CHAPTER 4

DATA ANALYSIS AND FINDINGS

This chapter describes the analysis from the data that has been collected in this study and the findings that are derived from the analysis. Results from the profiling of the respondents, the normality test, reliability test, multiple regression analysis and hierarchical multiple regression analysis are reported in this chapter.

4.1 Profile of Respondents

The demographic profile of the total respondents (n=105) that participated in this study is discussed in this section. Descriptive analysis in terms of frequency and distribution in percentage is conducted to better understand the characteristics of the population of this study. The general characteristics of the respondents are tabulated in Table 4-1 while the distribution of gender, age, ethnicity, monthly income, highest education level, current job position, current engineering sector, current engineering field and years of service are displayed in Appendix G.

There are 105 respondents. All of them are Malaysian while male respondents made up 75.2 percent and female respondents made up 24.8 percent of the population of study. In terms of age, 14.3 percent falls below the age of 25, 40 percents lies in the range of 25 to 32 years, 21.9 percent lies in the range of 33 to 39 years, 6.7 percent lies in the range of 40 to 46 years, 16.2 percent lies in the range of 47 to 65 years and 1 percent is above 66 years.

In terms of ethnicity of the respondents, Malays account for 32 percent, Chinese account for 67 percent, Indian account for 5 percent and other ethnicities account for 1 percent. Respondents with monthly income in the range of RM 2,000 to RM 4,000 make up the biggest group with 33.3 percent. This is follow by the above RM 10,000 monthly income group with 22.9 percent, the RM 4,001 to RM 6,000 monthly income group with 18.1 percent, the RM 6,001 to RM 8,000 monthly income group with 16.2 percent and the RM 8,001 to RM 10,000 monthly income group with 9.5 percent.

In terms of highest educational level, most of the respondents have first degree. This segment alone accounts for 73.3 percent of the population under study. Respondents with professional qualification make up for 8.6 percent while respondents with post-graduate degree make up for the remaining 18.1 percent. It is also observed that there is almost equal distribution of the respondents when considering the job position. Directors account for 10.5 percent, senior managers make up 6.7 percent while managers account for 16.2 percent when managements are considered. Senior executives account for 28.6 percent and junior executives account for 31.4 percent while the remaining of non-executives account for 6.7 percent.

Of the total 105 respondents, 49.5 percent are engaged in consultancy practices, 16.2 percent are in the government sector, 8.6 percent are contractors, 7.6 percent are into project management, 5.7 percent are suppliers, 3.8 percent are property developers while the remaining 8.6 percent are into other engineering practices. 74.3 percent of the respondents are civil engineers, 7.6 percent are mechanical engineers, 3.8 percent are environment engineers, 2.9 percent are chemical engineers, and 1.9 percent are electrical engineers while 9.5 percent account for other discipline of practice.

In terms of years of service in current company, more than half of the respondents have less than 5 years of service in the current company. 25.7 percents of the respondents have been attached with the current company for less than 2 years, while 32.4 percent of the respondents are attached with the current company of between 2 to 5 years. 19.0 percent of the respondents have been in the service of their present company for between 5 – 10 years. The segments of 10 to 15 years and above 15 years share the same frequencies of 11.4 percent.

Items	Frequency (N=105)	Percent (%)
Nationality:		
Malaysian	105	100.0
Non-Malaysian	0	0.0
Gender:		
Male	79	75.2
Female	26	24.8
Age Group:		
< 25 Years	15	14.3
25 – 32 Years	42	40.0
33 – 39 Years	23	21.9
40 – 46 Yeas	7	6.7
47 – 65 Years	17	16.2
> 66 Years	1	1.0
Ethnicity:		
Malay	32	30.5
Chinese	67	63.8
Indian	5	4.8
Others	1	1.0
Monthly Income:		
RM 2,000 to RM 4,000	35	33.3
RM 4,001 to RM 6,000	19	18.1
RM 6,001 to RM 8,000	17	16.2
RM 8,001 to RM 10,000	10	9.5
> RM 10,000	24	22.9
Highest Educational Level:		
First Degree (Bachelor)	77	73.3
Professional Qualification	9	8.6
Post-Graduate Degree	19	18.1

Items	Frequency (N=105)	Percent (%)
Current Job Position:		
Director	11	10.5
Senior Manager	7	6.7
Manager	17	16.2
Senior Executive	30	28.6
Junior Executive	33	31.4
Non-Executive	7	6.7
Current Engineering Sector:		
Government Sector	17	16.2
Property Developer	4	3.8
Contractor	9	8.6
Consultant	52	49.5
Supplier	6	5.7
Project Management	8	7.6
Current Engineering Field:		
Civil Engineering	78	74.3
Chemical Engineering	3	2.9
Electrical Engineering	2	1.9
Environment Engineering	4	3.8
Mechanical Engineering	8	7.6
Others	10	9.5
Years of Service in Current Company:		
< 2 Years	27	25.7
2 – 5 Years	34	32.4
5 – 10 Years	20	19.0
10 – 15 Years	12	11.4
> 15 Years	12	11.4

