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MEDIATING OF INNOVATION ON THE EFFECT OF TOTAL QUALITY MANAGEMENT TOWARD OPERATIONAL PERFORMANCE

Pudjo Sugito[1], Sunaryati Hardiani[2], Rona Aldy Pamukty[3]

[1,2]Associate Profesor at Faculty of Economics and Business, University of Merdeka Malang, Indonesia.

[3]Management Consultant at Tulungagung, Indonesia.

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ABSTRACT

This study aims to analyze the effect of applying total quality management (TQM) toward innovation, to analyze the effect of innovation on operational performance, to analyze the effect of applying total quality management techniques to operational performance, to analyze indirectly effect of total quality management to operational performance through innovation. The research population is all employees of UD.Wiguna Makmur, Trenggalek, East Java, Indonesia. The number of research population are 150 employees and all become respondent. Data collection techniques using a questionnaire. Data analysis techniques using Partial Least Square. The result of primary data analysis demonstrates that total quality management effects innovation, innovation effects operational performance, total quality management effects operational performance and innovation mediates the effect of total quality management toward operational performance. It is means that total quality management and innovation play an important role to improve operational performance.

Keywords- TQM, Innovation, Operational performance

1. INTRODUCTION

The dynamics of globalization demand that every business entity has the ability to adapt to an era of change that is increasingly rapid and uncontrollable. In addition, the demand for increased competitiveness has become an absolute necessity. So to win the competition in business competition, companies must have a competitive advantage. The predicate of competitive advantage occurs when a company can do something that competitors cannot do or has something that competitors want (Correia et al. 2020; Farida & Setiawan, 2022). In the era of trade liberalization, competitiveness is a difficult challenge for a company as well as a major issue. Companies must face intense global competition, rapid technological developments and relatively uncontrollable changes which in turn require companies to continue to make improvements and innovations in every field they have. Companies are required to be able to produce goods and services with good quality with better prices and services than competitors. To achieve this, it is necessary to improve quality in all aspects related to products, namely materials, labor, effective promotions and services that satisfy customers, so as to attract consumers who can ultimately increase the number of consumers and become loyal customers.

To achieve this, companies need a good management system and also to support continuous improvement by using Total Quality Management (TQM). According to Rathore, & Qureshi (2020), Total Quality Management is a management approach to an organization, centered on quality, based on the participation of all its members and aims for long-term success through customer satisfaction, and benefits for all members of the organization and society. Total Quality Management is an integrated approach to obtaining and maintaining high quality output, focusing on maintenance, continuous improvement and failure prevention at all levels and functions of the company, in order to meet or exceed consumer expectations.

With the implementation of TQM practices, it is hoped that it will provide a very broad space for the emergence of an innovation in the company. Because these TQM elements match the parameters of innovative performance very well. Total Quality Management is a system that is designed and then developed so that it becomes an approach process carried out by companies in carrying out their business to maximize competitiveness in various ways such as improvements and improvements in terms of products or services produced along with human resources, production processes and environmental conditions.

Its role in the innovation process is very important, according to Bakotic & Rogosic (2015) Innovation can be created because of the application of the elements of total quality management. Based on this, TQM is a good choice to improve quality while facilitating the innovation process. Curilova & Antipov (2020) stated that innovation makes companies adapt quickly, helps create new products, thanks to this the company can protect itself from its unstable business environment. Based on this background, the objectives of this study are (a) to analyze the effect of implementing total quality management techniques on innovation, (b) to analyze the effect of innovation on operational performance) c) to analyze the effect of implementing total quality management techniques on operational

