

The Influence Of Organizational Culture On Construction Risk Management Among Kuantan Malaysian Construction Industry: A Partial Least Square Structural Equation Modeling Approach

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Abstract:- Organization culture in nowadays industry especially the construction industry has become something crucial in determining the success of the construction project. The unsuitable culture can have an impact on the organization itself, based on the project management perspective. As for the construction, it is likely to face a different problem such as the quality that did not meet the expectation, overbudget, delay in terms of scheduling, unsafe condition and dissatisfaction of the clients. These problems above show how risky the construction project is. There are a few characteristics that show that the construction industry is different from other industries. This is why understanding the organizational culture is crucial because of the differences that will be faced. To address these issues above, this study aims 1) to investigate the relationship between market culture and Management risk in Pahang Malaysia; and 2) to identify the relationship between the hierarchy culture and Management risk in Pahang Malaysia. The researcher collected data from 89 respondents among construction companies in Kuantan. In this research, the PLS-SEM technique was used to analyze both the measurement and structural models. The result shows that there is a significant positive relationship between market culture and Management risk among the construction industry in Pahang, Malaysia. Meanwhile, the relationship between hierarchy culture and management risk was statistically not significant. Implications for practice and future research were also discussed.

Keywords:- Organization culture, market culture, hierarchy culture, management risk, construction industry, Malaysia.

1.0 Introduction

Risk management is one of the major knowledge areas propagated by the Project Management Institute (PMI, 2008). In construction projects, a risk management framework is a complete and systematic way of identifying, analyzing and responding to risks to achieve the project objectives (Institution of Civil Engineers and the Actuarial Profession, 2005; PMI, 2007). The advantages of the risk management process include identifying and analyzing risks, and enhancement of construction project management processes and effective use of resources.

Construction projects can be enormously complex and tense with uncertainty. Risk and uncertainty can

possibly have damaging effects on construction projects (Adeleke et al., 2019; Taofeeq et al., 2019; Flanagan, Norman & Chapman, 2006; Mills, 2001). Therefore, risk analysis and management will continue to be a major issue in the project management of construction projects in an attempt to effectively deal with uncertainty and unexpected events and to achieve project success.

Construction projects are always unique and risks raise from a number of different sources (Oyegoke, 2006; Pheng, & Chuan, 2006). Construction projects are fundamentally complex and dynamic, and involving many feedback processes (Abulhakim & Adeleke, 2019; Sterman, 2012; Uher & Loosemore, 2004). A lot of participants –

individuals and organizations (contractors contractor or developer, consultant, supplier, project managers, sub-contractors, engineer, architect, builder clients and so on) are actively involved in the construction project, and their interests may be positively or negatively affected as a result of the project implementation or project accomplishment (Project Management Institute, 2008). Different partakers with different experiences and skills typically have different expectations and interests (Dey & Ogunlana, 2004). This obviously creates complications and misunderstandings for even the most experienced project managers and contractors.

Cost of risk is a concept many construction companies have never thought about in spite of the fact that it is one of the largest expense items (Bamgbade et al., 2019; Cavignac, 2009). Risk management helps the key project participants – client, contractor or developer, consultant, and supplier – to meet their commitments and minimize negative impacts on construction project success in relation to cost, time and quality objectives.

Organization culture has become a crucial factor in determining the success of the construction project. This is why there are so much researches about organizational culture (Naqshbandi & Kaur, 2014). Organization culture can lead to effective project delivery when the uncertainty is been managed (Arditi et al., 2017). In order for the construction project to be successful, those factors that influence the success of the project itself should be well defined and discussed (Liu et al., 2007). Moreover, construction industries are likely to have their own culture which slightly different from the other industry. This is because of some of its peculiarities which are: complexity of site management, poor communication due to involvement of so many subcontractors, unique of each project, etc. (Riley & Clare-Brown, 2001).

This research focused mainly on the construction companies in Kuantan, Pahang and aimed at investigating the relationship between market culture, hierarchy culture and management risk among the construction industry in Kuantan, Pahang, Malaysia.

2.0 Literature Review

2.1 Overview of Malaysian Construction Industries

Since Malaysia became an independent nation way back in 1957, the construction industry has been one of the driving forces for her economic growth. This is because the construction industry helps to provide employment and increase job opportunities for the people in terms of socio-economy point of view (Omer & Adeleke, 2019; Khan et al., 2014). Unlike other industries, the construction industry is also known to have involved more risk. This is because, the industry involves many parties such as contractors, clients, subcontractors, architects, and engineers (Bamgbade et al., 2019). The size of the construction project itself can determine the industry's ability to manage the risk that might occur. Risk in construction can be categorized into six categories such as natural risk, physical risk, financial and economic risk, political and environmental risk, design risk, and the last one is a construction-related risk (Al-Bahar & Crandall, 2007). Effective construction risk management can be achieved with a supportive organizational culture in the organization.

