The Relationship between Team Competency and Design Risk Management among Construction Industries in Kuantan

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ARTICLE INFO	ABSTRACT
	This paper assessed the relationship between team competency and design risk management among Kuantan construction industries. Similarly, a survey was conducted among 10 local and national construction industries in Kuantan with a stratified random sampling. The returned questionnaires yielded 10 responses which was used for data analysis. Five point Likert scale categories of risk management from the previous studies was used and statistical analysis affirmed that there is positive relationship between team competency and design risk management among Kuantan construction industries.

1. Introduction

Risk can be defined as a form of circumstances comprising many unknown, unexpected, frequently undesirable and often unpredictable factors [9, 6]. According to [12], risk is an uncertain event that, if it occurs, has a positive or negative outcome on a project aim. In addition, risk can also be defined as the possibility of loss, injury, disadvantage or destruction [1]. In Addition, [5] defined risk as an uncertain event or condition that, if occurs, has an effect on at least one project objective.

Risk management is the process of identifying, assessing and controlling the uncertainties that occurs in the project. [14] Defined risk management as the process of identifying and assessing risk, and to apply methods to reduce it to an acceptable extent. According to [3], risk management is the term designated to the formalized process of harmonizing the risk and opportunities which a decision may result to and this includes proper action to produce an adequate balance in between the two. This variable can be measured by observing the time taken for the construction industries to handle the conflicts occurred during the construction projects' activities. It is revealed that risk management is known as one of the important scope that consists in project management ten

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knowledge areas [4]. According to [4], efficient and effective risk management approach entails proper systematic methodology, especially considering the importance of vast experience and knowledge.

Competency as defined by [15] is a person-related concept that refers to the dimensions of behaviour underlying competent performance. Team competency and skills are very important in ensuring the smoothness of the construction project activities and these can avoid mistakes from occurring in the project. In addition, team competency and skill is an important variable to be considered, because it provides knowledgeable and technical human resource which is required for contractors, project managers and team members to achieve the project goals [8]. According to [5] the team competency with their skills can be perceived in terms of attitude and knowledge.

Design is important for every construction project because through design, the project team members will be able to work on their tasks like making estimation on costs, listing out the materials and machineries and also scheduling. Maintaining and avoiding the risk in design is important since this will affect the whole project objectives and will cause delays in construction project. [7] Identified, there are forty-four risk factors that leads to delay due to deficiency of effective construction risk management among construction projects in Nigeria, the study revealed major risk factors such as; management, material, finance and design risk factors. Therefore, in this study, we focus on the design risk management which further aims to comprehend the relationship between team competency and design risk management among the construction industries in Kuantan. This effort might help to confirm whether the competency among the team members in construction industries could affect the design risk management. Hence, the research objective was identified as to analyze the relationship between team competency and design risk among construction industries in Kuantan.

2. Research Methods

2.1 Design of the Study

This study covers the construction industries in Kuantan by which the respondents were selected using a stratified random sampling. The total numbers of 10 construction industries which are under G7 category were randomly selected for the survey.

2.2 Data Collection

Following [10], a sample size of 10 were considered for the population of 110 construction companies. A questionnaire is a formulated written set of questions to which respondents record their answers, usually within rather closely defined alternatives [13]. The questions for this study was adopted and modified from [2]. As for this study, 10 sets of questionnaires were distributed to the selected respondents personally at the construction industries in Kuantan, Pahang.

2.3 Statistical Analysis

Statistical Package for Social Science (SPSS) version 22.0 for MS Windows was used to analyse the collected data. Meanwhile, the demographic profile of the companies and respondents were analysed with descriptive statistic. In addition, a reliability test was also conducted and being analysed. Descriptive statistics like the standard deviation, percentage and mean score were analysed. Following [6] of categories interpretation, values (range) was ascribed to the 5-point

Likert scale used in the questionnaire in ascending order as follows: 1= very low (0.1); 2= low (0.3); 3= medium (0.5); 4= high (0.7); 5 = very high (0.9).

