

DOCTOR OF BUSINESS ADMINISTRATION

Customer Relationship Management (CRM): An Exploratory Study into Service Quality Factors that relate to Loyalty in the Pest Management Service Organization

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DOCTOR OF BUSINESS ADMINISTRATION

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CONTENTS

Table of contents			iv - vii
Abstract			ix - x
Acknowledgements			xi - xii
Abbreviation			xiii- ix
1.0	**INTRODUCTION**		1
1.1	Service Industry in a Globalized of World		1
1.2	The services sector and its Contribution to the Malaysian Economy		3
1.3	An overview of the pest management industry in Malaysia		8
	1.3.1	Importance Of The Pest Management Industry	9
	1.3.2	Demand To Pest Control Services	11
1.4	Background of the Research Study		12
	1.4.1	Research Objectives	15
	1.4.2	Significance of the Study	17
	1.4.3	Value for the study for Academics	18
	1.4.4	Value for the study for Practitioners	18
2.0	**REVIEW OF THE LITERATURE**		23
2.1.0	Customer Relationship Management (CRM)		26
	2.1.1	CRM - An Overview	27
	2.1.2	Concept of CRM	28
	2.1.3	CRM - Technology	30
	2.1.4	CRM - Relationship	32
	2.1.5	CRM - Strategy	33
	2.1.6	CRM - Components	34
	2.2.0	Development and Importance of CRM	36
2.3.0	SERVICES - An Overview		37
	2.3.1	Concept of of services	38
	2.3.2	Characteristics of services	39
	2.3.3	Definitions of Service Quality	40
	2.3.4	Application of Service Quality in the Pest Control Industry	41
	2.3.5	Measuring Service Quality	42
2.4.0	Customer Satisfaction - An Overview		44
	2.4.1	Importance of Customer Satisfaction	45
	2.4.2	Customer Satisfaction Integration and CRM	45
	2.4.3	Customer Satisfaction and Service Quality	46
	2.4.4	Linkages between Customer Satisfaction, CRM, Service Quality and Customer Retention	48
2.5.0	Summary of the review of literature		50
3.0	**RESEARCH METHODOLOGY**		51
3.1.0	Research Problems		51
	3.1.1	Research Questions	55
3.2.0	Research Framework		52
	3.2.1	Development of Measurement of Service Quality for the Pest Management Services	56
	3.2.2	Justification of Measurement of Service Quality and	62

Methodology
3.2.3 Data Collection Methods and Tools 63
3.2.4 Organization of the Research Study 64
3.3 Development of the Research Instrument: Questionnaire Construction 64
3.3.1 Preparation of Research Instrument 66
3.3.2 Data Collection – Questionnaire Survey Implementation 67
3.4.0 Target population of Pest Management Service Organization 68
3.5.0 Sampling and Target Sample of Study 69
3.6.0 The Pilot Study and pre-testing of the questionnaires 70
3.6.1 Validity and Reliability 71
3.7.0 Rate of Return of Responses 75
3.8.0 Issues of Ethics in Research 75

4.0 ANALYSIS OF DATA 77
4.1.0 Revisiting the Research Problems 77
4.2.0 Coding of the Data 77
4.3.0 Statistical Analysis 77
4.4.0 Descriptive Analysis 78
4.4.1 Summary of the Demographic and Other Profiles 79
4.4.2 Gender of Respondents by Age 79
4.4.3 Types of Property under Pest Control Maintenance 79
4.4.4 Types of Pest Treatment and Services 79
4.4.5 Frequency of Pest Services 80
4.4.6 Annual Contract Value of Pest Services 81
Research Question 1 81
4.5.0 Ranking of Determinants of Service Quality 82
4.5.1 Discussion on of Service Quality Determinants 82
4.5.2 Relative Importance of the Service Quality Determinants 85
4.6.0 Inferential Statistics 86
4.6.1 Internal Consistency Reliability (Cronbach's Alpha) 86
Research Question 2 87
4.6.2 Correlation of Determinants of Service Quality 88
4.6.3 Pearson Correlation to Determine the Relationship Between Customer Loyalty and Customer Satisfaction 88
Research Question 3 91
4.6.4 Factor Analysis to Ascertain The Relationship Between CRM Components and Customer Satisfaction 92
4.6.5 Regression Analysis of CRM Components and their Contribution in Fostering Customer Relationship 97
4.6.5.1 Intercorrelation Analysis 97
4.6.5.2 Intercorrelation between Dependent and Independent Variables 97
4.6.5.3 Discussion - Customer Satisfaction and Customer Loyalty 102
4.6.5.4 Discussion - Regression and General Linear Model (GLM) 102

5.0	**CONCLUSIONS**	106
	5.1.0 Overview of Objectives and Outcome of Study	107
	5.1.1 Determinants of Service Quality Influencing Customer Satisfaction in Pest Management Service Companies	111
	5.1.2 Extent that Customer Loyalty is dependent on Customer Satisfaction and Service Quality in Pest Management Service Companies	114
	5.1.3 Determinants of Service Quality influencing the Relationship Between CRM Components and the Fostering of Customer Relationship in the Context of Pest Management Service Companies	115
	5.2.0 Implications of the Study for the Pest Management Industry	118
	5.2.1 The application of Service Quality in Malaysian Pest Control Industry	119
	5.3.0 Recommendations for Further Research	125
	5.4.0 Extending the Research	126
	5.4.1 CRM Models for the Pest Industry	126
	5.4.2 Standardization of service Quality Standards	126
	5.5.0 Limitations of the Study	126
6.0	**REFERENCES**	127
7.0	**APPENDIXES**	
1.0	A Summary of Malaysian Pest Management Industry market sector	149
1.1	Significant contribution of the pest management industry to the Malaysian services sectors	150
1.2	Demand for pest services - Projected Growth	152
2.0.	Definition of Services	154
2.1.1	Summary of the various service characteristics	155
2.1.2	Summary of Service Characteristics according to various writers	157
2.2.0	Differences between Services and Physical Goods according to Gronroos (1990)	158
2.3.0	Summary of Six Criteria of Perceived Good Service Quality according to Duggal and Siddiqi (2008)	159
2.3.1	Summary of some key operational processes which constitute a quality management system for Delivery of Services by pest management organizations	160
2.4.0	Instruments for Measuring Service Quality – SERVQUAL	161
2.5.0	The Distinction between Customer Satisfaction and Service Quality	163
3.0.0	Factors that Affect Customer Satisfaction	164
3.1.0	Gap Model of Service Quality	165
3.2.0	Research Tools	166
3.3.0	Development of the Research Instrument: Questionnaire Construction	170
3.4.0	Description of the Ten (10) SQ Determinants	171

3.5.0	Research Framework Mapping to CRM Components and Linkage to SQ Dimensions to be Measured.	172
3.6.1	Research Questionnaires Mapping to CRM components and linkage to Service Quality determinants	173
3.6.2	Mapping between the Questionnaires and the Modified SERVQUAL Model for each SQ determinants and literature sources	174
3.7.0	Organization of the research instrument where questionnaire was formulated in two sections, namely, Section 1 and Section 2.	179
3.8.1	The choice to two companies - Company A (Pest Dynamics (M) Sdn Bhd) and company B (Fog Master Sdn Bhd)**.**	180
3.8.2	Sampling Size and details - The choice to two companies - Company A (Pest Dynamics (M) Sdn Bhd) and company B **(**Fog Master Sdn Bhd)**.**	181
3.8.3	Recruitment letter - Correspondence (including organizational permission)	182
3.8.4	Appendix 3.8.4 Correspondence (organizational permission)	183
3.8.5	Correspondence (organizational permission)	184
3.8.6	Participant Information Sheet for questionnaire survey	185
3.8.7	Request To Receive Summary Of Research Report	187
3.8.8	Follow-up Letter in English to remind participant for questionnaire Survey	188
3.9.1	Procedures and steps were taken to ensure the validity and reliability of the research study	189
3.9.2	Procedure adopted on the mailing of questionnaires	190
4.0.	Coding of Data for questionnaire responses	191
4.1	Statistical Analysis	192
4.2	Descriptive Statistics and Details Analysis	193
4.3	Descriptive Statistics for Response of Questions (N=130) and Mean Score by Rank	200
5.0	CRM components - Independent variables for Factor Analysis	202
6.0	Cross tabulation - Type of property under pest control maintenance * Annual service contract value and purchases	204
7.0	Table Correlations of Service Determinants (Bivirate Correlation)	205
8.0	Factor Analysis Extraction. (Total Variance Explained Independent variables for CRM Components)	206
9.0	Factor Analysis Extraction. Total Variance Explained Service Quality Determinants)	207

TABLES

1.0	Estimates of Household Insecticide sales (2004-2008) in RM Millions	10
2.0	A Matrix Comparing the Various Components of CRM as defined by Researchers	35
4.5	Overall Total Customer Satisfaction Score	81
4.6	Descriptive Statistics (Hierarchy Ranking for SQ Determinants)	82
4.7	Results of the Alpha Cronbach Test on 45 Items on the Questionnaires.	86
4.8.1	Correlations - Spearman's Rho for the Top Three Service Determinants	88
4.8.2	Correlations Analysis of Service Contract with Company - Total Customer Satisfaction (SD)	89
4.8.3	Model Summary[b]	90
4.8.4	ANOVA[b]	90
4.8.5	Coefficients[a]	90
4.9.0	KMO and Bartlett's Test	92
4.9.1	Results of Factor Analysis for Independent variables for CRM Components	93
4.9.2	KMO and Bartlett's Test	95
4.9.3	Results of Factor Analysis for Dependent Variables for Service Quality Determinants	96
4.9.4	Correlations Matrix: TCS, PP, PR, TC, CF, TCS-10, TCS, TCS-45	100
4.9.5	General Linear Model: TCS-45 versus	103
4.9.6	Regression equation - TCS45 = -69.2 + 1.12PR + 2.93TC + 1.14CF	104

CHARTS

1.1	Malaysia GDP and Annual Growth Rates (2008 – 2010 Q1).	4
1.2	The Gross Domestic Product (GDP) contribution of Business Services and various Sub-Segment Share contribution to GNI in 2009.	5
1.3	Gross Domestic Product by Industry Origin, 2006-2010 (% Growth).	6

FIGURES

2.0.0	Strategic Use of CRM	36
3.1.0	The Research Framework developed from research problems (constructed by Researcher)	53
4.5.0	Individual Annual Service Contract and Length of Contract with Company	74
4.6.0	Total Customer Satisfaction Computation	81
4.7.0	Rank order of Determinants of Service Quality	83
4.8.1	Scree plot for the eigenvalues of factors for Independent variables	94
4.8.2	Scree plot for the eigenvalues of factors for Dependent variables	97
4.8.3	Pareto Chart of the CRM Factor – PP, PR, TC and CF	98
4.8.4	The Summary for TCS 45 (after Modifications)	99
4.8.5	The Matrix plot for PP, PR, CF, TC and TCS-45	101
4.8.6	Summary of the Residual Plots for TCS-45	102

Abstract

This research for a doctoral study was undertaken to ascertain the attributes of Service Quality which can influence the level of customer satisfaction and the relationship of the four CRM components - People (PR), Process (PP), Customer Information (CF) and Technology (TC). The relationship of the Service Quality determinants and the linkages of the four CRM components and their influence on total customer satisfaction were investigated.

The analysis showed the following rank in order of importance of the attributes of Service Quality - *Reliability, Competence, Responsive, Credibility, Access, Communication, Understanding, Security, Courtesy* and *Tangible.* These determinants were considered to be very significant in their contribution to high-quality pest services. This finding supports the substantial research on the importance of services, customer relationship management and the integration of the Service Quality attributes related to customer satisfaction in the context of CRM.

Prevailing perception suggest that an improvement in Service Quality attributes will result in a higher level of customer satisfaction. Consequently, improved customer satisfaction is likely to increase the probability of customer retention. Customer loyalty determined by the length of the period of customer's contracts with the pest management organization, is probably influenced by the level of customer satisfaction.

For the purpose of data collection, the target population and sample consisted of two pest management organizations and 550 corporate clients and 150 household individuals. A summary questionnaire was mailed to the respondents and the rate of return was 15%. SPSS and Minitab was used to analyse the data to respond to the research questions.

One of the findings indicated that the correlation between the length of the service contract and customer satisfaction was not statistically significant. This result seems to imply that the length of contract may depend on other factors such as homogeneity of the pest industry, customer's mind set, low pricing and even volatile market environment.

Also the findings suggested that CRM factors can help to identify the Service Quality attributes and key drivers leading to customer retention. The strong performance of the four components is critical to ensure that total customer satisfaction and impact on customer retention. The contribution of Technology (TC) to Total Customer Satisfaction (TCS) is significant among the four components in CRM and contributed to the CRM linkages. It was anticipated that the results derived from this study will enable the management of pest management organizations to determine which areas they should focus their efforts on continually to increase the customer satisfaction levels to achieve customer retention and continued profitability of the pest control business.

Finally, this study mapped out the relationship between the various Service Quality attributes and their performances to enable the organization to optimize resource allocation and prudent usage of resources for maximum profitability. This strategy to improve customer retention was seen as increasing customer satisfaction, prompting pest management organizations to deliver a service experience that was tailored to customer's needs. The novelty of the research lies in the establishment of a business model that linked Service Quality attribute performance to customer satisfaction which, in turn led to customer retention. It was noted that the findings of this study presented the pest management organization with a competitive strategy to consider and implement where appropriate.

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Abbreviation	Definition
ACSI	American Consumer Satisfaction Index
ANOVA	Analysis Of Variance, popularly known as the *ANOVA*, is a statistical test that can be used in cases where there are more than two groups.
APAL	Assistant Pesticide Applicator License
CEPA	Confederation of European Pest Control Associations
CF	Customer Information - component in the CRM research framework
CLV	Customer Lifetime Values
CRM	Customer Relationship Management
CR	Customer Retentiion
CSI	Customer Satisfaction Indices
DBA	Doctor of Business Administration
DIY	Do-It-Yourself"
ECA	Eastern Europe and Central Asian
ECSI	European Customer Satisfaction Index
EU	European Union
(E and P)	Expectations and Perceptions
ETP	Economic Transformation Programme (ETP) - The Unit Within The Prime Minister's Department
FDI	Foreign Direct Investment
FMS	Fog Master Sdn Bhd
GDP	Gross Domestic Product
GMP	Goods Manufacturing Practices
GNI	Gross National Income
GSI	Growth Strategies International
HACCP	Hazard Analysis and Critical Control Point
ICT	Information and Communications Technology
IMP3	Third Industrial Master Plan
IPM	Integrated Pest Management
JMM	Journal of Marketing Management
MANOVA	Multivariate Analysis Of Variance
MCSI	Malaysian Customer Satisfaction Index
MSI	Marketing Science Institute
NPMA	National Pest Management Association
OSHA	Occupational Health And Safety Act, 1989
PAL	Pesticide Applicator License
PCO	Pest Control Operator License
PDM	Pest Dynamics (M) Sdn Bhd
PP	People component in the CRM research framework
PEMANDU	The Performance Management And Implementation Unit
PPE	Personal Protective Equipment
PR	Process component in the CRM research framework
RATER	Reliability, Assurance, Tangibles, Empathy and Responsiveness
RQ	Research Questions

SERVPERF	The SERVPERF model evaluates service quality by perceptions only, without expectations and without importance weights
SERVQUAL	The most eminent instrument in attempting to systematize the service quality is "The gap *model*" of service developed by Parshuraman et al (1985).
SIRIM	The leading organisation in industrial research and development (R&D), fulfilling the industry needs by blending new innovations with quality and standards in Malaysia
SMEs	Small And Medium-Sized
SPSS	SPSS is a software package used for statistical analysis.
SPC	Satisfaction-Loyalty-Profit-Chain
SQ	Service Quality
TC	Technology component in the CRM research framework
TCS	Total Customer Satisfaction
UNISA	University Of South Australia
Q1	First Quarter
4Q	Fourth Quarter
WOM	Word Of Mouth

CHAPTER 1.0 Introduction

Success in delivering quality services and to achieve customer retention does not only depend on marketing or sale efforts but also on other factors related to service delivery, product acceptance and after sales support. In this increasingly competitive world, customers are in a position to demand increasing levels of Service Quality (SQ) and to survive in the highly competitive market; companies need to provide quality services so as to retain their customers. Companies should rather than simply react to their demands and expectations, should consider proactive ways to deliver SQ and seek to continuously improve levels of customer satisfaction.

1.1.0 Service Industry in a Globalized World

Given the intense business competition and the rapid growth in the service industry, the key to sustainable competitive advantage lies in delivering high quality services that will in turn result in satisfied customers (Shemwell, Yavas and Bilgin, 1998). The concept of building customer relationships and delivering quality service to encourage customer loyalty is of particular importance in the service sector where it is often argued that cost of acquiring new customers are significantly higher than retaining existing customers. Therefore, improving SQ is of paramount importance and recent developments in the services sector have increasingly focused attention on the beneficial effects of managing customer relationship.

In the past two decades, organizations have placed greater emphasis to retain their customers rather than to create a new set of clientele. Customer retention costs less and at the same time current customers can create more clientele for the organization by word of mouth in their marketing place due to positive SQ experiences. Even in situations of service failures, it was reported that an improvement in the quality of services delivered can maintain the actual users and attract further customers (Eboli and Mazzulla, 2007). As a component of the service industry, SQ has become a very important issue in marketing due to the fact that with increased competition SQ can be the differentiating factor of any industry. Therefore, by offering high levels of SQ, business organizations are known to have benefited in terms of higher returns on investment and increased in profits which ultimately manifested in the form of

increased market share. The quest to enhance their competitive edge and search for profits has compelled organizations to provide excellent SQ.

SQ is a requirement in today's competitive business, beginning from the organization's initial contact personnel to the service technician or delivery staff, marketing or sales and administration personnel and even the managing director, each of them plays a vital role in serving their customers. Accenture (2008), reported its research findings on global CRM practice found that customer churn resulting from poor services remained prevalent across industries. The study reiterated that consumers are empowered with more knowledge and choices than ever - driving a seismic shift in the balance of power to the consumer and adding to the complexities of multi-national corporations. The findings also indicated that increases in customer service expectations continue to outpace efforts made by companies to improve services in the first place.

SQ was proposed as the most potent tool for enhanced business performance (Corbett et al. 1998), builds loyalty and fends off competition for valued customers and is now regarded by many service organizations as one key means to achieve competitive advantage (Hart, Schlesinger and Maher, 1992; Zeithaml, Parasuraman and Berry, 1990). According to Landrum, Zhan and Peak (2009), as the importance and size of the service sector of the global economy grows, the study of services is becoming an increasingly important research topic. Recognizing the importance of the services sector to the country's economy, accelerated with the onslaught of global liberation and the emergence of internet technologies, the consumer's demand for services has become even more challenging and diversified (Korner and Zimmermann, 2000).

In explaining that the service sector as the fastest growing sector of the economy, Shugan (1994) has identified the advancement in technology to be the main reason for this development. The first is the need for specialization created by increasing complexity in business. This created a demand for specialists to provide services to multiple customers. The second reason is the consequence of business globalization due to the surge in internet usage. It can be observed that innovations and technological advances in information technology have led to an increase in activities such as data processing and manipulation and utilization of information in the service sectors.

1.2 .0 The Services Sector and Its Contribution to the Malaysian Economy

Heineke and Davis (2006) reported that by 2000, the service sector grew significantly in virtually every developed country, with the United States taking the lead as services accounted for almost 80% of gainful employment. This rapid growth was caused by several factors, including changing population lifestyles, deregulation, globalization and improved infrastructure and the widespread availability of new technologies. It is envisaged that organizations earned a large portion of their revenues from providing quality services as a result of the rapid growth in size of the service sector of the global economy. As services are distributed regionally and nationally, these services played a very important role in customer satisfaction (Landrum, Prybutok, Zhang and Peak, 2009).