Organizational culture is being considered as one determinant development of the organization (Šandrak & Matotek, 2014). Therefore, organizational culture can help the organization to manage its risk occurred effectively. As a matter of fact that, organizational culture can reduce the possibility of the risk to appear (Adeleke et al., 2019; Räsänen, 2012). According to Cameron (2004), there are few dimensions of organization culture including market culture and hierarchy culture. The market culture generally maintains the relationship with the external stakeholder, supplier, customer including the contractor (Wiewiora et al., 2013).

In fact, that market culture really considers the needs and requirements of the customer including fulfilling the customer needs. Organizational culture has become a relevant dimension in the construction industry because of its importance to focus on the

client demands. On the other hand, Hierarchy culture is the culture, which focused on the internal factors of the organization. Generally, all the roles and responsibility in the organization is being formalized and structured (Hassan & Adeleke, 2019; Ankrah & Langford, 2005).

Market culture's interest is to manage and keep the internal environment in the organization's performance accordingly. On the other hand, construction risk management has the same intention to focus on the internal and external environment of an organization. Therefore, the culture is able to give direction on the decision and behavior of the employees and management to work towards the goal, which also helps the organization to manage its risk. Market culture also able to reduce the market-related risk in the construction industry (Malik & Adeleke, 2018; Cameron & Quinn, 2006). Therefore it is hypothesized thus:

Hypothesis 1: There is a significant relationship between market culture and management risk.

Hierarchy culture is able to solve the management problem with the integration of various systems

within the organization. Hierarchy culture has become one of the forces in controlling the system of the organization, thereby making it easy to manage risk in construction projects. According to ISO 31000, the culture has an ability to affect construction risk management at all levels. Moreover, hierarchy culture is also known as the foundation of the implementation of construction risk management in the organization. Therefore it is hypothesized thus:

Hypothesis 2: There is a significant relationship between hierarchy culture and management risk.

2.2 Conceptual Framework

This study was conducted by utilizing a specific model that clearly shows the independent and dependent variables that are used. As illustrated in the conceptual framework (Figure 1), the dependent variable in this study is construction risk management (management risk) and the independent variables are market culture and hierarchy culture. The framework of the study is to depict the connection between independent and dependent variables of the study.

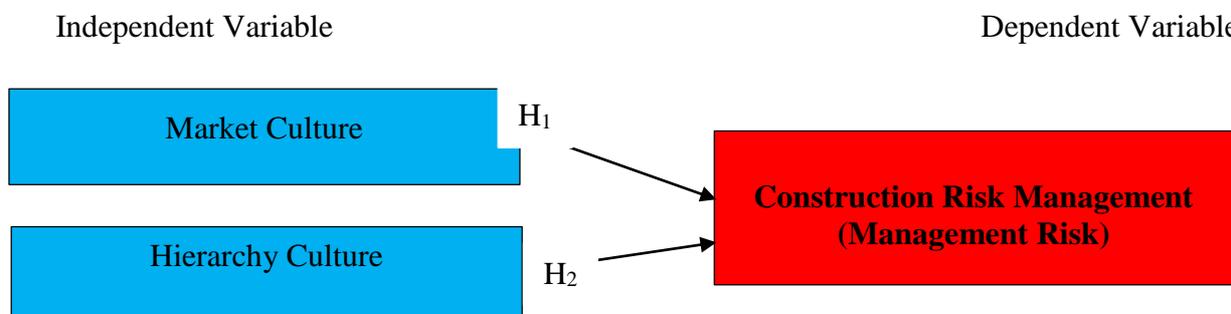


Figure 1: Research Framework

2.3 Relationship between Market Culture and Construction Risk Management (Management Risk)

Market culture's interest is to manage and keep the internal environment in the organization's performance accordingly. On the other hand, construction risk management has the same intention to focus on the internal and external environment of an organization. Furthermore, risk management in the construction project management context is a comprehensive and

systematic way of identifying, analyzing and responding to risks to achieve the project objectives (Adeleke et al., 2018; Taroun, 2014). Likewise, market culture is able to give direction on the decision and behavior of the employees and management to work towards the goal, which also helps the organization to manage its risk. During the implementation of risk management, the knowledge, experience, and judgment of the employee are being considered in order to identify the risk (Dikmen et al., 2004). Market culture also able to reduce the market-related risk in the

construction industry. It is also capable of strengthening the effort of the organization to develop risk management strategies and able to determine the image of the organization.