Table 4-1: Profiles of Respondents

4.2 Mean, Standard Deviation and Normality Test

Normality test is commonly conducted to determine the distribution of the data obtained. It would be crucial for the data to have normal distribution of symmetrical bell-shaped curve before further parametric analysis can be conducted. In this study, it is essential for the observed data to conform to normal distribution before multiple regression analysis can be conducted. Data transformation will be necessary should the

set of data do not observe the normality behaviour. Normal distribution curves can be evidently viewed from histogram with the greatest distribution lies within the middles segment while small frequencies lie to both extreme ends of the curves (Pallant, 2007).

A set of data is considered to be normally distributed if both the skewness and kurtosis analysis from the normality test exhibit values of between -2.000 and 2.000 (Sekaran, 2003). In this study, all individual questions from various variables in the questionnaire are tested for normality and the results are displayed in Appendix H. The mean values of the observed from this test lie in between 3.49 to 6.06. For the skewness analysis, it is observed from the normality test that the sets of data under study are in the range of -1.261 to 0.800. In terms of kurtosis analysis, it is observed that the sets of data under study are in the range of -1.303 and 1.925. Though it may be observed that the individual set of data exhibits certain degrees of leptokurtic and platykurtic distribution, nonetheless, the distributions are still in the acceptable range of -2.000 and 2.000. Both these analyses conducted deduce that the set of data is normally distributed based on the distribution values proposed by Sekaran (2003).

4.3 Reliability Test

Reliability test is conducted to assess the consistency of the sets of data obtained. The reliability of the sets of data assessed is measured using Cronbach's alpha coefficient. The value of 0.700 is considered to be an acceptable value with higher value indicates higher reliability of the sets of data under study. In this study, each variable is tested individually for reliability. The results for the reliability test are as indicated in Table 4-2 as follow.

Variable	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Dependent Variable:			
Adoption of Value Management	.674	.675	2
Moderating Variable:			
Awareness	.839	.840	4
Independent Variables:			
Resources	.819	.827	13
Team Dynamics	.826	.842	18
Approach Strategy	.897	.905	15

Table 4-2: Summary of Reliability Test

It can be observed from the reliability test above that except for dependent variable, the rest of the variables have high Cronbach's alpha coefficient of above 0.800. Moderating variable of awareness has Cronbach alpha coefficient of 0.839 while each of the independent variables of resources, team dynamics and approach strategy exhibits Cronbach's alpha of 0.819, 0.826 and 0.897. These indicate that the sets of data for these variables have high internal consistency. Moderating variable of awareness has Cronbach alpha coefficient of 0.839.

Though the dependent variable has Cronbach's alpha coefficient of less than 0.700, it is considerably close to 0.700 since it is 0.674. It is noteworthy to observe that Liu and Shen (2004) reported Cronbach's alpha of 0.6025 to 0.8457 for variables in their study to which this present study is adapted from. They mentioned that Nunnaly (1978) opined that for this type and scale study, a Cronback's alpha coefficient of 0.6000 would suffice.

4.4 Testing of Hypotheses

4.4.1 Multiple regression analysis

The relationship between independent variables of resources, team dynamics, approach strategy and dependent variable of adoption of Value Management as detailed in hypothesis 1, hypothesis 2 and hypothesis 3 will be investigated in this section. To examine the relationship between the independent variables of resources, team dynamics, approach strategy and the dependent variable of adoption of Value Management, multiple regression analysis is employed as per the method proposed by Coakes, Steed and Ong (2010) as well as Pallant (2007). Multiple regression analysis is a common method used to determine the relationship between a single dependent variable with more than two independent variables (Hair, Black, Babin, Anderson, & Tatham, 2006). The level of significance, α of 0.05 is adopted for this study. An independent variable is therefore, considered to have significant relationship with the dependent variable when the significant factor exhibits a value of less than 0.05.

The results from the multiple regression analysis to determine the relationship between the independent variables of resources, team dynamics, approach strategy and the dependent variable of adoption of Value Management are shown in Table 4-3 below.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.651	.424	.407	1.03499

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	79.770	3	26.590	24.822	.000
	Residual	108.192	101	1.071		
	Total	187.962	104			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.441	.951		-2.566	.012
	Resources	.059	.188	.033	.315	.753
	Team Dynamics	.165	.254	.071	.651	.517
	Approach Strategy	1.165	.226	.578	5.157	.000

a. Dependent Variable: Adoption of Value Management

Table 4-3: Summary of Multiple Regression Analysis

From the results above, it is observed that 42.4 percent of the variance (R Square) in the dependent variable of adoption of value management are explained by the independent variables of resources, team dynamics and approach strategy. Also, with level of significance, α of 0.05, resources and team dynamics are deemed as insignificant predictors of adoption of Value Management ($p > 0.05$). Approach strategy, on the other hand, is the significant predictor of adoption of Value Management based on level of significance, α of 0.05 ($p < 0.05$).

