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The Influence of Quality Control Circle on the Employee Performance & Productivity with Employee Motivation as Mediating Variable

Abstract. *Every individual employee contributes to the success (or failure) of company business. So, the personnel management goal is to continuously improve the quality and efficiency of the workforce. But without a clear understanding of which factors influence employee performance, it won't be easy to sustain success. This research aims to analyze the influence of the quality control circle on employee performance and productivity with employee motivation as the mediator. A quality circle or quality control circle is a group of workers who meet regularly to identify, analyze and solve work-related problems. The research sample are the 50 PT Suzuki Indomobil Motor company's employees. The authors use a quantitative approach based on analytical methods using structural equation modelling (SEM). Data for this study were collected using a questionnaire and then processed with smartPLS application. This research indicates that the quality control circle positively and significantly affects employee motivation, productivity, and performance. Employee motivation has a positive and significant effect on employee performance. However, employee motivation has no positive and significant impact on employee productivity. The mediation results show that motivation cannot mediate the effect of the quality control circle on employee performance and productivity. This research showed that employee performance and employee motivation could be improved by increasing the quality control circle activities' quality.*

Keywords: *quality control circle, employee performance, employee productivity, employee motivation, structural equation modelling.*

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Вплив гуртка якості на результативність і продуктивність співробітників з мотивацією співробітників як посередницькою змінною

Анотація. *Кожен окремий співробітник робить внесок в успіх (або провал) бізнесу компанії. Тому метою управління персоналом є постійне підвищення якості праці та ефективності працівників. Однак без чіткого розуміння того, які фактори впливають на результативність співробітників, нелегко досягти позитивних змін. Метою цього дослідження є аналіз впливу гуртка якості на результативність і продуктивність співробітників з мотивацією співробітників як посередницькою змінною. Гурток якості або коло контролю якості – це група працівників, які регулярно збираються для виявлення, аналізу та вирішення проблем, пов'язаних з роботою. Вибірка цього дослідження – 50 співробітників компанії PT Suzuki Indomobil Motor. Автори використовують кількісний підхід на основі аналітичних методів з використанням моделювання структурних рівнянь (SEM). Дані для цього дослідження були зібрані за допомогою анкети, а потім оброблені в програмі smartPLS. Результати дослідження свідчать, що гурток якості позитивно та суттєво впливає на мотивацію, продуктивність та результативність працівників. Мотивація співробітників позитивно і суттєво впливає на результативність співробітників. Однак мотивація співробітників не має позитивного та істотного впливу на продуктивність співробітників. Результати посередництва показують, що мотивація не може опосередковувати вплив гуртка якості на результативність і продуктивність співробітників. Це дослідження показало, що ефективність роботи та мотивацію працівників можна покращити, підвищивши якість діяльності гуртка якості.*

Ключові слова: *гурток якості, результативність працівників, продуктивність працівників, мотивація працівників, моделювання структурних рівнянь.*

INTRODUCTION

One of the main aspects of maintaining the company's sustainability is quality. To maintain quality in the company is to implement a work culture group or also called the quality control circle. According to Musri (2001), a quality control circle is a group of small workers from their working area who voluntarily and periodically conduct quality control activities by identifying, analyzing and finding solutions to problems.

Quality control circle requires workers to find problems in the work unit and procedures in the work process. Also, employees become motivated to improve their company's quality of work and products (Purba & Malia, 2007).

The company selected for this study also uses the quality control circle. PT Suzuki Indomobil Motor is a company devoted to assembling motorized vehicles, both two-wheeled and four-wheeled. Figure 1 presents data on the number of employees at PT. Suzuki Indomobil Motor with a total proposed ideas for one fiscal year.

