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The Moderation Effect of Organizational Culture on the Influence of Knowledge Management towards Quality Management in Large-Size Construction Companies

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ABSTRACT: The relationship between knowledge management and quality management is evident in how knowledge management supports the implementation of quality management in the construction process. However, inconsistencies exist regarding the influence of knowledge management on quality management, as highlighted in previous studies. These inconsistencies stem from debates on whether knowledge management significantly affects quality management. To investigate the moderating factors contributing to these inconsistencies, organizational culture is examined as a moderating variable. The objective of this study is to analyze whether organizational culture moderates the relationship between knowledge management and quality management. Using 26 large construction companies in East Java as the study population, the data was processed using the PLS-SEM method for conceptual testing. The obtained R^2 value is 0.63, indicating that 63% of the variance in quality management is explained by knowledge management and organizational culture. The results show that knowledge management has a significant influence on quality management, whereas organizational culture does not moderate this relationship. This finding underscores the importance of fostering effective knowledge management practices to enhance quality management in the construction sector.

Keywords: PLS-SEM Method, Quality Management, Construction.

I. INTRODUCTION

Knowledge management has become a well-known concept in the business industry over the past decades [1]. It involves the development and utilization of a company's knowledge assets to achieve advanced organizational objectives [2]. This poses unique challenges within the corporate business realm, including the construction sector and its subsectors. Construction companies are required to create business opportunities due to the escalating competition among firms [3]. Consequently, this heightened competition necessitates that construction companies compete to maintain sustainability. Such competition is closely tied to how a company prioritizes quality. Traditionally, achieving high-quality processes often demanded significant financial sacrifices [4]. However, emerging viewpoints suggest that enhancing quality does not necessarily lead to increased costs; instead, it can result in cost savings [5].

A robust process of quality improvement within the realm of quality management begins with effective quality management. This enhancement can be facilitated through knowledge management [6]. Several researchers emphasize that knowledge management, particularly tacit knowledge, can significantly influence innovation within quality management [7]. However, disparities and inconsistent outcomes regarding the impact of knowledge management are evident in existing research findings. Some studies indicate that knowledge management does not significantly affect quality management [8]. Additionally, other research suggests that knowledge management lacks a significant impact on the quality of construction products [9].

These inconsistencies may indicate that the implementation of knowledge management is hindered by organizational culture within companies [9]. Therefore, this study aims to examine the influence of knowledge management on quality management, as well as the moderating role of organizational culture in this relationship, within large construction companies in East Java.

Knowledge management is an organizational initiative aimed at managing knowledge as an asset. It is implemented through various strategies, including the timely dissemination of knowledge to the right individuals, enabling them to interact, share knowledge, and apply it in their daily tasks to enhance organizational performance [10]. The construction industry is closely tied to practices and experiences, making it a repository of rich knowledge [11]. Furthermore, knowledge sharing or social interaction involves the exchange of experiences, knowledge, and skills [12]. Knowledge sharing is both important and crucial, as it serves as a preventive measure against knowledge loss when organizational members leave the company. Additionally, it is essential for construction companies to document knowledge, as it can be easily lost during project transitions [13].

1. Quality Management

Quality is one of the most critical factors used as a parameter to determine the success of construction endeavors. In construction projects, quality is intricately linked to the implementation of effective quality management throughout the various phases of the project life cycle [14]. Companies undertake significant efforts to enhance product quality for service recipients through quality control, guidance, organization, and planning of quality management processes [15]. The rapid developments in the business world, particularly technological shifts impacting the economy, have driven companies to intensify their efforts to enhance quality and swiftly achieve market dominance [16].

2. Organizational Culture

Organizational culture is a cohesive unit of values, beliefs, assumptions, and symbols that guide the behavior of organizational members [17]. In the realm of organizations, culture is crucial as it significantly influences what occurs within the organization, how operations are conducted, the experiences of employees and customers, and the organization's competitive strengths or weaknesses [18]. As such, organizational culture plays a pivotal role in the success or failure of knowledge management initiatives [19]. It can be regarded as a driver or an environmental factor that influences how effectively a company develops and implements knowledge management [20].

II. RESEARCH METHOD

This study collected data from large construction companies in East Java, a province in Indonesia with the highest proportion of construction companies, accounting for 12.09% of the total number of construction companies in the country [21]. A total of 26 large construction companies in East Java were selected as samples. These companies specialize in civil building construction work. After distributing questionnaires to the selected companies, 69 respondents were obtained. These responses will be analyzed to examine the relationships between variables based on the hypotheses. The hypotheses of this study are as follows:

a. H1: The implementation of Knowledge Management significantly affects Quality Management in construction companies.
b. H2: Organizational Culture moderates the relationship between Knowledge Management and Quality Management in construction companies.

The method used to test these hypotheses is Partial Least Squares-Structural Equation Modeling (PLS-SEM). PLS-SEM is a statistical analysis technique characterized by its causal-predictive nature. This approach constructs statistically predictive model estimates to explain the cause-and-effect relationships of the studied phenomenon [22]. PLS-SEM offers several advantages, including high efficiency in parameter estimation, which increases the likelihood of identifying specific relationship patterns within a sample. Additionally, PLS-SEM can be applied to very small samples while still yielding results that represent the effects present in a larger population. It also employs bootstrap procedures to test the significance of assumed path coefficients and does not require data to be normally distributed, further solidifying its utility [23].

