CHAPTER 5 – DATA ANALYSIS

This chapter presents the findings of the survey. It begins with a description of the general characteristics of the respondents. This is followed by an analysis of the respondents towards the e-procurement system. The results of the reliability and regression tests are also discussed, followed by a test on the hypotheses developed in the previous chapter. Subsequently, the correlation test to examine the correlation between the factors and the challenges affecting the intention to implement an e-procurement system are also discussed.

5.1 Company Profiles of Respondents

In the data collection process, 300 questionnaires were distributed to companies that had registered with Ariba e-procurement system. However, only 277 questionnaires were returned. This yielded a return rate of 92.3 percent. Out of which, 22 sets of questionnaires were rejected due to incomplete answers. As a result, the final questionnaires analyzed consisted of 255 respondents, which yielded a response rate of 85 percent.

Based on the data collected, a demographic profile of the respondents was constructed. A completed profile of the respondents who participated in the survey is presented in Table 5.1. Descriptive analysis was carried out in order to understand the respondents' characteristics in number and percentage form.

The response rate of companies in the manufacturing line is 34.5 percent, service type is 38.4 percent and trading companies is 27.1 percent. In terms of company paid-up capital, 3.1 percent of the respondents are MYR2, followed by 19.6 percent paid-up capital range at more than MYR2 but equal to MYR50K, 39.2 percent more than MYR50K but equal to MYR99K and 38 percent more than MYR99K.

Table 5.1: Company Profile of the Respondents

	Frequency	**Percentage**
Type of Company		
Manufacturing	88	34.5
Service	98	38.4
Trading	69	27.1
Total	**255**	**100**
Paid-up Capital		
MYR 2	8	3.1
> MYR 2 but = MYR 50K	50	19.6
>MYR 50K but = MYR 99K	100	39.2
> MYR 99K	97	38.0
Total	**255**	**100.0**
Years of Operation		
Equal 1 year	10	3.9
> 1 year but = 5 years	73	28.6

Table 5.1: Continued		
> 5 years but = 10 years	76	29.8
> 10 years but = 20 years	25	9.8
> 20 years but = 30 years	64	25.1
> 30 years	7	2.7
Total	**255**	**100.0**
Size of Company		
2 – 10 persons	45	17.6
11 – 20 persons	45	17.6
21 – 50 persons	105	41.2
51 and above	60	23.5
Total	**255**	**100.0**
Annual Turnover		
= MYR 50K	5	2.0
> MYR 50K but = MYR150K	27	10.6
> MYR 150K but = MYR500K	67	26.3
> MYR 500K but = MYR 1m	89	34.9
> MYR 1m	67	26.3
Total	**255**	**100.0**
Quality Organization Cert.		
Yes	42	16.5

Table 5.1: Continued		
No	213	83.5
Total	**255**	**100.0**
Experience of dealing with Overseas Business Partners		
Yes	197	77.3
No	58	22.7
Total	**255**	**100.0**

From the analysis, a high proportion of the respondents companies were within the 5 years to 10 years (29.8 percent) for years of operation, followed by companies operating 1 year to 5 years (28.6 percent). The years of operation for more than 20 years to 30 years is 25.1 percent, 10 years to 20 years (9.8 percent) and equal to 1 year (3.9 percent). The years of operation more than 30 years is 2.7 percent. The remainder of the sample came from the company size group of 21 to 50 persons (41.2 percent), 51 persons and above (23.5 percent), 11 to 20 persons (17.6 percent) and 2 to 10 persons (17.6 percent). In terms of annual turnover, the largest group fall into the more than MYR500K but equal to MYR1 million forming 34.9 percent of the sample. This was followed by 26.3 percent above MYR1 million, more than MYR150K but equal to MYR500K (26.3 percent), more than MYR50K but equal to MYR150K (10.6 percent) and lastly equal to MYR50K (2.0 percent).

The respondents whose company is not certified by any quality body like ISO or TUV is 83.5 percent followed by 16.5 percent certified by a quality body. Most of the respondents have experience dealing with overseas business partners, 77.3 percent, and 22.7 percent do not have experience of dealing with overseas business partners.

