Task Complexity, Competency, and Performance of Manufacturing Employees

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Abstract. This research aims to identify factors that influence employee performance by analyzing the influence of task complexity and competency on employee performance. This research employs a quantitative design with a descriptive approach, using a questionnaire as the primary data source. The research population consisted of employees of the manufacturing industry in the medical equipment sector, with 100 employees as respondents. We used a multiple linear regression analysis. The research findings show that if competency supports task complexity, it will improve employee performance. We anticipate that this research will aid companies and employees in comprehending the significance of competency, which encompasses not only knowledge and skills but also the formation of work attitudes that motivate and inspire employees to embrace task complexity as a challenge and a chance to enhance performance. The novelty comes from its utilization of gap research, which broadens the scope of research by examining employee behavior in the industrial context.

Keywords: Task Complexity, Competency, Performance

1. Introduction

After the Covid-19 pandemic, the medical equipment manufacturing industry has shown increasing optimism. The public's need for medical equipment has increased since the Health Insurance Program (JKN) was introduced to provide comprehensive services (Nazmi, 2018). Competition in the medical device industry continues to increase accompanied by the superior innovation it offers. The market size of ventilators, which is a health product, for example, grows 5 percent every year so in 2021 it is worth USD 5.79 billion, and is expected to increase until 2027 amounting to USD 9.13 billion. (Kemenperin, 2022).

PT. Sinaraya Nugraha Ahmadaris Medika is one of the developing medical equipment sub-sector companies facing the challenges and opportunities of the medical device industry market.

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The development of this sector implies that companies must always optimize employee performance. The obstacle experienced by this company is that employees cannot complete work challenges or targets. The company's demands to show efficient performance have not been responded to well by employees. The key to increasing employee performance effectiveness is understanding the psychological state, motivation, and work behavior of employees (Firdaus, Setyani, et al., 2022; Kurose, 2013). Companies that understand employees' difficulties in dealing with the complexity of tasks and lack of competence can be overcome by the company by transferring knowledge and developing skills related to their performance. (Firdaus, Hana Setyani, et al., 2022).

Field studies in companies provide an overview of the problems of employees whose performance is not optimal due to the inability to adapt to the rhythm of work, due to the complexity of the work. Employees feel unsure of their abilities, unsure of their competence. Task complexity involves a high cognitive load (Usmany, 2023), which will affect the mental attention and performance of employees.

For some employees, their performance tends to decrease due to incomplete completion of tasks and the complexity of the work. Employees have different abilities in responding to the complexity of work (Adnyana & Mimba, 2019). Employees can optimize their performance when the workload is large and complex by providing motivation that employees will be able to complete work challenges, appreciation for their performance, pride in the company (Ramadhan & Sembiring, 2014). The complexity of the tasks faced by employees can improve performance to become more efficient if employees can predict, and understand the urgency of the task and the characteristics of the tasks they carry out. (Liu & Li, 2012).

Employee competency is needed by companies to be able to complete work better, more easily, and effectively (Harwina, 2022; Oktavia & Firdaus, 2023). The success of company performance and individual performance depends on employee competency because employee competency will reduce training costs, and reduce staff turnover so competency will make employees more productive (Kolibáčová, 2015). Gap research is the background in determining the objectives of this research. By reviewing several articles about task complexity and developing gap research from previous research. In experimental research, it was found that individuals tend to shift supervisory control at low levels of task complexity (Bolduan et al., 2022). Other findings identify task complexity consisting of design and task complexity dimensions (Ham, 2013), task complexity consisting of complexity models, measurement, and management (Liu & Li, 2012), as well as competencies that can predict high-potential employees (De Haro et al., 2023). These findings were developed by linking task complexity to employee performance through a causality approach with a quantitative research design.

The researcher's criticism provides a gap for this research, where research reviews articles related to competency (Mulcahy, 2000), So this gap was developed by examining the influence of competence on industrial employees. Other findings prove that there is a link between competency and employee performance (Syaripudin et al., 2022), which was then developed in this research by identifying the extent of the influence of competence on performance. Some researchers link competency with training to improve performance ((Indrani et al., 2023); linking competency with career development (Marnisah et al., 2022) and competence combined with work discipline (Anisa & Nuridin, 2023). This research develops factors that influence performance improvement, by combining competency factors with job complexity.

Literature review

Complexity of Employee Duties

Tasks are activities that employees must carry out related to work (Salimi et al., 2011). Another meaning of task complexity is the difficulty or structure of the task (Usmany, 2023). Task complexity can be defined as the demands on attention, memory, reasoning, and information processing imposed by a task (Kim, 2020; Salimi et al., 2011). Task complexity is a task that is unstructured, difficult to understand, and ambiguous (Liu & Li, 2011; Masruroh et al., 2020; Usmany, 2023). The definition of complexity is the employee's perception of a given task as inherently easy or difficult due to limited ability, memory, and ability to integrate problems (Adnyana & Mimba, 2019; Arjmand, 2016; Rustiarini, 2013; Salimi et al., 2011). So it can be concluded that Task Complexity is an unstructured task, difficult to understand because of the limited ability of employees to complete it.