2.4 Relationship between Hierarchy Culture and Construction Risk Management (Management Risk)

Hierarchy culture focuses on the stability of the organization through the adoption of values and norms. Therefore, the organization which adopts this kind of culture tend to be formal and more structure compare to other organization that adopts others culture (Albayrak & Albayrak, 2014). On the other hand, risk management has a common issue such as miscommunication among the stakeholder. However, hierarchy culture able to solve the problem because with the hierarchy culture, various systems within the organization is able to integrate with each other. This culture has become one of the forces in controlling the system of the organization, thereby making it easy to manage risk in construction projects (Bamgbade et al., 2019; Taofeeq et al., 2019; Jamil & Adeleke, 2018).

3.0 Methodology

The data were collected at single-point-in-time, so this research is a cross-sectional research design (Adeleke et al., 2018; Sekaran & Bougie, 2009). The research instrument was a questionnaire because it is known as one of the most widely used and accepted instruments for research purposes (Azman & Adeleke, 2018; Sekaran, 2003). The items from the existing literature and former researches were adopted and adjusted to construct the questionnaire items in order to make sure that

all the important points are covered during measurement. A total number of the 89 out of 100 questionnaires distributed were returned from the sampled companies. So, the sample size for this research was 89 companies in Kuantan, Pahang.

3.1 Instrument Design

This research used a quantitative method because it is more structured than the qualitative method of data collection. AS earlier discussed, this study used questionnaires as the approach to collect the data from the respondent. This was done because the questionnaire is tending to be easier in retrieving information from the respondents. Five-Point Likert scaling techniques. The instrument measure the responses by dividing the responses into five categories which consist of “Strongly agree=5”, “Agree=4”, “Neutral=3”, “Disagree=2” and “Strongly Disagree= 1”(Rahman & Adeleke, 2018). The categories will be used in order to get the appropriate responses with this instrument. According to Sekaran (2003) and Sekaran & Bougie (2009), to determine the standard deviation and the mean feedback on the variables and the mid-point of the scale, a researcher must adopt the rating scale. Furthermore, the data that had been collected was being analyzed using SPSS software version 22.0 for respondents’ demographic characteristics such as position, company years of existence, gender, company’s prime location, company’s ownership, work experience, number of full-time employees and company ownership. The data analysis adopted for both independent and dependent variables was Smart PLS version 3.0. All the variables in this research are multidimensional as presented in Table 1.

Table 1: Source of measurement

S/N	Constructs	Dimension	Source	Remarks
1	Organizational culture	Market culture Hierarchy culture	(Acar & Acar, 2014)	Adapted
2	Construction risk management	Management risk	(Adeleke et al., 2016)	Adapted

4.0 Result and Discussions

4.1 Data Collection and Sample

In Kuantan, Pahang construction companies were given 100 copies of the questionnaire. The number

of copies of the questionnaire filled and returned was 89, which is the same as the sample size needed for this research. Table 2 shows a summary of the demographic characteristics of respondents for this research.

Table 2: Summary of Demographic Scales of Respondents

Type	Items	Frequency (N)	Percentage (%)
Position	Contract Manager	2	2.20
	Project Manager	16	18.00
	Worker	47	52.80
	Others	24	27.00
Working Experience	1-3 Years	57	64.00
	4-6 Years	9	10.10
	7-9 Years	7	7.90
	>10 Years	16	18.00
Gender	Male	51	57.30
	Female	38	42.70
Type of Specialized Project	Residential Building	33	37.10
	Education Building	14	15.70
	Commercial Building	25	28.10
	Others	17	19.10
Company Ownership	Local	89	100.00
Company Prime Location	Local marker area	57	64.00
	Within a few states	25	28.10
	Across Malaysia	7	7.90
Company Existence	1-3 Years	12	13.50
	4-6 Years	8	9.00
	7-9 Years	6	6.70
	>10 Years	63	70.80
No. Of Full-time Employee	0-50	43	48.30
	50-100	32	36.00
	100-150	4	4.50
	>150	10	11.20

4.2 Measurement Model

The technique that was used to test and measure the inner and outer model is Partial Least Square

Structure Equation Modeling (PLS-SEM). Figure 2 shows the model of this research with the structural dimensions (Adeleke et al., 2015).