performance & d) to analyze the indirect effect of implementing total quality management (TQM) techniques on operational performance through the mediation of innovation. According to the International Organization for Standardization (ISO), TQM is a management approach to an organization, focusing on quality and based on the participation of all human resources and aimed at long-term success through customer satisfaction and providing benefits to members of the organization (its human resources) and public. Innovation or innovation comes from the Latin innovation which means renewal or renovation, based on novus (new). Innovation can also be interpreted as one of the choices of corporations in facing competition and sustainable management. Ibarra, at al. (2018) consider innovation as an effort by companies to develop, produce and market products that are new to the industry. In other words, innovation is the modification or discovery of ideas for continuous improvement and development to meet customer needs. Company innovation can result in research and development, production and marketing approaches and eventually lead to the commercialization of these innovations. In other words, innovation is the process of realizing a new idea, which is different from the previous one, by way of production or by making it real, where innovation includes the generation of evaluation, new concepts and implementation. Where the use of new and different methods and technologies to improve quality or lower costs, to meet or exceed company targets. Innovation is not only limited to objects or goods produced, but also includes attitudes, behavior or movements towards a process of change in all forms of social life. So, in general, innovation means an idea, product, information technology, institutions, behavior, values, and new practices that are not yet widely known, accepted, and used or applied by the majority of people in a particular locality, which can be used or encourage changes in all aspects of people's lives in order to improve the quality of each individual and all members of the community concerned. Masoud & Basahel (2023) revealed that performance is the end result of company activities and performance is the accumulation of the end result of all activities and processes of the company. Or performance is a view of the overall condition of the company over a certain period of time, is the result or achievement that is influenced by operational activities in utilizing the resources owned. According to Daft (2010), operational performance is an area of management that specializes in the production of goods and services, and uses special tools and techniques to solve production problems. Meanwhile, according to Handoko (2010) operational performance is the implementation of managerial activities that are carried out in the selection, design, renewal, operation and supervision of production systems. In other words, operational performance is a measurement of the company's performance against standards or indicators of effectiveness, efficiency and social responsibility. Some research results regarding the relationship between TQM, innovation and operational performance were revealed from Sharma & Modgil (2019) that the implementation of TQM has an effect on operational performance. This opinion was revealed by Sutrisno (2019) who in his research stated that TQM is correlated with operational performance as well as organizational performance. Sozbilir (2018) in his research article revealed that innovation has a significant impact on operational performance. The findings of this research are supported by Santa, R.; Hayland, P. & Farrell, M., (2018) in his article revealed that innovation has an effect on operational performance. Other researchers Bartolacci, Castelano & Cerqueti, (2018) also states that there is a correlation between innovation and business performance.These opinions are supported by Oduro (2019) that innovation strategy is closely related to achieving high operational performance. Also, Urbinati et al (2020); Chen & Kim (2023) support the research findings that both innovation and total quality management significantly effect company performance. Based on the research objectives and several previous studies, the following hypotheses can be formulated as follows (a) it is suspected that there is an effect of TQM implementation on innovation, (b) it is suspected that there is an influence of innovation on operational performance, (c) it is suspected that there is an effect of TQM implementation on operational performance and (d) it is suspected that there is an indirect effect of TQM implementation on operational performance through innovation mediation.

2. METHODOLOGY

This quantitative research has an independent variable, namely Total Quality Management with indicators of customer satisfaction, respect for all people, management based on facts and continuous improvement. The mediating variable in this study is innovation with indicators consisting of relative advantage, suitability, complexity, try ability and ease of observation. While the dependent variable is operational performance. The operational performance indicators are productivity level, product error rate, quality costs and product timeliness. The population in this study were all production employees at P.T.Wiguna Makmur, Indonesia. The population in this study were 150 production employees. So the sampling technique using a census. The data collection technique used in this research is questionnaire. The answer scale used in the questionnaire is an ordinal scale. Ordinal scales provide information about the relative number of different characteristics possessed by a particular object or individual. The answer choices are given with a range of 1 (strongly disagree) to 5 (strongly agree). Primary data was analyzed by the Partial Least Square (PLS) method..

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3. TECHNIQUE OF ANALYSIS

Furthermore, Primary data was analyzed using SEM-PLS in two stages. First stage, analysis of Outer Model. Outer Model aims to evaluate the construct variables being studied, namely the validity (accuracy) and reliability (reliability) of a variable, including (a) Internal Consistency (Internal Consistency/Composite Reliability), (b) Convergent Validity (Convergent Validity/Average Variance Extracted/AVE) and (c) Discriminant Validity. Internal consistency checks are useful for determining the consistency of results between items of the same Dada test in the form of reliability. This test will decide whether there is a correlation between major items to calculate the constructs of interest in their rankings. The commodity reliability value is used in this test and if the commodity reliability value is > 0.60, the variable is said to be reliable. Convergent validity is the degree to which alternative measures of the same construct are positively associated with a test. This is involved from the outer loading value to find out whether or not an indicator of a construct variable is correct or not. If the outer loading value > 0.7 is valid, then the indicator is valid. Discriminant validity aims to determine whether or not the predictor of a construct variable is correct through the Fornell-Larcker criteria, that is, if the square root value of the AVE value is greater than the maximum correlation value of a variable with other variables. The variable then discriminant validity is assigned to the great or valid variable.