Spohrer and Maglio (2008) reported that services are increasingly becoming a larger portion of the revenue of many a business organization. Furthermore, findings by Danciu (2007) showed that services contributed an average of more than 60% of the Gross National Product (GNP) of developed nations. It is interesting to note that even in the least of the developed countries; services typically contributed at least 45% of GDP (Czinkota, 2004).

The service industry is an important component of Malaysia's economy and assumes an increasing share of GDP as the economy matures, as is evident in the case of developed countries. As reported by SIRIM (2010), it contributed 55% to the country's GDP in 2008 and continues to grow as the economy's top GDP driver despite the setbacks caused by the global economic crisis. In 2009, the services sector contributed 57% of GDP and 60% of total employment. The services sector accounted for 57.1% of total GDP in 2010.

Chart 1.1 shows the Malaysian economy experiencing gradual growth of GDP from 2008 to 2010 (Q1) due to strong domestic demand, export growth and high rate of investment activities within the country. However due to the global economic down turn in 2009, Malaysia experienced a negative GDP growth rate of 3.5%, which was expected to become positive in 2010.

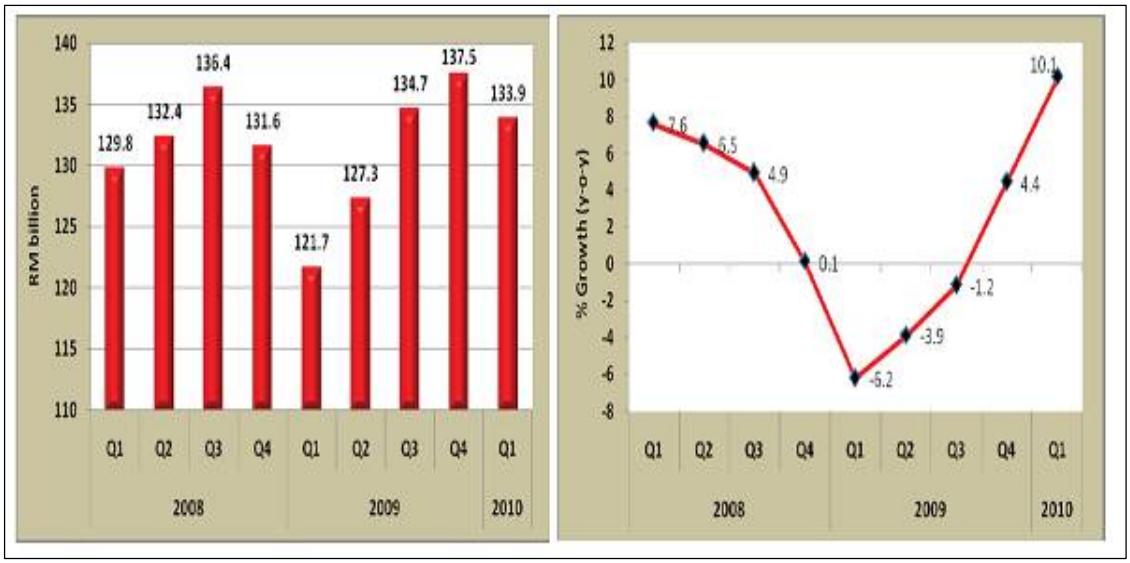


Chart 1.1 Malaysia GDP and Annual Growth Rates (2008 – 2010 Q1)
Source: Department of Statistics, Malaysia (2010)
Note: Growth rate refers to change from the same quarter of the previous year.

Overall, the Services sector was on a steady recovery as indicated by the growth path from 2009. However, momentum of growth was clear when the Malaysian economy grew by 4.6% in 1st Quarter 2011 as domestic demand overcame the modest recovery in advanced economies according to Bank Negara report which release these data in the first quarter. For the 2011, Bank Negara projected 5.5% economic growth for Malaysia. The service sector grew by 5.9% where trade surplus widened to RM 36.1 billion in the Q1 2011 against RM 25.5 billion in the 4Q 2010.

Undertaking a policy research study for the World Bank, Fernandes (2007) has stated that an efficient services sector has direct consequences for economic growth in transient economies highlighting Eastern Europe and Central Asian (ECA) countries. The importance of the services sector for GDP and employment has substantially increased since the beginning of their economic transition and it accounts presently for more than half of the economic activity in those countries. It was also noted that the significance of such high-quality services is closely linked to SQ and could also influence the attractiveness of a location for Foreign Direct Investment (FDI).

The economic momentum for Malaysia in 2010 showed the growth rebounded to 7.2% as compared to negative 1.7% in 2009. As the largest contributor to the economy, the Services sector strengthened further by 6.2% in the fourth quarter of 2010 as compared

to 5.4% in the last quarter. In year 2010, the Services sector accelerated to 6.8% as compared to 2.6% in year 2009. PEMANDU (2010), a unit under the Prime Minister's Department with the main role and objective to oversee implementation and assess progress of the Economic Transformation Programme (ETP) reported that the business services sector in Malaysia contributed RM19.5 billion to Gross National Income (GNI) in 2009. The sector is growing quickly as shown in Chart 1.2, between 2000 and 2010, the GDP contribution of business services grew by 7.9% a year, making it the second fastest growing sector of our economy.

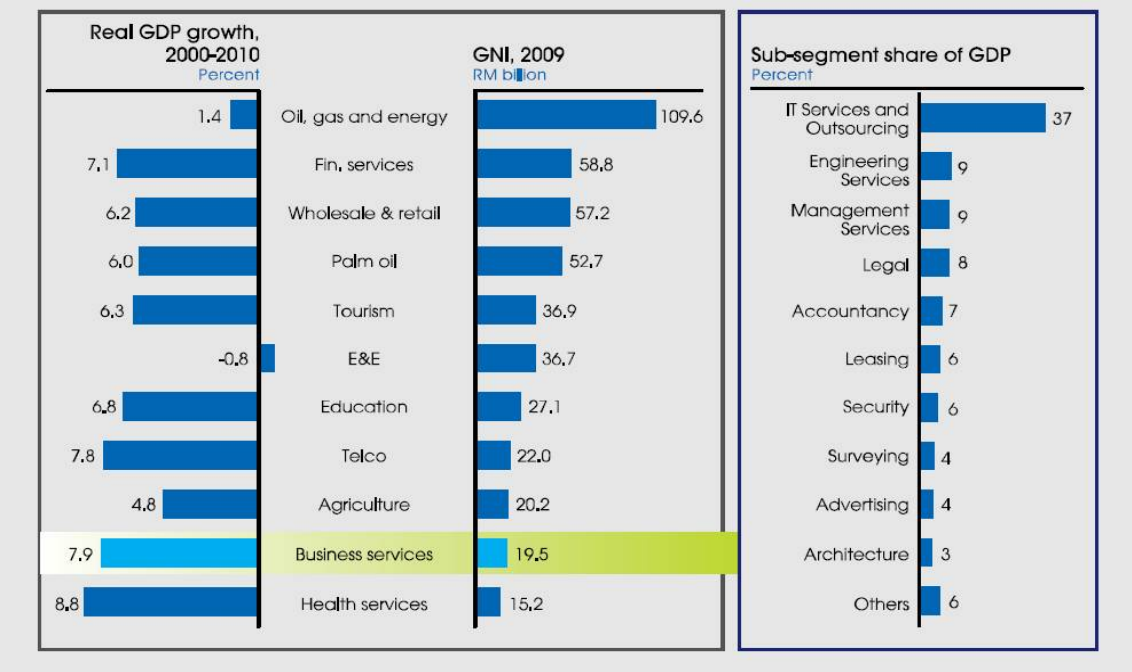


Chart 1.2 The Gross Domestic Product (GDP) contribution of Business Services and various Sub-Segment Share contribution to GNI in 2009
Source: PEMANDU (2010), The Economic Transformation Programme-A roadmap for Malaysia

According to Mahmood (2007), the Commercial Services sector in Malaysia is expected to contribute 59.7% of the GDP by 2020. Chart 1.3 showed the contribution to the GDP of Malaysia by industry origin, 2006-2010. The services sector, a major source of growth, was expected to sustain its development at 7.9% per annum. Robust growth in the services sector was contributed by finance (Islamic finance in particular), insurance, real estate and business services subsector which grew by 10.8% per annum. Another major contributor to the expansion of the service sector was the wholesale and retail trade. While the accommodation and restaurant subsector grew by 9.5% per annum due to the rapid expansion in tourism and tourism-related sectors.

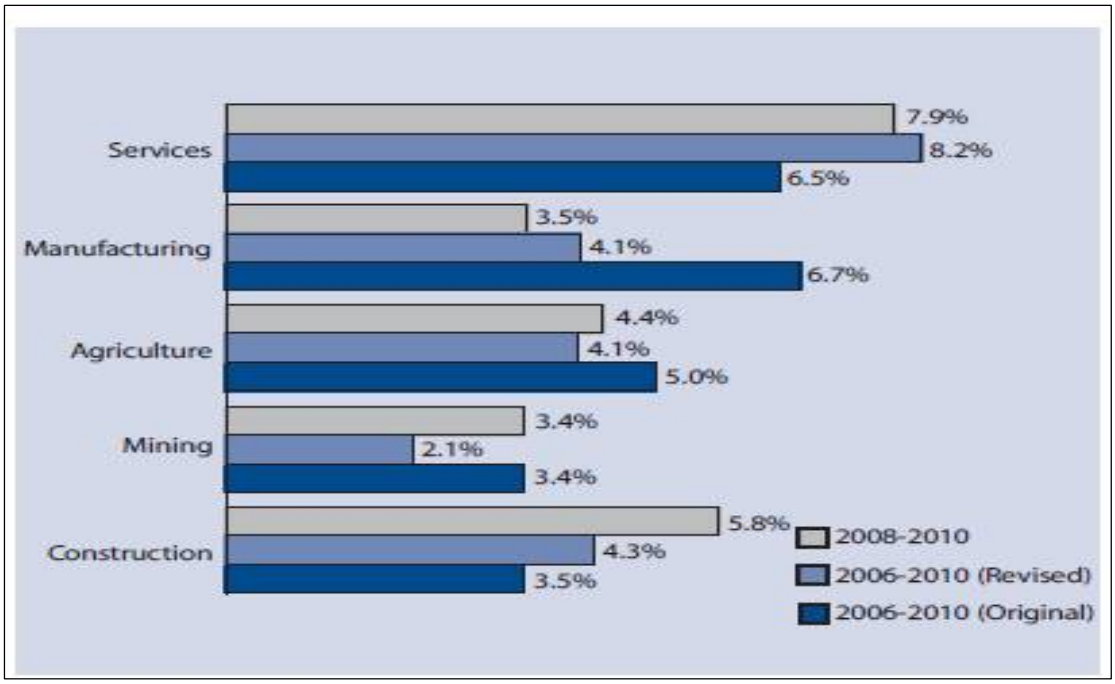


Chart 1.3 Gross Domestic Product by Industry Origin, 2006-2010 (% Growth)
Source: Mid Term review of the Ninth Malaysia Plan 2006-2010, p. 19

According to Quah (2009), it became clear that the growing weight of the services sector in the Malaysian economy meant that it became strategically important to build a stronger and more dynamic one. This was increasingly highlighted in the country's various development plans and was expected to play a greater role in broadening the economic base of the country. Complementing the growth and development in the manufacturing sector, the Government intensified its efforts to promote and develop the services sector to tap the full potential in the services sector and to raise its contribution to 60% of the GDP, as targeted in the Third Industrial Master Plan (Al-Amin, Mazharul and Siwar, 2007).

It was noted that by the end of the IMP3 period, the services sector's contribution towards GDP was targeted to increase by 8.4 percentage points to 66.5%, while that of the manufacturing sector to decrease by 2.9 percentage points to 28.5%. One of the key pillars of the IMP3 was to transform the services sector by promoting the adoption of information and communications technology (ICT) as the foundation for higher productivity growth across all sectors of the economy which was very much needed for the economy to achieve the desired high-income country status.

One thing, which is certain, is that in the globalization process and the global liberalization of services, Malaysian services sector will have to adapt to a more open market environment. The Budget speech by the Malaysian Prime Minister on the subject of liberalization of the service sector on 22 April 2009, reported that "*The liberalization initiatives will not adversely affect the domestic services industry and the government will continue to support the industry in capacity building and in the opening up of export markets.*" The liberalisation of the services sector was pursued with the view of creating a conducive business environment and these efforts are expected to enhance the level of competitiveness of the services sector in the country.

It was expected that with the gradual liberalization measures, this will inject some elements of competition and prepare local service providers to consider the importance of service quality. To meet the challenges posed by the global liberalization process, the Malaysian government has developed various strategies to enhance the competitiveness of the Malaysian services sector which needed to have a level playing field when competing with its foreign counterparts. It was necessary to consider domestic reforms in various services sectors where increased competition is likely to surface in the years ahead.

While it was acknowledged that making the various structural adjustments necessary to realize its goal of creating a service-oriented economy will undoubtedly be a painful process, it is, ultimately, necessary. Against this backdrop, Mahmood (2007) argued that for Malaysia to move towards global competitiveness, several factors were identified to play a crucial role. There is a need to change the mindset of the Malaysian population towards the concept of global competitiveness and to emphasize quality and ensure the quantum of human capital to meet these challenges.

Bearing in mind the argument of Mahmood (2007), it seemed appropriate to select a service industry in Malaysia and trace generally the development in the light of globalization and liberalization of markets. Given the increasing demand for competitive international standards of delivery and service levels due to the increase in standards of living in the country, there is a need to identify the impediments to SQ levels by domestic consumers.

The industry now identified is that of pest management, a service much required given the tropical climate of Malaysia and high humidity which affected both mankind and insects. Specifically, an attempt was made on the study of the pest management industry from the perspective of SQ and impact on CRM. This study concentrated on determinants of SQ, which can become an increasing differentiator between competing businesses (Parasuraman, Zeithaml and Berry, 1988).

1.3.0 An Overview of the Pest Management Industry in Malaysia

The pest management industry is expanding rapidly; much of future potential of the industry can be attributed to a strong housing market and improving economy. This industry requires the pest management organizations to be licensed by the government (under the Hydrogen Cyanide (Fumigation) Act 1953 and Pest Control Rules 2004 in order to provide fumigation or domestic or commercial pest control services for the control of nuisance insect pests, birds, mosquitoes, rodents, termites and weed control.

The growth of the pest management industry can be traced to the development of the society and the socio-culture changes that accompanied it. With the urbanization of the Klang valley, liberalization of services by the government and the development of internet technology, pest control services will be faced with significant challenges in the area of customer service and service delivery, both nationally and internationally. The change in demographics coupled with high customer expectations is making domestic pest management organizations rethink their customer service strategies.

Observations suggested that the market services for pest control are highly fragmented, with a sizable number of pest control service providers active in this sector. There seemed to be a need to explore opportunities for a greater amalgamation of pest control services and to identify key factors that drive the pest control service market. The following sectors were considered potential customers of the pest management industry – managers of facilities and hospitality industry like hotels, resorts, condominiums, restaurants, supermarkets, warehouses and hospitals, and town councils. It was envisaged that various types of pest control solution that needs to be provided to satisfy the customers. A summary of Malaysian pest management industry market sector was outlined in Appendix 1.0.

However, the adoption of quality standards such as ISO 9000:2000, Food Safety Standards, Goods Manufacturing Practices (GMP) and other international certified requirements such as Hazard Analysis and Critical Control Point (HACCP) demonstrated the rapid growth in the pest management service sectors.

1.3.1 Importance of the Pest Management Industry

Several surveys have been conducted between 1983 and 2001 among homeowners and the pest management industry in Malaysia but these surveys related mainly to the status of household pests and insecticide usage. The most common pests we encountered in Malaysia are cockroaches, ants, rodents and termites. Mosquitoes are also familiar pests in this tropical country. The first survey (Yap and Foo, 1984), revealed that mosquitoes were the most important group of household pests, followed by cockroaches and ants. Subsequently, it was noted that a similar finding was obtained during another survey in 1995 when 814 houses were investigated. Another survey conducted in April 1998 (Yap et al. 1999), found that cockroaches have risen in status to become the most important household pest, ahead of mosquitoes and ants.

According to Lee (2007), there was wider range of improved household insecticide products available against mosquitoes in comparison to other household insect pests in Malaysia. Despite the wide range of more than 200 household insecticide products for mosquito management in Malaysia, those for cockroaches and ant management were rather limited, about 19 products in total. Of that number, less than a handful of cockroach and ant baits were available for over-the-counter sales. Lee (2007) reported that in Malaysia, the consumer's spending on household pesticides grew from an estimated RM100 million in 1986 to RM175 million in 1997 – 1998. A further growth was noted of pesticides sales to a staggering RM 228 million in 2000 – 2001 (Yap, 1999), representing an increase of 30% in sales between 1998 and 2001.

However, the trend as shown in Table 1.0 noted a slight decrease to RM 204 million in the period between 2004 and 2008 compared to RM 228 million in the period between 1998 and 2001. An interesting fact observed was the actual growth of 20% increase in sales for pesticide liquid. These liquid sales indicated the growth of the urban pest management services as the usage of liquid indicated the providence of pest services.

Table 1.0: Estimates of Household Insecticide sales (2004-2008) in RM Millions

Household Insecticide	**2004**	**2005**	**2006**	**2007**	**2008**	**Growth %**
Aerosols	94	95	104	106	105	-0.9
Coils	70	67	70	72	71	-1.4
Mats	24	16	15	15	16	+6.7
Others* (liquid etc.)	-	10	10	10	12	+20
Total (RM Millions)	188	188	199	204	204	
(*These figures include other household insecticides like liquids, baits etc.)						

Source: Malaysia CropLife & Public Health Association, Annual Report 2008/2009 and Membership Directory

As shown by the survey conducted by Lee (2007) on the industry, termite treatment was regarded to be the most important and accounted for 50% of the estimated business turnover of the industry, followed by cockroach treatment (20%) and common ants' treatment (12%). The balance of 18% was attributed to other vector pests or incidental pest treatment such as houseflies, mosquitoes, and bed bugs which were considered as minor economic importance in the pest management industry.

Global Industry studies (IBISWorld Industry Reports, 2010) showed that the increasing common infestation of pests will continue to harm businesses and consumers, to the benefit of industry operators. It was envisaged that as environmental and health concerns increases, more people are expected to hire professionals, rather than attempt to do pest control treatment themselves. The growth in the population will also generate new demand for pest control services. In the United States, the pest control industry over the last four years, experienced growth figures that showed economic dynamism with annual growth of service revenue of 5.6%, with total revenues topping out at US$ 6.5 billion. According to the Confederation of European Pest Control Associations (CEPA) which represented the interests of 7,000 companies with an estimated turnover of € 1.600 million; the industry experienced greater pressure from consumers and regulation from the government across to the European continent.

In Malaysia, the trend is changing where an increasing number of homeowners are turning to professional pest control providers to solve their household pest problems. They realized that pests are no longer merely a nuisance but are potential health threats

and its ensuing medical costs are sufficient to motivate any homeowner to seek professional pest services. The industry is no longer considered small and it has provided employment for over 15,000 people in about 450 pest management companies. Thus, the Malaysian government has focused on improving regulatory practices with the implementation of the Pest Control Rules (2004), Pesticide Act 1974, OSHA Act 1989, and HCN (fumigation) Act 1958. These legislations made it mandatory for companies providing pest control services to register themselves and obtain the necessary licenses to operate the business.

However, this regulatory measure has not been very successful in weeding out unsafe pest control practices and unscrupulous pest control operators. Under this condition, leaving the matter in the hands of the market alone may not result in a desired situation and can in fact give rise to more complex problems for the industry in the future. The attention given by the government in regulating the industry indicated the importance in ensuring that the industry provides quality services to the consumers. The significant importance of the pest management industry to the Malaysian services sectors is detailed Appendix 1.1

1.3.2 Demand for Pest Control Services

Globalization and increased connectivity though the internet coupled with the integration in the economic, social, technological, cultural, political and ecological spheres have created special challenges for the pest management industry in meeting customer's needs while remaining economically competitive. To understand why the Malaysia pest services market has grown in the past, and what implications this might have for the future, it is important that, rather than looking at trends in pest volumes, several factors that fuelled the demand for the services were discussed and these factors are presented in greater depth in Appendix 1.2.