Hypothesis 1: H_0: There is no significant relationship between resources and adoption of Value Management among engineering professionals in the Klang Valley.

H1: There is significant relationship between resources and adoption of Value Management among engineering professionals in the Klang Valley.

From the analysis results tabulated in Table 4-3, it can be deduced that the independent variable of resources has insignificant relationship with the dependent variable of adoption of Value Management with a level of significance, α of 0.05. Therefore, Hypothesis 1 is rejected with $\beta = 0.033$ ($p > 0.05$).

This is in stark contrast with the studies conducted in other countries. Liu and Shen (2004), Fong and Shen (2000) and Chen, Chang and Huang (2010) have found that resources are an essential element for the successful adoption of Value Management among engineers in China, Hong Kong and Taiwan respectively and thus a significant contributor to the adoption of Value Management among engineering professionals. Nonetheless, the perception and characteristics of engineering professionals in the Klang Valley tend to vary from those of China, Hong Kong and Taiwan with regards to the effects of resources to the adoption of Value Management.

Hypothesis 2: H_0: There is no significant relationship between team dynamics and adoption of Value Management among engineering professionals in the Klang Valley.

H2: There is significant relationship between team dynamics and adoption of Value Management among engineering professionals in the Klang Valley.

It is observed from Table 4-3 that the independent variable of team dynamics has insignificant relationship with the dependent variable of adoption of Value Management with a level of significance, α of 0.05. Therefore, Hypothesis 2 is rejected with $\beta = 0.071$ ($p > 0.05$).

Again, the results obtained from this study are incongruent with studies conducted in other countries. Liu and Shen (2004), Ting and Cheah (2004) and Chen, Chang and Huang (2010) have reported that team dynamics has been determined to be a vital aspect for implementation of Value Management in their respective countries of study. Ting and Cheah (2004) found in their studies in Singapore that the implementation of Value Management would not have materialised without the agreement and support from various stakeholders involved.

It is evident from this study that engineering professionals in the Klang Valley tend to be idiosyncratic from their counterparts from other countries pertaining to the reaction of team dynamics to the adoption of Value Management.

Hypothesis 3: H_0: There is no significant relationship between approach strategy and adoption of Value Management among engineering professionals in the Klang Valley.

H3: There is significant relationship between approach strategy and adoption of Value Management among engineering professionals in the Klang Valley.

Examining Table 4-3, it is inferred that the independent variable of approach strategy has significant relationship with the dependent variable of adoption of Value

Management with a level of significance, α of 0.05. Therefore, Hypothesis 3 is accepted with $\beta = 0.578$ ($p < 0.05$).

The findings from this study are consistent with studies conducted by Liu and Shen (2004), Ting and Cheah (2004) and Fong and Shen (2000) in China, Singapore and Hong Kong respectively. They have established through their studies that a prudent approach strategy to implementing Value Management is a pre-requisite for successful adoption of Value Management. It can be ascertained here that the engineering professionals in the Klang Valley have similar views pertaining to the importance of approach strategy to the adoption of Value Management.

4.4.2 Hierarchical Multiple Regression Analysis

Hypothesis 4, hypothesis 5 and hypothesis 6 are tested using hierarchical multiple regression analysis to determine the moderating effects of awareness to the relationship between independent variables of resources, team dynamics, approach strategy and dependent variable of adoption of Value Management among the engineering professionals in the Klang Valley. Hierarchical multiple regression analysis is used to evaluate the relationship between a set of independent variables and the dependent variable moderated by the moderating variable by controlling the effects of different sets of independent variables on the dependent variable.

Interaction variable must be created first to enable the testing of the interaction between independent variable and moderating variable in explaining the dependent variable. In this study, the interaction variables are created by multiplying the effects of moderating variable of awareness with independent variables of resources, team

dynamics and approach strategy into Aw_Re, Aw_TD and Aw_AP respectively. These interaction variables are subsequently tested for their significance in the relationship with the dependent variable of adoption of Value Management. The results from the hierarchical multiple regression analysis are tabulated in Table 4-4 as follow.