5.2 Company Business Patterns

This section examines the business pattern of the respondents companies. Specifically, the following habits will be examined: the frequency the respondents companies communicate with overseas business associates, the amount of time the respondents spend during a communication, the value of each dealing and the frequency of each communication mode (see Table 5.2). In addition, it also determines the frequency of respondents dealing with business partners in six different countries (see Table 5.3), and the respondent's preference between the six countries (see Table 5.4).

Concerning the frequency of dealing with overseas business partners, the study found that the majority of the respondents (43.5 percent) deal more than 6 times per month. This was followed by respondents who deal 2 to 3 times per month (23.1 percent) and 4 to 5 times per month (21.2 percent). The remaining respondents deal with overseas business partners between 0 to 1 times per month (12.2 percent).

Table 5.2: Business Pattern

	Frequency	Percent
How often do you dealing with overseas business partners?		
0-1 time	31	12.2
2-3 times	59	23.1
4-5 times	54	21.2
more than 6 times	111	43.5
Total	255	100

How much time you spend for business dealing each time		
Less than 30 minutes	38.0	14.9
30 - 60 minutes	126.0	49.4
60 - 90 minutes	69.0	27.1
more than 90 minutes	22.0	8.6
Total	255	100
Please indicate value of the each dealing with overseas business partners		
less than RM 10,000	40	15.7
RM 10,001 - RM20,000	69	27.1
RM 20,001 - RM 50,000	61	23.9
RM 50,001 - RM 100,000	36	14.1
RM 100,001 - RM 300,000	23	9.0
more than RM 300,001	26	10.2
Total	255	100
What is the method of communication to deal with overseas business partners		
Telephone and Fax	117	45.9
Emails	127	49.8
B2B	11	4.3
Total	255	100

The study found that almost half of the respondents (49.4 percent) spent about 30 to 60 minutes during the conversation. About one fourth (27.1 percent) of the respondents indicated that they spent about 60 to 90 minutes per conversation. Another 14.9 percent of the respondents said that they spent less than 30 minutes in dealing with overseas partners. The remaining 8.6 percent of the respondents indicated that they spent more than 90 minutes in the conversation each time.

Concerning the value of each dealing with overseas business partners of the respondents examined, about 27.1 percent of the respondents indicated that dealing value is around RM10,001 to RM20,000, while for another 23.9 percent the dealing value is between RM20,001 to RM50,000 per month. Nearly 15.7 percent of the respondents mentioned that the dealing value is less than RM10,000 and 14.1 percent of the respondents indicated that their dealing value is between RM50,001 to RM100,000 each deal. Another 10.2 percent of the respondents indicated that their value was in the range of more than RM300,001, while 9 percent of the sample was in the range between RM100,001 to RM300,000 each time.

The study found that most of the respondents (49.8 percent) use networks such as email to communicate with their overseas business associates. Although 45.9 percent of the respondents use other modes such as telephone and fax as their communication tool and 4.3 percent use B2B network to communicate with

overseas partners. This finding indicates that most of the respondents have communicated with their overseas business partners through the network and telephone or fax.

In relation to the frequency of dealing with overseas business partners, Table 5.3 indicates that most companies have experience of liaising with six different countries. They usually deal with the six countries shown in Table 5.3 to fulfil their needs and wants.

Table 5.3: Frequency of dealing with overseas business partners in the six different countries

Frequency		USA	UK	EURO COUNTRIES	JAPAN	CHINA	ASEAN COUNTRIES
Always	Frequency	90	46	10	34	81	46
	Percentage	35.3	18.0	3.9	13.3	31.8	18.0
Often	Frequency	76	86	34	38	78	38
	Percentage	29.8	33.7	13.3	14.9	30.6	14.9
Occasionally	Frequency	56	83	100	62	54	95
	Percentage	22.0	32.5	39.2	24.3	21.2	37.3
Rarely	Frequency	22	33	93	101	25	58
	Percentage	8.6	12.9	36.5	39.6	9.8	22.7
Never	Frequency	11	7	18	20	17	18
	Percentage	4.3	2.7	7.1	7.8	6.7	7.1

Table 5.3 shows the frequency of dealing with overseas business partners. For dealing with the USA the majority of respondents are always and often, 35.3

percent and 29.8 percent, respectively. Followed by 22 percent occasionally, 8.6 percent rarely and 4.3 percent never. The frequency of dealing with the UK, is 18 percent always, followed by 12.9 percent rarely and 2.7 percent never dealing with business partners in the UK. The majority of the respondents' answers are often (33.7 percent) and occasionally (32.5 percent).