2.4 Reliability Analysis

The Cronbach's alpha coefficient threshold was used to comprehend the reliability of all items in this study. This is important in order to be sure that the scales adopted in this study were not ambivalent. Therefore, higher Cronbach's alpha coefficient is a sign of greater consistency among the items for each component and the declaration that the measurements are reliable. Following [11] the minimum reliability threshold level, where 0.7 is regarded acceptable. The table below shows that all the Cronbach's alpha coefficient values collected in this study were above the 0.7 minimum threshold by which for team competency, the Cronbach alpha was 0.846 and for design risk it was 0.821.

Table 1
Cronbach's alpha

Constructs	Total Items	Cronbach Alpha (α)
Team Competency (TC)	16	0.846
Design Risk (DR)	10	0.821

3. Result and Discussion

Out of 10 respondents that participated in this survey, 30% were project manager, 10% were architect, 10% risk manager, 30% were engineer and 20% were quality control. Their years of work experiences were from 1 to 10years and more. About 20% of the respondents have 1 to 3years of working experience, 20% have 4 to 6years experience , 50% of them have 7 to 9 years of working experience and 10% of them has been working for more than 10years. As for gender, the percentage of male respondents were 70% compared to female which was 30%.

Table 2
Demographic Breakdown of the Respondents

Respondents	Frequency	Percentage (%)
Position in the company		
Project manager	3	30
Architect	1	10
Risk Manager	1	10
Engineer	3	30
Quality Control	2	20
Working experience (Years)		
1-3	2	20
4-6	2	20
7-9	5	50
>10	1	10
Gender		
Male	7	70
Female	3	30

A total of 60% of the companies were specialized in housing construction, another 20% were road construction and another 20% were government project construction. As for company ownership, they were the highest rate for local companies which were 80% and the remaining 20% were national companies. About 20% of the companies have executed less than 10 projects, 40%

were in the range of 11 to 20 projects, 10% were around 31 to 40 projects, another 10% between 41 to 50 and 20% were more than 50 projects been executed. Finally, as for the year of company existence, 10% were around 4 to 7 years, 40% between the range of 7 to 9 years and 50% of the companies has been in existence for more than 10 years.

Table 3
Demographic Breakdown of the Industries

Parameters	Frequency	Percentage (%)
Industry specialization		
Housing construction	6	60
Road construction	2	20
Government project construction	2	20
Industry ownership type		
Local	8	80
National	2	20
Project executed (numbers)		
<10	2	20
11-20	4	40
31-40	1	10
41-50	1	10
>50	2	20
Industry existence (years)		
4-7	1	10
7-9	4	40
>10	5	50

Pearson Correlation Analysis was used in this paper in order to assess the relationship between dependent variable (design risk management) and independent variable (team competency). The result from the analysis determines either the variable was positively or negatively related. Correlation analysis used to measure the strength of the relationship between team competency and design risk management were the two variables used in this study. For the strength of correlation coefficient value, the sizes were describe as follows: 1.00 (perfect), 0.80 to 0.90 (very strong), 0.50 to 0.80 (strong), 0.30 to 0.50 (moderate), 0.10 to 0.30 (modest), >0.10 (weak) and 0.0 (no correlation).

Table 4
Pearson Correlation

		TC	DRM
TC	Pearson Correlation	1	.173
	Sig. (2-tailed)		.632
	N	10	10
DRM	Pearson Correlation	.173	1
	Sig. (2-tailed)	.632	
	N	10	10

Table 4 shows the correlation matrix for independent variable and dependent variable. The result shows that the team competency (independent variable) has modest positive correlation (r= 0.173) at the 1% significance level (2-tailed) with design risk management (dependent variable). Hence, the formulated research objective was accepted.

4. Conclusion

This study was investigated particularly to determine the relationship between team competency and design risk management among construction industries in Kuantan. Results affirmed that there is a significant positive relationship between team competency and design risk management among Kuantan Malaysian construction industries. This point that team competency plays a major role in controlling future risk occurrence in Kuantan Malaysian construction industries project. Similarly, the empirical and the theoretical implications in this paper has contributed to the growing body of knowledge in this area of research, and on the long run can be used towards risk reduction in Kuantan construction industries.

Therefore, future studies can determine the implementation of design risk management in other industries to give better reliability to the application of team competencies as a multi-dimensional variables. Also, the sample size for the future study can be increased to better generalize this findings.

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