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.651[a]	.424	.407	1.03499
2	.657[b]	.432	.409	1.03355
3	.682[c]	.465	.427	1.01784

a. Predictors: (Constant), Mean_Approach_Strategy, Mean_Resources, Mean_Team_Dynamics

b. Predictors: (Constant), Mean_Approach_Strategy, Mean_Resources, Mean_Team_Dynamics, Mean_Awareness

c. Predictors: (Constant), Mean_Approach_Strategy, Mean_Resources, Mean_Team_Dynamics, Mean_Awareness, Aw_Re, Aw_AP, Aw_TD

d. Dependent Variable: Mean_AVM

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	79.770	3	26.590	24.822	.000[a]
	Residual	108.192	101	1.071		
	Total	187.962	104			
2	Regression	81.140	4	20.285	18.990	.000[b]
	Residual	106.822	100	1.068		
	Total	187.962	104			
3	Regression	87.469	7	12.496	12.061	.000[c]
	Residual	100.493	97	1.036		
	Total	187.962	104			

a. Predictors: (Constant), Mean_Approach_Strategy, Mean_Resources, Mean_Team_Dynamics

b. Predictors: (Constant), Mean_Approach_Strategy, Mean_Resources, Mean_Team_Dynamics, Mean_Awareness

c. Predictors: (Constant), Mean_Approach_Strategy, Mean_Resources, Mean_Team_Dynamics, Mean_Awareness, Aw_Re, Aw_AP, Aw_TD

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	79.770	3	26.590	24.822	.000[a]
	Residual	108.192	101	1.071		
	Total	187.962	104			
2	Regression	81.140	4	20.285	18.990	.000[b]
	Residual	106.822	100	1.068		
	Total	187.962	104			
3	Regression	87.469	7	12.496	12.061	.000[c]
	Residual	100.493	97	1.036		
	Total	187.962	104			

a. Predictors: (Constant), Mean_Approach_Strategy, Mean_Resources, Mean_Team_Dynamics

b. Predictors: (Constant), Mean_Approach_Strategy, Mean_Resources, Mean_Team_Dynamics, Mean_Awareness

c. Predictors: (Constant), Mean_Approach_Strategy, Mean_Resources, Mean_Team_Dynamics, Mean_Awareness, Aw_Re, Aw_AP, Aw_TD

d. Dependent Variable: Mean_AVM

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.441	.951		-2.566	.012
	Mean_Resources	.059	.188	.033	.315	.753
	Mean_Team_Dynamics	.165	.254	.071	.651	.517
	Mean_Approach_Strategy	1.165	.226	.578	5.157	.000
2	(Constant)	-2.308	.957		-2.411	.018
	Mean_Resources	.091	.190	.051	.482	.631
	Mean_Team_Dynamics	.151	.254	.065	.595	.553
	Mean_Approach_Strategy	1.224	.232	.608	5.286	.000
	Mean_Awareness	-.111	.098	-.094	-1.133	.260

3	(Constant)	5.801	3.952		1.468	.145
	Mean_Resources	.034	.937	.019	.036	.971
	Mean_Team_Dynamics	-2.448	1.206	-1.056	-2.030	.045
	Mean_Approach_Strategy	2.267	1.005	1.125	2.256	.026
	Mean_Awareness	-1.903	.872	-1.612	-2.183	.031
	Aw_Re	-.002	.183	-.009	-.008	.993
	Aw_TD	.528	.240	2.768	2.199	.030
	Aw_AP	-.175	.196	-.999	-.892	.374

a. Dependent Variable: Mean_AVM

Table 4-4: Summary of Hierarchical Multiple Regression Analysis

From the results above, it is observed that 46.5 percent of the variance (R Square) in the dependent variable of adoption of value management are explained by the independent variables of resources, team dynamics and approach strategy, moderated by awareness. Also, with the level of significance, α of 0.05, the interaction between resources-awareness and resources-approach strategy are deemed as insignificant predictors of adoption of Value Management ($p > 0.05$). The interaction between approach strategy and awareness, on the other hand, is the significant predictor of adoption of Value Management based on level of significance, α of 0.05 ($p < 0.05$).

Hypothesis 4: H_0: There is no significant relationship between resources and adoption of Value Management, moderated by awareness among engineering professionals in the Klang Valley.

H4: There is significant relationship between resources and adoption of Value Management, moderated by awareness among engineering professionals in the Klang Valley.

From the results presented in Table 4-4, it is deduced that there is insignificant relationship between resources and adoption of Value Management, moderated by awareness among engineering professionals in the Klang Valley with a level of significance, α of 0.05. Hypothesis 4 is rejected with β = -0.009 ($p > 0.05$).

The findings from this study that awareness does not moderate the effects of resources to the adoption of Value Management is not consistent with the gap identified by Liu and Shen (2004), Fong and Shen (2000) and Shehu and Akintoye (2009) in their studies in China, Hong Kong and UK respectively. They have reported that awareness is an essential element that will trigger the adoption of Value Management through proper allocation of resources. However, the perceptions of engineering professionals in the Klang Valley obviously differ from the proposed relationship that awareness will moderate the relationship between resources and adoption of Value Management by Liu and Shen (2004), Fong and Shen (2000) and Shehu and Akintoye (2009).