In task complexity, employees' cognitive functions will contribute to distinguishing task characteristics, which relate to the type of task, structure, and task conditions related to the choice of tasks to be carried out. (Kim, 2020). In general, task complexity consists of 3 forms (Bolduan et al., 2022; Ekundayo & Babalola, 2018; Hærem et al., 2015) antara lain :

1. Component complexity; tasks that have more steps to complete a task
2. Coordinative complexity: the relationship between work priorities and the actions required to turn tasks into task products
3. Dynamic complexity: Dynamic complexity is the change in actions and information cues an employee requires as they adapt to a defined hierarchy of goals.

Several researchers found that task complexity affects performance (Masruroh et al., 2020); (Adnyana & Mimba, 2019);(Kim, 2020); (Yumhi et al., 2023). In contrast, the following findings found that performance was not influenced by task complexity (Rustiarini, 2013) ; (Usmany, 2023) ; other findings illustrate that task complexity decreases performance (Agustini & Dwirandra, 2017; Akbari & Putri, 2021; Rudyanto, 2020).

Employee Competency

Competence is defined as the ability, skills, behavior and knowledge of employees to do work well, productively and safely (Kolibáčová, 2015; Mulcahy, 2000). Competence is the knowledge, skills and internal factors that exist within employees so that they can work effectively (Indrani et al., 2023). Competence is a combination of skills, knowledge and work attitudes that are reflected in work behavior and the ability to carry out work duties and obligations properly (Anisa & Nuridin, 2023; Marnisah et al., 2022; Syaripudin et al., 2022). Another definition of competence is the ability of employees to carry out work and have excellence in knowledge, skills and work attitudes (Harwina, 2022; Purwanto & Hartono, 2022). This study uses three indicators of competence that refer to the opinion of Syaripudin et al., (2022), namely:

1. Technical Competencies: the ability of employees to work by using in-depth knowledge and understanding.
2. Social Competencies relate to the fact that employees need the ability to communicate, cooperate, and build social connections and structures with others.
3. Personal Competencies: Cognitive abilities of employees so that they can develop a system of values, attitudes and ethics and have a willingness to learn.

Some researchers found that competencies affect performance (De Haro et al., 2023; Indrani et al., 2023; Oktavia & Firdaus, 2023; Purwanto & Hartono, 2022). While other findings show that employee competence is not related to performance (Kolibáčová, 2015). Previous research also revealed that competence has a negative effect on performance (Marnisah et al., 2022).

Employee Performance

Performance studies are often related to tools and procedures that can increase work effectiveness and efficiency (Kolibáčová, 2015; Tabiu et al., 2016). Performance can be described as a progressive indicator that represents the ability to develop (Qalati et al., 2022). The multi-dimensional concept of performance refers to technical and contextual abilities in demonstrating employee abilities and making contributions to the company (Firdaus, 2021). Employee performance is employee behavior as a result of achievement in carrying out work roles and tasks (Siswanto et al., 2023). Performance is defined as results or benchmarks. work achieved by employees in carrying out the duties and responsibilities assigned to them (Rustiarini, 2013; Wolor et al., 2021).

Employee performance is built by three-dimensional constructs, namely Task Performance, Contextual Performance, and Counterproductive Work Behavior, which are under employee control while still prioritizing company goals. (Ramos-Villagrasa et al., 2019). Employee Performance can be measured through (1) Output Quality (2) Timeliness, and (3) Results obtained.

Conceptual Framework

The establishment of a conceptual framework is intended to clarify the relationship between the variables formed and the research hypothesis, which is based on a theoretical framework by expressing it in the form of a statement (Sekaran, 2016), among others:

Hypothesis 1: Task complexity has a significant influence on performance

Hypothesis 2: Competency has a significant influence on performance

Hypothesis 3: Task Complexity and Competency have a significant influence on Performance