In terms of EURO countries, the survey found that the frequency of dealing with business partners is low. About 39.2 percent of the respondents mentioned that they only deal with EURO business partners occasionally. Another 36.5 percent of the respondents mentioned that they only do so rarely, while 7.1 percent of the respondents reported that they never deal with EURO business partners. Only 13.3 percent of the respondents indicated that they often deal with EURO business partners, and the remaining 3.9 percent always deal with their partners in EURO countries.

Table 5.3 shows that the majority of respondents rarely deal with Japan at 39.6 percent and the minority responded as never dealing with business partners in Japan at 7.8 percent. About 24.3 percent of respondents deal with Japan occasionally. Another 14.9 percent often and 13.3 percent always deal with business partners in Japan.

As for dealing with China, the majority of the respondents were found to deal with their business associates always (31.8 percent) and often (30.6 percent). Another 21.2 percent of the respondents indicated that they deal with business

partners in China occasionally and only 9.8 percent of the respondents reported that they rarely deal with China. The remaining 6.7 percent of respondents indicated that they never deal with China.

As for dealing with ASEAN business partners, the majority of respondents answered as occasionally (37.3 percent), rarely (22.7 percent) and never (7.1 percent). Those respondents who indicated that they are always or often dealing with ASEAN business partners were 18 percent and 14.9 percent, respectively.

The study also examines respondents' preference for countries based on their ranking (See Table 5.4). It was found that 64.3 percent of the respondents rank the USA as their most preferred country. This was followed by rank 2 at 19.2 percent, rank 3 at 2.0 percent, rank 4 at 4.7 percent, rank 5 at 4.3 percent and rank 6 at 5.5 percent. As for the UK, it was found that 4.3 percent of the respondents rank the UK as their most preferred country. This was followed by rank 2 at 7.8 percent, rank 3 at 19.2 percent, rank 4 at 51.4 percent, rank 5 at 5.9 percent and rank 6 at 10.2 percent.

A total of 21.2 percent of the respondents rank EURO countries as their first most preferred overseas business partners. This was followed by rank 2 at 47.5 percent, ranking 3 at 10.2 percent, rank 4 at 7.8 percent, rank 5 at 5.9 percent and rank 6 at 7.5 percent.

The majority of respondents ranked Japan at 4 (54.1 percent). This was followed by 20.8 percent at rank 3, rank 2 at 8.2 percent, rank 5 at 6.7 percent, rank 6 at 6.3 percent and the remaining, rank 1 at 3.9 percent.

Table 5.4: Countries preference ranking

Rank the countries choice according to your preference (1 as your most preferred country, 6 as your least preferred country)							
Ranking		USA	UK	EURO COUNTRIES	JAPAN	CHINA	ASEAN COUNTRIES
1	Frequency	164	11	54	10	88	12
	Percentage	64.3	4.3	21.2	3.9	34.5	4.7
2	Frequency	49	20	121	21	28	25
	Percentage	19.2	7.8	47.5	8.2	11.0	9.8
3	Frequency	5	49	26	53	59	48
	Percentage	2.0	19.2	10.2	20.8	23.1	18.8
4	Frequency	12	131	20	138	55	119
	Percentage	4.7	51.4	7.8	54.1	21.6	46.7
5	Frequency	11	18	15	17	11	24
	Percentage	4.3	7.1	5.9	6.7	4.3	9.4
6	Frequency	14	26	19	16	14	27
	Percentage	5.5	10.2	7.5	6.3	5.5	10.6

Based on the findings, respondents ranked China as their preferred country at rank 1 (34.5 percent), rank 2 at 11 percent and rank 3 at 23.1 percent. The remaining ranking is rank 4 at 21.6 percent, rank 5 at 4.3 percent and least preferred at 5.5 percent. For the ranking of preference towards ASEAN countries, 46.7 percent of respondents respond at rank 4. This result was followed by rank 3 at 18.8 percent, least preferred at 10.6 percent and rank 5 at 9.4 percent. The

remaining respondents ranked ASEAN countries at 1 and rank 2, at 4.7 percent and 9.8 percent, respectively.