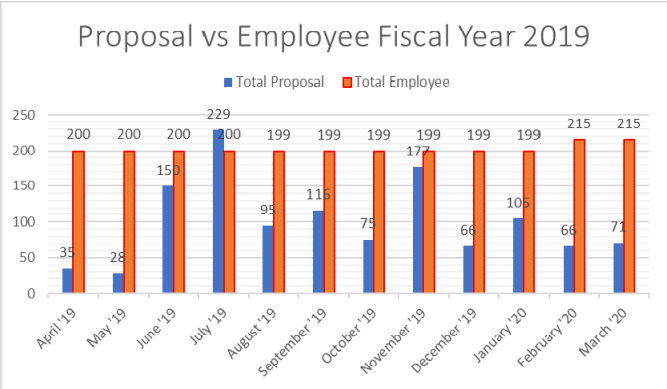

Figure 1. **Proposal vs Employee Fiscal Year 2019**

Figure 1 shows that workers' participation in making proposals to increase production and saving is still below the company's ideal standard and only in July 2019 can exceed the ideal standard from the company. So, the employees' awareness is still lacking to make suggestions and indirectly indicates that employees lack motivation, performance, and productivity to increase production and save for the company.

LITERATURE REVIEW

Quality control circle

Based on the theory put forward by Ishikawa (1976), the quality control circle is a method to hone the thinking skills of the workers in the company and hone the workers' thinking framework to solve problems that arise in the work process determine decisions to solve these problems. Usually, seven to twelve volunteers from the same organization will form a quality control team. Circle members pick up knowledge through training programs, problem-solving sessions and group discussions.

Shrivastava & Jain (2020) have proven the relationship between the activities of the quality control circle on work productivity. They examine aspects of the activities of the quality control circle and relate them to aspects of work related to productivity. The result is that the quality control circle contributes to organizational development, participatory work culture, and self-improvement that is part of work productivity.

Rafaai, Z. F. B. M. et al. (2018) examine the relationship between quality control circle activities and employee productivity. The result is that the quality control circle has a positive and significant effect on employee productivity, becoming more responsible, more careful and more involved in work when they feel valued, thereby increasing productivity.

Employee's motivation

According to Katzell & Thompson (1990), motivation at first glance is related to the effort and encouragement that arises from within a person carried out to fulfil all the goals desired by a person. The basic key to motivating people at work is paying people for being exemplary workers and punishing or firing them if they make a minor or fatal mistake.

Farisi, Irnawati, & Fahmi (2020) examine the factors that affect employee performance through motivation to carry out their work. One of the hypotheses tested in their research is that motivation can affect employee performance.

Suryani, Cahyono, & Utami (2020) conducted research with a non-probability sampling method to determine the effect of motivation on employee productivity. This study shows that motivation has a positive and significant effect on employee productivity, with a t-test result of 2.63%.

Employee's performance

According to Borman & Motowidlo (1997), performance is divided into two types, namely task performance and contextual performance. Task performance relates to the individual skills used to perform activities that will contribute to the 'technical core' of the organization. These contributions can be either direct workers (for example, production workers) or indirect workers (for example, managers or staff). At the same time, contextual performance refers to activities that do not contribute to the company's technical core but that support an organizational, social, and psychological environment that is in harmony with the organization's goals. Contextual performance includes behavior such as helping coworkers or being a reliable member of the organization, and providing advice on how to improve work procedures.

From the study by Moulana, Sunuharyo, & Utami (2017), it was found that work motivation has a positive and significant effect and was proven as an intervening variable/variable that strengthened the influence of motivation on employee performance.

Employee's productivity

Hill (2017) define productivity as the ratio between what is produced and what is needed to produce it. Productivity measures the relationship between outputs such as goods and services produced and inputs including labour, capital, materials and other resources. In addition, two types of productivity are usually more specifically measured: labour productivity which measures output in terms of hours worked or pay and 'total factor' productivity, including equipment, energy, material and labour costs.

Sya'rani, Artiningsih, & Syahrani (2020) examine the relationship that affects employee productivity through employee motivation in the form of enthusiasm and work ethic of employees. The result is that work motivation has a positive and significant effect on employee productivity.

Purwanto & Wulandari (2016) do research regarding the relationship between motivation and employee productivity. Their research shows that work motivation has a positive and significant influence on work productivity.

RESEARCH METHODOLOGY

Research hypothesis

This study is based on the following hypothesis (Figure 2).

H_1: Quality control circle positively and significantly affects employee motivation.

