Implementation the Trilogy Juran in SMEs Business Case Study in Indonesia

Ayi Tejaningrum

1Faculty of Management, STIE Ekuitas, Bandung, Indonesia.

*Corresponding author: ayi.tejaningrum@ekuitas.ac.id

Abstract. The study was conducted on 12 Small and Medium Enterprises (SMEs) in 4 cities in West Java Province using qualitative research methods in-depth interviews became the main source for obtaining data. SMEs have major weaknesses with regard to low product quality. The purpose of this study is to obtain information and data analysis regarding how the Juran Trilogy is applied in quality management. Grounded theory is used for research methods with the Snowball Sampling approach to determine the number of samples. Based on field data shows that Indonesian SMEs have weaknesses in the planning phase especially for the transformation of the quality dimension into the production process. This condition is caused by weak access to technology and raw materials. In the process of quality control, it is generally already well done by SMEs but it has not been supported by the process of recording a new reactive to the problem, so the high inconsistency in the quality dimension. The government must be involved in assisting SMEs to access mastery of technology and raw materials and improve the skills of SME owners to be able to carry out planning, control and quality development (The Trilogy Juran) transformation for all their employees.

1. Introduction

Joseph M. Juran is one of the world leaders who focus on quality development in the company. Juran is famous for its quality management Trilogy concept. In addition to Juran, there are other prominent figures such as W. Edward Deming who is famous for Deming’s 14 point, Philip B Crosby with his Quality is free, and A.V. Feigenbaum who spawned the three steps to quality concept of Walter A Shewart, Kaoru Ishikawa and Genichi Taguchi. Joseph was born on December 24, 1904 in Braila-Moldova, Dr. Joseph M. Juran from a father named Jacob who is engaged in the shoe business. History notes how Juran suffers from anxiety when he sees his father's business suffering from an inability to manage product quality. Coming from this concern, Juran did the analysis and gave birth to the concept of Trilogy Juran’s. In this model introduced three stages in the process of quality management that is quality planning, quality control and quality improvement.

SMEs in Indonesia today become the backbone of the nation's economy because it is a dominant business population that reaches 99.6%. Grows 59.08% of GDP and contributes 14.05% of exports volume (Business Profile of Micro, Small and Medium Business SME Bank Indonesia, bi.go.id). On the other hand, Indonesian SMEs experience some problems especially limitations in market access, access to financial institutions, access to raw materials as well as access to limited natural resource ownership. Many factors affect the inability of SMEs to access the market including the limited knowledge and skills of SMEs in formulating the wishes and expectations of consumers into the quality of technical dimensions; the courage to bear the low risk, the mastery of technology is still limited in terms of upstream industry downstream macro.
At the paper OECD Ministerial Conference on Small and Medium-sized Enterprises, taking place on 22-23 February 2018 in Mexico [1] mention SMEs are lagging behind in the digital transition and are disproportionately affected by trade barriers deficient intellectual property protection and quality of infrastructure and institutions [1]. SMEs managers must be able to improve understanding of quality and apply it to the ability to compete in a turbulent business environment and ensure the adoption of quality culture in all aspects of the organization [2]. Total quality management is positively related to the performance of SMEs in the manufacturing sector [3]. Shows that the low capability of SME products is due to a weak quality culture [4]. Problems relating to the ability to meet the expectations and desires of consumers or meet the quality of products that consumers expect becomes a major thing and important to be analyzed further. In previous research conducted by the authors show the quality of SME products is still far from the value expected by consumers especially with respect to the consistency of quality dimensions [5]. As mentioned earlier, Dr. Joseph M. Juran Engineering who is very interested in the field of product quality development gave birth to Trilogy Juran models are: quality planning, quality control and quality improvement [6]. This paper attempts to explain how Indonesian SMEs are implementing the Trilogy Juran, to further analyze why the quality of SME products has not been as expected.

2. Theoretical review

2.1 The Juran’s model

The Juran Trilogy can summarize in three primary managerial functions. Juran’s views on these functions are explained in the following section [7]. Hence, figure 1 shows The Juran Trilogy.