The results of these findings show that the USA is the most preferred country followed by China, EURO countries, ASEAN countries, with the UK and Japan being the least preferred. The above results are based on the respondents' choice for rank 1 as their preferred country.

5.3 Reliability Test

A reliability test was conducted to ensure that the instrument measures are consistent and stable over time (Cavana et al., 2001). In other words, the reliability of the measure is without bias (error free) and, hence, ensures consistent measurement across time and across the various items in the instruments.

In this study, the reliability of the standardized scales was confirmed using Cronbach's coefficient alpha. The higher the coefficients, the better the measuring instruments. However, according to Pallant (2001), Cronbach's alpha should be at least 0.70 to be considered as acceptable. Besides the Cronbach's Alpha, it is also important to study Corrected Item-Total Correlation in order to identify the degree to which each item correlates with the total value (Pallant, 2001).

Table 5.5: Summary of Reliability Statistics

Variable	Cronbach's Alpha	No of items
Vendor Management	0.922	6
Contract Management	0.726	4
Spend Analysis	0.866	5
Features and Infrastructure	0.713	4
System Integration	0.867	4
Resistance of End User and Immaturity of System	0.820	4
Cost of Implementation	0.862	4
Success Implementation	0.802	5

In this study, all the Cronbach's alpha coefficients showed values higher than .08. By convention, a lenient cut-off of .60 is common in exploratory research; alpha should be at least .70 or higher to retain an item in an "adequate" scale; and many researchers require a cut-off of .80 for a "good scale" (Tabachnick & Fidell, 1996). In our study context, we have a good scale for further analyzing the data. Table 5.5 shows the results of the reliability test.

5.4 Test of Hypotheses

5.4.1 Relationship of Success Factors, Challenges and Implementation of E-procurement System

Correlation analysis is used to examine the relationship between two variables in a linear fashion (Pallet, 2001). This study used the Pearson product-moment correlation coefficients to measure the relationship of the success factors (vendor management, contract management, spend analysis and features, and infrastructure) and intention to implement an e-procurement system. In terms of

the strength of the relationships between the two variables, Cohen (1988) has suggested some guidelines to determine whether the relationship of the variables is small, medium or large (as per Table 5.6).

Table 5.6: Strength of Relationship between Two Variables

Value of Pearson Correlation (r)	Strength of the Relationship
r = .10 to .29 or r = -.10 to -.29	Small
r = .30 to .49 or r = -.30 to -.49	Medium
r = .50 to 1.0 or r = -.50 to -1.0	Large

The summary of the correlation and significance are indicated in Table 5.7. The results show that all the items in hypothesis 1 are supported. It is shown that various success factors have a positive impact on the implementation of an e-procurement system. The strength of the relationship among success factors and the coefficient indicates the direction of the relationship (positive or negative). The absolute value of the correlation coefficient indicates the strength, with larger absolute values indicating stronger relationships. The correlation coefficients on the main diagonal are always 1, because each variable has a perfect positive linear relationship with itself. The significance of each correlation coefficient is also displayed in the correlation table. The significance level (or p-value) is the probability of obtaining results as extreme as the one observed. Further study in our research has been extended using Pearson Correlation to evaluate the relationship of four independent variables and the dependent variable of actual action.

The vendor management (r = .568, p =.000), contract management (r = .524, p = .000), spend analysis (r= .584, p = .000) and features & infrastructure (r= .502, p = .000). Generally, all the results show that all four variables are found significant with the dependent variable.

