Chapter 4

Research Result

4.1 Respondents Profile

Distribution Of The Respondents

The sample used in this study consisted of 151 respondents from eight companies. Table 4.1a showed the distribution of the respondents in the respective companies.

Table 4.1a: Distribution of the Respondents

Company	Number	**percentage(%)**
A	15	**9.9**
B	24	**15.9**
C	25	**16.6**
D	13	**8.6**
E	11	**7.3**
F	25	**16.6**
G	20	**13.2**
H	18	**11.9**
Total	151	**100**

Demographic profile of the Respondents

The characteristics of respondents in this sample varied in respect of their age, education level and their position/ designation the company. An analysis of the respondents characteristics' is shown in Table 4.1b(i);(ii) and (iii) respectively.

(i) Demographic Profile of the Respondents(by Age)

In table 4.1b(i), the analysis showed that 2.6 % of the respondents aged more than 50 years, and 3.3% of the respondents aged less than 21 years old. Most of the respondents was which is the aged between 21 to 50 years. which were included 41.0% 21 to 30 years; 22.5% 31 to 40 years and 10.6% 41 to 50 years.

Table 4.1b(i): Demographic Profile of the Respondents(by Age)

Class	Number	**Percentage**
<21	5	**3.3**
21~30	62	**41.0**
31~40	34	**22.5**
41~50	16	**10.6**
>50	4	**2.6**
missing	30	**19.9**
total	151	**100**

(ii) Demographic Profile of the Respondents(by Education)

In table 4.1b(ii), the survey data indicated that the education level among the respondents was equally distributed. This showed that education was not a primary factor to the use of the systems. The clerical staff used IS for data entry and received orders from management level, whereas the executives used it for process monitoring the process and decision making.

Table 4.1b(ii): Demographic Profile of the Respondents(by Education)

Class	Number	**Percentage**
SRP	3	**2.0**
SPM/STPM	55	**36.4**
Certificate/ Diploma	48	**31.8**
Degree	27	**17.9**
missing	18	**11.9**
total	151	**100**

(iii) Demographic Profile of the Respondents(by Position / Designation)

In table 4.1b(iii), the analysis showed that 39.7% of the respondents were clerical/operational staff. Whereas 15.2% and 23.8% of the respondents were technical staff and executive. The respondents were widely spread from clerical staff to executive. This meant that IS was used by all level of staff in the organization. For example, transaction processing system was used by clerical staff such as keying-in the data; and the management information system on the other hand provided routine summary and exception report for the management level for decision making.

Table 4.1b(iii): Demographic Profile of the Respondents (by Position / Designation)

Class	Number	**percentage**
clerical / operational staff	60	**39.7**
technical staff	23	**15.2**
Executive	36	**23.8**
Managerial level	15	**9.9**
others	8	**5.3**
missing	9	**6.0**
total	151	**100**

User Satisfaction Response

Table 4.1c showed that out of the 151 questionnaires completed, 88.7% of the respondents indicated their age and position/designation, whereas only 86.8% indicated their education level obtained. This meant the respondents were willing to respond to the survey.

Table 4.1c: User Satisfaction(Q25) Responses Summary

	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
By Age	134	88.7%	17	11.3%	151	100%
By Education	131	86.8%	20	13.2%	151	100%
By Position/ designation	134	88.7%	17	11.3%	151	100%

Further analysis is discussed below:

(I) User Satisfaction of the System(Q25) Analysis : By age

A cross tabulation was conducted between the different age groups and user satisfaction. The result of the cross tabulation was shown in table 4.1c(i). From this table, it was observed that more than 50% of respondents indicated a neutral standing in respect of their satisfaction towards a particular information system. The results of the Chi-square test, 0.606, showed that there was no significant difference among the different age groups towards the user satisfaction at the 0.05 confidence level.