H_2: Employee motivation positively and significantly affects employee performance.

H_3: Employee motivation positively and significantly affects employee productivity.

H_4: Quality control circle positively and significantly affects employee performance.

H_5: Quality control circle positively and significantly affects employee productivity.

H_6: Quality control circle positively and significantly affects employee performance through employee motivation.

H_7: Quality control circle positively and significantly affects employee productivity through employee motivation.

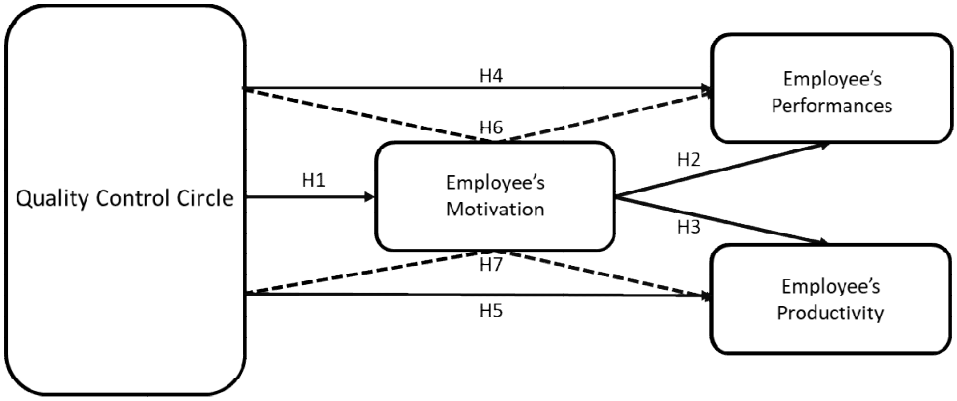

Figure 2. **Research theoretical framework**

Research sample

This research data collection was carried out on employees at PT Suzuki Indomobil Motor between May-June 2021 with a quantitative method.

Authors uses a non-probability sampling method, meaning that each member of the population does not have the same opportunity or opportunity as the sample. Then it will be used with a sub-method using purposive sampling. The criteria used as research samples are as follows:

1) Employees of PT Suzuki Indomobil Motor.

2) Currently/have been a member of the quality control circle at PT Suzuki Indomobil Motor.

So, the sample in this study was 50 employees of PT Suzuki Indomobil Motor who entered the criteria above. The respondents who participating in quality control circle at PT Suzuki Indomobil Motor have a working period of 6-10 years (46% or 23 people), 11-15 years (18% or 9 people), 1-5 years (18% or 9 people), and over 15 years (18% or 9 people).

Data analysis

The independent variable is the quality control circle (X_1) in this study. The dependent variables are employee performance (Y_2) and employee productivity (Y_3). The intervening variable is employee motivation (Y_1).

The research instrument used is a questionnaire that is presented containing 40 questions, 10 questions on quality control circle, employee motivation, employee performance, and employee productivity. To collect primary data, the authors used questionnaire with a Likert scale.

The questionnaire data were analyzed by using the SPSS (Statistical Program for Social Science) program. Also, the authors use confirmatory factor analysis to find the most dominant factors in one group of research variables. The validity test uses Pearson correlation with a significance level of 5% or 0.05. Due to the number of samples in this study (N=50), the critical point of the 5% significance level is > 0.279.

The reliability test uses Cronbach's alpha method with standard ≥ 0.60. If it exceeds 0.60, it can support consistent data. To test the hypothesis, the authors use smartPLS and test for CFA (confirmatory factor analysis) inner and outer model combined with loading factor test with ≥ 0.7 standard and average variance extracted with > 0.5. Also fit model (Goodness of Fit) should meet the requirement for SRMR. The structural model is considered fit if the estimated model value is < 0.10, the hypothesis is accepted.

RESULTS AND DISCUSSION

Validity test

Validity test using significance value 5%. For 50 samples (N=50) in this study the critical point of the 5% significance level is > 0.279.

