity, composition engineering is generally done to pursue quantity requirements such that the level of elasticity decreases. Currently, differences in handling in the process of clay exploration emerge. When the quantity of raw materials is still abundant and the demand is not too much, raw material entrepreneurs will usually precipitate clay that has been explored for a long period of time, that is, at least one month. This scenario make the minerals contained in the soil decompose such that the quality of raw materials is gets better. Nonetheless, given the urgency of demand, deposition is rarely done because the land that has been explored is immediately taken to the craftsmen's production site.

With regard to the standard of ceramic raw materials that must be met, hitherto, craftsmen and the relevant government do not have standardisation. Hence, assessing whether the ceramic raw material is in accordance with the specifications if not tried directly is difficult. The problem is that direct experiments will add costs to the production process. Craftsmen hope that the government can standardise the types of land that can be used. The standardisation of the types of raw materials can protect Purwakarta crafters because the types of land used today have not been standardised. The use of raw materials that are not in accordance with the standard specifications is feared to affect the final results of ceramic products.

4.4 Durability

Products that have long durability will be perceived as having good quality. Endurance is related to the level of ability of a product to tolerate pressure or stress without experiencing significant damages until a replacement is available (Tjiptono, 2009). Thus, durability is related to how a product can last up to a specified period of time, or, if a damage occurs, then the product is expected to be easily replaced.

Clay as a raw material for Purwakarta ceramics that is elastic makes the raw material produce a final product that is not easily broken and strong to withstand heavy loads. This raw material is also strongly burned with a temperature of 850–950oC even for up to 16–24 hours.

The length of the combustion process and the high temperature make the corrosion of the ceramic smaller such that the end result of the ceramic becomes strong and not easily cracked.

4.5 Reliability

Reliability is a small possibility of damage or failure to use. Reliability is a quality dimension that relates to the possibility that a product can work satisfactorily at certain times and conditions. Weather conditions with two seasons also do not affect the quality of the clay so much. During the rainy season, raw materials tend to be wetter, but the quality of their flexibility does not change at all. Only a few differences emerge in treatment, namely, burning that becomes longer. Meanwhile, during the dry season, soil conditions that tend to become drier must only be slightly moistened.

Clay raw materials that have gone through a plastic packaging process will survive the same conditions for one year but will survive for one week only if they have not undergone the process. The point is that the same condition is related to the texture of the soil. For instance when the plastic has been opened, the clay tends to be drier. As for quality, it has not changed at all.

4.6 Service Capability

For high involvement products, serviceability is an easy way to repair a product. A product is considered serviceable when repaired easily and cheaply (Tjiptono, 2009). Mowen and Minor in Setiawan and Sobari (2008) concluded that serviceability is the convenience of products to be repaired or appropriate, reliable and timely personal services. Garvin (1984, in Shaharudin et al. (2010) argued that serviceability is speed, ability and friendliness in providing services. On the basis of the two meanings above, service capabilities are the ease of repair or appropriate, reliable and timely services.

In addition to service delivery, raw material entrepreneurs also have a guarantee policy for raw material products that are considered by craftsmen as not in accordance with the specifications they normally obtain. For instance, ceramics are difficult to form or break before being burned. Raw material entrepreneurs allow craftsmen to exchange raw materials that they feel are not in accordance with what they expect. The warranty applies to ceramics before being burned.

4.7 Aesthetics

Aesthetic refers to the appeal of a product to the five senses, such as attractive physical forms, colors that match the preferences of a customer and the aroma of a bread that can evoke appetite, (Tjiptono, 2009). Mowen and Minor revealed that aesthetic is how the product is seen, felt, heard. Thus, aesthetic is a product attraction that can be felt by one or all of our five senses.

The attractiveness of clay as a ceramic raw material in Purwakarta is a smooth texture when touched. In addition, the ceramic raw material in Purwakarta has the color of granola, which, when burned, will produce terracotta colors that are attributed to the characteristics of pottery ceramics.

4.8 Customer Perceived Quality

Quality perception refers to the image and reputation of products and companies' responsibility for them. Given the lack of knowledge of consumers about product attributes, they commonly perceive the quality from the aspect of price, brand name, advertisement, reputation of the company and the country of manufacture (Tjiptono, 2009). In addition, Mowen and Minor (1998) corroborated that perceived quality is a combination of all categories, which are the influence of brand image and other intangible factors that influence the consumer perceptions of quality.

Ceramic craftsmen who are already accustomed to handling the production process with clay raw materials can usually easily categorise the quality of clay even just from seeing its color. The color of granola owned by Purwakarta clay can be categorised as ceramics that have good quality. Apart from that fine ecstasy from clay, it perceives ease in the ceramic printing process.

5. CONCLUSIONS AND SUGGESTIONS

5.1 Conclusions

On the basis of the abovementioned description and discussion, the following are concluded. Firstly, the attributes of product quality in the production process in the ceramic industry in Purwakarta have been applied in accordance with the principle of product attributes and the final results have fulfilled the attributes of product quality aspects.

Secondly, the raw materials of clay used by craftsmen come from raw material providers. Providers provide services in the delivery of raw materials and provide guarantees if the raw materials sent are not in accordance with the specifications needed by craftsmen or different from before.

Thirdly, the obstacles faced in relation to the application of these product attributes faced by craftsmen today are the decreasing amount of clay raw material supplies. However, composition engineering produces low levels of material elasticity. Consequently, the ceramic becomes fast cracking, obtains high seepage and gets easily broken. This situation is exacerbated by different methods of handling in the process of the exploration of clay such that the quality of raw material for clay is also not uniform.

5.2 Suggestions

On the basis of the conclusions described, this research provides the following suggestions. Firstly, craftsmen consistently apply the production process in accordance with product attributes to produce quality output. Secondly, training should be provided to raw material providers in the exploration of clay to be sent to craftsmen. With this training, exploration will be better, and exploration materials will have an effect on better final product quality. Thirdly, training must be provided to craftsmen in composition engineering so that the

results are better than the results so far. The raw material guarantee policy provided by the provider is to be socialised so that it can benefit craftsmen and providers.

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