Table 4.1c(i): Satisfaction of the System(Q25): By age

Scale	0		1		2		3		4		5		Total	
Age	N	%	N	%	N	%	N	%	N	%	N	%	N	%
21	0	0	0	0	0	0	2	1.5	1	0.7	0	0	3	2.2
21 - 30	1	0.7	0	0	8	6.0	35	26.1	29	21.6	2	1.5	66	49.3
31 - 40	0	0	0	0	5	3.7	25	18.7	9	6.7	2	1.5	41	30.6
41 - 50	0	0	0	0	2	1.5	6	4.5	9	6.7	2	1.5	19	14.2
>50	0	0	0	0	0	0	1	0.7	4	3.0	0	0	5	3.7
Total	1	0.7	0	0	15	11.2	69	51.5	43	32.1	6	4.0	134	100

Chi-square Significant level: p =0.606

Note: Scale indicator
0 = missing value
1 = very dissatisfied
2 = dissatisfied
3 = neither dissatisfied nor satisfied
4 = satisfied
5 = very satisfied

(ii) User Satisfaction of the System(Q25) Analysis: By Education Level

A cross tabulation was conducted between the different education qualification groups and user satisfaction. The result of the cross tabulation was shown in table 4.1c(ii). From this table, it was observed that more than 50% of respondents indicated a neutral standing in respect of their satisfaction towards a particular information system. The results of the Chi-square test, 0.097, showed that there was no significant difference among the different education groups towards the user satisfaction at the 0.05 confidence level.

Table 4.1c(ii): Satisfaction of the System(Q25): By Education Level

	0		1		2		3		4		5		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
SRP	0	0	0	0	1	0.8	2	1.5	1	0.8	1	0.8	5	3.8
SPM/ STPM	1	0.8	0	0	3	2.3	26	19.8	17	13.0	1	0.8	48	36.6
Cert/ Diploma	0	0	0	0	6	4.6	23	17.6	16	12.2	2	1.5	47	35.9
Degree	0	0	0	0	5	3.8	17	13.0	8	6.1	1	0.8	31	23.7
Total	1	0.8	0	0	15	11.5	68	51.9	42	32.1	5	3.8	131	100

Chi-square Significant level: p =0.097

Note: Scale indicator
0 = missing value
1 = very dissatisfied
2 = dissatisfied
3 = neither dissatisfied nor satisfied
4 = satisfied
5 = very satisfied

(iii) User Satisfaction of the System(Q25) Analysis : By Position/Designation

A cross tabulation was conducted between the different position/designation groups and user satisfaction. The result of the cross tabulation was shown in table 4.1c(iii). From this table, it was observed that more than 50% of respondents indicate a neutral standing in respect of their satisfaction towards a particular information system. The results of the Chi-square test, 0.787, showed that there was no significant difference among the different position/designation groups towards the user satisfaction at the 0.05 confidence level.

Table 4.1c(iii): Satisfaction of the System(Q25): By Position/Designation

	0		1		2		3		4		5		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Clerical/ Op. Staff	1	0 7	0	0	6	4.5	30	22.4	15	11 2	3	2.2	55	41.0
Technical Staff	0	0	0	0	3	2.2	9	6.7	9	6.7	2	1.5	23	17.2
Executive	0	0	0	0	4	3.0	21	15.7	14	10.4	0	0	38	28.4
Manager	1	0	0	0	2	1.5	10	7.5	5	3.7	1	0.7	18	13.4
Total	1	0.7	0	0	15	11.2	69	51.5	42	32 1	5	3.7	131	100

Chi-square Significant level: p =0.787

Note: Scale indicator
0 = missing value
1 = very dissatisfied
2 = dissatisfied
3 = neither dissatisfied nor satisfied
4 = satisfied
5 = very satisfied

In conclusion, the respondents' user satisfaction was independent of their age, education background or position/designation.

4.2 Validity of the Result

There were a total of 26 input variables that had to be extracted. An examination of the factor loading coefficients of the VARIMAX rotated factor. VARIMAX converged in eight iterations, and a total of five factors with eigenvalue greater than unity were extracted. Eigenvalue data were shown in table 4.2a. The first successive eigenvalue was 5.4 times larger than the next, whereas the second successive eigenvalue was 1.18 times larger than the following, indicating a steep gradient after the first factor. It could also be concluded that the first factor was the most important factor in this study. The scree plot was shown in Figure 4.2a. The Plot level off after the fifth factor. This further confirmed that the study had extracted 5 factors.