Table 1

Validity test

Variable	Statement	Significance Level (5%)	Pearson Correlation	Description
1	2	3	4	5
QCC	**QCC 1**	> 0,279	0,820	**Valid**
	QCC 2	> 0,279	0,809	**Valid**
	QCC 3	> 0,279	0,487	**Valid**
	QCC 4	> 0,279	0,808	**Valid**
	QCC 5	> 0,279	0,486	**Valid**
	QCC 6	> 0,279	0,758	**Valid**
	QCC 7	> 0,279	0,622	**Valid**
	QCC 8	> 0,279	0,833	**Valid**
	QCC 9	> 0,279	0,740	**Valid**
	QCC 10	> 0,279	0,384	**Valid**

1	2	3	4	5
Employee Motivation	**EM1**	> 0,279	0,779	**Valid**
	EM2	> 0,279	0,804	**Valid**
	EM3	> 0,279	0,804	**Valid**
	EM4	> 0,279	0,901	**Valid**
	EM5	> 0,279	0,867	**Valid**
	EM6	> 0,279	0,844	**Valid**
	EM7	> 0,279	0,850	**Valid**
	EM8	> 0,279	0,928	**Valid**
	EM9	> 0,279	0,829	**Valid**
	EM10	> 0,279	0,829	**Valid**
Employee Performance	**EP1**	> 0,279	0,743	**Valid**
	EP2	> 0,279	0,871	**Valid**
	EP3	> 0,279	0,489	**Valid**
	EP4	> 0,279	0,908	**Valid**
	EP5	> 0,279	0,865	**Valid**
	EP6	> 0,279	0,898	**Valid**
	EP7	> 0,279	0,856	**Valid**
	EP8	> 0,279	0,922	**Valid**
	EP9	> 0,279	0,849	**Valid**
	EP10	> 0,279	0,914	**Valid**
Employee Productivity	**P1**	> 0,279	0,859	**Valid**
	P2	> 0,279	0,930	**Valid**
	P3	> 0,279	0,919	**Valid**
	P4	> 0,279	0,808	**Valid**
	P5	> 0,279	0,881	**Valid**
	P6	> 0,279	0,852	**Valid**
	P7	> 0,279	0,916	**Valid**
	P8	> 0,279	0,930	**Valid**
	P9	> 0,279	0,821	**Valid**
	P10	> 0,279	0,804	**Valid**

Reliability test

The reliability test applies Cranach's alpha method with a standard value ≥ 0.60 so that the statement can be said to be reliable.

Table 2

Reliability test

Variable	Critical Value	Cronbach AlphaTest Result	Description
Quality Control Circle	≥ 0,60	0,873	**Very Reliable**
Employee Motivation	≥ 0,60	0,954	**Very Reliable**
Employee Performance	≥ 0,60	0,951	**Very Reliable**
Employee Productivity	≥ 0,60	0,964	**Very Reliable**

The reliability test results show that the results exceed the standard Cronbach alpha value, namely 0.60. It means that each questionnaire item in the variable is said to be reliable and reliable.

Hypothesis test

Confirmatory factor analysis outer model

Confirmatory factor analysis outer model is used to identify the relationship between variables by conducting a correlation test and measuring whether the test model obtained is in accordance with the researcher's hypothesis or not reflectively (Campbell & Fiske, 1959).