Hypothesis 5: H_0: There is no significant relationship between team dynamics and adoption of Value Management, moderated by awareness among engineering professionals in the Klang Valley.

H5: There is significant relationship between team dynamics and adoption of Value Management, moderated by awareness among engineering professionals in the Klang Valley.

Examining the results in Table 4-4, it is deduced that there is significant relationship between team dynamics and adoption of Value Management, moderated by awareness among engineering professionals in the Klang Valley with level of significance, α of 0.05. Hypothesis 5 is accepted with β = 2.199 ($p < 0.05$).

The gap identified by Liu and Shen (2004) and Fong and Shen (2000) with regards to the moderating effects of awareness to the relationship between team dynamics and adoption of Value Management is congruent with the results conducted in this study. To further explore and better understand the moderating effects of awareness on the relationship between team dynamics and adoption of Value Management, the graphical interface depicting the interaction between the three adoption of Value Management, team dynamics and awareness is developed.

The mean awareness obtained from the analysis is used to differentiate between low awareness and high awareness of the respondents with the lower half of the mean awareness is recoded as low awareness while the upper half of the mean awareness into high awareness. The responses of team dynamics independent variable are recoded into low, moderate and high by segmenting of scores recorded according to low awareness and high awareness segments. The medians obtained from recoding of team dynamics of low, moderate and high are used to characterise the interaction. The interaction graph plotted displaying the moderating effects of awareness to the relationship between team dynamics and adoption of Value Management is as displayed in Figure 4-1.

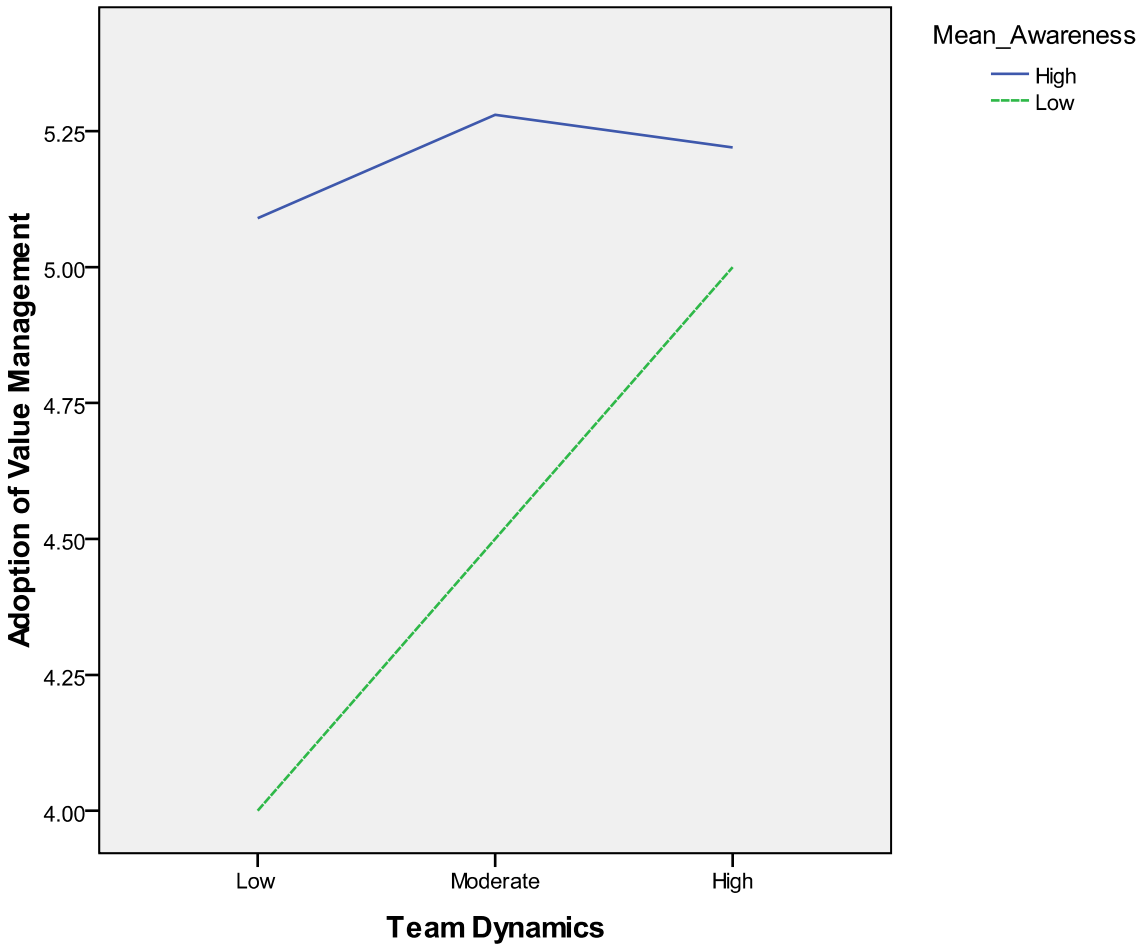

Figure 4-1: Moderating Effects of Awareness on the Relationship between Team Dynamics and Adoption of Value Management