Figure 4.2a: Eigenvalue for factors constructed

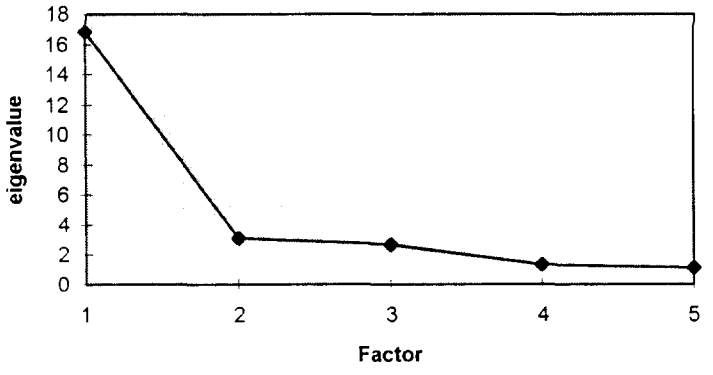

Table 4.2a illustrates shows the result of the Factor Analysis carried out. In this study. Factor 1 was loaded 13 items and accounted for 64.6% of the variance explanation. Factor 2 was loaded eight items and accounted for 12.0%, and factor 3 was loaded seven items and accounted for 10.2%. Factor 4 and 5 were contended while the Eigenvalue was not less than 1.0.

From the result, the study wasl focussed on 3 factors that affected the IS success the most, namely:

Factor 1: Information product quality

Factor 2: Knowledge and involvement

Factor 3: Output quality

Factor 1: Information and product quality

Information and system quality contributed 64.6%(Table 4.2a) of the overall perception and consisted of 13 items. This implied that the end-user considered information and system quality to be very important and that the information system must provide them. The attributes in Factor 1 were given factor loading of more than 0.8 were system breakdown, accuracy of the systems, response time, reliability of the systems, and currency of the systems. This showed that end users were more concerned with this attributes. With the quality systems provided, the user could perform tasks with no disturbance. As a result, the performance of the user could improve, which in turn would increase the person's productivity.

Factor 2: knowledge and involvement

Knowledge and involvement were considered as important factors that contributed to IS success. In this factor the three attributes which were given factor loading of more than 0.8 were feeling of participation, user involvement and effective training provided. The users needed to have adequate knowledge in handling the system provided. This meant that training played an important role to help increase the user's knowledge. In addition, involvement of the end-user in system development could also motivate the user, as this would allow them to feel that they were part of the team. Therefore, understanding how the system was developed would enable the end-user to handle the system more easily.

Table 4.2a: Results of Factor Analysis

	Factor 1 information & system quality	Factor 2 knowledge & involvement	Factor 3 output quality	Factor 4 Improve-ment	Factor 5 Docu-mentation
Q1 Availability of the system	.75439				
Q2 Timeliness of the output	.65869				
Q3 Relevant of the output	.64773				
Q4 Communications between IS staff and mana	.56016				
Q5 Accuracy of information provided by the	.92017				
Q6 Currency (up-to-date) of output information	.81877				
Q7 Prompt rectification of problem	.56833				
Q13 Response time of the system	.85355				
Q14 Low percentage of system breakdown	.95646				
Q16 Fast response from support staff to remedy	.62055				
Q21 Data security and privacy	.74539				
Q24 System development meets the objectives	.70155				
Q26 Reliability of the system	.84642				
Q4 Communications between IS staff and mana		.66100*			
Q10 Steering committee for development of system		.74652			
Q11 User involvement in development of system		.89500			
Q12 Accessibility to the system		.66219			
Q17 Effective training provided		.86931			
Q18 Confidence in systems		.72406			
Q19 Feeling of participation		.94266			
Q23 Understanding of systems		.75847			
Q2 Timeliness of the output			.56900*		
Q3 Relevant of the output			.55900*		
Q8 Ease of use of the system			.76815		
Q20 Flexibility of data and reports availability			.51211		
Q22 Completeness of output information			.96190		
Q24 System development meets the objectives			.63000*		
Q27 Systems help in carrying out daily function			.85481		
Q15 Improvement of systems required				.85001	
Q16 Fast response from support staff to remedy				.70600*	
Q9 Documentation of the system					.86345
Q20 Flexibility of data and reports availability					.52300*
Q21 Data security and privacy					.50300*
Eigenvalue	16.80	3.11	2.64	1.35	1.10
Explained Variance	64.6%	12.0%	10.2%	5.2%	4.2%

Note: *mark indicates that the attribute also categorized in the factor before.