Against the backdrop of increased consumer's environmental awareness seeking safe treatment of pesticides for pest problems, the increasing population growth coupled with changing demographics and the trend in urban migration to seek employment opportunities has contributed to the demand for pest control services. It also recognizes that the positive economic outlook (GDP) at about 6 % for the past few years has

resulted in a higher gross monthly household income. Such strong growth contributed to increased business and standard of living in Malaysia which has improved in recent years with the per capita income in current price and also in purchasing power. And with the higher disposable household income, it is not wrong to suggest that the demand for such pest services will continue to increase. Housing sales and residential construction were also expected to rise, increasing demand for services therefore, the rise in the total number of premises needing pest control services. Added to this, key customer segments, such hospitality and food retail and manufacturers are large-scale food production facilities whereby can be magnets for many types of pests that require mandatory pest control services with the implementation of food safety certification and HACCP standards by the Malaysian government. The above factors seemed to indicate the robust growth of the pest control market.

1.4 Background of the Research Study

The rapid increase in the number of pest control companies and the demand for pest services in urban areas coupled with intense competition has resulted in unhealthy price-cutting measures for survival. The situation has forced the pest management companies to consider the delivery of high quality services as one of the key to competitive advantage, which, in turn, will result in satisfied customers and their retention.

Motivation for this research is driven by two current trends. The first is delivery of high SQ for the pest control industry and second is the rapidly transforming Information Communication Technology (ICT) environment. According to Mohammed and Rashid (2012), with the growing popularity of CRM, it is becoming one of the hottest academic and practical topics in the business field. However, there is limited research that reveals the relationship between CRM dimensions and pest management service delivery performance.

CRM has in recent years evolved and emerged into a technology that has enabled business management to leverage customer information in nurturing and strengthening profitable relationships. Their development was based on the assumption that the ability in capturing of customer information in digital databases that led to

epistemologically superior insights about the customer. Zahay and Griffin (2004) further added that organizations that can collect data about customers with the objective to get a clear image about them from different perspectives will be able to establish long term relationship. Therefore this study is an attempt to provide a value conceptual model that explains the theoretical linkages existing between CRM dimensions and service quality

According to Kasim (2009), CRM has been increasingly adopted because of its benefits of greater customer satisfaction and loyalty, which in turn, led to enhanced financial and competitive performance. This research seeks to examine the linkages and relationship of the various service determinants and to determine whether their performance is responsible for SQ. It will at the same time consider the role of technology and whether the performance of service delivery and data on customer information available plays a mediating role in the CRM linkages to achieve CR in the Malaysian pest management industry.

The industry is facing an increasingly competitive market which signifies the greater need for service organizations to differentiate their customers. Data collected will enable service organizations to integrate a significant amount of their customer information. CRM is viewed as an opportunity to use this information about their customer to improve the relationship for achieving customer loyalty and improving customer satisfaction and consequently increasing profitability.

The objective is to identify various SQ determinants that influence customer satisfaction and to explore the contribution of customer satisfaction and SQ in relation to customer loyalty. From this level, the research will determine which key SQ determinants are and their association with CRM components that fostered customer relationship in the pest management industry.

Currently, efforts to improve customer service have been concentrated on technology and there is an increased focus on ICT to provide applications and infrastructure in support of customer relationships (Reinartz, Krafft, and Hoyer, 2004). Researchers have suggested that by amassing detailed information on customer interaction data, CRM technology can help organizations to be aware of SQ and devise methods for

improving the efficiency of customer interactions to deliver value to the business organization and to the customer (Nakata and Zhu, 2006). Similarly, Zhiltsov (2006) argued that during the past few decades, SQ has become a major area of attention owing to its strong impact on business performance, lower costs, customer satisfaction, customer loyalty and profitability. The pressures of competition have forced business organizations to look not only on business processes and service delivery but also at the way they are delivered and performed to meet customer expectations.

Secondly, the growing importance of market orientation in the services sector in general, and relationship marketing in particular are effective organizational business strategies relevant for the pest management industry for cultivating customer retention. This constituted a natural extension for research from the perspective of SQ and the role of technology in the pest control industry.

With the introduction of the certified Pest Applicator License (PAL) and the Certified Pest Control Operator License (PCO) in the Malaysian pest control industry the average services and a lack of knowledge in pest management is no longer acceptable to customers. This has been observed by Duggal and Siddiqi (2008) who noted that the competitive advantage rests with organizations that follow standards successfully through a documented quality system and provide customer value through the most efficient use of technology and people. With such expectations, the industry, as with all service-related businesses, needs to focus on quality of service.

According to Fryatt (2006), future changes in customer service in the pest management industry will be driven by changing consumer attitudes, perceptions and expectations, which was suggested as dimensions of service quality. There is need to investigate and understand the service delivery problems from the pest service company's perspective to reach an understanding of the SQ to be delivered. The industry is labor intensive and the shortage of labour added greater pressure to the industry to provide excellent service quality. Frequent staff turnover resulted in service inconsistency. Research effort is needed to concentrate on determinants of SQ which can become increasingly a differentiator between competing businesses (Parasuraman, Zeithaml and Berry, 1988). In the pest control industry, it can be the main differentiator.

Currently, the Malaysian pest management industry is characterized by intense competition especially when the industry is faced with new entrants that offer cheaper pest control services. With technological advances and new pest-treatment systems, non-chemical or safer substitutes are presently available in the industry. Economic and environmental factors have combined to shift emphasis away from merely relying on the conventional method of applying new chemical pesticides. However, an approach towards more efficient method of applying existing chemical pesticides is needed and the development of alternative techniques like biological control seemed necessary. Ideally and increasingly, the combination of all available methods into an effective Integrated Pest Management Program (IPM) may hold the key to development within the industry future to enhance SQ in pest treatment. With such development, IPM as according to Gips (1990) is a pest management system that, in the context of the associated environment and the population dynamics of the pest species, utilizes all suitable techniques and the emphasis on the judicious use of insecticides and must be viewed as the last option for control within a management program as compared to the first option in the pest treatment.

1.4.1 Research Objective

The main objective of this study is to first find out perceived SQ using the modified SERVQUAL as the underlying theoretical framework and then the role of these perceived service determinants as a mediating variable to achieve customer retention.

(a) **Impact of CRM components on customer retention in the pest management industry.** In this regard, the perceptions of the customers regarding the impact of CRM on SQ will be investigated and research be carried out to evaluate the impact of CRM components on customer retention in the pest management industry.

(b) **To identify the SQ determinants that are responsible for customer retention**. In addition, the purpose of linking CRM concept is to identify the SQ determinants that are responsible for customer retention. As the existing literature on the SQ in relation to CRM within the context of the pest management industry is limited, it is appropriate that this research be undertaken. Accordingly, Kasim and Minai (2009) highlighted the limited

literature on CRM studies in relation to the hotel industry in Malaysia since little is known about the use of CRM strategy and customer performance measures and their relation with performance.

(c) **To identify linkages of CRM components that is responsible for competitive performance though more effective use of its resources.** Mohammed and Rashid (2012) argued that it is an accepted fact that the concept of CRM neither has been fully verified, nor empirically assessed to determine the strength of the relationship between dimensions of CRM and hotel industry performance in Malaysia. In response, this study also raise the awareness among practitioners in the service industry and assisted them in improving performance though more effective use of its resources and competitiveness. It is not advisable to rely totally on competitive pricing to secure businesses in the pest service industry, given a homogenous market. Instead, business organizations may need to distinguish themselves on the basis of SQ and not rely solely on price alone. The findings of this study indicated that since the pest services offered can be easily duplicated by competitors, it is envisaged that efficient utilization and allocation of resources will help the pest management companies to remain competitive. In order to improve performance and competitiveness – the relationship between the CRM components that determines Service Quality needed to be explored.

This study also aimed at investigating the overall SQ from the pest service company's perspective to reach an understanding of the SQ to be delivered and identifies those service dimensions that bring customer satisfaction. This will enable the Pest Management Industry to identify the most effective ways of closing the service gaps and choose which gaps to focus on. The findings will contribute to both marketing knowledge and best practices. In greater detail, it also investigated what the key moderators are in the relationship between the CRM components and their performance linkage that fostered customer relationship through Service Quality.

This research for a doctoral study was undertaken to ascertain the attributes of Service Quality which can influence the level of customer satisfaction and the relationship of the four CRM components - People (PR), Process (PP), Customer Information (CF) and Technology (TC). The relationship of the Service Quality determinants and the

linkages of the four CRM components and their influence on total customer satisfaction were investigated.

In the context of the pest management industry, the objective is to understand that Customer Relationship Management (CRM) has been increasingly adopted in Malaysia because of its benefits of greater customer satisfaction and loyalty,

The outcome of this study provided an understanding about the factors associated to service quality perceived by customers and how service quality is not only measured but also provided a means of improving service quality in order to bring about customer retention, which in turn, led to enhanced financial and competitive performance (Kasim and Minai, 2009). CRM is expected to drive business performance through the profitability improvements such as efficient businesses, greater customer satisfaction, customer loyalty and retention.

1.4.2 Significance of the Study

Fryatt (2006) stated that customer service is the cornerstone of the pest management industry approach worldwide. It is important that research emphasis was given to this industry as service companies have to deliver customer services to a wide range of targets namely, residential homes, commercial premises and public service environment. In considering the external influences on customer service, we cannot afford to overlook the increasing dealings with an informed customer who has accessibility via the internet and its search for information

This research and documented knowledge gained on the subject of CRM and SQ can be of use to researchers, managers and business practitioners in providing a direction on how to investigate and or to modify the existing SQ concepts in the pest management industry. The results of this study would help the pest management organizations to identify the strength and weakness of SQ and to implement an effective strategy to meet customers' expectations. In light of these considerations and current trends within the service industry, this research will provide key players in the pest management industry some useful insights in enhancing their competitiveness towards improving the overall service sector in Malaysia

1.4.3 Value of the Study for Academics

The key factor in CRM is the building and maintenance of long-term customer relationships. The relationship is supported (but not driven) by cutting edge Internet Technology and the relationship delivers value to customers and profits to companies, which, in this age of globalization and fierce competition, is an area of research worthy to consider. This research provided an interesting contribution to the service industry with the exploration of the linkage between CRM and contemporary marketing services theory. Existing literature implied a relationship between SQ and customer retention, but there is less published empirical research in this area to link SQ and CRM to customer loyalty. The primary contribution of this research is to understand the factors related to customer retention and to determine whether the adoption of CRM technology actually led to better customer relationships and improved service delivery performance.

1.4.4 Value of the Study for Malaysian Pest Management Industry.

This study sought to obtain a better understanding to which the extent SQ permeates within the Malaysian pest management industry by investigating on customer's perceptions of SQ and applying the components of CRM to explore the integration of the various services determinants to determine customer satisfaction with the service delivery provided.

One of the main problems faced by the Malaysian pest management industry is the labour factor and which is highly dependent on human manpower in the service delivery. As stated, the industry is highly dependent on human manpower in the service delivery according to a study carried out by Lee, (2014) as the contributory factors and challenges that hinders growth of pest control business in Malaysia. While pest management organizations today face a competitive marketplace, they would need to note that the *manpower shortage in the industry* is equally an important challenge. Steps must be taken to address this demand for manpower and as stated is highly dependent on human manpower in the service delivery. It is vital to note here that manpower shortage has been identified as a factor that can hinder the growth of the industry

It is however difficult to immediately solve this manpower issue with the certification and licenses regulation. Also as the service provided is intangible in nature and also because it dealt with expectations and perceptions of consumers which is also difficult as well to determine due to the complexity of human behavior (Chingang and Lukong, 2010), manpower becomes a limitation for the Malaysian PCO companies to expand rapidly. It is however difficult according to previous studies to measure service quality because of its intangible nature and also because it deals with expectations and perceptions of consumers which is difficult as well to determine due to the complexity of human behavior.

According to Douglas and Connor, (2003) the intangible elements of a service (inseparability, heterogeneity and perishability) are the critical determinants influencing service quality as perceived by a consumer. This means that a service provided must be well defined by the service provider in terms of its characteristics in order to understand how SQ are perceived by consumers. In this regard, the performance of the service delivery output or the process may greatly differs in various service industries and such differences in service industries are based on the characteristics of service which include; intangibility, heterogeneity, perishability and inseparability. This implied the difficulty for consumer to understand the nature of what they receive and in the pest management sector it is very difficult to evaluate intangibility because their services are centered on the performance.

Secondly, it is also difficult to evaluate heterogeneity that the variability or difference at the level of delivery of service due the difference in human behavior of those offering services. According to Beamish and Ashford (2007), this is the reason for the difficulty in determining the SQ.

However, the perishability characteristics features of a service is not consumed that cannot be used again and since services are produced and consumed at the same time implying that they cannot be stored for later usage. These aspects of service made it very difficult to measure service unlike those physical products; their quality is measured objectively using factors such as durability and number defects because of its tangible nature (Gronroos, 1982).

The SERVQUAL model was modified and adapted with ten dimensions of SQ and these dimensions mainly focused on the human aspects of service delivery. According to study carried out by Ladhari, (2009), it was recommended that the SERVQUAL model as a good scale to use when measuring service quality in various specific industries but that it is appropriate to choose the most important dimensions of this model to fit to that particular service being measured in order to assure reliable and valid results. Shahin (2005) considered the use of SERVQUAL model because it took into account customer's expectation of a service as well as the perceptions of the service which best measure SQ in services sector.

There is a gap in the literature on service delivery in the pest control industry with the impact of CRM. The research addresses this gap through analyzing the service determinants and components. For the industry, increasing the service delivery will ensure the industry gained a more professional image and standing in the market. This is the research gap and in order to fill the gap, the study attempted to measure the SQ and customer satisfaction in the pest management industry using modified SERQUAL model from the consumer's perspective in order to know their perceptions.

The integration of CRM and SQ in the Malaysian pest management industry has not been fully investigated. From the viewpoint of practitioners, the proposed research dissertation is " interdisciplinary " in nature, in that it sought to integrate customer relationship and marketing literature by looking at service performance and customer retention. The potential of CRM is yet to be realized and hence the need for further research.

Furthermore, the research is important in order for pest management organizations to provide high quality services in order to meet or exceed clients' expectations. To achieve this, there is a need to ascertain the gap which existed between the SQ expected by clients to that of provided by the pest management service organizations. This will help pest management organizations to identify and measure the services that they would be provided to customers. Based on the results of this study, pest management organizations and managers may be able to determine better where to concentrate their efforts and scarce resources when it comes to the formulation of organization strategy.

As stated the study addresses key relationships between service dimensions, service performance and service quality within the context of the Malaysian pest management industry. Although previous research has been carried out to address similar issues in other sectors such as hotel, tourism, telecommunication, public services sectors, banking and financial industry, relatively few studies pertained directly to Malaysian pest management industry.

In the recent study conducted by Khalid, Haslina and Huda (2010), in investigating the perception of the CRM systems in the private hospitals revealed that there is a lack of adoption of CRM systems in the private sector hospitals and there is a substantial lack of understanding of the benefits of CRM systems in hospitals in Malaysia.

As a result, it became clearer that there is limited understanding of the CRM concept and low perception of the benefits associated with the implementation of CRM systems. In this regard, there is main responsibility on the management of these hospitals regarding the learning and seeking for new technologies such CRM systems that could contribute to enhancing the quality of services, increasing customers' satisfaction and loyalty, and boosting revenues and profits.

Nastaran (2013) highlighted that there is a lack of research on the benefits of CRM for customers in the Malaysian context. In addition, there has been limited study of the influence of these benefits on customer satisfaction. Mohammed and Rashid, (2012) stressed that it is an accepted fact that the concept of customer relationship management neither has been fully verified, nor empirically assessed to determine the strength of the relationship between dimensions of customer-relationship management.

This study attempted to assess the CRM dimension and the 4 components relationship to achieve customer retention in the pest management industry performance. The study will add and to a lesser extent explain the theoretical possibilities of their mediating role in the relationship between CRM dimensions and the pest management industry performance.

In term of practical implication, a suitable business model for the pest management industry can be derived to provide important implications for business practitioners. The research findings of this study on the effect of CRM technology adoption on customers' outcomes may provide additional insights for CRM applications and business strategies for service organizations as a whole in Malaysia. It will enable business owners, managers, decision makers and other researchers to identify its best practices in the service sector.

Chapter 2.0 REVIEW OF THE LITERATURE

In the development of the literature review, the customer service issues and insights into the theory relating to the SQ concepts of customer satisfaction and CRM will be discussed. Bitner (2001) has suggested that effective customer service emphasizes key aspects of service expectations, informed behavior expectations, aligning service standards with guarantees, timely responses, and accurate information and services provided before, during and after the sale. This is particularly true for non-tangible service products and therefore it is important for business organizations to have a strong understanding of what it distinguishes that makes for exceptional service.

In order to establish the theoretical foundations of this research, it is important to look at the relationship between CRM, SQ and CS. For the purpose of this doctoral research, review of literature from the major streams of CRM and marketing services domain were undertaken. The review of the literature will focus on CRM and link it to services quality approach. – focusing on the development, evolution and progress of CRM. However, the intent of this review of the literature is to select studies that looked at CRM and its related service quality, customer loyalty and the identification of key drivers of customer satisfaction and retention.

According to Zairi (2000), the importance of customers has a definitive role as customers are the purpose of what we do and rather than them depending on us. We are very much dependent on them. A simple definition of a customer is this - a person or organization who purchases products or services from a marketer who believes that they will benefit from the goods and services offered by the marketer's organization. Knowing the customer will enable us to study customer satisfaction and measure SQ so that the organization will serve them better in order to increase retention and loyalty. This is the main theme of CRM. CRM is one of the basis for achieving increased efficiency and leveraging a competitive advantage with the use of technology to gain insights into the behavior of customers and to better manage effective relationships.

In the study on global quality standards and pest management service, Duggal and Siddiqi (2008) have considered the service as a transactional process as quite different from that of manufacturing. Accordingly, there is no "product" per se, and usually an

“entity” (service) flows through the process which involved activities where work is processed, transacted or completed. This entity may change shape, form, and also travel across several departments, processes and even replicate itself.

The study also indicated that the first challenge a pest management organizations faces is transactional processes that tended to grow in complexity and diversity as the size of an organization grows. Complexity also occurred when multidimensional services or choice of pest control tools and techniques to control one pest species differed from one client to another. When the pest management service company grows it will begin to face external customer’s processes such as quality standards, standard operating procedures, protocols and quality audit processes.

Another observation made by Duggal and Siddiqi (2008), is that of pest management organizations tended to organize work functionally rather than from an end-to-end process perspective, thus compounding the task of process streamlining. As such, it is difficult to see a transactional process from one end to the other end. Functional hierarchies make it even more complicated and challenging for the process improvement team. This is due to the distances to be covered between customers and poor standard or failed service delivery leading to dissatisfaction of both the customer and the employee, the latter having to resolve the service deficit. Under such circumstances, treatment towards a customer will be consistent across all contact and service channels.

Rapid changes are taking place in the pest management environment - there is a growing diversity caused by changing demographic composition of the Malaysian population where consumers are more knowledgeable due to being more technology savvy, becoming more value conscious, have wider choices of service, sensitive to price and the intolerance to low service levels. The marketplace is characterized by intense competition, fragmentation, and increasing difficulties to differentiate. These changes have driven the marketplace to become more relationship-based and customer-centric.

Researchers have also attributed that CRM has become one of the most controversial issues and many businesses have focused on this subject as a tool to improve

profitability (Balaram and Adhikari, 2010; Becker et al. 2009; Dimitriadis and Steven, 2008). However, Rababah, Mohd, and Ibrahim (2011) described that the understanding of the meaning of CRM as still incomplete and on growing. CRM has been described as a business philosophy (Ryals and Knox, 2001) or understood as business strategy (Croteau and Li, 2003) and even defined as a business process (Srivastava, et.al., 1999) and as an enabling technology for organizations to foster closer relationships with their customers (Hsieh, 2009).