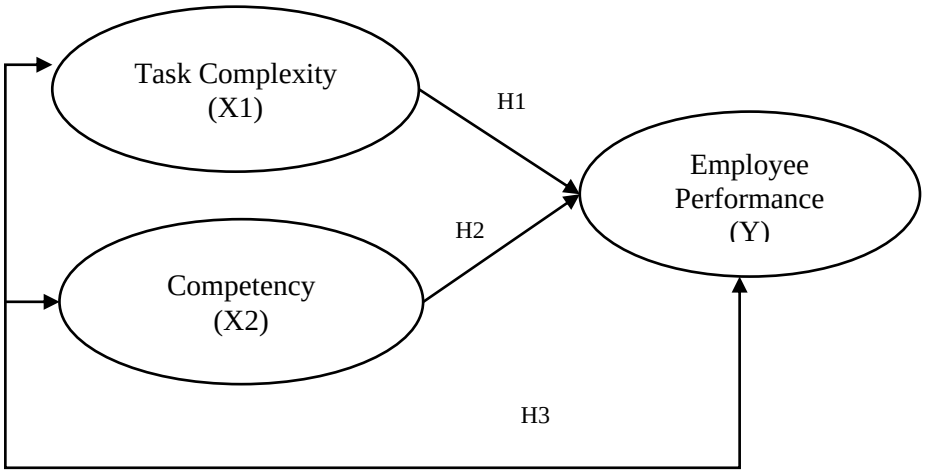

Figure 1. The Conceptual Framework

2. Method

Based on the objectives to be achieved, the research approach uses a quantitative approach. This type of research is descriptive to provide an overview of the phenomena observed in more detail along with data, characteristics, and relationship patterns between the variables of task complexity and competency to employee performance. This research is located at PT. Sinaraya Nugraha Ahmadaris Medika Pasuruan is the research population. The sampling technique used was Total Sampling, with a total of 100 employees as respondents.

Validity test and Reliability test

Validity test of 6 task complexity statement items, 6 competency statements, and 6 employee performance statements. The test results concluded that the 18 statement items were declared valid with a significance value smaller than <0,05. Test the reliability of the questionnaire using Cronbach's Alpha coefficient at more than the significance level.

Table 1 Reliability Test Result

Variable	Cronbach's Alpha	Significance Level	Description
Complexity	0,829	0,60	Reliable
Competency	0,711	0,60	Reliable
Performance	0,664	0,60	Reliable

Source: Primary data processed, 2023

The reliability test results in Table 1 show that the reliability value of the questionnaire on the Complexity, Competency, and Performance variables is good with a CR value above 0,60.

3. Results and Discussion

Finding

Normality test results can use a P-P Plot graph with the assumption that the data is normally distributed if the data is spread around the diagonal line and follows the direction of the diagonal line of the regression model (Garth, 2008; Rachbini et al., 2020).

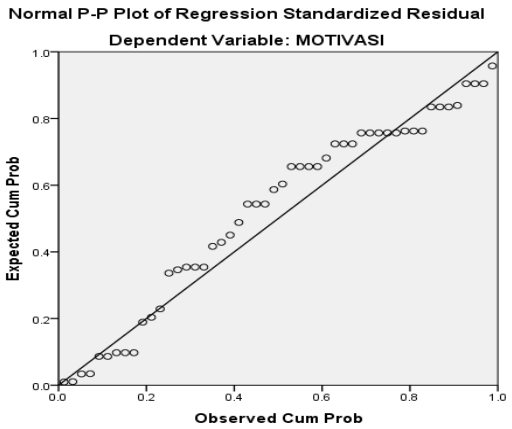

Figure 2. Grafik P-P Plot

Source: SPSS Processed Data, 2023

The normality test results in Figure 1 show that the points are spread around the plot and follow the diagonal line, so the residual value is normal. Multicollinearity testing by analyzing the regression model to see whether there is a perfect or near-perfect correlation between the independent variables, using the VIF and Tolerance values in the regression results.

Table 2 Multicollinearity Test

Coefficients								
		Unstandardized Coefficients		Standardized Coefficients	t	*Sig.*	*Collinearity Statistics*	
Model		B	Std. Error	Beta			*Tolerance*	VIF
1	(Constant)	14.242	4.256		3.714	.000		
	Complexity	.242	.083	.343	2.827	.005	.724	1.062
	Competency	.317	.083	.447	3.727	.000	.724	1.062
a. Dependent Variable: Performance								

Source: Primary data processed, 2023

The output of the Multicollinearity test illustrates that there is no multicollinearity between the Complexity and Competency variables, which is indicated by the Collinearity Tolerance value for the Complexity and Competency variables being 0.724 or more than 0.10, and the VIF value for both variables is 1.062. After the classical assumption test which shows that the path analysis model is free from the classical assumption test, then multiple linear regression analysis is carried out using SPSS for Windows version 23. The results of data analysis using partial influence testing analysis to prove the influence of variable X1 (Complexity) on Y

(Performance) and the influence of variable X2 (Competency) on Y can be seen in the following table :

Table 3. Partial Test Results (T-Test)