![Figure 1: The Juran Models](image)

From the picture above, the quality must first be planned, what kind of quality will be offered to consumers? Companies must have careful planning, which comes from the value of expectations and consumer desires. This refers to the opinion of Shigeru Mizuno [8], Crosby [9]. The second stage is quality control, where the company must plan well, so that the activity from the input process to the output is able to provide the quality dimension in accordance with expectations. Next, is the development stage, the company must be able to make continuous improvement of the current and future
quality dimensions this is in line with the values and expectations of consumers are constantly changing [10]

2.2 Quality planning concepts
The quality planning is an activity that involves the development of products, systems and processes needed to meet or exceed customer expectations. Some of the steps needed in the first quality planning process relate to determining who the customer is [11]. The company cannot work on all customer segments because each segment has different values and wishes. SMEs must first determine who consumers will be served by being distinguished by age, income, gender, culture, place of residence and so on. The second stage of quality planning is determining what consumers need or want. SMEs must be able to identify consumer needs that have been determined in the first stage. For this stage, UKM can refer to eight dimensions of product quality namely: performance, features, reliability, and conformity with specifications, durability, service, aesthetics, and perceived quality. The third stage is to develop products with features that respond to customer needs: at this stage SMEs must be able to develop products according to the features needed by customers. The fourth stage is to develop systems and processes that enable organizations to produce these features; SMEs must think and plan all components of the process that determine the quality features or dimensions needed by consumers. The final stage is to spread the plan to the operational level

2.3 Quality control
The Quality control involves the following process:

i. Firstly is assess actual quality performance in the first stage with regard to quality control is to assess the product quality directly in the field, set the sample analysis, record and process it into information.

ii. Secondly, compare performance with goal. The next stage is to compare with the criteria set in the planning stage to analyze whether there are deviations.

iii. Thirdly, act on differences between performance and goal: the last stage is to take action on the deviation that occurred [11].

2.4 Quality improvement
The improvement of quality should be ongoing and continual;

i. Develop the infrastructure necessary to make annual quality improvement: this stage SMEs have to invest with regard to infrastructure either in the form of machines or tools needed for product quality development.

ii. Identifying the specific areas need improvement and implement projects: Of the many dimensions of quality, SMEs must determine what priority dimensions should be developed to assign key performance indicators.

iii. Establish a project team with responsibility for completing each improvement projects

iv. Provide teams with what they need to be able to diagnose problems to determine root causes, develop solutions and establish control that will maintain gains made [11].

3. Methodology and sample

3.1 Methodology
In this research use qualitative research method with grounded theory approach and case study as its base. Grounded Theory by Creswell [12] is qualitative strategy in which the researcher derives general abstract theory of a process, action or interaction grounded in the views of participation in a study. Here it is seen that grounded theory is one of the qualitative methods of research where researchers can draw generalizations from an abstract theory of process action or interaction based on the views of the participants. Creswell describes the understanding of case studies namely the stages of the process to explore in depth programs, events, activities, processes on one or more individuals must be limited by
time and activity and researchers must gather detailed information using various data collection procedures during the period continuous time [12].

3.2 Sample research
The research was conducted on creative industry-based SMEs located in 4 cities in West Java namely Bandung, Cimahi, Sumedang and Tasikmalaya. Research is conducted by direct interviews with business owners. Research is conducted by direct in-depth interviews with business owners. For data collection using Snowball Sampling where the sample will be selected directly by the researcher, the analysis is done with grounded research approach, to be studied in more depth and the sample will continue to be added until the data is in relatively stable condition. In the initial stage one sample is taken for each city, analyzed followed by the second sample then analyzed and will stop the number of samples when getting homogeneous data and information.