Table 5.7: Summary of Correlation Analysis

Variables	Pearson Correlation	Sig	Strength of the relationship
Success Factors and Implementation of E-procurement System			
Vendor Management and Implementation E-procurement System	0.568**	0.000	Strong
Contract Management and Implementation E-procurement System	0.524**	0.000	Strong
Spend Analysis and Implementation E-procurement System	0.584**	0.000	Strong
Features & Infrastructures and Implementation E-procurement System	0.502**	0.000	Strong
Table 5.7: Continued			
Challenges and Implementation of E-procurement System			
System Integration and Implementation E-procurement System	0.265**	0.000	Weak
Resistance User and Implementation E-procurement System	0.420**	0.000	Medium
Cost of Implementation and Implementation E-procurement System	0.564**	0.000	Strong

** Correlation is significant at the 0.01 level (2-tailed).

The results suggest that hypothesis 2 is supported. The strength of the relationship ranges from weak to strong. More specifically, the strength of the relationships is in the following ranking, from the strong to the weak. All the

challenges of implementation measured in this study have a positive influence on implementation of e-procurement system within the respondent's organization.

More specifically, system integration (r = .265, p =.000), resistance user (r = .420 p = .000) and cost implementation cost (r= .564, p = 009), are statistically significant in affecting respondents intention towards implementing an e-procurement system. The relationship of the challenges and implementation of e-procurement range from weak to strong, with cost of implementation of e-procurement system having a strong relationship with the intention of implementing an e-procurement system, while system integration has a weak relationship with implementation of an e-procurement system.

In summary, all of the results supported the hypotheses.

Table 5.8: Summary of Results for Hypothesis

Hypothesis	**Status**
H1: Success factors have a significant impact on the implementation of e-procurement	
H1a: Vendor Management has a significant impact on implementing e- procurement system	Supported
H1b: Contract Management has a significant impact on implementing e-procurement	Supported
H1c: Spend Analysis has a significant impact on implementing e-procurement	Supported
H1d: Features and infrastructure of E-procurement has a significant impact on implementing e-procurement	Supported
Hypothesis	**Status**
H2: Challenges have a significant impact on the implementation of e-procurement	

Table 5.8: Continued	
H2a: System Integration has a significant impact on implementing e-procurement	Supported
H2b: Resistance of end user and immaturity of e-procurement-based market service has a significant impact on implementing e-procurement	Supported
H2c: Cost of implementation has a significant impact on implementing e-procurement	Supported

5.5 Multiple Regression Analysis

The multivariate analysis is a multiple regression model to test the relationship of the independent and dependent variables. According to Pallant (2001), multiple regression is able to provide the information about the model as a whole (all subscales), and the relative contribution of each of the variables that make up the model (individual subscales).

5.5.1 Success Factors that Influence Implementation E-procurement

In this study, multiple regressions are used to examine the relative importance of the success factors (vendor management, contract management, spend analysis and features) for making a prediction of implementation of e-procurement system. From Table 5.9, it can be seen that this model explains 59.0 percent of the variance of the implementation of e-procurement system. The result of the ANOVA test shows that this model reaches statistical significance (Sig = .000, $p<.0005$).

Table 5.9: Model summary for factors implementation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.590(a)	.348	.38	2.560

a. Predictors: (Constant), Features, Vendor Management, Contract Management, Spend Analysis

b. Dependent Variable: Implementation E-procurement

Table 5.10: Result for ANOVA test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	876.597	4	219.149	33.431	.000(a)
	Residual	1638.799	250	6.555		
	Total	2515.396	254			

a. Predictors: (Constant), Features, Vendor Management, Contract Management, Spend Analysis

b. Dependent Variable: Implementation E-procurement

Table 5.11 Coefficients of Success Factors and Implementation E-procurement

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta	Tolerance	VIF	B	Std. Error
1	(Constant)	9.319	1.174		7.936	.000		
	Vendor Management	.084	.140	.107	0.597	.551	.081	12.351
	Contract Management	.017	.147	.013	0.115	.909	.205	4.876
	Spend Analysis	.373	.176	.381	2.119	.035	.081	12.388