However according to Mohammed, Rashid and Tahir, (2014), prior studies indicated that the relationship between CRM technology and organization performance is equivocal. The ambiguous and different interpretations that resulted in mixed results may be due to a lack of understanding of the various components and mechanisms that linked CRM technology and organization performance.

Dowling (2002) has described CRM as mainly based on the belief that establishing a sustainable relationship with customers is the cornerstone for retaining loyal customers which are much more profitable. Alomtairi (2009) stated that the adoption of CRM strategy will be of great benefit to business organizations as they can reap tremendous benefit of increasing sales through market segmentation, customizing products and services, obtaining higher quality products, gaining access to customer information and in this regard, ensuring customer-retention and loyalty. Verma and Chandhuri, (2009), expressed similar views that successful implementation of CRM strategy enhances customer loyalty and business profitability.

Several researchers referred to the importance of carrying out studies on CRM and this indicated that researchers have selectively focused on specific service sectors, such as telecommunication (Almotairi, 2009; Beldi et al. 2010), call centre or contact centre (Abdullatif et al. 2010), banking (Akroush et al. 2011; Becker, Greve and Albers 2009; Hussain et al. 2009; Krasnikov et al. 2009;) and healthcare (Bunthuwun et al. 2011). Mohammed and Rashid (2012), argued that due to the competitive environment and growing popularity, CRM is crucial and has become a niche for firm performance.

Mohammed and Rashid, (2012) argued that it is a proven fact that the multi-dimensions concept of CRM can be considered relatively new, because of the only few

studies, which are made on the CRM dimensions of some service sectors such as banking (Akroush et al. 2011; Sadek et al. 2011; Yim, Anderson, and Swaminathan, 2005) and contact centers (Abdullateef et al. 2010), thus the range of information on this concept is quite limited.

Akroush et al. (2011) revealed that research into the multi-dimensions concept of CRM in Malaysia can be considered relatively new with only a few studies which are made on the CRM dimensions of some service sectors. Moreover, current researches have revealed that service firms, like hotels, require a better understanding of customer orientation and performance (Sin et al. 2005). As such CRM is becoming one of the hottest academic topics but there is limited research that revealed the relationship between CRM dimensions and pest management service delivery performance. Consequently, it is clear that there is a marked lack of research on CRM concept in the pest control industry in Malaysia.

Although CRM is considered to be a business philosophy, it is closely related to relationship marketing. An extensive review of the literature suggested that it is the link with technology and marketing of services. Based on this perception, it is worthy to note that marketing researchers have begun to investigate and understand the linkage between CRM technology, relationship marketing and business relationships as providing opportunities for sustainable competitive advantage. There has been a significant increase in CRM related research over the last few years (Ngai, 2005; Kamakura et al. 2005).

2.1.0 Customer Relationship Management (CRM)

Most of the CRM definitions converge on two common aspects – relationship and information technology. Against this background, it will be appropriate to conceptualize CRM as the information technology face of the business process that aims to establish enduring mutually beneficial relationships with customers in order to drive CR, value and profitability up (Agrawal, 2009, p. 151). Agrawal's concept of CRM accordingly underlined the role of ICT in providing the information on customers such as their shopping behavior, purchasing patterns and usage habits of the company's services or products, enabling the company to determine the value of a customer.

Lun, Jinlin, and Yingying (2008), defined CRM from a balanced perspective that "CRM is the philosophy, policy and coordinating strategy mediated by a set of information technologies, which focused on creating two way communications with customers so that firms will have an intimate knowledge of their needs, wants, and buying patterns". The essence of CRM can be regarded as a strategic tool that required a fine coordination between people, process and technology to achieve CR. Rababah, Mohd, and Ibrahim (2010), provided one of the most recent and holistic definitions of CRM and suggested that "CRM is the building of a customer-oriented culture by which a strategy is created for acquiring, enhancing the profitability and retaining customers, that is enabled by IT applications; for achieving mutual benefits for both the organization and the customers".

Rababah, Mohd, and Ibrahim (2010), further adds that for increasing the understanding of the notion of CRM, there is a need for an extensive and critical investigation for the different components and elements of CRM consisting of three components - people, processes, and technology.

2.1.1 CRM - An overview

Due to the nature of the highly aggressive market competition in Malaysian Pest Management sector, it is critical that the industry should new strategy like CRM technology to assist its employees in providing services to serve customers better and improve organization performance. In the environment of extensive competition and rapid technological development, CRM has the potential for achieving success and growth for organizations (Rababah, Mohd, and Ibrahim, 2011). Organizations have to develop new strategies beyond traditional marketing techniques that focus on retaining current customers and building relationships with them (Kotler and Armstrong, 1999). This is because the cost to attract a new customer is as much as six times the cost to keep a current one (Rosenberg and Crepiel, 1984) and the loss of a customer may mean losing more than a single sale.

Many companies are developing CR and loyalty programme (Kotler and Armstrong, 1999) and transforming their approach to customer management by shifting their focus from customer acquisition to CR (Payne, 2006). Kudyba and Romesh (2002) have

suggested that through this knowledge discovery which included obtaining information on services or products, contact channels and competitors, business organizations can identify further the market opportunities available as well as suitable strategies to be developed.

2.1.2 Concept of CRM.

According to Ngai (2005), CRM is experiencing exploding growth as an attractive area for research to find new ways to manage growth and sustain competitive advantage in an increasingly competitive market. CRM strategy when properly implemented can be shown to improve profitability. Customer Satisfaction can be important for maintaining long-term relationships as it can have a significant impact on the intention to re-purchase and willingness to recommend. CRM has become widely recognized as an important business approach, but there is no universally accepted definition of it (Ngai, 2005).

Various researchers seemed to denote that CRM is the philosophy, policy and coordinating strategy connecting different players within an organization for their efforts to create an overall valuable series of experiences, products and services for the customer (Swift, 2001; Dyer, Liebrenz-Himes and Shamma, 2006; Kincaid, 2003; Fox and Stead, 2001; Parvatiyar and Sheth, 2001; Sin, Tse and Yim, 2005; Anderson and Mittal, 2000 and Payne, 2006).

CRM can be considered a management tool that integrates people, processes and technology under one corporate objective - that of satisfying the customer's desires so that the customer will continue to have a productive involvement with the organization (Rababah, Mohd, and Ibrahim, 2011). Under such circumstances, it is appropriate to accept the definition for CRM as a concept to be considered in order to approach the subject matter with a common understanding. The definition of CRM by Parvatiyar and Sheth, (2001, p. 5) seemed appropriate and it is the strategic use of information, process, technology and people to better manage the customer's relationship with a company (marketing, sales, services and support) across the whole customer life cycle.

Fjermestad and Romano (2003), has expressed a similar viewpoint with Kindcaid (2003) and considered CRM to be a marketing tool while integrating technology, software, people and business processes with the aim of minimizing costs in business organizations. Fjermestad and Romano (2003) suggested that successful CRM required attracting and keeping economically valuable customers while repelling and eliminating economically invaluable ones. Richard (2008) stated that CRM provided improved business opportunity and this is mainly due to two related factors, specifically, customer's focus and relationship management that have become fundamental marketing and business philosophies for many companies seeking a competitive advantage.

Peel (2002) defined CRM as about understanding the nature of the exchange between customer and businesses, and managing it appropriately. The challenge is to optimize communications between parties to ensure profitable long-term relationships. CRM is a key focus for many organizations now as a shift away from customer acquisition towards customer-retention.

Against this background, Abdullateef et al. (2010), concluded that customer orientation is a crucial factor in the successful implementation of CRM. Wang et al. (2010), considered that customer - orientation as one of the most important dimensions of CRM as the main purpose behind customer–oriented behavior is to increase customer long-lasting satisfaction and to create customer-loyalty.

It is appropriate to consider the commonly cited definition of CRM obtained from the CRM (UK) Ltd (2002) which provided the following definition: CRM is the establishment, development, maintenance and optimization of long-term mutually valuable relationships between consumers and organizations. The key focus to the above definition is in a long-term mutually valuable relationship.

The concept of CRM has emerged in response to decreasing customer loyalty and increasing competition. It was originated in the United States in the late 1990s, and, to date, has been accepted in a significant number of companies worldwide. The lack of understanding of CRM led to its failure and to the misconception that CRM is just a technology.

However, technology is simply the enabler of CRM applications. Interestingly, some have claimed that CRM as a business strategy while others imply that CRM is a philosophy, business approach, process or methodology. In spite of the extensive literature relating to CRM, paradoxes existed, there seemed to be no consensus and the contention is that there is still much debate over exactly what constituted CRM.

Zineldin (2000) referred to this lack of clarity in the literature regarding the meaning of relationship marketing and that CRM was only a new paradigm when based on technological advances. A similar viewpoint was expressed by Bull (2003) in that CRM is a highly fragmented environment and has come to mean different things to different people. The relative lack of empirical studies in CRM has been noted by several researchers (Bull, 2003; Gummesson, 2004; Reinartz et al. 2004; Richard, 2008; Stefanou et al. 2003).

2.1.3 CRM - Technology

In recent times, the specific advantages of the Internet Technology as a transaction and communication channel presented new opportunities for businesses to create a long-term relationship with their customers (Gurau, 2003). Information technology was seen as the integral component of CRM but in some situations, it was considered a strategy used to learn more about customers' needs and behaviors for creating CR and, ultimately, establishing and maintaining a long lasting relationship with customers (Hanson, 2000; Peppers, 1999; Azani and Khorramshahgol, 2005). Consistent with this thinking, Kasim and Minai (2009) argued that hotels can use information technology to improve their performance as it possesses enough information regarding the customer and their various needs and it can utilize this important resource to manage customer relationship. It is clear that CRM is defined as the tools and methodologies that aid businesses in the management of customer relationships in an efficient and organized way. It can be ascertained that technology is merely an enabler in the overall process.

CRM technology has the potential to expand at a phenomenal rate (Zablah, Bellenger and Johnston, 2004). Narang et al. (2011), has provided an overview of CRM as a computerized system for identifying, targeting, acquiring, and retaining the best mix of

customers. In this regard, CRM helped in profiling prospects, understanding their needs, and in building relationships with them by providing the most suitable products and enhanced customer service. In order to achieve this, it integrated back and front office systems to create a database of customer contacts, purchases, and technical support and these databases helped the business organization in presenting a unified front to its customers, and to improve the quality of the relationship, while enabling customers to manage some information on their own (Narang et al. 2011).

Karimi, (2001) reported that organizations can greatly improve relationships with customers by employing information technology which can facilitate and enhance customer relationships in various ways but mainly enabled companies to attain customization to develop technology-based services that can provide the same high level of service that customers expect. What was needed was a systematic approach to obtain and analyze the information so as to understand what the customer wants. This approach is likely to result in a customer loyalty and retention (Álvarez, Martín and Casielles, 2007; Rust and Chung, 2006). In addition to this, providing high quality customers' service, technological capabilities alone are not adequate (Dyche, 2001).

In addition, the rapid growth of the Internet have greatly increased the opportunities for marketing and has transformed the way relationships with customers are managed (Bauer et al. 2002). Even so, with the emergence of the rapid advances in technology, CRM has undeniably become a powerful tool in transforming not only the dynamics of social and business interactions but also the marketing perspectives (Luck and Lancaster, 2003).

Several factors have contributed to the rapid development and evolution of CRM. The growing importance of CRM in the services sector can be attributed to four main factors according to Kumar and Reinartz (2006) and these included:

(a) **Consumer –** the changes with respect to consumer diversity against the backdrop of globalization where customer expectations are changing with a high degree of personalization. This diversity was triggered by a changing world demographic as observed in all industrialized nations which in turn change customer needs and wants and serve as a good indicator of the future marketplace.
(b) **Marketplaces –** the changes is seen to focus on goods rather than services and has led to a mass-market, product-focused marketing strategy in which business

organization tend to sell the same products and services possible. Due to globalization, the marketplace experiences intense competition, more fragmented and differentiation is becoming more difficult.

(c) With **technology and mobile gadgets**, customers are empowered in their choice whom to choose and how to communicate with the companies across various available channels. The absence of the intermediary process is changing the nature of marketing and making relationship marketing more popular. The introduction of **sophisticated computer and telecommunication technologies** that allow organizations to directly interact with end-customers such as the insurance industry, airline and travelling sector, banking and financial services, hospitality industry and healthcare services. Hence, the traditional "intermediary" factors such as agents or dealers will gradually cease to provide these services.

(d) Similarly, **emerging digital and Computer technology** available for the building of marketing databases and direct marketing tools have provided the means for marketing approaches to be revolutionized. Businesses no longer need the marketing functions formerly performed by intermediaries. This approach has emphasized the direct integration with customers across all possible contact points.

The intention of CRM to build and maintain long-term customer relationships which delivered value to customers and added profits to companies was enabled and supported (but not driven) by the cutting edge information technology. This is the core of CRM. However, the technologies are relatively unimportant in themselves. Rather, the issue is one of what processes to integrate and the overall level of integration that is required for a successful CRM programme.

2.1.4 CRM - Relationship

The main purpose of relationship marketing is CR and loyalty (Bitner, 1995; Kotler and Armstrong, 2004). The increasing popularity of relationship marketing can be explained by an assumption that building and maintaining relationships with customers' led to long-term CR and profitability for the organization (Schneider, White and Paul, 1998). Other researchers have suggested that building long-term relationships with customers is through mutual collaboration and trust (Grönroos, 1997; Shani and Chalasani, 1992).

Danciu (2007) suggested that the stimulus for relationship marketing performance may be due to the quality of service and this requires the business organization to focus on long-term customer relationship. Therefore, to be able to establish and maintain long-term relationship, the business organization should understand customer's expectations,

know their customers, evaluate services process, provide SQ and adequately manage customers' relationships. The CRM concept as highlighted by Danciu (2007) outlined specifically that the customer helped the business organization to provide the benefits that the consumer would value. This value was created with the customers and therefore in CRM, this required the business organization to design and align its business process, communications, technology and people in support of the value that the customers wanted. It is with the recognition of the value of customers over their purchasing lifetimes that the business organization sought to bond progressively ever more tightly with customers.

Similarly, CRM is seen as a concept for integration with customers all possible and different points of contact – email, telephone, facsimile, and web, Internet, and call centers. Therefore when businesses begin to employ the productive use of these contact points, customer knowledge obtained is facilitated by CRM. Customers can then expect to benefit from better products and services, and competitive pricing and good support provided. In the same manner, businesses can learn a great deal about customers, transactional habits and patterns. In the process of understanding the customer better, CRM helped organization to understand customer behavior better as the customer is the central focus (Feinberg et al, 2002).

This provided CRM with a well defined platform for all business units to interact with their clients and fulfill all their needs and demands very effectively in order to build long-term relationship. The concept of CRM is to solidify relationship with customers and at the same time reducing cost and enhancing profitability and productivity for the business.

2.1.5 CRM - Strategy

The review of literature suggested that CRM refers to business strategy aimed at gaining long-term competitive advantage by delivering customer value. CRM is a widely adopted management strategy that unites information technology (ICT) with marketing and is a process used to learn more about customers' needs in order to develop stronger relationships with them. In a competitive business environment, what is important in business planning is the ability to generate useful information at rapid

speed and organizations can exploit such information by designing strategies uniquely targeted to consumer needs and by integrating various data, for example, across purchases, operations, and service logs, these organizations can obtain a more complete view of customer behavior. Ali et. el. (2013) reported that CRM can be viewed as a strategy for organization to improve their performance by maintaining a long-term relationship with customers.

Another view by Greenberg (2001), mentioned that a panel of CRM experts defined CRM as a business strategy to select and manage customers to optimize long-term value. In the Harvard Business Review (2002), CRM aligned business processes with customer strategies to build customer loyalty and to increase profits over time. Gronroos (1990), described CRM as the process of creating, maintaining, and enhancing relationships with business customers or consumers through fulfillment of promise made. Alternatively, CRM can be defined as a process of identifying, differentiating, retaining and growing customers through customization (Strauss et al. 2006).

2.1.6 CRM - Components

The understanding of CRM concept is like an analogy developed by Kincaid (2003) and defined CRM as the strategic use of information, processes, technology and people to manage the customer's relationship with a company. In his study, he provided a descriptive analogy of the components which connect and link the CRM application. It used a machine (CRM technology) and power (employees as people) to turn raw materials (customer information) into products (processes and interactions that build Customer Relationship).

As the above definition stated, CRM is about putting the four core elements (information, process, technology and people) together and each with its own unique combination that an organization can provide its customers with personalized experiences to increase customer retention. Each of these components is critical in delivering a successful CRM programme.

The concept of CRM within the organization is an all-embracing approach which seamlessly integrated sales, customer service, marketing support, field support and other functions that touches customers. (Ou and Banerjee, 2009), When using this approach, by integrating people, process and technologies and leveraging the internet, the relationship with all its customers including e-customers, distribution channels members, internal customers and suppliers are maximized (Xu et al. 2002). Arab et al. (2010) reported that integration of people; technology and process are the root factors that contributed to the successful CRM in business.

Table 2.0 summarized the key areas of CRM as highlighted by the various studies carried out between 2001 and 2011. There is some consensus reached among the various studies with regards to the key areas of CRM. Sin, Tse and Yim (2005), have argued that CRM has generally been assumed to create a competitive edge for an organization, as well as to have a positive impact on organizational performance.

Table 2.0 A Matrix Comparing the Various Components of CRM as defined by Researchers

Researchers	People Component	Process Component	Information Component	Technology Component
Kincaid (2003)	People	Process	Information	Technology
Sin, Tse and Yim (2005)	Key customer focus	Knowledge management (process)	CRM organization (people)	Technology based
Fox and Stead (2001)	People	Process	Strategy	Technology
Parvatiyar and Sheth (2001)	People	Process	Information	Technology
Kumar and Reinartz (2006)	Consumers	Marketing functions	Marketplaces	Technology

From the analysis of various definitions of CRM, Sin, Tse and Yim, (2005) identified a similar set of four components of CRM as those of Kincaid (2003), Fox and Stead (2001), and Parvatiyar and Sheth (2001). Similarly, Kamakura et al. (2005) have outlined CRM as the process of collecting and analyzing a firm's information utilizing technology to enhance customer interaction and values. Sue and Morin (2001) also highlighted the element of technology in their definition of CRM defining it as a technology enabled business strategy whereby companies leverage increased customer knowledge to build profitable relationship.

Building on the review of literature, an interesting observation is that Sin, Tse and Yim (2005) hypothesized that CRM as a multi-dimensional construct consisting of four broad behavioral components: customer focus, CRM organization, knowledge management, and technology-based CRM. This is in accord with the notion that successful CRM is predicated on addressing four key areas: *strategy; people; technology*; and *processes* (Fox and Stead, 2001).

2.2.0 Development and Importance of CRM

The review of literature also showed that CRM provided an opportunity for management to adopt a strategic approach to customer or client management affected all company operations and functionalities. CRM helped businesses to use technology and human resources (people) to gain insight (information) into the behavior that enable organizations to better manage their customers through the introduction of reliable systems, processes and procedures for interaction. It included the process of identifying, accepting and building appropriate mutually beneficial relationships with each customer through the use of technology in order to maximize value for each party concerned. CRM aimed to ensure that the organization focused on developing and maintaining profitable customer relationship.

Definition of CRM is visually depicted in Figure 2.0 using the Kincaid's framework of a CRM and concept of CRM by Parvatiyar and Sheth (2001).