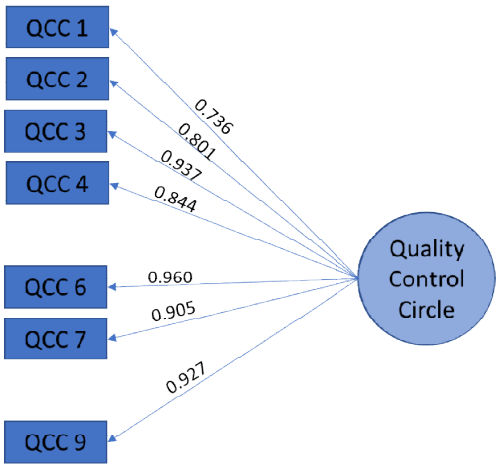

*Figure 3.***Variable construct test for quality control circle**

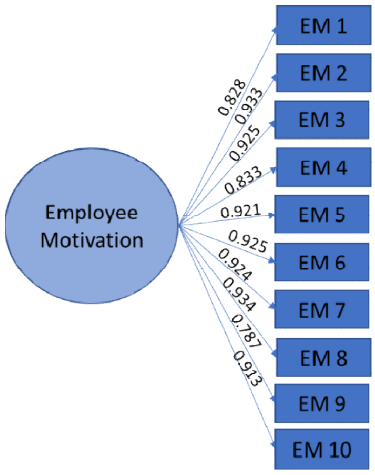

*Figure 4.***Variable construct test for employee motivation**

*Figure 5.***Variable construct test for employee performance**

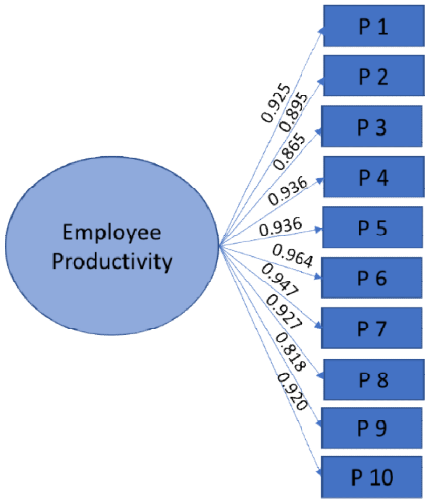

*Figure 6.***Variable construct test for employee productivity**

The result of the CFA outer model from the 4 variable has an indicator value obtained that meets the standard loading factor ≥ 0.7.

Fit model

The goodness of Fit test determines whether the estimated structural model is under the standard. The requirements for a model can be said to be valid by measuring the SRMR (Standardized Root Mean Square Residual) (Dijkstra & Henseler, 2015).

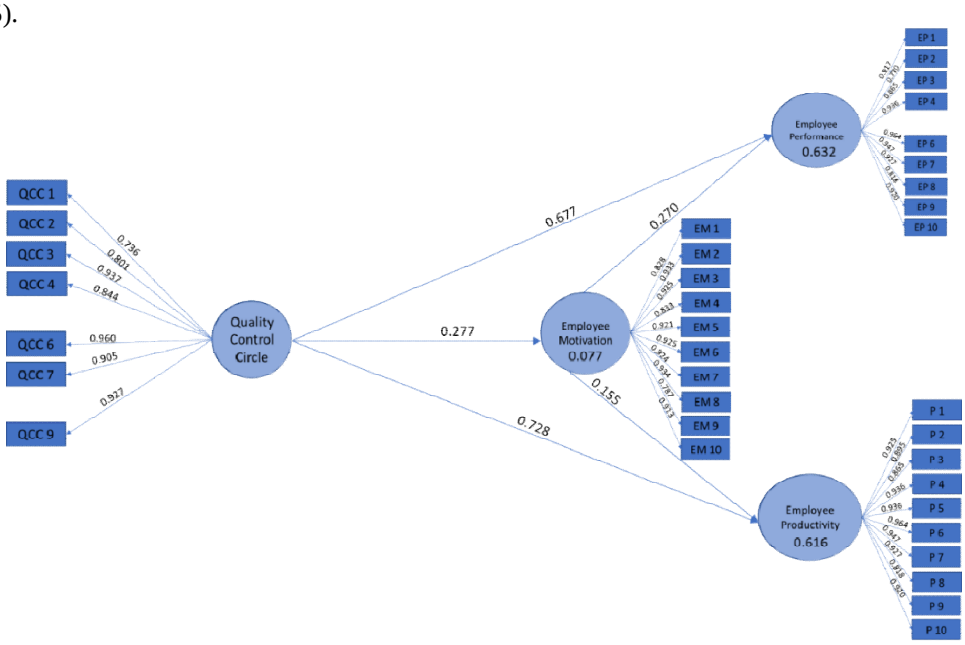

Figure 7. **The variable model with an algorithm**

After creating a variable model, the next step is to verify convergent validity from the AVE value. The AVE (Average Variance Extracted) value is a value that measures the level of variance captured by the construct compared to the level of measurement error, for the standard value ≥ 0.7 is considered very good. In contrast, the standard > 0.5 is acceptable.