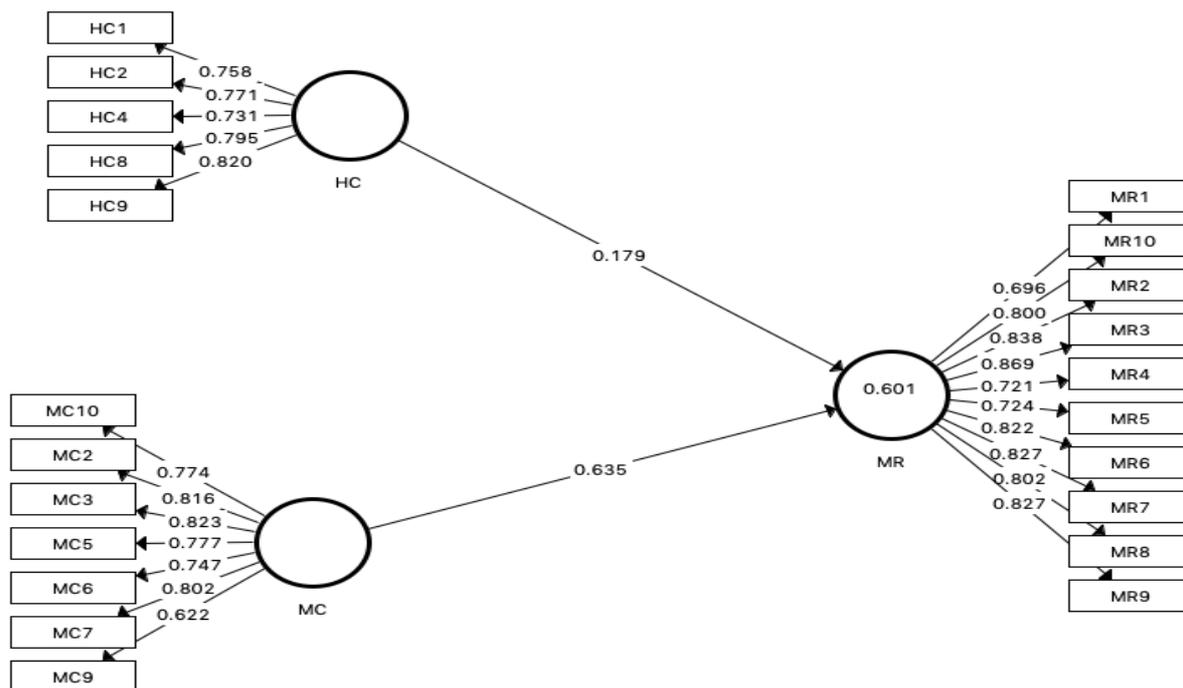


Figure 2: Measurement model

In Table 3, the measured content validity was being illustrated in two different ways. The first one was using high loading in the items on their corresponding constructs in relation to other constructs. The second one was by using the loading of items that were significantly loading on their corresponding constructs by confirming the content validity of the measures utilized in the study (Adeleke et al., 2016; Chow & Chan, 2008). There

are three criteria that were adopted for the purpose of establishing the convergent analysis which consists of Composite Reliability (CR), Average Variance Extracted (AVE), and Factor Loadings (FL). The loadings of all items were tested and those that their values were more than 0.5 were accepted. CR is the degree to which a group of items shows latent constructs of the model (Taofeeq et al., 2019; Hair et al., 2017).

Table 3: Factor Analysis and Loading of the items (Cross-Loading)

	MR	HC	MC
CRM1	0.696	0.478	0.503
CRM10	0.800	0.518	0.709
CRM2	0.838	0.536	0.672
CRM3	0.869	0.492	0.613
CRM4	0.721	0.601	0.549
CRM5	0.724	0.503	0.607
CRM6	0.822	0.554	0.615
CRM7	0.827	0.514	0.593
CRM8	0.802	0.411	0.570
CRM9	0.827	0.487	0.614
HC1	0.521	0.758	0.506
HC2	0.484	0.771	0.599
HC4	0.456	0.731	0.577

HC8	0.500	0.795	0.594
HC9	0.526	0.820	0.563
MC10	0.624	0.666	0.774
MC2	0.663	0.567	0.816
MC3	0.585	0.602	0.823
MC5	0.572	0.511	0.777
MC6	0.610	0.542	0.747
MC7	0.586	0.500	0.802
MC9	0.448	0.545	0.622

Furthermore, Converge validity can be justified as the degree to which a bunch of variables is converged to measure a certain concept. The loadings of all items were tested and those items which have values more than 0.5 were accepted. CR

is the degree to which a group of items shows latent constructs of the model (Taofeeq et al., 2019; Adeleke et al., 2015; Hair et al., 2011). Then, the value of Composite Reliability (CR) and Average Variance Extracted (AVE) are shown in Table 4 below.