Table 5.11: Continued

Features	.156	.115	.116	1.355	.176	.355	2.814

a. Dependent Variable: Implementation E-procurement

From Table 5.11, the following equation can be expressed as:

Implementation E-procurement = 9.319 + .373 (Spend Analysis) + .156 (Features) + .084 (Vendor Management) + .017 (Contract Management)

From Table 5.11, the beta coefficients also provide a useful comparison of the relative importance of the success factors. The results reveal that "spend analysis" of the success factors ($\beta = .373$, $p<0.01$) is the most significant factor contributing to forming influence towards the implementation of an e-procurement system. The senior management requires spend analysis reports to identify addressable expenditure within the organization and forming the effective strategy to procure the items that fall in this group.

Features and infrastructure is found to be the next significant variable ($\beta = .156$, $p<0.01$) that influences the intention of respondents towards implementation of an e-procurement system in their organization. Before the implementation of an e-procurement system, companies will normally look into the system features and identify benefits of the system itself. Subsequently, companies will study their existing network infrastructure to support the new system.

5.5.2 Challenges Attributes that Influence Intention of Respondents towards Implementation of an E-procurement System

Multiple regressions are also used to examine the relative importance of the challenges attributes (system integration, resistance user and cost implementation) for making predictions on the implementation of an e-procurement system. From Table 5.12, it can be seen that this model explains 56.7 percent of the variance of the respondents' intention towards the implementation of an e-procurement system. The results of the ANOVA test are shown in Table 5.13, which explains that this model reaches statistical significance (Sig = .000, p<.0005).

Table 5.12: Model Summary for Challenges of Implementation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.567(a)	.321	.313	2.608

a. Predictors: (Constant), Cost Implementation, System Integration, Resistance User
b. Dependent Variable: Implementation E-procurement

Table 5.13 Result for ANOVA test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	808.571	3	269.524	39.635	.000(a)
	Residual	1706.825	251	6.800		
	Total	2515.396	254			

a. Predictors: (Constant), Cost Implementation, System Integration, Resistance User
b. Dependent Variable: Implementation E-procurement

Table 5.14 Coefficients of Challenges and Implementation E-procurement

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta	Tolerance	VIF	B	Std. Error
1	(Constant)	11.613	1.110		10.463	.000		
	System Integration	-.091	.090	-.075	-1.017	.310	.500	2.002
	Resistance User	.038	.116	.031	.325	.746	.302	3.315
	Cost Implementation	.691	.095	.582	7.279	.000	.423	2.364

a. Dependent Variable: Implementation E-procurement

From Table 5.14, the following equation can be expressed as

$$Implementation\ E\text{-}procurement = 11.613 + .691\ (Cost\ Implementation) + .038\ (Resistance\ User) + -.091\ (System\ Integration)$$

From Table 5.14, the beta coefficients provide a useful comparison of the relative importance of the challenges attributes. Three variables are found to contribute unique contributions to the equation. The results reveal that “cost implementation” of the challenge ($\beta = .691$, $p<0.01$) is the most significant factor contributing to forming influence towards the implementation of an e-procurement system. A company’s resources is always the main component regarding the intent to implement and procure a certain system. Also, not surprisingly, the cost of implementation has considerable impact on the implementation of an e-procurement system.

In conclusion, it was found that the cost of implementation contributes to the respondents' intention towards the implementation of an e-procurement system. Thus, it is important for the senior management to consider before the purchase and implementation of a new system for the organization.

5.6 Conclusion

Based on the results, seven variables including vendor management, contract management, spend analysis, features and infrastructure, system integration, resistance user and cost implementation were found to influence the intention of respondents towards the implementation of an e-procurement system.

The research found that more of the respondents had experience of dealing with overseas business partners from the United States of America, United Kingdom, Euro Countries, Japan, China and ASEAN countries. From the research, it can be concluded that the United State of America is the most preferred country of choice among Malaysian respondents.

Subsequently, in Chapter 6, the discussion will cover the limitations of the research, suggestions for future study, overall study implications and the overall conclusion of this study.