Table 3

Average variance extracted

	AverageVarianceExtracted (AVE)
Quality Control Circle	0,768
Employee Performance	0,806
Employee Motivation	0,799
Employee Productivity	0,730

The AVE test results show that all variables meet the convergent validity standard because all variables exceed the standard AVE value of 0.7. After this test, the goodness of fit model can be calculated for the SRMR value.

Table 4

Goodness of fit

	Estimated Model Result
SRMR	0,097
d_ULS	6,210
d_G	13,402
Chi-Square	1759,275
NFI	0,540

According to Hu & Bentler (1999), a valid requirement for SRMR so that the structural model is considered fit is if the estimated model value is < 0.10. Based on the calculation results, the estimated model result is 0.097, which meets the valid requirements, namely < 0.10.

Hypothesis test

The hypothesis test is used for the independent variable (quality control circle) influences employee performance and employee productivity. There are also two tests for hypothesis tests: direct influence test and indirect influence test.

Table 5

Direct influence test

Hypotesis	OriginalSample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
H_1	0,277	0,127	2,178	0,030
H_2	0,270	0,091	2,966	0,003
H_3	0,155	0,097	1,595	**0,111**
H_4	0,677	0,082	8,263	0,000
H_5	0,728	0,080	9,120	0,000

Table 6

Indirect influence test

Hypotesis	OriginalSample (O)	SampleMean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
H_6	0,075	0,089	0,052	1,440	**0,150**
H_7	0,043	0,058	0,046	0,928	**0,354**

The hypothesis was testing according to standard P-value < 0.05 and T statistic > 1.96. Therefore, from testing the hypothesis for the direct influence test result, only influence between employee motivation and employee productivity is unacceptable. For hypothesis test for the indirect influence test result, are between quality control circle will not affect employee performance through employee motivation also quality control circle will not affect employee productivity through employee motivation.

The results of this study (first hypothesis (H_1)) confirm the conclusions of Paulina (2015) that quality control circle has a significant positive effect on employee motivation.

Moulana et al. (2017) suggest that employee motivation has a significant positive effect on employee performances. The second hypothesis (H_2) of this study confirms this fact.

The third hypothesis (H_3) of this study is not acceptable. However, Sya'rani et al. (2020) claim that employee motivation has a significant positive effect on employee productivity in the form of employee enthusiasm and work ethic. The results of our study do not confirm this conclusion.

According to Soeseno & Jamal (2018), the quality control circle positively affects employee performance. The fourth hypothesis (H_4) of this study confirms this fact.

Quality control circle has a positive effect on employee productivity, according to Zubaidi Faisal Bin Mohamad Rafaai (2018). The fifth hypothesis (H_5) of this study confirms this fact.

Sari, Surachman, & Ratnawati (2018) claim that the current quality control circle will affect employee performance through employee motivation. However, the results of this study (sixth hypothesis (H_6)) are not in accordance with Sari, Surachman, & Ratnawati's (2018)

research results. So it can be concluded that the sixth hypothesis in this study is not acceptable.

In addition, the results of this study (seventh hypothesis (H_7)) are not in accordance with Wahrudin's (2020) conclusion, which states that the quality control circle has a significant positive effect on employee productivity through employee motivation.

CONCLUSIONS

This research indicates that the quality control circle positively and significantly affects employee motivation, productivity, and performance. Employee motivation has a positive and significant effect on employee performance. However, employee motivation has no positive and significant impact on employee productivity. The mediation results show that motivation cannot mediate the effect of the quality control circle on employee performance and productivity. This research showed that employee performance and employee motivation could be improved by increasing the quality control circle activities' quality.

Based on the study results, employee performance and employee motivation can be improved by increasing the quality of the quality control circle activities in which participants must work together to give their best efforts. Increasing motivation, performance, and employee productivity will impact growing profits for the company. The company is also expected to work with employees to make several policy innovations in quality control circle activities.

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