4. Results and discussion
4.1. Description of sample SMEs
As stated earlier that the initial stage in the implementation of Trilogy Juran is quality planning related to determining who consumers will be served. There are 12 SMEs analyzed which are shown in table 1:

| No | SMEs                  | Product           | Description product                                                                 |
|----|-----------------------|-------------------|-------------------------------------------------------------------------------------|
| 1  | Opak Odang            | Traditional Food  | This food is made from glutinous rice flour which is chopped with grated young coconut and fried in palm oil. This product is traditional food of the Sumedang people, tastes salty and crunchy with a thin and round shape. |
| 2  | Krupuk Agung          | Traditional Food  | This “Krupuk” is made from cassava flour mixed with fish flavourings. Traditional Indonesian food at a price that is cheap and popular with most people was eaten with rice. |
| 3  | Noga Mawar            | Traditional Food  | This food is made from palm sugar mixed with peanuts. Usually eat as a snack with hot tea. |
| 4  | Paprici               | Agriculture       | Engaged in agricultural business with the main product being cultivation and distributor of paprika. This business has been running for 7 years and absorbs 4 workers and 50 farmers. |
| 5  | Qukyta Shoes          | Craft shoes       | This company produces special types of handmade shoes with the female target market. Established since 2016, the owner of the company is based on his hobby which is adventure to see opportunities for fashion shoes for women who have these hobbies to look fashionable. |
| 6  | Amenity Design Interior |                 | Engaged in interior design business specifically for household needs with a workforce of 14 and established since 2010. |
| 7  | Kulit Rancabali       | Tanning Of Goat And Sheep Skin | This business is the tanning of raw goat skin and sheep to be used as material for making leather jackets. This business has been operating from the time of Japanese occupation or around the 1940s. Currently it has a workforce of 30 people. Producing processed food with the main raw material of fresh fruit mixed with cane sugar. Fresh fruit prepared is native |
| 8  | Harum Sari            | Candied fruit     |                                                                                      |
Indonesian fruit called kedondong. This business has been running since 1992, the funds currently have 10 workers

| No. | Company Name      | Industry          | Description                                                                 |
|-----|-------------------|-------------------|-----------------------------------------------------------------------------|
| 9   | CV Putra Galuh    | Coconut Essence   | This food is processed as a result of coconut water extraction. Founded in 2008 with a current workforce of 8 people. |
| 10  | Mulayana Fasyeh   | Office Uniform    | Office uniforms are the main business of Mulayana Fasyeh. Uniforms that are commonly produced orders from government offices such as schools, government, military, etc. This business has been running since 2007 and currently has 19 workers. |
| 11  | Krupuk Apip       | Traditional Food  | This “Krupuk” is made from cassava flour mixed with fish flavourings. Traditional Indonesian food at a price that is cheap and popular with most people. I was eaten with rice. |
| 12  | Kebaya            | Embroidery        | Kebaya is traditional Indonesian clothing. This business moves in embroidery for Kebaya clothing. Founded in 1974 with 30 employees. |

From table 1, the types of businesses and names of SMEs are sampled in 4 cities with 12 samples. Some samples are engaged in the food processing industry and a small part in the fashions and craft industries. In the analysis process explained descriptively regarding the stages of Trilogy Juran. The first concerns quality planning, both quality control and third quality development.

4.2 Quality planning implementation in SME’s

How to carry out quality planning related to which consumers will be targeted by their business. There are five stages in the process of implementing quality planning namely:

i. Determining Customers.
ii. Identify customer’s needs.
iii. Product development with features that meet customer needs.
iv. Implement the plan to the operational level.
v. Implement the plan to the operational level.

4.2.1. Determining customers. Generally, SMEs have defined the segmentation of the customers to be served. They realize the importance of segments because it will determine the price and quality offered. The segmentation used by the SME sample is age and income. The culinary industry is 100 percent based on revenue. While for agriculture and garment industry is age and income. Price segmentation in food SMEs is a lower segment with a price range of 30% to 40% cheaper than similar products issued by large businesses. For example, in the fruit processing industry, the price offered is IDR 15,000 / kg; the price of a large business is IDR 28,000. In interior design, shoes and fashion, the segmentation used is age and income. For shoes, take the lower middle segment with the main target of women. In the target interior design is the lower middle class for new households (age) while the border takes the segment of young people with lower middle income.