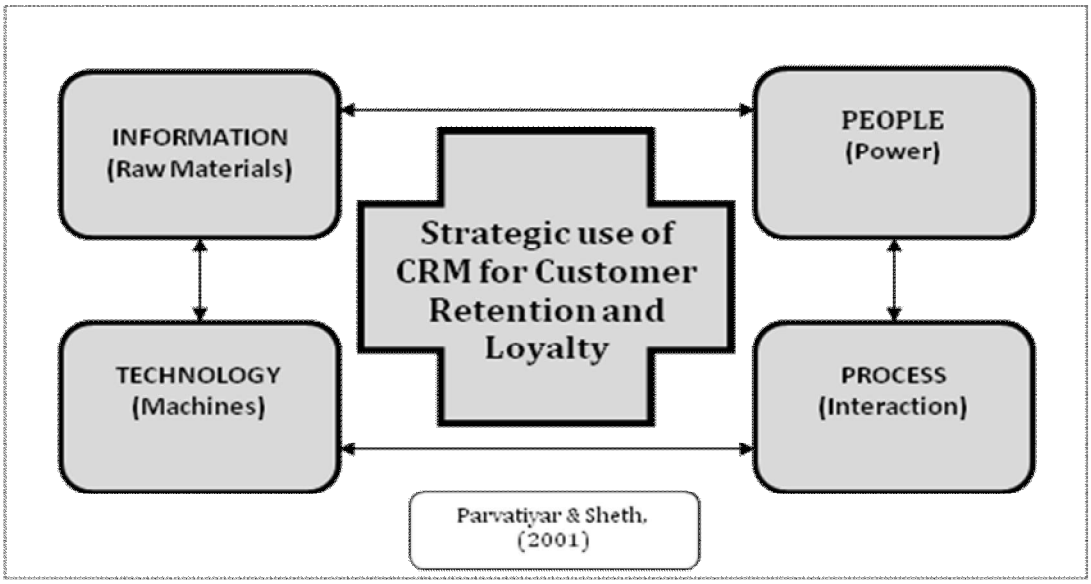


Figure 2.0.0 - Strategic Use of CRM

Similarly, Parvatiyar and Sheth, (2001, p. 5) outlined four components of CRM as: The strategic use of information, process, technology and people to manage the customer's relationship with a company (marketing, sales, services, and support) across the whole customer life cycle. Therefore, it implied that long-term relationships with customers when efficiently managed are better than short-term transactional exchanges (Berry, 1983; Grönroos, 1990; Raman and Pashupati, 2004).

2.3.0 SERVICES - An Overview

In the midst of fierce competition, pest management organizations must recognize the importance of SQ and being service oriented and heavily dependent on skilled labour. Such competitive challenge required the organizations to deliver high SQ standards and innovations to be the key differentiating factor in services market scenario (Sudhahar and Selvam, 2008). This study will attempt to establish the correlation between SQ and customer satisfaction which results in customer retention. Business organizations realized that to retain customers as well as to survive and grow, the main differentiator is to provide a high quality of satisfactory service.

Sachdev and Verma (2004) identified three forces that dominated the marketing environment in the services sector. They are:

(a) Increasing competition and fierce competitive environment,
(b) Changing and improving technologies.
(c) Continuous shift in the regulatory environment which has led to the growing of customer sophistication.

Heineke and Davis (2006) likewise reported that the rapid growth of services was caused by several factors, namely, changing population lifestyles, deregulation, and new and improved infrastructure, including the widespread availability of new technologies. As such, their perceptions and expectations are continually evolving, thus making it very difficult for service providers to manage services effectively.

Both academia and business world have in, recent years, focused essentially on ascertaining the customers' perceptions of SQ and, subsequently, formulating strategies to meet these customer expectancies. Similar studies have shown a direct connection between the level of quality of goods and services and their financial performances.

Reichheld and Sasser (1990) concluded in their landmark study published by the Harvard Business Review that a 5% increase in customer satisfaction can lead to an increase of profitability of anywhere between 25 and 125%. The study reported that as a customer's relationship with the company lengthens, profits will correspondingly rise and companies can boost profits by almost 100% by retaining just 5% more of their customers. The study revealed a very strong relationship between a customer's intention to repurchase and a provider's ability to resolve a customer's problem on the spot. Specifically, 95% of the customers said that they intend to repurchase if their problem was resolved quickly. According to Hart, Heskett and Sasser (1990), a decrease in CR from 95% to 70% can have a dramatic impact on a company's bottom line.

It is interesting to note that from the services marketing perspective (Chen and Popovich, 2003), the researchers have reported that service has to be delivered on time which presupposes that interpersonal relations and interactions of groups existed where all the parties have their own roles and cooperated with one another to deliver to customers through people. The viewpoint in accordance to Jain (2005) in that the four principles of marketing-mix concept (product or service, place, promotion, and price) were expanded to include the "fifth element" of CRM. Jain (2005) has suggested CRM to be a significant part of marketing approach and this inclusion was strengthened also by Kotorov (2003) who claimed that CRM as mainly associated with service.

2.3.1 Concepts of Services

The concept of services has been expounded by various by researchers who have given different definitions of service as shown in Appendix 2.0. It can be derived that the definitions of "service" indicated the use of a variety of terms to capture the essence of 'services', including activities, benefits, satisfaction, performance, process, deeds or acts and their differences from products or goods, all of which implied that services are the result of dynamic interactions between service providers and customers.

The review of literatures suggested that services should be defined in terms of the extent to which the customer receives the intangible benefits of service during the service encounter (Bateson, 1995). Therefore, the most important characteristic of services is the fact that services are processes. Similarly, these definitions indicated that

consumption and production are partly simultaneous activities, and that customers also participated in the service production process following from the interactive process characteristics. The linkage of CRM with services was further enhanced by considering the related definition of CRM as a set of business strategies designed to add value to customer interactions by providing SQ that exceeded the customer's expectations (Minocha, 2000).

2.3.2 Characteristics of Services

Service are any acts or performances that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Most importantly, this may vary according to the expectations and perspectives of both the service providers and customers. It is critical to distinguish between physical goods and services. Such dichotomy and service characteristics are highlighted to be used as a base for presenting the claimed differences in the discussion of SQ.

Other viewpoints to be considered of an increasing number of companies integrating services dimension into their physical product offerings (Wise and Baumgartner, 1999; Fitzsimmons and Fitzsimmons, 2004; Paloheimo et al. 2004).

Important characteristics of services, separating them from products, are the impossibility of separating production from consumption and the storing of services and their non-material quality, transience and heterogeneity. Understanding the nature of SQ and measuring it has become difficult because SQ is an elusive and indistinct construct (Kerin et al. 2003; Kotler, 2003; Pride and Ferrell 2003; Solomon and Stuart 2003). Researchers attributed specific characteristics to services that implicitly or explicitly differentiated them from physical goods as shown in Appendix 2.1.1 - Summary of the various service characteristics and Appendix 2.2.2 - Summary of Service Characteristics according to various writers.

SQ and satisfaction are considered the determinants of purchase intentions (Parasuraman, Zeithaml and Berry, 1988). The intangible nature of services made it difficult for customers to evaluate the service prior to purchase and therefore service purchase may be considered risky (Zeithaml 1981). Furthermore, it is impossible to

preserve services which raised the issue of harmonizing an offer and demand for services. The same service can be provided by different persons in an institution, and each of them may provide it in their own way. Thus, heterogeneity also counted among characteristics of services that differentiate them from products.

According to Collier (1987), one of the major problems faced by the service provider is its subjectivity which made it difficult for companies to take into cognizance the customer's perceptions of SQ so that the service package defined and planned by the company is able to meet customer expectations. Customer's involvement created uncertainty as the service provider must exercise care in what was being produced and how it was being produced (Muddie and Prine, 2006). Another viewpoint given by Gronroos (1990) described differences between physical goods and services as shown in Appendix 2.2.0 - Differences between Services and Physical Goods.

2.3.3 Definitions of Service Quality

Studies by Gronroos (1984) and Parasuraman, Zeithaml, and Berry (1985, 1991) showed the traditional approach of defining SQ. They emphasized that SQ perception is a comparison of consumer expectations with actual performance. In some instances, SQ was defined as conformance to customer expectations (Berry et al. 1988) while in another situation SQ was described as the difference between customer expectation and perceived service (Parasuraman et al. 1985). Chia et al. (2002) described SQ as a comparison between consumers' expectations and their perceptions of the service they actually received. Vavra (1995) suggested that SQ is the delivering of products and services that fully met consumer needs and expectations.

Zeithamal, Parasuraman and Berry (1990) defined SQ as the extent of discrepancy between customers' expectations or desires and their perceptions. Lehtinen (1983) viewed SQ in terms of process quality and output quality where process quality is determined by the customer during the period of service and, the output quality were assessed by the customer after the service has been performed. Gronroos (1983) distinguishes between technical quality (what is delivered) and functional quality (how it is delivered) and suggested that the latter is critical to perceptions of SQ.

2.3.4 Application of Service Quality in the Pest Control Service Industry

For competitive survival, pest control companies were focusing on areas in their operations that may give them an edge over their competitors. A key area identified was the delivery of high levels of SQ which was increasingly being offered as a strategy by service providers to position themselves more effectively in the marketplace (Parasuraman et al. 1988; Cronin et al. 1992). Despite the recognized benefits and the demand for high SQ, measuring it is difficult because of the complex nature and intangible characteristics of services.

Based on the research of Gronroos (1990), there are six criteria of a good perceived service and although, all six guidelines are useful as managerial principles, some are observed to be more critical than others. This can be seen in the study by Duggal and Siddiqi (2008) and the key operational processes have been summarized in Appendix 2.3.1 Summary of Six Criteria of Perceived Good Service Quality and 2.3.1 - Summary of some key operational processes which constituted a quality management system

From the above key process attributes, it was noted that SQ has to be implemented systematically and strategically throughout the pest control organizations, from the top down in all management processes - administrative, technical, sales, marketing and service delivery. Duggal and Siddiqi (2008) reported in their study that several key operational processes which constituted a quality management system for pest management organizations have to exist in order to deliver quality services.

For the benefit of the pest management industry having diverse market segments, the study by Brady and Cronin (2001) found the notion that providing high SQ caused satisfaction which held well across similar diverse cultures. They suggested that service practitioners should provide quality service as a means of improving satisfaction measurements. Moreover, Asubonteng et al. (1996) suggested that as SQ increases, satisfaction and intentions to reuse the service also increases.

Saravanan and Rao (2007) asserted that customer satisfaction is based on the level of SQ delivered by the service providers which was determined by the customer's experiences at all points of contact with the service providers.

Ultimately, this shows that there is some link between SQ and customer satisfaction which highlighted that the importance of customer's satisfaction when defining of SQ (Wicks and Roethlein, 2009). Customer satisfaction is the ultimate outcome of quality service performance that has fulfilled expectations. Customers are satisfied when their expectations are met and exceeded. Marketers are interested to know the factors that are responsible for customer satisfaction. Gržinić (2007) stated that this is a result of growing and increasingly diverse needs of the consumers, along with increasing competition, market globalization and the development of modern technology.

2.3.5 Measuring Service Quality

Shahin (2006) and Wisniewski (2001) indicated that the difficulties in defining SQ and measuring it have aroused much interest and debate in the literature. Similarly, Thongsamak (2001) highlighted that the characteristics of services are unique and intangible. Shanin (2006) concurred with the findings that measuring SQ is a very complex task because of the peculiarities embodied in the SQ itself.

The issue of complexity is attributed to the unique characteristics of services identified as intangible, heterogeneous and inseparable, thus making it difficult to measure SQ objectively (Zhao et al, 2002). It was pointed out earlier on that a service is hardly reproduced consistently and exactly due to the variability (heterogeneity) of service from time to time and from one customer to another (Ghobadian et al, 1994; Erto and Vanacore, 2002). Therefore, due to such differing views and debates on the concept of SQ, Shanin (2006) suggested that it may be appropriate to consider several different viewpoints of the 'definitions' which constitute SQ.

From the various reviews of the literature spread across services, it was derived that some researchers have commonly referred SQ as the extent to which a service meets customers' needs or expectations (Lewis and Mitchell, 1990; Wisniewski and Donnelly, 1996). The pioneers of SQ research, Parasuraman et al. (1985) have elaborated that SQ can be defined as the difference between customer's expectations of service and perceived service itself. As such, if the expectations are greater than performance, then perceived quality is less than satisfactory and hence customer dissatisfaction occurs.

Another factor which makes SQ difficult to measure is the requirement to compare quality in terms of how well the service level delivered matches customer's expectations. Delivering quality service means conforming to customer's expectations on a consistent basis (Lewis and Booms, 1983). In the delivery of services, three different dimensions of service performance were considered - levels of material, facilities, and personnel (Sasser et al. 1978; Lehtinen and Lehtinen, 1982). This trichotomy implied that SQ involved more than outcomes. It also included the manner in which the service was delivered.

Similarly, with the perception that services were difficult to duplicate by service personnel, it was seen that the production and consumption of services were likewise inseparable. Where labour intensive services are concerned, the provision of quality service during the performance, this will usually involved an interaction between the client and the service personnel from the service firm. In this instance, the input from the client therefore becomes critical to the determination of the quality of service performance. Since there is human involvement of service provided, it meant that no two services will be completely identical, making it difficult to measure and evaluate the SQ rendered. Thus, in any evaluation of SQ, customers' expectations were keys to that evaluation.

Similarly, Hernon and Nitecki, (2001) argued that SQ is an evaluation of specific attributes and this judgment is cognitive. To maintain or improve SQ, an organization has to identify what constituted quality to those being served (Hamilton, Crompton and More, 1991; Manning, 1999). In addition, managers can benefit from knowing what customers want and how SQ contributed to increasing retention rates of key customers (Absher and Woo, 2000; Lin and Wei, 1999). According to studies by Rust and Olive (1994), SQ is perceived as a cognitive process that resulted from factors such as customer satisfaction. This means that customer satisfaction is an affective reaction to a service encounter (Choi et al. 2004).

2.4.0 Customer Satisfaction – An overview

Many companies are focusing upon SQ improvement issues in order to drive high levels of customer's satisfaction. This is especially the case in the service sector and

customer satisfaction is considered to be one of the most valuable assets for the organization to retain its customers (Fornell, 1992; Halstead and Page, 1992). Peng and Wang (2006) argued that with the aim of sustaining long-term relationships with customers, many businesses have changed their strategic focus to emphasize CR. Such emphasis in preserving their long-term customer relationships requires businesses to measure and adjust appropriately the quality of service provided to customers which is a major influence on customer's satisfaction and retention.

To retain customers, many firms have focused their attention on increasing customer satisfaction levels (Payne, 2006). It is worthwhile to note that Kotler and Armstrong (2004) have integrated customer's satisfaction into CRM. They described it as the overall process of building and maintaining profitable customer relationships by delivering superior customer value and satisfaction. Several studies (Cardozo, 1965; Fornell, 1992; Halstead and Page, 1992) have shown that customer satisfaction presumably led to repeat purchases and favorable word-of-mouth publicity.

Westbrook and Oliver (1991), emphasized customer's satisfaction as the core of the post purchase period in saturated markets. The degree of customer's satisfaction is indeed a key measure but to what extent customer satisfaction led to retention is an important issue to be examined. On the other hand, the argument from Kärnä (2004), stated that the customer's satisfaction approach defined quality as the extent to which a product or service meets and/or exceeds a customer's expectations. The strength of this approach compared to the quality approach is that it captured what is important for the customers rather than established standards based on management judgments that may or may not be accurate.

Defining and measuring quality in services and satisfaction is being difficult due to the intangible nature of the service offering. Many of the researches on SQ have been carried out within the framework of widely accepted SQ model (SERVQUAL) developed by Parasuraman et al. (1985, 1988, and 1991). Discussion and details on the use of the SERVQUAL model for the measurement of the SQ is found in Appendix 2.4.0 - Instrument for Measuring Service Quality.

2.4.1 Importance of Customer Satisfaction

Measuring customer's satisfaction is important in today's world of accountability and performance measurement. The review of the literature has shown that customer's satisfaction has become a key issue for companies in their efforts to improve quality in the competitive marketplace. Customer's satisfaction does affect customer relationship (CR) and, therefore, profitability and competitiveness (Anderson and Sullivan 1993). Kotler (1994) pointed out that the key to customer relationship (CR) is customer satisfaction. According to Jones and Sasser (1995), complete customer satisfaction is the key to securing customer loyalty and generating superior long-term profitability for the organization. It is also apparent that high customer satisfaction led to the strengthening of the relationship between a customer and a company, and this deep sense of collaboration has been found to be profitable (Storbacka et al. 1994).

Accordingly, customer's satisfaction is seen as an important factor in the development of the service delivery process of pest control services. It is natural that managers in the pest management industry should be concerned about customer's satisfaction because of its expected influence on contracts renewal, customer relationship and word-of mouth reputation.

2.4.2 Customer Satisfaction Integration and CRM

The review of the literature focused CRM with relationship management, following the service concept to include the process of SQ to achieve customer satisfaction. The literature highlighted this relationship where customer's satisfaction and CRM are closely interrelated and strictly cannot be separated. According to Sureshchander et al. (2001), customer's satisfaction is an asset that should be monitored and managed just like any physical asset and this is true for both service-oriented and product-oriented organizations. Andaleeb and Simmonds (1998) and Comm and Mathaisel (2000) highlighted the misconception of SQ and satisfaction that existed in the literature. As suggested by Hoyer and MacInnis (2001), satisfaction is associated with feelings of acceptance, happiness, relief, excitement, and delight. In order to achieve customer's satisfaction, organizations must be able to satisfy their customers' needs and wants (La Barbera and Mazursky, 1983).

To apply the same ideal of customer satisfaction to the management of pest management organization, it is important that SQ and the diverse range of related pest services provided to customers are good. How this can be achieved is often the concern of pest management organization as management can improve the productivity and service efficiency. Singh (2006) has highlighted the importance of customer satisfaction and have shown that customer's satisfaction has a positive effect on an organization's profitability. As a result, the consequences of customer's satisfaction and dissatisfaction must be considered. There is also a positive connection between customer satisfaction, loyalty and retention, indicating their contribution towards a successful business. Baksi and Parida, (2012), stated that the perception of SQ is extremely individualistic in nature.

Nastaran (2013) investigated the efficacy of customer relationship management (CRM) benefits for customers in relation to customer satisfaction from customers of three Malaysian companies (AEON, Tesco, PETRONAS) and the results indicated that the benefits of CRM for customers have had a significant positive effect and enhanced customer satisfaction. Therefore incorporating the benefits of CRM for customers and the relationships of these benefits with their satisfaction can significantly improve marketing performance.

Rababah, Mohd, and Ibrahim (2011), suggested that CRM enabled organizations to know their customers better and to build sustainable relationships with them indicating that the importance of SQ and linkages with customer satisfaction is often seen as the key to an organization success and long - term competiveness. In the context of CRM, customer satisfaction is viewed as the determinant of customer relationship (CR).

2.4.3 Customer Satisfaction and SQ

An analysis of the literature has also highlighted the fact that SQ and customer satisfaction concepts have been linked to customer behavioral intentions. These are purchase and loyalty intention, willingness to spread positive views by word of mouth and business referral intention (Kang, Nobuyuki and Herbert, 2004; Olsen, 2002; Söderlund and Öhman, 2005). The linkages between SQ and customer satisfaction leading to long term CR has been an intensively discussed subject in the areas of

consumer and marketing research (Hennig-Thurau and Klee, 1997). Thus, it is important to distinguish critically between the two concepts. This will allow for the measurement of SQ and ascertain the role of each service determinant that is responsible for CR. The findings by Singh (2013) stated that SQ is an important part of customer satisfaction and further customer satisfaction is an essential requirement for the survival and growth of any business.

The findings by Sureshchanda et al. (2002) into SQ revealed that customer satisfaction can occur at various levels in an organization, e.g. satisfaction with the services providers, satisfaction with the services tangibles and satisfaction with the whole organization. Similarly, delivering high-quality services will generate customer satisfaction. Therefore, Customer satisfaction is the key factor determining how successful the organisation will be in customer relationships (Reichheld, 1996). In this regards, Managers need to take care to deliver better SQ to attain maximum customer satisfaction.