Beside that, the addition of technological process improvements or information systems which on the surface may take away human responsibility was likely to lead to job dissatisfaction(Kiernan V.M., 1995). Organizations and management should be made aware and must be handled carefully. Motivating the employees to change can lead to user satisfaction.

This second factor showed that it was useless to develop a complicated system which could not produce a good output quality. This was because the end-users were more concern with completeness, flexibility of output, and a system that will help them in carrying out their daily tasks. This will not only reduce the users' work load, but will also improve the quality of the work and increase productivity.

Factor 3: output quality

The third factor that affected the success of an information system was the system output quality. In this factor the two attributes which was given a factor loading of more than 0.8 was completeness of the system's output and the systems that carry out the daily function. It can be concluded that the users preferred to have a more complete report that can reduce their workload. It also seemed that automation was readily required to overcome the tasks which was performed by automation systems.

From the results obtained, the success of the information system was highly dependent on the systems provided and the human interactions. John P. Chin Virginia(1988) highlighted that for many tasks, speed and accuracy were two related performance measures which would affect a person's attribute towards the systems. Besides that, the learning time and retention of acquired knowledge were also associated with how effectively a system can be used.

What motivates the use of an IS? Users' expressions of what they are revealed by their expectations and their perceptions of what they think they are getting. A user will use IS when the anticipated performance benefits such as increases in decision quality, consistency, and speed of decision making takes

place. User training is often essential to the effective use of installed systems. It should also be viewed as the time spent with customers of the information systems organization. Positive rapport can be built during training sessions if the information systems organization viewed this as an opportunity to do so. However, the commitment of most companies towards training is not strong as the training budget is usually the first to be cut when there is a need to tighten the belt.

The other factor that leads to user satisfaction was user involvement and user participation. User participation has been widely touted as a means to improve user satisfaction with systems development. People and organizations tend to reject new technology because they are reluctant to change. For this reason, it is important that the change come about as part of accompanying change in the organizational practices and culture. Through learning and training people can be confronted to information technology.

In addition, users involvement in the change can also lead to job satisfaction. This aspect relates back to the discussion of empowerment needed for example to effectively implement automated processes. In determining the extent of its involvement with performance evaluation, the IS organization must weigh the cost of the effort(additional hardware, software, labor and organizational disruption) against the potential cost of resource ineffectiveness and inefficiency.

User Satisfaction Measure's result by Companies

Table 4.2b summarizes the mean and the standard deviation of the three factors extracted from Table 4.2a. All the factors have the mean scores of more than 3 and the standard deviation spread small that was having a value of 0.33. This result implied that majority of the users' perception of the information system was slightly above average(average = 3.0). Out of three factors analyzed, factor 3 had the highest mean score(3.36), followed by factor 1(3.33) and factor 2(3.19). This showed that the users were more satisfied with information and product quality(factor 1); and output quality(factor 3) of the systems. Factor 2 which had the lowest mean score compared to factor 1 and 3 can be interpreted as that the end-users do not have adequate training and information given to them. The may be due

to the lack of interaction between the information systems' staff or management and the end-users.

Table 4.2b: Mean score & SD on user satisfaction measure

Company	Factor 1 : Information & product quality	Factor 2 : Knowledge & involvement	Factor 3 : Output Quality
A	3.33	3.19	3.52
B	2.94	2.79	2.96
C	3.55	3.61	3.63
D	2.95	2.82	3.29
E	3.46	2.93	3.35
F	3.17	3.26	3.21
G	3.36	3.32	3.08
H	3.89	3.60	3.87
Mean	3.33	3.19	3.36
SD	0.32	0.32	0.30

4.3 Reliability of the Result

Table 4.3a depicts the reliability results of the respondents. The overall reliability obtained was 0.9645 or 96.45%. This meant that the data collected was stable in terms of internal consistency. All the attributes stood equally important hence, not one item could be deleted to improve the result's reliability.