4.2.2 Identify customer’s needs. Of the 12 samples, all have the same understanding of the quality requirements needed by the target audience. In food SMEs, they understand the dimensions of quality namely about good taste, does not contain excessive oily, clean, healthy, does not contain harmful substances and preservatives. While for the design and clothing industry, the dimensions needed regarding quality according to UKM are designs that keep abreast of the times are durable, do not contain defects and are pleasing to the eye.
4.2.3 **Product development with features that meet customer needs.** How SMEs develop the quality dimensions needed by consumers in the previous stage. In general, they understand and consistently make various efforts to achieve this. For example, in the interior design industry, SMEs are trying to see the development of the interior design industry through the internet and visiting developers. In the food industry, SMEs continue to seek technology to be able to meet the needs of these consumers. In the leather tanning industry, in addition to trying to improve the existing process also conduct a comparative study of tanning SMEs in other regions.

4.2.4 **Develop system and process.** This stage relates to the implementation planning process of the quality dimension of the process. How SMEs do this stage, in general the main problem is here, namely how to transform the dimensions of product quality in the process of input to output. SMEs generally only use felling and periodic trials. The results achieved are not a maximum, so the quality dimensions in consistencies continue to occur defective products are still being sold because they avoid losses.

4.2.5 **Implement the plan to the operational level.** Most SMEs have limited access to technology to meet the dimensions of product quality that consumers expect. In the food industry there is no technology that makes "opak" and crackers not contain excessive oil, so that the coconut oil will remain in the wrapper. This condition is not liked by consumers because it will reduce the level of crispy and high cholesterol. In leather tanning SMEs, the technology they have not been able to access is how to reduce fat levels on the skin which makes the skin rot faster and contain bacteria. Also related to technology to smooth the skin is still traditional so it is not evenly distributed on all products. In the paprika farming industry, it is related to the handling process that will make paprika durable and not easily damaged.

4.3. **Quality control implementation in SME’s**

The next stage of the Juran Trilogy is how SMEs control quality. The following is a description of the condition. There are 4 parts of the quality control process, namely first with regard to as follows;

- i Assessing the quality of actual performance.
- ii Compare performance with objectives.
- iii Act on differences between performance and objectives.
- iv Take action against deviations that occur.

4.3.1. **Assessing the quality of actual performance.** Overall (100%) sample SMEs inspect the quality of products well analysed since the raw material comes into the final product. The weakness is only based on felling SME owners without measurable standard and not recording events. This condition results in a variety of product variations that make in consistencies in the quality of the products produced. In addition to this, felling in the quality control process is less distributed to employees, so that if the owner experiences obstacles, the tendency of the actual performance quality assessment process will be neglected. This condition occurs in 100% of SMEs or all SMEs.

4.3.2. **Compare performance with objectives.** The process of comparison between the expected dimensions and events generally has been carried out by SMEs although only by using instincts and explanations, it has not been scientifically recorded and analysed. But SMEs understand what dimensions contribute to the biggest disability. The weakness at this stage is that the comparison is only qualitative such as comparison of colours, comparison of crispness, comparison of oil content, comparison of performance that is difficult to quantify due to weak access to technology.

4.3.3. **Act on differences between performance and objectives.** Some measures have been taken by SMEs to maintain product quality performance including:

- i Firstly is involving human resources to control quality and working with the action plan in quality maintenance.
- ii Secondly is using good equipment, temperature regulation and storage.
iii Then, in order to keep the product from moisture, once again the process of distributing knowledge regarding quality control is not fully owned by all company employees.

4.3.4. Take action against deviations that occur. Some actions often deviate from SME quality planning, especially when prices of raw materials and auxiliary materials rise. SMEs have control over the use of raw materials; they understand the very close relationship between the use of raw materials and product quality. In processing SMEs try to fulfill the raw material in quality one. The problem arises when the price of raw materials is high, there are two actions taken by SMEs, namely raising prices or decreasing product quality by using two quality raw materials. Based on the results of interviews with 12 SMEs, samples of 9 SMEs 75% did the first act, namely replacing raw materials with the second quality, and as many as 25% or 3 SMEs will increase prices by first communicating them to consumers.