From the Figure 4-1, it can be determined that there is a significant difference between the effects of low awareness and high awareness to the relationship between team dynamics and adoption of Value Management. For low awareness segment, it moderates the team dynamics to the adoption of Value Management in an increasing, linear manner. However, the effects of high awareness to the relationship between team dynamics and adoption of Value Management vary greatly from the low awareness segment. It moderates the effects from low to moderate team dynamics in an increasing manner but decreases from moderate to high. The interaction indicates that the positive impact of team dynamics towards adoption of Value Management is greater among

respondents with low awareness while the impact of team dynamics towards the adoption of Value Management among respondents with high awareness varies.

Hypothesis 6: H_0: There is no significant relationship between approach strategy and adoption of Value Management, moderated by awareness among engineering professionals in the Klang Valley.

H6: There is significant relationship between approach strategy and adoption of Value Management, moderated by awareness among engineering professionals in the Klang Valley.

It is deduced from Table 4-4 that there is insignificant relationship between approach strategy and adoption of Value Management, moderated by awareness among engineering professionals in the Klang Valley with a level of significance, α of 0.05. Hypothesis 6 is rejected with $\beta = -0.999$ ($p > 0.05$).

This is in contradiction with the gap identified by Liu and Shen (2004) and Fong and Shen (2000) who have conducted the study in China and Hong Kong respectively. They have claimed that through higher awareness of Value Management practices, it will moderate the adoption of Value Management among engineers through well manoeuvred approach strategy. The results obtained in this study dispel the effects of awareness to the relationship of approach strategy and adoption of Value Management among the engineering professionals in the Klang Valley region.

4.5 Summary

This chapter details the data analysis and results of the descriptive statistics, multiple regression analysis and hierarchical multiple regression analysis conducted in this study. Descriptive statistics is used to determine the distribution of the pattern of the respondents while multiple regression analysis and hierarchical multiple regression analysis are used to test the hypotheses developed in this study. It is determined that only approach strategy has significant relationship with the adoption of Value Management among the engineering professionals in the Klang Valley. Also, this study suggests that awareness moderates the relationship between team dynamics and adoption of Value Management among engineering professionals in the Klang Valley.

CHAPTER 5

DISCUSSION AND CONCLUSION

This chapter discusses the findings that are deduced from this study and possible reasons for the particular responses. This chapter also describes the bounding limitations of this research, suggestions for future research as well as implications and conclusions drawn from this study.

5.1 Discussion of the Findings

The results from the analysis is summarised as Table 5-1. It is ascertained that only approach strategy has significant relationship with the adoption of Value Management among the engineering professionals in the Klang Valley. Also, it is determined from this study that awareness moderates the relationship between team dynamics and adoption of Value Management among engineering professionals in the Klang Valley.

Hypothesis Testing Results	Results
H1: There is significant relationship between resources and adoption of Value Management among engineering professionals in the Klang Valley.	*Rejected*
H2: There is significant relationship between team dynamics and adoption of Value Management among engineering professionals in the Klang Valley.	*Rejected*
H3: There is significant relationship between approach strategy and adoption of Value Management among engineering professionals in the Klang Valley.	*Accepted*
H4: There is significant relationship between resources and adoption of Value Management, moderated by awareness among engineering professionals in	*Rejected*

the Klang Valley.	
H5: There is significant relationship between team dynamics and adoption of Value Management, moderated by awareness among engineering professionals in the Klang Valley.	*Accepted*
H6: There is significant relationship between approach strategy and adoption of Value Management, moderated by awareness among engineering professionals in the Klang Valley.	*Rejected*

Table 5-1: Summary of Hypothesis Testing Results

5.1.1 Research Objective 1

From the results of the multiple regression analysis shown in Section 4.4.1, it is deduced that there is no significant relationship between resources and adoption of Value Management among the engineering professionals in the Klang Valley (β = 0.033, $p > 0.05$).

This might be due to different environments that are governing the characteristics of the engineering professionals pertaining to the significance of allocation of resources to the adoption of Value Management in their practices. Respondent A commented that Malaysia is a country blessed with ample natural resources and thus costs associated with these resources are relatively affordable as compared to other countries. Thus, the engineering professionals in Malaysia have the privilege of not having to struggle to keep costs low and scramble for better allocation of financial resources to keep a project going. Respondent D further added that in terms of time management to project delivery, delay seems to be a common fad. It is not

uncommon that extension of time (EOT) is applied and granted to allow an extended period to complete a project.