SMART PLS 4 software was used to perform the analysis in this study. The conceptual model in SMART PLS 4 is based on three variables: KM (Knowledge Management), QM (Quality Management), and OC (Organizational Culture). Each variable is reviewed in the literature to identify measurement indicators. Furthermore, each indicator item for Knowledge Management, Organizational Culture, and Quality Management is detailed in Table 1.

Table 1. Items of Knowledge Management, Organizational Culture, and Quality Management

Variable	Item Indicator	Explanation	References
Knowledge Management	KM1	Technology Solutions	[24],[25], [26]
	KM2	Policy/Strategy Structure	
	KM3	Knowledge Culture	
	KM4	Acquisition	
	KM5	Conversion	
	KM6	Application	
	KM7	Protection	
Organizational Culture	OC1	Employee Participation	[27], [28], [29]
	OC2	Innovation Orientation	
	OC3	Performance Emphasis	
	OC4	Punishment	
	OC5	Team Orientation	
Quality Management	QM1	Customer Focus	[9], [30], [31]
	QM2	Leadership	
	QM3	Continual Improvement	
	QM4	Process approach	
	QM5	Systems approach to management	
	QM6	People Involvement	
	QM7	Factual Approach to Decision Making	

	QM8	Mutually Beneficial Supplier Relationships

III.RESULT AND DISCUSSION

A. Validity Convergent and Reliability

The conceptual model in this study employs a reflective measurement of indicators for the constructs. The model design is depicted in SMART PLS 4, and its evaluation includes tests for convergent validity and reliability [22]. Convergent validity is considered acceptable if the indicators have outer loading values exceeding 0.7 and the variables have Average Variance Extracted (AVE) values greater than 0.5. Additionally, the reliability test uses the Cronbach's Alpha method, with a minimum acceptable value of 0.7. The design and evaluation are illustrated in Figure 1 and Table 2.

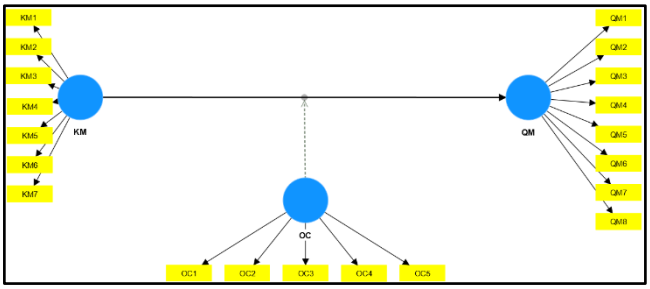

Figure 1.The Conceptual Model Design in SMART PLS 4

Table 2. Convergent Validity and Reliability Test Result

Variable	*Item*	*Outer Loadings*	*AVE*	*Cronbach's Alpha*
Knowledge Management	KM 1	0.721	0.559	0.869
	KM 2	0.825		
	KM 3	0.763		
	KM 4	0.718		
	KM 5	0.733		
	KM 6	0.711		
	KM 7	0.758		
Organizational Culture	OC 1	0.735	0.563	0.807
	OC 2	0.788		
	OC 3	0.729		
	OC 4	0.749		
	OC 5	0.751		
Quality Management	QM 1	0.766	0.587	0.899
	QM 2	0.775		
	QM 3	0.727		
	QM 4	0.807		
	QM 5	0.715		
	QM 6	0.788		
	QM 7	0.829		
	QM 8	0.714		

Based on Figure 1, the conceptual model shows that organizational culture is designed to moderate the relationship between knowledge management and quality management. Additionally, Table 2 presents the results of the convergent validity test, indicating that all items are acceptable. For the knowledge management variable, the item with the highest value is "policy/strategy structure," at 0.825. Similarly, for the organizational culture variable, the item with the highest value is "innovation orientation," at 0.788. Lastly, within quality management, the item with the highest value is "factual approach to decision-making," at 0.829. These three items have the most significant influence on their respective variables.

Convergent validity is assessed using the Average Variance Extracted (AVE) values, with a criterion of exceeding 0.5. The knowledge management variable has an AVE value of 0.559, the organizational culture variable has an AVE value of 0.563, and the quality management variable has an AVE value of 0.587. All variables meet the convergent validity test criteria as their AVE values surpass the threshold.

Variable reliability is evaluated using the Cronbach's Alpha method. The Cronbach's Alpha value for the knowledge management variable is 0.869, for the organizational culture variable is 0.807, and for the quality management variable is 0.899. All three variables exceed the minimum threshold of 0.7, confirming their overall reliability.

B. Validity Discriminant

The discriminant validity test ensures that variables are distinct and represent unique phenomena. Conducting this test is essential and necessary [32]. To assess the discriminant validity, the Heterotrait-Monotrait Ratio of Correlations (HTMT) method is employed. The acceptance criterion for variables using the HTMT method is that the values must be less than 0.9 [23]. The results of the discriminant validity test using the HTMT method are presented in Table 3.