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	17.232	4.457		4.227	.000
	Complexity	-.344	.065	.505	4.317	.000
	Competency	.175	.062	.276	2.363	.022

a. Dependent Variable: Performance

Source: SPSS Processed Data, 2023

Table Partial influence testing via the T-test shows that the Sig X1(Complexity) = 0,000 Sig value < 0,05, which means that the first hypothesis is accepted, but the direction of the influence is negative B=-0,344. This means that the higher Variable X1 (Complexity), the lower Variable Y (Employee Performance). which gives the meaning that **The second hypothesis was also proven** to be accepted which was marked by the Sig X2 value (Competency) = 0,022 or < 0,05, and B=0,175. Partial testing proves that **There is an influence between** Variable X2 (Competency) to Variable Y (Employee Performance), with a positive relationship direction. Next is a simultaneous test to assess whether a set of independent variables (X) has a significant effect on the dependent variable (Y), with the F test or ANOVA in Table 3 below.

Table 4 Anova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	94.628	2	47.464	15.424	.000[b]
	Residual	143.582	47	3.059		
	Total	238.210	49			

a. Dependent Variable: Performance

b. Predictors: (Constant), Competency, Competency

Table 5 Output Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.642[a]	.398	.372	1.749

a. Predictors: (Constant), Competency, Complexity

b. Dependent Variable: Performance

Source: SPSS Processed Data, 2023

If the Sig value. > 0,05 then H_0 is accepted, and H_0 is rejected. If the Sig value < 0,05. Table 3 shows the results of the F test, the Sig value = 0,000. This means 0.00 < 0.05 or **there is an influence of Variables** X1 (Complexity) and X2 (Competency) on Variable Y (Employee Performance). Table 4. The summary model output shows an R-value = 0.642, which means a simultaneous effect of 64.2%. The results of this simultaneous test prove that the third hypothesis is accepted. It can be concluded that Complexity and Competency together influence Employee Performance with an influence value of 64%.

Discussion

This research proves that Task Competency influences Employee Performance, in a negative direction. The tasks given to employees are unstructured and difficult to influence employee work results. The higher the task complexity, the lower the employee performance. The results of this study are in line with the findings (Agustini & Dwirandra, 2017); (Akbari & Putri, 2021); (Rudyanto, 2020). Task complexity yang built by indicator of component complexity, coordinative complexity, and Dynamic complexity affect employee performance, especially coordinative complexity contributed the most to employee performance. This illustrates that the tasks given are complex and require action to change the task into something new, making it difficult for employees because of limitations in processing information and lack of initiative. Companies need to understand that employees need a learning process and be facilitated to be more innovative through training and rewards. The tasks given need to be equipped with clear instructions, and clear direction when it comes to development or change.

The results of the analysis prove that Competency will have a positive influence on Employee Performance. The higher the employee competency, the better the performance given to the company. Employee abilities, skills and knowledge supported by a positive work attitude will help increase work output so that the tasks carried out can be carried out effectively and efficiently. Technical Competencies possessed by employees contribute the greatest influence compared to the other two indicators of competency, namely Social Competencies and Personal Competencies. This finding is in line with the findings De Haro et al., (2023); Indrani et al., (2023); Oktavia & Firdaus, (2023); Purwanto & Hartono, (2022). On the other hand, this finding is different from the findings Marnisah et al., (2022).

The results of the simultaneous test as proof of the third hypothesis show that if Task Complexity and Competency work together, they will be able to have a positive influence on Employer Performance. Tasks given by the company that are unstructured, numerous and require high levels of employee effort will be able to be handled well if employees have the ability, knowledge, skills, and a work attitude that is full of a sense of responsibility. These findings are in line with the findings Masruroh et al., (2020); Adnyana & Mimba, (2019); Kim, (2020); Yumhi et al., (2023); (Masruroh et al., 2020); (Adnyana & Mimba, 2019);(Kim, 2020); (Yumhi et al., 2023).

The results of these findings provide practical implications that improving employee performance requires the employee's ability to sort and choose priorities for tasks that must be carried out, and competence will help employees overcome the complexity of problems. Technical, social, and personal competencies will help employees understand their tasks and employee knowledge will help them complete their tasks even in difficult times or when the workload is high. Theoretical implications also prove that the Coordinative complexity possessed by employees will be able to make it easier to produce task products if supported by Competency, especially technical abilities that enable employees to optimize their knowledge and work experience.

4. Conclusion

Effectiveness and efficiency of employee performance will be achieved if employees have competence and perceive the complexity of tasks as professional demands and responsibilities. Employee performance is measured through the quality of work results, timeliness of carrying out tasks, and the output produced, influenced by Task Complexity and Competency. A limitation of this research that allows for further research is including training variables and structured complex tasks. In this way, it is hoped that further ways can be identified so that task complexity can be addressed more easily, and more challengingly and make performance more optimal and productive.

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