This may have bred the perception that resources are least important when consideration is applied to the adoption of Value Management. This is in stark contrast with countries like Taiwan, Singapore and Hong Kong where resources are scarce and valuable, therefore, allocation of resources will be primary consideration for implementing programmes like Value Management.

5.1.2 Research Objective 2

As shown in Section 4.4.1, it is deduced that there is no significant relationship between team dynamics and adoption of Value Management among the engineering professionals in the Klang Valley ($\beta = 0.071$, $p > 0.05$).

The insignificant relationship of team dynamics and adoption of Value Management might be due to the underlying behaviours of the engineering professionals towards team dynamics which have been shaped over the years. Respondent A commented that it has been an accepted norm in the engineering sector that each and every party involved is aggressively protecting their own interests in the project and thus attaining team dynamics seems to be an uphill tasks for most project managers. However, Respondent A observed that this trend is gradually changing over the years with more emphasis being placed in team dynamics to achieve the project goals or objectives.

Respondent C opined that even though team dynamics is achieved, team dynamics will not be a significant consideration factor for adoption of Value Management until the actual implementation stage where the inputs and contributions of all stakeholders and team members will be vital. This is due to the fact that the team structure and members are usually not known in the early stage of Value Management implementation. Therefore, building team dynamics cannot be possible until the later stage of the project implementation and Value Management implementation when all team members are engaged in the project.

5.1.3 Research Objective 3

From the results in Section 4.4.1, it is deduced that there is significant relationship between team dynamics and adoption of Value Management among the engineering professionals in the Klang Valley ($\beta = 0.578$, $p < 0.05$).

Respondent B opined that approach strategy is essential for implementation of any projects or programmes particularly for programme like Value Management where substantial planning and considerations are required. Thus, providing clear objectives, having apt culture fit and well-developed methodology for Value Management implementation will be pre-requisite for its acceptance. Respondent D concurred with the arguments of Respondent B. Respondent D further commented that the engineering professionals tend to be drawn to the perceived benefits of Value Management and how Value Management could further assist them to deliver the project effectively and efficiently.

The results obtained is consistent the studies conducted by Liu and Shen (2004), Ting and Cheah (2004) and Fong and Shen (2000) from China, Singapore and Hong Kong respectively. Despite the differences in culture, maturity of project management and development of project delivery techniques, approach strategy is a significant factor in inducing the engineering professionals in adopting Value Management. Therefore, devising and executing approach strategy must be given high priority to ensure more will adopt Value Management in their project management and delivery system.

5.1.4 Research Objective 4

From the results presented in Section 4.4.2, it is deduced that there is insignificant relationship between resources and adoption of Value Management, moderated by awareness among the engineering professionals in the Klang Valley (β = -0.009, $p > 0.05$).

Again, the insignificant relationship between resources and adoption of Value Management, moderated by awareness among the engineering professionals in the Klang Valley might be due to the norms of the engineering professionals. Respondent A commented that higher awareness of Value Management does not necessarily warrant higher allocation of resources to induce adoption of Value Management. Despite having awareness of Value Management, engineers preferred to be convinced with hard facts of the success of Value Management practices rather than having resources to conduct Value Management.

It can be suggested here that though engineers may operate on the same technical basis, the guiding principles of project management might differ from country

to country. Hence, the argument of awareness moderates the relationship between resources and adoption of Value Management does not apply among engineers in the Klang Valley.

5.1.5 Research Objective 5

From the results in Section 4.4.2, it is deduced that there is significant relationship between team dynamics and the adoption of Value Management, moderated by awareness among the engineering professionals in the Klang Valley ($\beta = 2.199$, $p < 0.05$).

This is consistent with the gap identified by Liu and Shen (2004) that awareness moderates the relationship between team dynamics and the adoption of Value Management. It can been determined from the Figure 4-1 that low awareness moderates the relationship between team dynamic and adoption of Value Management in a consistent and linear manner. It can be suggested that engineers with low level of awareness view team dynamics as an important factor that induce them to adopt Value Management. This might be due to the appeal of Value Management benefits in the initial stage and the effects of peer pressure from their team members to adopt Value Management. However, the effects of team dynamics became gradually insignificant to the adoption of Value Management for high awareness as team dynamics moved from moderate to high. This might be contributed to the fact that gaining higher awareness no longer excites the engineers to adopt Value Management as the topic might not be interesting over time. This could be further affected by the strong influence of team members over the decision whether to adopt Value Management due to high level of team dynamics. Respondent B, Respondent C and Respondent D concurred that it is

essential for the engineers to continue to be excited with the notion of Value Management and this excitement enhance the team dynamics towards implementing Value Management.