Table 4: Convergent Validity Analysis

Construct Dimension	Items	Loadings	Composite Reliability	AVE	Cronbach's Alpha
Market Culture	MC10	0.774	0.909	0.591	0.883
	MC2	0.816			
	MC3	0.823			
	MC5	0.777			
	MC6	0.747			
	MC7	0.802			
	MC9	0.622			
Hierarchy Culture	HC1	0.758	0.883	0.601	0.834
	HC2	0.771			
	HC4	0.731			
	HC8	0.795			
	HC9	0.820			
Management Risk	MR1	0.696	0.945	0.631	0.934
	MR10	0.8			
	MR2	0.838			
	MR3	0.869			
	MR4	0.721			
	MR5	0.724			
	MR6	0.822			
	MR7	0.827			
	MR8	0.802			
MR9	0.827				

Additionally, discriminant validity is important for the construct validity of the outer model. The discriminant validity needed to be tested before examining the hypothesis through path analysis. It shows the extent to which items differ between

constructs (Hassan & Adeleke, 2019). Moreover, it indicates the items that are used in different constructs do not overlap. As illustrated in Table 5, the square root of AVE for all the constructs was used to replace the diagonal elements on the

correlation matrix. The discriminant validity of the outer model for this study was confirmed where the diagonal elements in the table were higher than the other elements of the column and the row where they are located. Therefore, the outer model's discriminant validity of this study was confirmed. As indicated in Table 5, satisfactory discriminant

Table 5: Validity Analysis

	MR	HC	MC
Management Risk	0.795		
Hierarchy culture	0.643		
Market culture	0.766	0.731	

The next process after confirming the goodness of the outer model was to investigate the relationships that were hypothesized in the study. PLS Algorithm was run to investigate the hypothesized model through Smart PLS. The path coefficient was gained through running PLS Algorithm, which is shown in Table 6 below. Table 6 showed the hypotheses testing. The results showed that market culture

Table 6: Results of the Inner Structural Model

Items	Construct/ Variable	Beta	S/E	T-Value	P-Value	Findings
H ₁	Market culture -> Management risk	0.635	0.101	6.305	0.000	Supported
H ₂	Hierarchy Culture -> Management risk	0.179	0.129	1.388	0.083	Not Supported

According to Cohen (1989), the criteria of effect size is less than 0.02 (0.02 = small, 0.15 = medium, 0.35 = high). From Table 7, the effective size of market culture is large and hierarchy culture can be

Table.7: Direct Effect IV-DV

R-Square	Included	Excluded	F-Square	Effect Size
Market Culture	0.601	0.421	0.451	Large Effect
Hierarchy Culture	0.601	0.587	0.035	Small Effect

5.0 Conclusion

This study focused on market and hierarchy culture as factors that influence the management risk among the construction companies in Pahang, Malaysia. The findings of this study will help future researchers who want to conduct research to gain information from previous research regarding construction risk management and organizational culture in construction companies. This research is not only relevant for academic purposes but can

validity was also achieved when the value representing the square root of the AVE (appearing bold on the diagonal) were all loaded above the recommended threshold value of 0.5 and greater than the off-diagonal correlations (Taofeeq et al., 2019; Sabodin & Adeleke, 2018).

(MC) variable has a significant positive relationship on management risk ($\beta= 0.635, t = 6.305, p = 0.000$). On the other hand, hierarchy culture (HC) has negative relationship on management risk ($\beta= 0.179, t = 1.388, p = 0.083$). Hence, only one variable has a significant relationship on construction risk management in Pahang, Malaysian construction industries.

considered as small. The formular for the calculation of effect size is as follow:

$$\text{Effect size (f)} = \frac{R^2_{\text{incl}} - R^2_{\text{excl}}}{1 - R^2_{\text{incl}}}$$

also be useful to those in the construction company. This is because; the study can help the company establish its organization culture, which can assist them to perform better in terms of managing and resolving the risk that might occur.

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