The second stage of Structural Model analysis is Inner Model. Structural model analysis aims to test the research hypothesis. At least there are 3 parts that need to be analyzed in this structural model, namely (a) Collinearity (Colinearity Variance Inflation Factor(VIF). Collinearity is useful to show how strong the relationship between latent/construct variables is. If there is a clear association, the model is problematic from the point of view of methodological analysis because it has an effect on the estimation of statistical significance. This problem is known as collinearity. By looking at the Variance Inflation Factor (VIF) value, the value used to analyze it is, if the VIF value > 5.00 means there is collinearity and vice versa if VIF < 5.00 then it doesn't happen.

4. RESULTS AND DISCUSSION

Based on the primary data that has been processed, then the measurement model is tested to assess the validity and reliability of the model by means of convergent validity, discriminant validity and composite reliability. To make it easier to see the outer loading results of the indicator blocks that measure constructs, a path diagram is presented as follows.

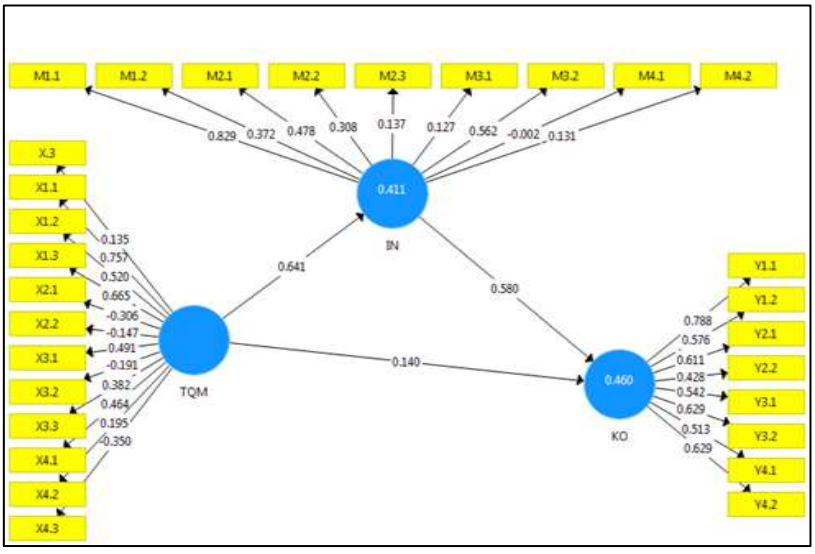

Figure 1. First Convergent Validity

Source: PLS Calculation Results, 2023

As shown in Figure 1, the loading factors of several indicators are invalid because they have a loading factor below 0.5. Invalid indicators are X1.2 (0.520), X2.1 (-0.306), X2.2 (-0.147), X2.3 (0.135), X3.2 (-0.191), X3.3 (0.382), X4.1 (0.464), X4.2 (0.195), X4.3 (-0.350), M1.2 (0.372), M2. 1 (0.478), M2.2 (0.308), M2.3 (0.137), M3.1 (0.127), M4.1 (-0.002), M4.2 (0.131), Y1.2 (0.576). Y2.2 (0.428), Y3.1 (0.542), Y4.1 (0.513) and Y4.2 (0.629) so these indicators must be removed from the model. Removing indicators will be followed by re-estimating or re-estimating. Re-estimating or re-estimating the evaluation of the measurement model is intended to re-examine the validity of the loading factor for each indicator. If the validity test with outer loadings has been fulfilled, then the measurement model has the potential to be tested further. To facilitate the visualization of the re-estimation results, the measurement model path diagram is presented as follows:

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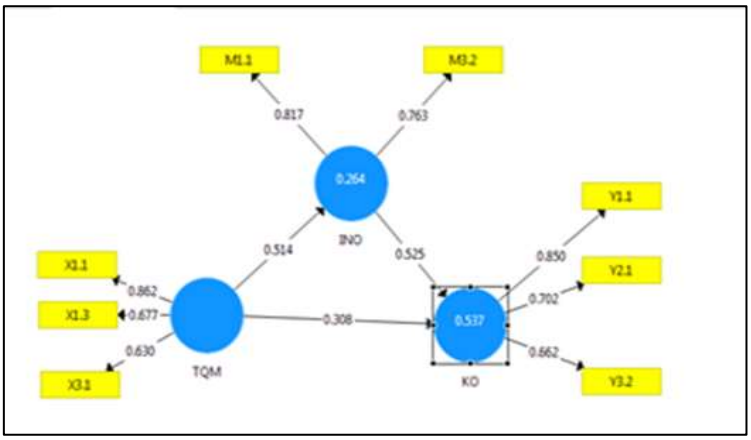