The analysis was carried out based on the value of alpha greater than 0.80 as rule-of-thumb(Crano & Brewer, 1973). These calculated coefficients indicated that the scales appeared to have high internal consistency. The analysis suggested that the factor structure of the questionnaires were stable and provided strong evidence for the construct validity of the measure.

Table 4.3a : Reliability Test Result

		Alpha if Item Deleted
Q1	Availability of the system	.9651
Q2	Timeliness of the output	.9641
Q3	Relevant of the output	.9652
Q4	Communications between IS staff and management	.9645
Q5	Accuracy of information provided by the	.9655
Q6	Currency (up-to-date) of output information	.9656
Q7	Prompt rectification of problem	.9641
Q8	Ease of use of the system	.9653
Q9	Documentation of the system	.9774
Q10	Steering committee for development of system	.9641
Q11	Users involvement in development of system	.9661
Q12	Accessibility to the system	.9649
Q13	Response time of the system	.9645
Q14	Low percentage of system breakdown	.9660
Q15	Improvement of systems required	.9669
Q16	Fast response from support staff to remedy	.9658
Q17	Effective training provided	.9650
Q18	Confidence in systems	.9655
Q19	Feeling of participation	.9662
Q20	Flexibility of data and reports available	.9643
Q21	Data security and privacy	.9648
Q22	Completeness of output information	.9670
Q23	Understanding of systems	.9656
Q24	System development meets the objectives	.9659
Q25	Satisfaction of the systems	.9645
Q26	Reliability of the system	.9662
Q27	Systems help in carrying out daily function	.9665

N of Cases = 8.0 N of Items = 27

Alpha = .9670

4.4 Effectiveness Measures

Table 4.4a compared the mean score of the single scale and composite scale measurement. The overall information systems effectiveness of the 8 companies were examined. The study also compared the mean scores of each company for the single scale(Q25): Satisfaction of the systems; and the composition success measure, that is the arithmetic mean of all 26 attributes. The multiple correlation R indicated the extent of the correlation between the single satisfaction score and the composite score. The value of coefficient, R square is 0.8415. This meant that the single scale is able to explain 84.15% of the system's success, and the balance 15.85% were affected by other factors which was not explained in the composite scale.

Table 4.4a: Effectiveness measure

Company	Composite scale	Single Scale
H	3.75	3.89
C	3.59	3.60
A	3.34	3.33
G	3.25	3.45
E	3.24	3.00
F	3.10	3.08
D	2.97	3.00
B	2.93	2.92
Mean	3.27	3.28
SD	0.29	0.34
Pearson's R :	0.8415	

Note : composite scale : means score of the 26 attributes
single scale : score for attribute in Q25

The mean score of the composite scale and single-scale obtained was 3.27 and 3.28 respectively, which was slightly higher than 3(average). The standarc deviation obtained for both scales were 0.29 and 0.34 respectively. This meant tha the dispersion of the sample was centered.

Out of the eight companies analyzed, six company had mean values more than three. This was indicated that the end-users from thus companies satisfied with the information system provided. On the other hand, two companies (B and D) hac

mean values less than three. This indicated that the end-users were dissatisfied with the information system provided in these two companies. These companies should therefore take appropriate actions to analyze and determine the causes for the dissatisfaction. Steps should be taken to overcome such problems.

Table 4.4b compared correlation between

- the single scale (Q25) : the satisfaction of the system.
- the composite scale , being arithmetic mean of attribute ratings for all 26 attributes.

It can be concluded that these two scales were very closely correlated. The single scale (Q25) had 6 attributes with the significant level of more than 0.05, whereas, the composite scale had only 3 attributes with the significant level of more than 0.05. The attributes which were not significant in the single scale were also found to be not significant in the composite scale. Both the scaleswhere the attributes were insignificant, also had lower correlation. This was shown in Figure 4.4a and Figure 4.4b, that was the different in correlation and significant level for the single scale and composite scale respectively. It was shown that the higher correlation's attributes were significant, whereas lower correlation's attributes were insignificant. This was meant the lower correlation's attribute was less related to the user satisfaction.