In the competitive marketplace, it is extremely important to conduct regular customer surveys in order to collect data related to customer expectations. Such customer feedback plays a very significant role as it can help to provide a better service and hence, increase customer satisfaction. The distinction between customer satisfaction and SQ has revealed a number of key elements that distinguish customer satisfaction from SQ are shown in Appendix 2.5.0 - Distinction between Customer Satisfaction and SQ.

A review of the emerging literature suggested that there appears to be relative consensus among academic marketing researchers that SQ and customer satisfaction are separate constructs which are unique though they share a close relationship (Cronin and Taylor, 1992). Also, it is observed that most researchers in the marketing services field have maintained that these constructs are distinct (Bitner, 1990; Carman, 1990; Boulding et al. 1993; Spreng and Mackoy, 1996). Bitner (2001) has suggested that effective customer service emphasizes on key aspects such as service expectations, informed behavior expectations, aligning service standards with guarantees, timely responses, accurate information and services provided before, during and after the sale SQ. These aspects are crucial to business organizations and customers who experience

low quality service will be more inclined to deflect. However, there is no consensus on the definition of customer satisfaction (Beerli, Martân and Quintana, 2004).

2.4.4 Linkages between Customer Satisfaction, CRM, Service Quality and CR.

In the competitive market place, the preferences and the needs of the customer is always evolving. Therefore CRM is fundamentally used in the establishment, development, maintenance and optimization of long-term mutually beneficial relationships between customers and organizations. customer satisfaction has been linked with SQ. It is within this context of relationship marketing that customer satisfaction is often viewed as a central determinant of CR. Based on the notion that SQ is becoming an increasingly important differentiator among competing businesses in the pest control service industry, a multiple-item instrument called SERVQUAL for measuring consumer perceptions of SQ is used. Cuomo (2000) stated that the techniques of customer satisfaction analysis allowed the critical aspects of the supplied services to be identified and customer satisfaction to be increased.

Kumar and Reinartz (2006) argued that, traditionally, customer satisfaction is expected to lead to greater retention or loyalty, which, in turn, leads to greater business profit. This is considered to be a linkage that is consistent with the satisfaction-loyalty-profitability chain as postulated by Anderson and Mittal, (2000). Kumar and Reinartz (2006) stressed that although customer satisfaction and loyalty are key mediators of profits, these measures cannot be taken as simple predictors of profit. What is more important is to identify and nurture relationship with profitable customers. McCarty (1997) has aptly described that organizations view customer satisfaction as a cost rather than an investment. Customer loyalty has to be earned. Szwarc (2005) further argued that there is a distinction between Satisfied and 'loyal' customers. Satisfied customers are more likely to 'promote' the company as they talk about their satisfactory experience. Loyal customers, however, are more beneficial because they are more likely to buy additional products, often without shopping around for the best price.

Zairi (2000) reported numerous studies that have looked at the impact of customer satisfaction on repeat purchase, customer loyalty and retention. They all convey a similar message in that satisfied customers are most likely to share their experiences

with other people to the order of perhaps 5 or 6 of them. Equally of importance is that, dissatisfied customers are more likely to tell another 10 persons about their unfortunate experience. Organizations can effectively compete and succeed in an increasingly competitive environment with improvement of perceived SQ which will enhance corporate image, customer satisfaction, and customer loyalty (Laohasirichaikul, B, Chaipoopirutana, S. and H, Combs, 2010).

Prevailing perception suggest that an improvement in SQ attributes will result in a higher level of customer satisfaction. Consequently, improved customer satisfaction is likely to increase the probability of CR. Customer loyalty determined by the length of the period of customer contracts with the pest management organization, is probably influenced by the level of customer satisfaction. This study was undertaken to ascertain the attributes of SQ which can influence the level of customer satisfaction and the relationship of the four CRM components - People (PR), Process (PP), Customer Information (CF) and Technology (TC). The relationship of the SQ determinants and the linkages of the four CRM components and their influence on total customer satisfaction based on the review of literature were investigated.

It is interesting to note that Minghetti (2003) asserted that besides an in-depth knowledge of customers' needs, behavior, and preferences and CRM new technologies are one of the core drivers of change in the organizational performance. Findings by Dyer, Liebrenz-Himes and Shamma, (2006) reveal that CRM, when implemented well with the quality and quantity of information housed in the CRM database, will help a firm to understand better and adapt its marketing and businesses processes to its customer's preferences. Differentiating customer treatment based on customers' needs and values hold the key to increasing CR, satisfaction and profitability. Jayashree, Shojaee and Pahlavanzadeh (2010) highlighted that not only organizations gather data for own uses but also they use them to improve customer services to increase the motivation of customer loyalty by giving promotions, gifts, or bonus incentives which helps to increase sales and also improved customer service.

It is important to consider the suitable use of technology to obtain the right information from the right people at the right time so that the right decisions can be made and the services can be rendered efficiently (Dutu and Halmajan, 2011). Consequently,

organizational performance can be improved. In this case, Sigala (2005) asserted that CRM Technology as a competitive advantage strategy becomes a necessity for attracting and improving guests' patronage in the Malaysia hotel industry.

2.5 Summary of the review of literature.

The review of literature suggested that perceived SQ is an important success factor for most businesses (Grönroos, 2001; Gebauer and Friedli, 2005; Parasuraman, 1998). Empirical researches carried out by several researchers (Bolton and Drew, 1991; Boulding et al. 1993; Cronin and Taylor, 1994) have given confirmation to the assumption that SQ has an important effect on long - term customer relationship and on customer satisfaction. As such, it can be said that both customer satisfaction and long-lasting customer relationships have positive effects on a company's success (Anderson et al. 1994; Anderson and Sullivan, 1993). Reichheld and Sasser (1990) reported a high correlation between CR and profitability in a range of industries. The work of Haridasan and Venkatesh (2011) in the telecommunication sectors has shown that SQ has become an important means of differentiation and path to achieve business success.

Furthermore, the existing academic literature of CRM does not provide a clear indication of what specifically constitutes CRM and some organizations view CRM primarily as investments in technology and software. Some consider CRM as aggressive attempts in developing sound and productive relationships with customers. Based on review of literature, studies have focused on the link between customer loyalty and profitability (Reinartz and Kumar 2000), customer profitability (Niraj, Gupta, and Narasimhan 2001) and the components of CRM strategy, such as the link between satisfaction and business performance (Kamakura et al. 2002).

As a result of that, it is reasonable to conclude that it is not only very little attention has been given to the CRM dimensions in the pest management industry, but there is also plenty of opportunity for extending the literature about CRM dimensions and service delivery performance, both theoretically and empirically. Therefore this study is an attempt to provide a value conceptual model that explained the theoretical linkages existing between CRM dimensions and service quality.

Chapter 3.0 RESEARCH METHODOLOGY

Based on a thorough review of theoretical background and prior empirical studies in the area of SQ, CRM, and customer satisfaction, an integrated research framework concerning the relationship of the SQ determinants have been developed. Using the SERVQUAL model, this study aimed to examine the impacts of SQ dimensions and determine the perceived importance and satisfaction on each dimension of SQ. The research method must be appropriate to the objectives of the study as methodology connotes a set of rules and procedures to guide research against which its claims can be evaluated and understood. Daly (2003) stated this is fundamental to the construction of all forms of knowledge and provided the tool whereby understanding is created.

3.1.0 Research Problems

In the context of the Malaysian pest management industry, it not uncommon to encounter a high number of complaints that the organizations received regularly, indicating severe dissatisfaction with the service delivery provided. There is service gap between what customers expect of a service and what they actually received. The focus of the research is to find the relationship between SQ determinants responsible for customer satisfaction and CRM components. Limited research studies have been carried out in the Malaysian pest control industry Cronin and Taylor (1992) used the SERVQUAL dimensions which have been adapted to ensure their application in a variety of settings. This research on SQ determinants linking customer satisfaction to a CRM approach represented an early attempt in the study of the Malaysian pest management industry.

Therefore, the ability to capitalize on SQ and the availability of technology to develop a CR strategy using CRM is the objective of this research which is summarized below:

To **investigate** factors that relate to customer relationship and develop a better understanding of relationship between SQ, CRM, and customer satisfaction which might lead to customer relationship in the pest management service organization within the Malaysian pest management industry.

3.1.1 Research Questions (RQ) - The following RQ was developed into more easily examinable parts to guide this doctoral study:

RQ 1 What are the SQ determinants which influence customer satisfaction in the pest management service company?

RQ 2 To what extent is customer loyalty dependent on customer satisfaction and SQ in the pest management service company?

RQ 3 What are the key SQ determinants of the CRM components that foster customer relationship in the context of a pest management service company?

3.2.0 Research Framework

Quantitative research design was employed in this study and the research steps applied were in accordance with scientific research design approach where the data collected was based upon a predetermined instrument and in accordance with the objectives developed for this study (Bodgan and Biklen, 1982).

Jayashree, Shojaee and Pahlavanzadeh (2010) described that customer relationship management (CRM) as the collection of Processes, people and technology that seeks to find costumers of organizations. Such ability to retain customers and to make them loyal is due to the organization's ability in recognizing the customers' needs and behaviors. Organizations which implement CRM successfully will gain customer loyalty and profitability.

CRM plays an important role for organizations that seeks strategic position in the industry and this is due to progress in Information Technology which has a positive effect in this development. It is important to avoid viewing CRM only as a technology, but to make it successful, organizations need to integrate and make balance between process, people and technology (Jayashree, Shojaee and Pahlavanzadeh, 2010)

The literature on marketing showed that there is significant importance for organizations to develop and maintain enduring customer relationships for the sustainability of businesses success. CRM is premised on the belief that collecting data

and developing a relationship with customers is the best way to build loyalty, enhance CR and subsequently generate profits. This is achieved by exploring, describing and explaining how the linkages in the relationship of the four components of CRM, namely is a process, people, customer information and information technology.

Kotler (1997) pointed out that CRM principally revolved around marketing and it begins with a deep analysis of customer behavior. Therefore, the purpose of this study starts with the customer behavioural intent and this can be achieved by analysing them and determining from the customer's viewpoints the hierarchy of the importance of the ten SQ dimensions (Reliability, Responsiveness, Competence, Access, Courtesy, Communication, Credibility, Security, Understanding the Customer and Tangibles) as independent variables and SQ as dependent variable. These variables under study were neither controlled nor manipulated, and no artificial setting was created for this study. The unit of analysis for this study is customers as respondents.

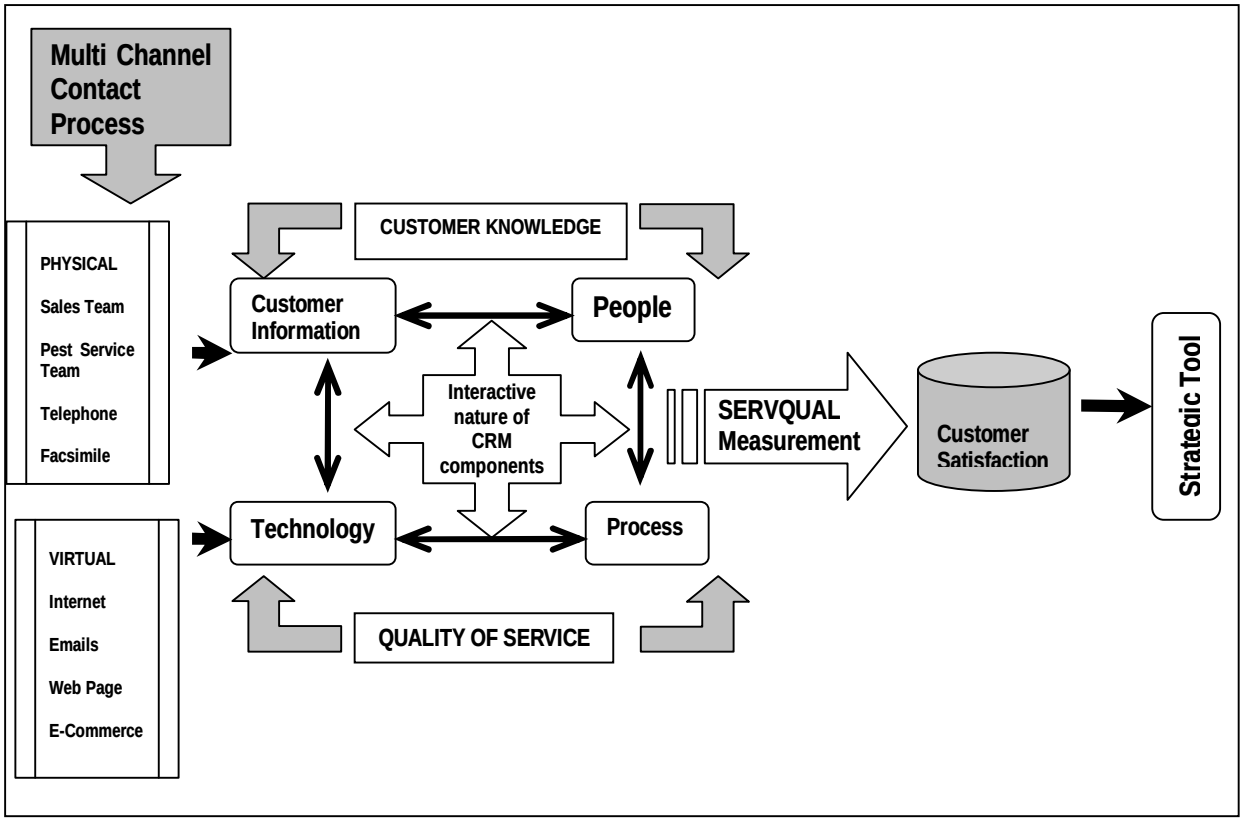


Figure 3.1.0 - The Research Framework developed from research problems (constructed by Researcher)

The conceptual framework of CRM component linkages shown in Figure 3.1.0, for this study was developed based on an extensive review of the market orientation on SQ , relationship marketing and CRM literature, integrating CRM technology to provide SQ has a strong positive effect on customer relationship, enabling the organization in delivering service excellence and achieving CR and loyalty.

The conceptual framework of CRM component linkages can be characterized by organizations that have multi channel contact process with customers usually based on two levels, namely physical (using hardware such as telephone, facsimile and people) and virtual contact (using email and social media). Technology applications enable the integration, linking front and back office functions of the business, and which then tracked the customer to analyze customer behavior or purchasing patterns. The conceptual framework identified that the computer technologies required in CRM included front-office applications supporting sales and marketing services the and back-office applications facilitating the integration and analysis of data. While the back office components like the database and data-mining tools assisted in identifying and tracking customer needs effectively and efficiently.

According to Ryals, (2005), CRM implementation allowed the smooth passage of customer knowledge within an organization that could lead enhanced decision making. Similarly, Law, Leung and Buhalis (2009) argued that in the today's era of internet, e-mail inquiries are the primary communication implying the customers' high expectation of receiving a response to their e-mail.

As such, business organizations no longer manage customer satisfaction as an isolated function. The linkage of services and CRM application has been identified by Kalakota and Robinson (2001, p. 171) as "*the timely delivery of excellent service*", a definition which emphasized on the concept of SQ.

In order to address customer needs, the business organization has to link both the physical and virtual contacts with one another to function effectively for quality service. Therefore the key to the implementation of this CRM initiative involved people, process and technology (which are both the physical and virtual contact) to capture customer information. Their linkage and integration to produce excellent

customer satisfaction is to retain customers and enhance loyalty. This strategy to improve customer relationship was seen as increasing customer satisfaction, prompting pest management organizations to deliver a service experience that is tailored to customer needs.

The study aimed to establish a business model that links SQ attribute performance to customer satisfaction which, in turn led to customer relationship. The findings of this study present the pest management organization with a competitive strategy to consider and implement where appropriate. In preparing the research design of this study, the approach is to determine the critical factors of SQ from the customers' perspective. Specifically, it is necessary to identify the important determinants of SQ within the pest management industry.

The review of literature has found that there is a strong and positive relationship between SQ attributes and customer satisfaction which led in turn, to CR (Rust and Oliver, 1994; Fornel et al. 1996). However, there is a lack of consensus among researchers to explain the linkage between SQ attributes and customer satisfaction and how the resulting relationship can lead to CR.

Services are becoming important for many organizations whose objective is to enhance SQ performance and this requires reliable methods of measurement, assessment, and improvement (Spohrer and Maglio, 2008). As a result, accurate and reliable instruments that can assess and measure SQ are needed. Peng and Wang (2006) suggest that organizations should measure the quality of their service delivery to preserve their long-term customer relationships. Measuring customer satisfaction was based on SQ attributes and service determinants which were designed for to understand the relationship between these two elements. Typically, performance was evaluated on a rating scale whereas importance can be either rated by the respondents or calculated on the basis of performance (Oliver, 1997).

According to Reichheld and Sasser (1990), SQ needs to be measured for improvement and the importance of measuring SQ have created an interest among the service providers and researchers because SQ was being used to position the organization in the market place. Earlier arguments from the review of literature on SQ, described it as

a comparison of what a customer expects (perception) and how it is delivered and performed (expectations). What is lacking is referred to as service gaps, that is, the discrepancy in the performance of the services between the customer satisfaction perceptions (P) and expectations (E). Zeithaml and Bitner (1996) have provided further insights into SQ measurement by stating that there are two aspects that need to be taken into consideration when evaluating SQ namely content and delivery. Basically, it is assumed that customers may be in the best position to evaluate the quality of delivery while the service providers are the best judges of the content of the service delivery.

There are many factors that affect overall customer satisfaction. Hokanson (1995) outlined several of these factors as shown in Appendix 3.0.0 (Factors that Affect Customer Satisfaction) which include attributes such as employees who are friendly, courteous, knowledgeable, helpful, accuracy of billing, billing timeliness, competitive pricing, SQ , good value, billing clarity and quick service. These factors were taken into consideration for the formulation of the research instrument - questionnaire.

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3.2.1 Development of Measurement of SQ for the Pest Management Services

It is important to understand how consumers perceive SQ because according to Saravanan and Rao, (2007) the need for survival and growth in this competitive markets are main critical factors for companies in the search for providing superior SQ to achieve Customer Satisfaction.

SQ is considered very important because it leads to higher customer satisfaction, cost reduction, profitability, customer retention and loyalty. Companies must understand the important concepts of SQ and CS in order to remain competitive in business and hence it is very important to know how to measure these constructs from the consumers' perspective in order to better understand their needs and to be able to satisfy them.

According to Magi and Julander (1996), the nature of services are intangible, evaluating the customer's perception of quality can be done through the interaction with the personnel offering services. From their suggestion, the interaction between consumer and service provider is very important when measuring SQ because through that interaction, the service provider could easily understand the consumer better and

identify what the customer exactly wants. Therefore, many researchers have tried to develop various models to measure it, even though some claim it is hard to measure because of its intangibility which is hard to quantify (Eshghi et al. 2008).

Researchers such as Negi, (2009) and Ladhari, (2009), have proven that providing good SQ to customers retains them, attracts new ones, lowers cost, positive word-of-mouth recommendation, enhances corporate image and above all improves profitability.

In the context of the pest management services, there are various measurement models have been developed to measure SQ which was to measure the gaps between customers' expectations of service performance and their assessment of actual performance. The approach to these models followed either attitude-based measures or disconfirmation models. It is good for the context of the pest management sector even though it has its weaknesses due to the abstract and nature of service quality concept which is resultant from the fact that services rendered are intangible, heterogeneous and inseparable from production, delivery and consumption

(a) According to Shahin (2005), it is very important to measure SQ because it allows for comparisons before and after changes, identifies quality related problems, and helps in developing clear standards for **service delivery.**
(b) Cronin & Taylor, (1992), developed the **SERVPERF model** which used the performance approach method which measures service quality based on customer's overall feeling towards service. This model is good to measure SQ but it does not provide information on how customers will prefer the service to be in order for service providers to make improvements.
(c) Another service measurement model, **evaluated performance model (EP)** was developed by Teas, (1993), which measured the gap between perceived performance and the ideal amount of a dimension of SQ, rather than the customer's expectation. In this regards, the model addressed some of the criticism of some previous models developed by Gronroos, (1984) and Parasuraman et al. (1985, 1988
(d) **Multidimensional and hierarchical construct Model** proposed Brady & Cronin, (2001), in which SQ is explained by three primary dimensions; interaction quality, physical environment quality and outcome quality. Each of

these dimensions consisted of three corresponding sub-dimensions. Interaction quality made up of attitude, behavior and expertise; physical environment quality consisting of ambient conditions, design and social factors while the outcome quality consisted of waiting time, tangibles and valence. According to these authors, hierarchical and multidimensional model improved the understanding of the basic issues about service quality such as service quality perceptions; how service quality perceptions were formed; and where the service experience took place. According to Brady & Cronin, (2001), this framework can help managers to improve customers' service experiences.