4.4. Quality Improvement Implementation in SME’s

There are 4 actions that must be carried out in the quality development phase namely:

i Developing the infrastructure needed to carry out annual quality improvements.

ii Identifying certain areas that need improvement and implementing improvement projects improvement projects.

iii Provide the team with what they need to be able to diagnose problems to determine the root cause develop solutions.

iv Establish controls that will maintain the results made.

4.4.1. Developing the infrastructure needed to carry out annual quality improvement. In general, the infrastructure used by SMEs is still simple both from buildings, road access, warehouses, production sites, and machinery and production equipment. All SMEs combine buildings for businesses with homes. From field research and interviews, SMEs generally set aside a portion of the profits to repair business buildings, buy equipment and machines that are needed. With regard to quality improvement in infrastructure development it is not specifically intended for quality improvement.

4.4.2. Identifying certain areas that need improvement and implementing improvement projects. There is no specific area for quality improvement; the area used is combined with the location of the process. The business owner is the main initiator in the process of repairing and developing quality. SMEs consistently have quick reactions to quality improvements, but are incidental when problems arise.

4.4.3. Establish the project team with responsibility for completing each improvement project. Have not formed a committee or project that is specifically served to make quality improvements. Repairs are carried out by all employees and business owners [13]. There is no specific section for quality development.

4.4.4 Provide the team with what they need to be able to diagnose the problem to determine the root cause, develop a solution, and establish controls that will maintain the results made. Conditions that have not been scientifically conducted are based on written data and facts. UKM only conducts it based on the initiative of the owner and also felling which has been carried out for generations. The stage of diagnosing the problem has been done well and determining the control that must be done has also been done well but the quality development decision is always hampered by the costs of production and access to the technology that has not been obtained.

Acknowledgments

The author highly appreciates the Director General of Higher Education of the Republic of Indonesia who has provided financial support for the implementation of this activity.
References

[1.] OECD 2018 Strengthening SMEs and entrepreneurship for productivity and inclusive growth. SME Ministerial Conference 22 - 23 February 2018 Mexico City

[2.] Saumyaranjan , S Y 2018 Total Quality Management in Indian Manufacturing SMEs. Procedia Manufacturing Volume 21 Pages 541-548

[3.] Edwin A, Evawere A 2016 Impact of Product Quality Management on the Growth of Small and Medium Sized Enterprises. European Journal of Social Sciences, Vol. 52, No. 2 2016 Page16

[4.] Tejanningrum 2016. Quality Culture and Capability Process Supply Chain of SMEs. International Journal of Innovation and Organization, Vol.9.2 Oct 2016: 214-225

[5.] Tejanningrum . A. 2014. Inconsistency Quality Products (on Six Sigma Programs) Effect on Customer Loyality: Case Study of Industri “Tahu”. Journal “Management Study” ISSN 2328-2185, January 2014. Vol 2 No 1. David Publishing USA

[6.] Juran 2015. Juran’s Quality Management and Analysis. Mc Graw Hill International Edition. Singapore.5-19

[7.] Juran J. M.1995 Quality designing, creating the new definition of quality into goods and services. Jakarta: Library Binaman Pressindo

[8.] Shigeru M 1994 Wide Total Quality Control. Jakarta. Management Institute

[9.] Crosby P.B 1986 Quality is Free, The Art Of making Quality Certain New York, McGraw-Hill Book Co

[10.] Juran M. Joseph 1989 Juran on Quality By Design, New York, McMillan Company

[11.] Goetsch L. D., Davis B. S.2014. Quality management for production, processing and services. New Jersey: Prentice-Hall

[12.] Cresswell Jhon W 2009 Research Design, Qualitative, Quantitative, and Mixed Methods Approaches Sage, LA

[13.] Tejanningrum. A. 2016. Transformational Knowledge and Skills Realated to The Establishment of quality culture and effect on products quality. Proceeding The Fifth International Conference on Entrepreneurship and Business Management (ICEBM 2016)