Even though the result showd that both the single and composite were highly correlated, the composite scale had obtained higher significant results. It can be concluded that the composite scale obtained better performance in the measurement. The reasons were that the respondents could evaluate the attributes in more detail instead of giving standard replies as in the single-scale. As mentioned before, the single scale and composite scale which obtained 84.15% correlation, did show that both the results are valid and can be used in the future research.

Table 4.4b: Correlation of the attributes

		Single Scale		Composite Scale	
		Correlation	1-tailed Sig	Correlation	1-tailed Sig
Q1	Availability of the system	.822	.006	.832	.005
Q2	Timeliness of the output	.878	.002	.927	.000
Q3	Relevant of the output	.765	.014	.823	.006
Q4	Communications between IS staff and mana	.876	.002	.887	.002
Q5	Accuracy of information provided by the	.735	.019	.785	.011
Q6	Currency (up-to-date) of output information	.683	.031	.763	.014
Q7	Prompt rectification of problem	.893	.001	.964	.000
Q8	Ease of use of the system	.684	.031	.810	.007
Q9	Documentation of the system	.290	.243	.338	.206
Q10	Steering committee for development of system	.502	.001	.918	.001
Q11	Users involvement in development of system	.833	.005	.725	.021
Q12	Accessibility to the system	.922	.001	.879	.002
Q13	Response time of the system	.794	.009	.892	.001
Q14	Low percentage of system breakdown	.563	.073	.716	.023
Q15	Improvement of systems required	.415	.154	.574	.068
Q16	Fast response from support staff to remedy	.605	.056	.753	.015
Q17	Effective training provided	.905	.001	.834	.005
Q18	Confidence in systems	.775	.012	.836	.005
Q19	Feeling of participation	.877	.002	.784	.011
Q20	Flexibility of data and reports available	.837	.005	.936	000
Q21	Data security and privacy	.848	.004	.893	.001
Q22	Completeness of output information	.401	.162	.591	062
Q23	Understanding of systems	.825	.006	.796	.009
Q24	System development meets the objectives	.767	.013	.890	.009
Q26	Reliability of the system	.562	.074	.705	025
Q27	Systems help in carrying out daily function	.502	.102	.646	042

Figure 4.4a: Comparison correlation for Single Scale and Composite scale

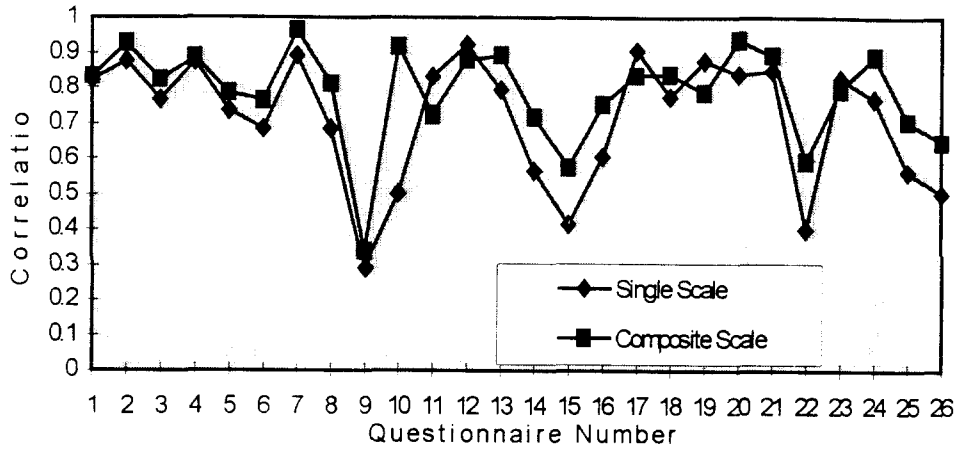

Figure 4.4b: Comparison Significant level Single Scale and Composite Scale