(e) Mittal and Lassar's **SERVQUAL-P** model which reduces the original five dimensions down to four, notably the dimension of Reliability, *Responsiveness, Personalization* and *Tangibles.* However, the SERVQUAL-P Model also included the Personalization dimension, which referred to the social content of interaction between service employees and their customers (Bougoure and Lee, 2009)

(f) SQ can be evaluated and measured using SERVQUAL, developed by Parasuraman et al. (1988), the SERVQUAL model which is a multi item scale developed to assess customer perceptions of SQ in service and retail businesses. The scale defined SQ into five dimensions as follows: Tangibles, Reliability, Responsiveness, Assurance and empathy. It is based on capturing the gap between customers expectations and experience which could be either negative or positive based on whether the expectation is higher than experience or expectation is less than or equal to experience respectively. The instrument defined the customer's evaluation of quality as a function of the gap. This is the difference between the expected service and perceived service. SERVQUAL is based on the proposition that SQ can be measured as the gap between the service that customers expect (E) and the performance they perceive (P) to have received (Parasuraman et al, 1988). The SQ scores (Q) can be measured by subtracting the customer's perception score from the customer's expectations score. This is as denoted by the following equation: $Q = P – E$. The Gap Model of SQ is depicted in Appendix 3.1.0 - Gap Model of Service Quality.

SERVQUAL has been subjected to a number of criticisms which according to Buttle (1996), the SERVQUAL, has several limitations as it only focuses on the process of the

service delivery, not the outcomes of the service encounters. It is also noted that the five dimensions (reliability, assurance, tangibility, empathy, and responsiveness) were not universal and they cannot capture the variability of the service quality dimensions. Some research findings have cast doubts on the applicability of the five dimensions of the model to different service settings (Ramsaran-Fowdar 2007). This implied that SERQUAL generic measure of service quality may not be appropriate for all services.

After an extensive literature review, the SERVQUAL model was modified by adding an additional 10 dimension for the Pest management services in order to assess SQ and CS. Primarily the SERVQUAL model was developed for service and retail businesses and its objective is to know how customers of a business rate the services offered to them (Parasuraman et al. 1988). The SERVQUAL model is important in grouping customers of a company into different quality ranks by determining their SERVQUAL score which is of course very important to know how to target the various ranks.

The implications of using this modified model in assessing service quality and customer satisfaction from the consumer's perspective included knowing about customers' perceptions on service quality, trying to meet and manage customers' expectations, improving quality management by identifying areas that have weaknesses in terms of satisfying customers' needs.

Although it is able to measure the ten dimensions of SQ, relatively less information is available on the importance of each service dimension that is relevant to the Malaysian pest management industry. Furthermore, SERVQUAL is industry specific and may not be universal for all services (Babakus and Boller, 1992; Carman, 1990; Parasuraman et al. 1991). Some adaptation and modification of the SERVQUAL instrument is necessary for its application to the pest management industry.

Parasuraman, Zeithaml and Berry (1988, p. 31) have pointed out that SERVQUAL can be adapted or supplemented to fit the characteristics or specific research needs of a particular organization. Therefore, an initial evaluation of SERVQUAL was undertaken before the main data collection effort began. This was to ensure that SERVQUAL was tailored to the research needs characteristic of the Malaysian pest management industry. Input was provided by both organizations under this study and the senior

management team. Decisions to modify the instrument were based on the relevancy of the questions to the pest management services and on the ability of customers to respond to the questions without experiencing confusion or undue frustration.

However, Landrum et al, (2008) suggested that to measure the SQ, it was calculated as the difference in the two scores where better SQ resulted in a smaller gap. The instrument proposed the difference between customer's perceptions of what a service should deliver and how that service met idealized expectations revealing a gap that inferred that services that are or are not meeting a client's requirement. This assessment is conceptualized as a gap between what the customer expects by way of SQ from a class of service providers and their evaluations of the performance of a particular service provider. Parasuraman, Zeithaml, and Berry (1988) stated that since SQ depends on the relationship of customer expectations with customer perceptions, it is appropriate to calculate SQ by subtracting expected from perceived service.

Cronin and Taylor (1992) used the SERVQUAL model in the analysis of banking, pest control, dry cleaning, and fast food services. They argued that the SQ measurement of customers' expectations is unnecessary although Parasuraman, Zeithaml, and Berry (1994) disagreed with it. Their intent is to measure customers' expectations of various aspects of SQ and customer's perceptions of the service actually received from the local service organization. It is appropriate to modify and adapt the SERVQUAL model to this study pertaining on SQ in the pest management industry. The questionnaires sought data that is relevant from the customers' perception only.

As such, the measurement of SQ for this research was modified to assess the expectations and perceptions of SQ in the Malaysian pest management industry. The modified SERVQUAL model will be based on the customer's evaluation of SQ which represents a multi-dimensional construct. This was based on the most important and desirable attributes or SQ determinants of the basic needs of the customer. Each of the identified SQ determinants has different features and have different influences on the final SQ.

The need to expand the original five dimensional instruments to ten dimensional instruments is due to the nature of the pest management industry where the range of

service dimensions is fairly large due the variety of customers that engage the services. Therefore, it was anticipated that more data be generated and this allows for a greater depth of analysis. This will enable the researcher to segment the customers according to types of services and these segments can be analyzed with other data as in the case of demographics. According to Szwarc (2005), SERVQUAL is suitable in industries where customers' perceptions of services are generally low and this is the perception of customers towards the pest management industry.

Some researchers (McDougall and Levesque, 2000; Negi, 2009) proposed that quality and satisfaction were determined by the same attributes like Parasurman et al. (1988, p.16) tried to relate customer satisfaction to service quality since what SERVQUAL model struggles to measure is attitude. Accordingly, they see customer satisfaction as transaction specific meaning consumers get satisfied with a specific aspect of service while perceived service quality is a global judgment or attitude to a service.

The justification for the use of the modified SERVQUAL model in measuring SQ for this research was drawn from similar study on service quality by Badri et al. (2003) to identify the SQ gaps in the IT centres in the three institutions of higher education in the United Arab Emirates. An assessment and application of the SERVQUAL model in measuring service quality in information technology centre and their findings showed respondents felt that SERVQUAL is a useful indicator for IT center service quality in institutions of higher education. SERVQUAL identified gaps in service quality for the three institutions. Similarly, Abd Manaf et el. (2007), used the SERVQUAL model in measuring service quality of airline services in Malaysia to examine the various service dimensions of SQ.

As stated the most dominant instrument in measuring service quality is SERVQUAL. Ilhaamie (2010) used the SERVQUAL scale to conduct a study to determine the level of service quality as assessed by the external customers and their expectation and perception towards services provided by the Malaysian public organizations. Similarly, Aliah and Tarmize (1998) adapted the SERVQUAL scale comprising of 25 items to measure service quality provided by an income tax payment department in Malaysia.

In this regard, Negi, (2009), used the modified SERQUAL model to determine customer satisfaction through perceived quality in the Telecommunication industry. Akan, (1995) used the SERVQUAL model in the four stars hotels in the Hospitality sectors to measure the SQ dimensions and some of the most important attributes influencing the perception of SQ. Buttle, (1996,) highlighted several researchers that have used the SERVQUAL model in various industries (retailing, restaurants, banking, telecommunication industry, airline catering, local government, hotels, hospitals, and education). SERVQUAL model was widely used with a few adaptations in multiple sectors to assess both service perceptions and expectations "across a range of different service characteristics." (European Commission, 2008). This research received inspiration from previous studies that have adapted SERVQUAL model to suit the purpose of the study.

3.2.2 Justification of Measurement of SQ and Methodology

With the subject of service delivery and fulfillment as a process of CRM, it is important to consider service companies that have developed through labor-intensive service operations and are highly successful by any measure. According to Duggal and Siddiqi (2008), the pest management service still remained very labor-intensive in spite of automation effects, where high-quality personal relations of service staff and clients cannot be overestimated.

In the services sector, the provision and delivery of service involved a variety of interactions between an organization and its customers, in particular, human personnel who were instrumental in the creation and provision of SQ. Leonard (1999) clearly described that services are performances and the greater the involvement of people in creating values for customers, the greater the challenge. The pest management industry that was being studied was highly dependent on labour component and service orientated.

In order to understand users' perception of services as well as identify improvement requirements, the study used a set of ten dimensional instruments in SERVQUAL instead of the original five designed by Parasuraman, Zeithaml and Berry (1988) and Parasraman, Berry and Zeithaml (1991) and, subsequently, modified by Cronin and

Taylor (1992). Being labor-intensive service companies they create customer value through performances. The relevance was also in the humane values (people) and process (service delivery) which are identified as components of CRM as described by Kincaid's (2003). The modified SERVQUAL instrument consisted of forty-five (45) statements that measured services based solely on user's perception of actual performance and, subsequently, summarized the services to reflect the importance of the ten service dimensions. The attributes were carefully selected from the review of the literature and modified to comply with the context of pest management service delivery.

3.2.3 Data Collection Methods and Tools

In deciding on the research methodology to be pursued, it was important to distinguish between the quantitative or qualitative approach of the research process. The research objective was to **investigate** the relationship between the various CRM components to achieve CR. This approach required a process of theory testing which is an attribute of quantitative research. An advantage of this approach is its ability to show the causal relationship between the variables. According to Neuman, (2000), Quantitative research emphasized the measurement and analysis of causal relationship between variables not processes. Quantitative research usually takes a linear path and is more likely to use explicit, standardized procedures and a causal explanation. Thus, the research data in quantitative studies were often collected according to a structured plan, using self-administered questionnaires with questions which have pre-designated response options and usually left with little opportunity for the respondents to explain their answers. Such structured approach allowed the researcher to compute exact percentages and data collected to be subjected to statistical analysis.

The quantitative approach is best described by Creswell (1994) as an inquiry into a social or human problem, based on testing a theory composed of variables, measured with numbers, and analyzed with statistical procedures in order to determine whether the predictive generalizations of the theory hold true. Holton and Burnett (1997, p.71) reported that "One of the real advantages of quantitative methods is their ability to use smaller groups of people to make inferences about larger groups that would be prohibitively expensive to study".

Therefore, the real advantage in using quantitative approach is the flexibility to determine the sample size and dealing with non response bias which is very essential. As such, it is important that data gathered in such a manner can be quantified. In this respect, the questionnaire was designed in such a format that the data could be easily entered into the computer for analysis. According to Burns and Grove (1999) data collection should be an accurate and systematic gathering of information relevant to the specific objectives.

3.2.4 Organization of the Research Study

Burns and Grove (1997, p 225) stated that the design of a study is the end result of a series of decisions made by the researcher concerning how the study will be conducted which is closely associated with the framework of the study. Furthermore, the research design must be reliable and valid for the purpose of the intended study. The same goes for selecting and developing the data collection, coding and analysis, interpretation and presentation of results. Conventionally, the research design was made of these key components: research question, what data to collect, data collection methods, and data analysis (Yin, 1994).

This study investigated the modified SERVQUAL model for the measurement of SQ of two pest management organizations. According to Fryatt (2006), future changes in customer satisfaction in the pest management industry will be driven by changing consumer attitudes, perceptions and expectations which have been suggested as dimensions of SQ. The study is to measure and identify the various variables associated with the four CRM components as described in the three (3) research questions.

3.3.0 Development of the Research Instrument: Questionnaire Construction

This study utilized a survey approved for data collection as shown in Appendix 3.2.0 – Research Tool The data collection for this research is a field study because it examined SQ perception of customers in their natural transaction. The variables under this study were neither controlled nor manipulated and the unit of analysis for this study was customers as respondents. Data were collected by a self-administered questionnaire and analyzed using the special package for the data analysis (SPSS ver. 15). The study was

to measure and identify the variables associated with the four CRM components as described in the three (3) research questions.

According to Sekaran (2000) this survey questionnaire was appropriate, since it was the least expensive, least time consuming and requires fewer skills as compares conducting interviews. The choice of using mailed questionnaires was supported by De Vos et al. (2002). The various advantages in using mailed questionnaires to collect data were basically the cost of distributing the mailed questionnaires as being relatively low and larger sample of the population distributed within a brief period of time when considering the geographical areas that was to be covered. The choice of using mailed questionnaires as the research instrument was discussed in Appendix 3.3.0 - Development of the Research Instrument: Questionnaire Construction.

As stated earlier, the survey instrument for this study is the modified SERVQUAL perception instrument. Thus it is important to determine the context surrounding the Malaysian pest management industry and SQ issues. To ensure the comparability of the data and so that the data analysis can be considered in the same context, this research adopted the five –point Likert scale. The ordinal scales using a five-point Likert the five-point format response scale to measure these variables and determinants of SQ to reduce the frustration level of the respondent patience and thereby increasing the response rate and the quality of the responses.

There have been many studies aiming to develop *Scales* for *measuring customer satisfaction* and to gauge the loyalty factor. In an attempt *to measure* the complexity of a service, the adoption of **the five –point Likert scale** has been carefully considered in order that scales with even numbers force a choice in respondents that may not reflect their true beliefs. The participants were asked to state their agreement/disagreement on a scale of 1 = strongly disagree and 5 = strongly agree. The ordinal scale ranked the variables in such a way to denote differences among the various categories.

The adoption of the five-point Likert scale was carefully considered in order that scales with even numbers force a choice in respondents that may not reflect their true beliefs. A respondent, for example does not have a middle option in a scale using one to four and this forces the respondents to make a more positive or negative choice than what

they may believe. This scale permitted the customer to indicate how satisfied he or she was with the various attributes of a product or service. Respondents were not expected or required to interpret what responses such as "satisfied" and "very satisfied" might mean. It fitted a wide variety of product and service attributes, including those that were subject to variability, those that are not subject to variability, and those for which performance cannot exceed requirements. Most important, the scale elicited responses that do not require interpretation by the researcher as the responses are not ambiguous. Scales with more than 5 options, such as 1-7 or 1-9, can be more confusing and more difficult for respondents to use.

3.3.1 Preparation of Research Instrument

This research investigated the impacts of SQ dimensions and determined the perceived importance and customer satisfaction on each dimension of SQ and the need to determine which service attributes were responsible to minimize customer dissatisfaction. Similarly, it also investigated which of the service attributes add value and increased customer satisfaction. A good understanding of SQ attributes helps management to make better decisions on resource allocation and thus reduces operation costs (Matzler and Sauerwein, 2002).

The SQ factors were first proposed by Parasuraman et al. (1988) were identified as determinants of SQ. Refinements and modifications to the model have been carried out to suit the Malaysian pest control industry, cultural and local service landscape practices in order to obtain the relevant information to achieve the research objective. The detail descriptions of these ten SQ dimensions were shown in Appendix 3.4.0 - Description of the Ten (10) SQ Determinants.

Studies on SQ determinants by Danciu (2007), Gasvin (1984, 1987), Parasumaran, Berry and Zeithamel, (1985, 1986, 1991) have suggested the multidimensional characters of the SQ along ten (10) dimensions are outlined in research framework mapping to the CRM components described in Appendix 3.5.0 - Research Framework Mapping to CRM Components and Linkage to SQ Dimensions to be Measured.

In considering the above determinants of perceived SQ, it was important to view SQ from the customer's perspective. As such, delivering quality service has become an important goal for business organizations and is gaining attention among marketing researchers.

The questionnaires for the respondents were designed for the target population of the pest management companies for this study. To obtain a better understanding of the target population's needs and expectation, the modified SERVQUAL Model was used and then conducted the mapping to the questions. It has to be related to the CRM components to answer the three Research Questions. Appendix 3.6.1 and 3.6.2 shows the mapping between the questionnaire and the modified SERVQUAL Model. The questionnaires were developed based on adaptation from various studies as reflected in the literature sources. The questionnaires chosen and the mapping to link them to the research questions and the variables (Ten SQ dimensions based on modified SERVQUAL) and attributes to be measured are designed for the basis of data collection and analysis as described Appendix 3.6.1 of the research framework mapping to the CRM components.

It was determined that the ten SQ dimensions namely, *Access, Communication, Competence, Courtesy, Credibility, Reliability, Responsiveness, Security, Tangible and Understanding* as independent variables and SQ as dependent variable for statistical analysis.

3.3.2 Data Collection - Questionnaire Survey Implementation

The study will analyze the SQ dimensions and the impact on CRM from the customers' point of view. A questionnaire survey was prepared to obtain the data about the customer's experiences in various service dimensions and expectation of SQ. The questionnaire survey was to develop empirical evidence on the SQ factors which influence customer satisfaction in the context of the pest management organizations. Between customer satisfaction on the one hand and CR and loyalty on the other is CRM Technology and its influence on SQ. These key variables were useful guides to the formulation of the questionnaire as outlined in Appendix 3.7.0 - Organization of the research instrument where questionnaire was formulated.

Therefore, the data collected via a survey questionnaire which was designed to evaluate SQ dimensions. Research participants are the existing customers who have pest control contracts with the pest management organizations selected for the study. They were asked to complete these questionnaires on determinants of SQ.

3.4.0 Target population of Pest Management Service organizations.

In any study, a population is defined as the total group of subjects that meet a designated set of criteria. In this study the target population was narrowed to include all the population about which the researcher would like to make generalizations. As this research dealt with the relationship between changes in SQ attributes and performance, customer satisfaction and customer behaviors, therefore, it is imperative to examine factors affecting customer relationship in light of the current service attribute quality and customer satisfaction paradigm. This sets the criteria for consideration as the target population for the researcher.

The target population remained the pest management industry. Opinions canvassed from industry sectors by the researcher for this doctoral research have acknowledged that the market services for pest control was highly fragmented, with a large number of pest control service providers active in the sector. The industry trend is changing and is by no means considered small. It was estimated that the industry has provided employment for over 15,000 people in the estimated 450 pest management companies. Lee (Malaysian Business, 2004) opinioned that the pest control business is a service-driven industry and a fairly lucrative business to venture into, judging from the low capital needed to set up a company. Essentially, it is driven by the ability to provide good service and solve pest problems.

However, Lee (Malaysian Business, 2004) cautioned that the industry being service-driven, a good reputation is often required before one actually sees the company beginning to prosper. While it is a low-capital lucrative multi-million ringgit industry that is often underestimated by many young entrepreneurs but the need to be honest is important to survive this business.

3.5.0 Sampling and Target Sample of Study

In carrying out the study, sampling was the process of selecting a portion of the population to represent the entire population (Polit and Hungler, 1999, p. 714). The selection of the sampling method to use in a study depended on a number of related practical issues. This included considering the nature and objective of this study, the time and budget resources available.

A deliberate process to select small samples that were chosen to represent the desire population was adopted. As the measurements will be quantitatively measured, there is a need to randomly select individuals from the accessible population because manipulations, control and generalization of findings were not the intention of this study (Streubert and Carpenter, 1999, p. 22). The most common traditional sampling method were used for this study i.e. the non- probability sampling. The approach in using non-probability sampling provided a range of alternative techniques based on the researcher's subjective judgment and the selection of elements for the sample was not necessarily made with the aim of being statistically representative of the population (Saunders *et. al.,* 2003).