The results indicate that awareness has a role in moderating the effects of team dynamics to induce engineers to adopt Value Management. It can be seen that awareness provides the excitement for the team and the team dynamics enables peer pressure to play a role in inducing engineers to adopt Value Management.

5.1.5 Research Objective 6

From section 4.4.2, it can be deduced there is insignificant relationship between approach strategy and the adoption of Value Management, moderated by awareness among the engineering professionals in the Klang Valley ($\beta = -0.999$, $p > 0.05$).

Despite the proposal by Liu and Shen (2004) that awareness moderates the relationship between approach strategy and the adoption of Value Management, it is foreseen that there is overlapping between awareness and approach strategy. Respondent A is of the opinion that engineers would have been aware of the significance of Value Management to enable them to consider the approaches being directed to them to adopt Value Management. Respondent B concurred with Respondent A and further added that approach strategies directed at implementing Value Management would not have been effective should engineers do not have prior awareness of Value Management. Hence, this might explain why awareness would not have significant moderating effects on the relationship of approach strategy and the

adoption of Value Management among the engineering professionals in the Klang Valley.

5.2 Limitations of the Research

Due to time constraint, only quantitative approach is conducted for this study. It would have been more robust should a qualitative study in terms of a more in-depth semi-structured and focus group interviews were conducted with experienced engineers who have vast exposure of Value Management implementation as well as qualified Value Management managers. This is even more essential given that this study is an exploratory study.

The usage of non-probability sampling would have induced potential biasness in this study. It is foreseen that the usage of probability sampling would potentially reduced the biasness associated with the method of sampling. Potential respondents should also be enlarged to include those outside the Klang Valley to represent the distribution of engineers around Malaysia and hence enable this study to be generalised to the population of engineers in Malaysia.

5.3 Suggestion for Future Research

Considering the study conducted, it would be prudent to further explore the relationship between the adoption of Value Management with various individual sub-variables of resources, team dynamics and approach strategy. It is foreseen that this initiative will provide better insights into more specific factors that induce the adoption of Value Management. This should also include the moderating effects of awareness

into the relationship between the aforesaid dependent variable and independent variables. Qualitative method should also be considered to ensure better understanding of the underlying principles that have guided the behaviours and characteristics of engineers in Malaysia.

It would be worth noting that a study should extend beyond this exploratory study into more robust study where a larger population of respondents is sought and that this population should extend beyond the Klang Valley for generalisation of the study throughout Malaysia. It would be discreet to adopt probability sampling to reduce potential biasness associated with non-probability sampling.

5.4 Implications and Conclusion

With the growing awareness and concerns on how public projects are managed, the engineering sector has been subjected to intense pressure to implement Value Management to effectively and efficiently deliver the projects intended. While the implementation of Value Management has been made mandatory for projects worth RM 50 million and above, a more pragmatic approach would be required to induce engineers to adopt Value Management in their practices. This study investigated the possible factors that are central to engineers in their considerations for adopting Value Management with the intention of providing information for various parties involved to better chart their strategies in promoting Value Management.

It can be determined from this study that approach strategy significantly contributes to the adoption of Value Management among the engineering professionals in the Klang Valley and awareness moderates the relationship between team dynamics

and the adoption of Value Management among the engineering professionals in the Klang Valley. This is despite the findings of other researchers like Liu and Shen (2004), Ting and Cheah (2004) and Fong and Shen (2000) in China, Singapore and Hong Kong respectively that there are other factors that contribute to the adoption of Value Management. This might be due to the effects of local environments and cultures which dictate the characteristics and behaviours of the engineers in the country.

Based on the findings, this study has exposed the need to consider the local environments and cultures when adopting a new concept of management method or technique. Strategies for the implementation of Value Management that have worked in other countries may be incongruent in this country and requires appropriate adjustments to suit the local culture and environments. This has further opened up a broader future scope of research for the implementation of Value Management in Malaysia with due consideration for local characteristics that had dictated the local scenes. Researchers can consider studying the effects of local cultures and environments on other behaviours of Value Management like the effectiveness and efficiencies of implementation in Malaysia.

This study also suggested that various parties involved in promoting Value Management to focus their efforts in devising pragmatic approach strategies to appeal to the targeted audience. These would include crafting clear objectives, enabling compatible cultures, developing clear and simple methodologies as well as ensuring effective dissemination of perceived benefits to induce engineers in adopting Value Management practices. It would be prudent to look into the effects to promote Value Management through established Value Management team members by manipulating

their expertise to disseminate and subsequently excite engineers to adopt Value Management in their practices.

Nonetheless, this study also indirectly indicates that there is a need to drastically uplift the project management and project delivery techniques in this country. While other countries have successfully established Value Management practices in their project management and project delivery system, Malaysia is still very much in the infancy stage of implementation. Therefore, vibrant advances will be essential to further the cause of adoption and implementation of Value Management for delivering the intended values to the general public.