Figure 2. Second Convergent Validity

Source: PLS Calculation Results, 2023

From Figure 2, it can be seen that the magnitude of the loading factor is the result of the re-estimation of each indicator that measures the construct. The re-estimation results show that all indicators have good validity because they have a loading factor of more than 0.6. Because the validity test with outer loadings has been fulfilled, the measurement model has the potential to test the hypothesis. In this study to test the hypothesis using several criteria that must be met, namely the original sample, T-statistics and p-value. The original sample value is used to see the direction of hypothesis testing, if the original sample shows a positive value it means the direction is positive and if the original sample value is negative it means the direction is negative. Then the T-statistic is used to show significance. For testing using T-statistics, it must be known whether the hypothesis has direction or not. Test criteria with a significance level of 0.05 are determined if t count > t table, which is more than 1.68 then the hypothesis is accepted. Meanwhile, if t count < t table, which is less than 1.68 then the hypothesis is rejected. Then the last is the p-value. This criterion is also used to test the significance of an outcome. The p-value that must be achieved so that a hypothesis can be accepted is <0.05. In order for a hypothesis to be accepted, all three criteria must be met. If one or more of these criteria are not met then the hypothesis is rejected.

Table 1. Hypothesis Testing

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
TQM -> INO	0.514	0.531	0.133	3.862	0.000
INO -> KO	0.525	0.510	0.113	4.666	0.000
TQM -> KO	0.308	0.321	0.111	2.785	0.000
TQM -> IN -> KO	0.270	0.274	0.101	2.672	0.000

Source: PLS calculation results, 2023

Based on table 1, it was revealed that all research hypotheses were supported. That's because all T Statistics are greater than 1.96 and P Values are also greater than 0.050. This means that total quality management (TQM) influences innovation (INO), innovation influences operational performance (KO), total quality management (TQM) influences operational performance (KO) and innovation mediates the effect of total quality management on operational performance. The results of this study support all previous research conducted by Daft (2010), Handoko (2010), Sharma & Modgil (2019) that the implementation of TQM strongly effect on operational performance. Also, in line with the opinion of Sutrisno (2019) who in his research stated that TQM is correlated with operational performance as well as organizational performance. In line with Sozbilir (2018) in his research article revealed that innovation has a significant impact on operational performance. Supporting Santa, R.; Hayland, P. & Farrell, M., (2018) in his article revealed that innovation has an effect on operational performance. Also, agree with Bartolacci, Castelano & Cerqueti, (2018) which states that there is a correlation between innovation and business performance and Oduro's research results (2019) that innovation strategy is closely related to achieving high operational performance. Even, this research findings is also supported by Arbinati (2020) and Chen and Kim (2023). This right proves that innovation and Total Quality Management are still consistently required by all business entities. This means that innovation and TQM were needed not only a few decades ago, but even more absolutely necessary in the current era of trade liberalization. This is because in the era of liberalization a competitive advantage is needed, which of course can only be achieved through innovation and total quality management. Because as it is known that continuing to improve the performance of business entities is a must to ensure the existence and sustainability of the business.

5. CONCLUSION

Based on the results of primary data analysis and the results of hypothesis testing, it can be concluded that total quality management significantly effect on innovation, innovation significantly effect on operational performance, total quality management significantly effect on operational performance and innovation mediates the effect of total quality management toward operational performance. It means that in order to improve operational performance, entity business should implement and sinergyze innovation and total quality management. For this reason, further research can still be carried out regarding innovation. However, it is more focused on what kind of innovation mediates the effect of total quality management on operational performance. For example, how is it related to incremental innovation and others?

6. LIMITATIONS

The research's sample size is quite limited, only employees at a particular business entity in East Java, Indonesia. Therefore, generalisastion of this research findings of course just for one company. It is required larger research population, to anlyze the consistency of this reserch result. However, this findings at least enrich to management science especially in operational management area.

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