Table 3. Heterotrait-Monotrait Ratio of Correlations Test Result

	KM	OC
OC	0.747	
QM	0.746	0.871

Based on Table 3, the results of the HTMT discriminant validity test reveal the following values: the variable 'knowledge management' to 'organizational culture' has a value of 0.747, 'knowledge management' to 'quality management' has a value of 0.746, and 'organizational culture' to 'quality management' has the highest value at 0.871. Considering all these HTMT values, it can be concluded that the variables exhibit distinctiveness.

C. Measuring the Value of Coefficient Determination (R^2)

The coefficient of determination, or R-squared (R^2), assesses how much of the variance in the endogenous variable is explained by the structural model [33]. To interpret the R^2 value, the results can be classified as having a small effect (R^2 = 0.19), a medium effect (R^2 = 0.33), or a large effect (R^2 = 0.66) [34]. The R^2 test results are presented in Table 4.

Table 4. R^2 Test Result

Variable	R^2	R^2 Adjusted
Quality Management	0.63	0.613

Based on Table 4, the R^2 test result is 0.63, indicating that 63% of the variance in quality management can be explained by the model, which includes knowledge management and organizational culture. This finding suggests that the combined influence of knowledge management and organizational culture on quality management demonstrates a moderate effect.

D. Path Coefficient and T Statistic

Hypothesis testing for direct and moderating effects within the inner model can be conducted using the bootstrapping method in SMART PLS. This approach is employed to assess whether there are direct effects of exogenous variables on endogenous variables and to examine the influence of moderating variables. Path coefficients are represented by standardized beta values. T-statistic values must exceed 1.96, and p-values should be less than 0.05. These criteria are applied in studies with two-tailed hypothesis testing (α = 5%). The analysis of path coefficients and T-statistics is presented in Figure 2 and Table 5.

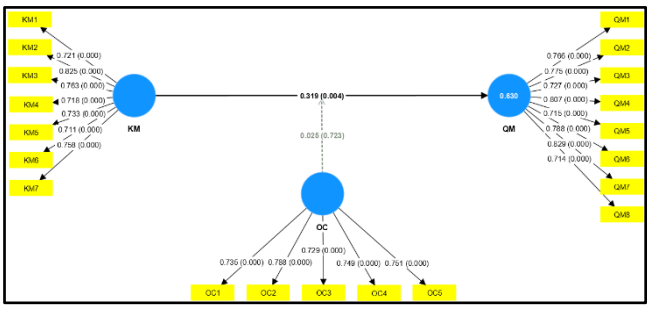

Figure 2. Bootstrapping Analysis in SMART PLS 4

Table 5. Standardized Beta, T Statistic, and P Values Test Result

Hypothesis	Exogenous Variable	Endogenous Variable	Moderating Variable	Standardized Beta	T Statistic	P Values
H_1	Knowledge Management	Quality Management		0.319	2.887	0.004
H_2	Knowledge Management	Quality Management	Organizational Culture	0.025	0.354	0.723

Based on Figure 2 and Table 3, the results of the first hypothesis (H1) reveal a T-statistic value of 2.887 and a p-value of 0.004, both of which meet the significance criteria for a 5% alpha-level test. Therefore, there is a significant relationship between knowledge management and quality management. The extent of the influence of knowledge management on quality management is indicated by the f^2 value, where f^2 = 0.35 indicates a large effect, f^2 = 0.15 indicates a medium effect, and f^2 = 0.02 indicates a small effect [35]. Knowledge management has a medium-level effect on quality management, as reflected by an f^2 value of 0.15.

The results of the second hypothesis (H2) show a T-statistic value of 0.354 and a p-value of 0.723, neither of which meet the significance criteria for a 5% alpha-level test. As a result, the organizational culture variable does not significantly moderate the relationship. Hence, it can be concluded that organizational culture does not play a role in either strengthening or weakening the connection between knowledge management and quality management.

IV. CONCLUSIONS

The purpose of this study is to understand how knowledge management affects quality management and how organizational culture moderates these relationships within large construction companies. The research findings indicate that knowledge management and organizational culture together explain 63% of the variance in quality management, as evidenced by the determination coefficient (R^2) test. The

obtained R^2 value meets the criteria for a moderate level of influence. The results of the first hypothesis (H1) reveal a significant relationship between knowledge management and quality management. Additionally, the impact of knowledge management on quality management is at a medium level of influence. Therefore, construction companies can enhance their implementation of quality management by improving their knowledge management practices. However, regarding the second hypothesis (H2), it is concluded that organizational culture does not moderate or play a role in strengthening or weakening the relationship between knowledge management and quality management. The limitation of this research is that the study population includes only large, qualified companies in East Java. For future research, it is recommended to explore the tendencies of different types of organizational cultures in construction companies that could support the knowledge management process and improve quality management. Additionally, further investigations should examine how knowledge management can aid in improving quality management across different levels of construction companies.

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