Purposeful sampling in the method used in the identification of the target sample of this study. The researcher was given access to the customer records of PDM and FMS as described in Appendix 3.8.1 and 3.8.2. This study confined the respondents to customers of the two pest management organizations, their selection and the choice of these two companies for sample selection in Pest Management Service Organization (in Malaysia) were based on the criteria explain the Research methodology.

i. Both companies have installed similar software for CRM (Termisoft Pty Ltd from Australia) which provided similar platform to evaluate their technological performance. Both companies implemented CRM software (Service Pro software systems) since 1996 and it was considered necessary to confine the respondents to these two companies which had installed CRM Software for ease of tracking of customers and their records.
ii. Both companies are in the same industry for the same period and have similar industry market segments for sample selection. The exclusion of other Pest management companies in this study is due to the wide variability in the market segment of each individual company and the heterogeneity of the market within the industry.

iii. The respondents in these two companies have existing pest control service contracts and they were familiar with the organizations and received services provided. It sought permission to access their existing customers for the study to be conducted.

In the selection of the sample of participants, criteria used were that: they had existing pest control service contracts and they were familiar with the organizations and received services provided by them. Using the list of customer, purposeful selection of every three names chosen in sequential order constituted the study sample. This sampling method provided the way to select specific participants who can be sent the questionnaire survey forms. In total, a sample size of 700 were selected from PDM and FMS. The sample was further categorized into two groups, the first being corporate or commercial clients (550 of them) and the second being household customers (150 of them). The sample size was selected equally based on the group category for corporate or commercial clients (225) and the second being household customers (75) from PDM and FMS respectively. The survey questionnaires were distributed by mail to the 700 participants which seemed to have met the established criteria stated by Spector (1992) and Hair et al. (1995).

This study adopted the survey method and a questionnaire in the collection of data from 700 respondents in a target population of two pest management organizations. Purposeful sampling was used to select the respondents and responses were received through a mailed questionnaire. The responses received were coded for analysis so that the answers for the research questions on customer satisfaction, SQ and CRM technology support, customer loyalty and retention pertaining to pest management organizations can be provided.

3.6.0 The Pilot Study and pre-testing of the questionnaires.

On completion of the questionnaire and before implementation of the study, the researcher had to ensure that the instruments had acceptable levels of reliability and validity. Its contents had to be verified from the perspective of validity and reliability. This was done by pre-testing the questionnaires in a pilot study and was an essential part of any survey (Szwarc, 2007). A pilot test was conducted as a pre-test of the initial questionnaires designed to detect weaknesses in design and instrumentation and to

provide proxy data for selection of a probability sample. The main purpose was to ensure that the questionnaires work the way in which they were intended and the respondents do not have any difficulties in understanding and answering them. According to Cooper and Schindler, (2003), it should, therefore, draw subjects from the target population and simulate that the questionnaires have been designed for data collection.

3.6.1 Validity and Reliability

In this research, the content validity of the measurement of the research instrument was ascertained by asking expert pest managers who were familiar in the areas of pest control service industry to examine the questionnaires and provide feedback for revision. After they reviewed the questionnaire, changes where necessary were made based on their recommendation to clarify and eliminate any ambiguous statements and questions. Their comments on the questionnaires, clarity of instructions given on the questionnaire survey forms and their acceptance will imply whether that the contents measure the variables intended in the research, namely customer satisfaction, SQ and CRM technology support.

Besides validity, the questionnaire had to be tested for its reliability, that is, the consistency of responses by the respondents between two parties with a time interval of a week. For this purpose a pilot sample of 20 individuals (14 representing corporate clients and 6 representing household's individual) having contracts with both the pest management companies was selected to respond to the draft questionnaire. This questionnaire was administered to the 20 individuals and the responses of each of these respondents were correlated to ascertain the degree of reliability. These twenty customers did not participate in the main study. Also, in the pilot test, each questionnaire was examined for its clarity and relevance to the purpose of the research, which resulted in some modifications to the questionnaires.

The purpose of the pre-testing of the questionnaire was to ensure that participants would understand the designed questions and help identify possible problems or redundancy in any of the items with the questionnaire. Minor problems were identified such as typo and grammatical errors, restructure of the format for Section A on the

hierarchy ranking of the service determinants and clearer instructions in some of the instructions to answer needed clarity. Revisions to the minor problems encountered were rectified and amendments to the questionnaire were made to avoid any frustration and low response rates.

The procedures and steps were taken to ensure the validity and reliability of the study is outlined in Appendix 3.9.1.

As discussed earlier, before assessing the SQ it was necessary to establish the validity and reliability of the measurement of the research instrument for data collection. In order to draw any valid inferences from the research, the measures of the variables should have validity and reliability (Nunally, 1978). According to Rosental and Rosnow, (1984), reliability dealt with how consistently similar measures produce similar results and it has the two dimensions of repeatability and internal consistency (Zigmund, 1995). The Cronbach's alpha was used to determine the internal consistency of the items within each of the measurements (Portney and Watkins, 2009). Internal consistency referred to the ability of a scale item to correlate with other items in the scale that was intended to measure the same construct. Items measuring the construct are expected to be positively correlated with each other.

In this research, the instruments scales measuring SQ were checked for reliability by determining Cronbach's alpha and an alpha value of 0.60 or greater was considered acceptable. According to Schuessler (1971), a scale was considered to have good reliability if it has an alpha value greater than 0.60.

After the data collection was completed, the content validity of the customer satisfaction and SQ attribute measures was assessed by descriptive analysis. Frequencies and descriptive statistic (mean and percentage) were used to explore information about the distributions of variables to describe the industry respondent's background, including the means scores, standard deviation, frequencies, percentages, correlation of the response values to provide better understanding of the variables and to profile the respondents' demographic characteristics, customer satisfaction, SQ and their relationship with the four components of CRM. Variance and standard deviation were obtained to measure variability around the mean of a distribution.

Subsequently, Factor Analysis was used to gain insights into service quality determinants within SERVQUAL and their relationship with demographics to examine the dimensionality of these variables. The approach was supported by similar study conducted in the Malaysian Hotel Industry by Kasim and Minai (2009) on CRM linking the CRM strategy, customer performance measures and performance. The aim of factor analysis is to condense the number of attributes into smaller set of factors to help understand what impacts on overall customers' perception of the services provided. This technique was used to condense (summarize) the information contained in a number of original variables (items) into a smaller set of new, composite dimensions or factors with a minimum loss of information. Such analysis provided an empirical assessment of the interrelationships among items in a variable in forming the conceptual and empirical foundation of a summated scale (Hair et al. 1998). Factor Analysis was resorted to satisfy the need of identifying structure through data summarization and data reduction allowing for identifying the customer satisfaction dimension.

Because factor analysis provided evidence of the dimensionality of a measure, factor analysis with a verimax rotation was used to determine the number of factors contained in the research. An eigenvalue greater than 1 was considered to indicate the presence of an interpretable factor so the factors with eigenvalues greater than 1 were taken into account for interpretation. Factor loading values indicated the strength of relationship between each item and each factor. Values greater than 0.3 are considered to be substantial or salient; however, factor loadings of 0.50 or greater were considered to be practically significant (Hair et al. 1998). Thus, a factor loading value of 0.40 was used for the cut-off point for this research.

After determining the various construct and variables by factor analysis, Pearson correlation coefficients among the constructs were calculated. It was important to know if the independent variables in a regression were correlated, because multicollinearity was a threat to the interpretation regarding the influence of independent variables on the dependent variable in the regression (Pedazur, 1982). If independent variables were highly correlated, the influence of each of the independent variables on the dependent variable may be misinterpreted. Multicollinearity was a problem that occurred with regression analysis when there is a high correlation of at least one independent variable

with a combination of the other independent variables or it simply refers to high correlation among the independent variables. This occurs when too many variables have been considered in the study and a number of different variables measure similar phenomena. Such existence of multicollinearity affects the study as well as the interpretation of the results. Therefore, it was important that the examination of the correlation matrix among independent variables were the first diagnostic tool for the multicollinearity problem; however, multicollinearity among more than two independent variables will not exhibited by simple correlations alone.

In order to determine which dimension the customer perceived to be important, this research study used correlation analysis to determine the strength of the relationship between each individual dimension and overall satisfaction with the services. Correlation analysis and factor analysis were conducted to determine the existence of inter-relationships between dimension and clustering data into identifiable components which were necessary before proceeding further with causal analysis.

Correlations and regression analysis were given information on validity of the service quality attributes and the relationship between them. As the scales used are ordinal, Spearman's Rank Correlation which is a technique used to test the direction and strength of the relationship between two service attributes were employed. Also one way between groups' analysis of variance test (ANOVA) and the application of multivariate analysis of variance (MANOVA) methods were carried out to compare the mean factor scores for all the contributing dimensions on the demographic variables. The one-way ANOVA test was performed to determine whether there existed a significant difference in terms of the customer's perception of pest management service quality dimensions and satisfaction among the demographic variables in this study. ANOVA confirmed the significance of variance for each group and those for the total sample.

Another diagnostic tool used was eigenvalues of the correlation matrix. If one or more near linear dependencies existed in the data, then one or more of the eigenvalues will be small. The strength of the linear dependency is indicated by the nearness to zero of the smallest eigenvalue (Hwang, 1996). Multicollinearity is often measured by the ratio

of the largest to the smallest eigenvalue, which is called the condition number of the correlation matrix.

3.7.0 Rate of Return of Responses

Prior to sending out the questionnaires, the study was guided by the procedures adopted on the mailing of questionnaires described in Appendix 3.9.2. The survey questionnaires were distributed via mail to all selected population who has met the sampling criteria for optimizing questionnaire return rates according to Dillman (2000) was adopted to ensure a high rate of return. A total of 700 questionnaires were sent out to the targeted sample population for the survey. Earlier efforts to send out second reminder were done in order to increase the response rate. After two mailing attempts, the number of usable and valid questionnaires received was a total of 130. This represented an effective response rate of 15%. Although the number of responses from the survey were rather low, it was considered acceptable for the pest management industry. The response rate was acceptable by industry standards as Malaysians generally were unenthusiastic respondents to surveys.

3.8.0 Issue of Ethics in research

Ethically, the researcher must recognize the responsibility for the proper design, methodology and careful execution of the research in such a way that the findings have a high degree of validity. The research participants should at all times be treated respectfully and courteously and their selection to be solely based upon the criteria for inclusion in this study. It was critical for the researcher to seek informed consent before conducting the study.

The participants were informed of the purpose of the study, use and storage of the findings once the study has been completed, and that participation was on a voluntary basis. Essentially, this requires the researchers to ensure that the nature of data collected were appropriate and steps taken to ensure confidentiality and data collection procedures were anonymous.

Research ethics refers to the application of moral standards to decisions made in planning, conducting and reporting the results of research studies (McNabb; 2004, p. 55). He further emphasized that the ethical principles to be respected in research are truthfulness, thoroughness, objectivity and relevance. Therefore, data collection procedures needed to be organized both to maximize the quality of data and to deal with the related issues of access and ethics. Since researchers cannot demand access to people, situations or data for research purposes, assistance and permission were involved. These were necessarily linked to ethical issues.

CHAPTER 4.0 ANALYSIS OF DATA

4.1. Revisiting of Research Problems

This chapter presented data that were collected by a questionnaire survey. Data analysis consisted of examining, categorizing, tabulating, or otherwise recombining the evidence to address the initial propositions of a study (Yin, 1994). The data were analyzed using descriptive and inferential statistics, to find answers to three research questions posed in this study. The main variables in the three research questions relate to customer satisfaction, SQ and CRM components, and customer retention and loyalty.

4.2 Coding of Data

Firstly the examinations of the primary raw data collected were carried out to ensure the accuracy of the data analysis. The collected questionnaires were screen for completeness. Any incomplete questionnaire was rejected. This involved screening and cleaning before they can be analyzed. The procedures were in accordance with Tabachnick and Fidell (2001), where two broad categories of problems were discussed i.e. case-related issues (such as the accuracy of the data input, missing observations and outliners) and distribution issues (such as normality).

The next step were to code the questionnaire responses according to rank order and Likert 5.0 scales where appropriate, following which the data were tabulated and entered into SPSS statistical software ver. 15. The convenience of SPSS software to facilitate the coding of these questionnaire data by keying in the entry of the responses directly into the computer helped to avoid confusion, especially when there were many items and a large number of questionnaires as well. It was easy to transfer responses directly into the SPSS data sheet. Details of the procedures to code the questionnaire responses are discussed in Appendix 4.0 - Coding of Data for questionnaire responses

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4.3 Statistical Analysis

In the analysis part, the statistical package named SPSS ver. 15 was used. Data were first keyed in on the SPSS worksheet before the analyzing steps began. SPSS program provided an easy task for researchers in evaluating and managing information gathered

from primary data. In addition, it provided a lot of useful statistical tools for evaluating the data collected from the questionnaire survey. Three major statistical analysis tools used in this study were descriptive analysis and internal-consistency reliability analysis (Cronbach's Alpha) and statistical inference analysis.

Initially, descriptive analysis in the form of frequency counts, percentages, means and standard deviation were checked to obtain an overview of the pattern of respondents provided in Section 1 and 2 of the marked questionnaires. Subsequently, Factor Analysis were used to gain insights into SQ determinants within SERVQUAL and their relationship with demographics. Regression analysis has used to determine the relationship between and among SQ dimensions.

For this reason, the study by Mohammed, Rashid and Tahir, (2014), considered the use marketing capabilities (planning and implementation) as mediators between CRM technology and organization performance. The study surveyed a sample of 447 hotels firm in Malaysia and used correlation and regression for analysis of data and testing. The findings suggested that CRM technology were associated with the four dimensions of organization performance (i.e. financial, customer, internal process and learning and growth). The findings by Mohammed, Rashid and Tahir, (2014), revealed that marketing capabilities (planning and implementation) played a mediator role in the relationship between CRM technology and various dimensions of organization performance.

The procedures and methodology for the statistical analysis were discussed in Appendix 4.1 - Statistical Analysis.

4.4.0 Descriptive Analysis

Descriptive analysis was conducted to answer the main objectives of the study. The data was analyzed and statistical testing conducted in order to assess the relationship of the four CRM components responsible for SQ determinants in the context of the pest management service in Malaysia. Moreover, the descriptive analysis also served as the basic foundation for determining the association between the independent and dependent variables of the study. The Tables and Figures depicting the data analysis

and statistical outcome were described in detail in Appendix 4.2 - Descriptive statistics and details analysis.

4.4.1 Summary of the Demographic and Other Profiles.

4.4.2 Gender of Respondents by Age - The majority of the respondents were between 26 to 35 years of age (30 per cent), followed by the age groups of between 36 to 45 years (27 per cent) and those between 46 to 55 years accounts (24%). About 18% of the respondents were above 55 years.

4.4.3 Types of Property under Pest Control Maintenance – It was noted that a third of the respondents who have pest control maintenance contracts were individual owners of private apartment units, private residence, and home dwellings which accounted for about 36%. The commercial shop houses, office buildings, Hotels & resorts, and apartment buildings accounted for 18%. Following closely were the warehouses, factories/ and manufacturing plants which made up 17% of the total pest control maintenance contracts. In total, commercial sector accounted for an estimated 64% while the private and individual property owners account for 36% of the pest control maintenance contracts.

4.4.4 Type of Pest Treatment and Services - The findings of this study showed that 92% of the services provided are basically for general pest control contract service and this indicated that the basic nuisance and common pest problems. The demands for such contract service were very competitive and broad across the wide spectrum of commercial and private individual property owners. However, it was noted that 5% of the pest services provided were for Anti-Termite control. As indicated by the study, Anti-termite control was ranked second in demand as most property owners were not aware of the termite problem until an infestation was detected and it was notoriously difficult to prevent such damages due to the lack of soil treatment by housing developers during the construction stages.

4.4.5 Frequency of Pest Services - The demand for MONTHLY frequency seemed to be the main choice and they accounted for 43% of the respondents. This was followed by BI-MONTHLY frequency by 28% of the respondents. The frequencies

were also dependent on the types of property, buildings and business sector. Table 4.2 summarized the frequency used by customers in this study. The higher frequency required for the restaurants and hotel sectors were attributed to the standards required and specified by HACCP compliance and Goods Manufacturing Practices (GMP) for the food exporters which was a growing trend globally and the need to comply with the local municipal laws (Ministry of Health, Local Municipal Council and such related governing authorities). The descriptive statistics as depicted in Figure 4.3.0 *(see Appendix 4.2, page 163)* on the frequency used by customer, showed that the demand for monthly pest services from the hotels, service apartments and resorts were higher due to the fact that any risk of pest issues experienced will affect the reputation of the hospitality sector.

4.4.6 Annual Contract Value of Pest Services - Overall, about 42% of respondents have individual annual contracts of less than RM 1000, followed by 25% of respondents with contract values ranging from RM 1001 to RM 5,000 per annum (Table 4.3). The findings also revealed that the highest contributor (42%) to the total contract value was derived from the category. A cross tabulation of the types of property under pest control maintenance against service contract showed that 37% of the annual contract was from this category of individual private apartments units and private residence or home owners.

Both the Hospitality sector and manufacturing industry contributed a total of 34% to the annual contract. The findings revealed that 52% of the annual contracts were entrenched in the commercial sector while individual private customers accounted for 37%. Such contrasting customer profile resulted in different customer expectations of SQ. However, a contrasting observation was the high proportion of respondents (25%) that have used the pest services for more than 9 years. The analysis of the data showed a total of 43% of respondents who have pest services exceeding 5 years have remained loyal customers as a result of earning customer's satisfaction (see Table 4.4). This category of customers has remained loyal for more than 9 years and will become repeat customers spreading positively by word-of-mouth their satisfaction of services rendered. It will benefit the company to invest time and resources in engaging this category of loyal customers.

Research Question 1:
What are the SQ determinants which influence customer satisfaction in the pest management service company?

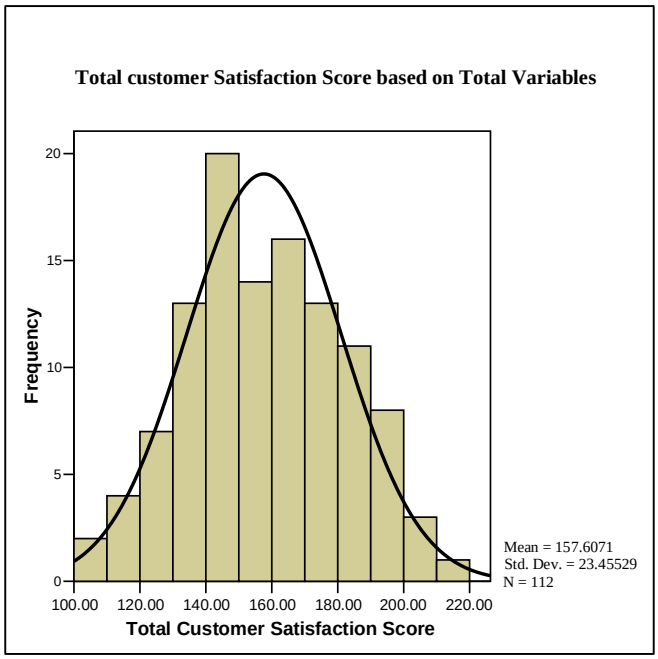
The first research question posed was what were the SQ determinants which influenced customer's satisfaction in a pest management service company? The total customer satisfaction score was computed from the responses of the 45 questions in the marked questionnaires. Appendix 4.3 shows a summary of the total satisfaction score including the mean values ranging from a high of 3.78 (Question C23) to a low 2.90 (Question C33) on a 5 point Likert scale. Table 4.5 and Figure 4.6.0 showed the detailed calculation of the total Customer satisfaction score from grouped data. According to Geetika (2010) SQ can be measured in terms of customer perception, customer expectations, customer satisfaction and customer attitude. Sachdev and Verma (2004) support this view and indicate that the evaluation of SQ leads to customer satisfaction.

Table 4.5 Overall Total Customer Satisfaction Score

Mean	157.6071
Median	156.0000(a)
Mode	183.00
Std. Deviation	23.45529
Variance	550.151
Range	112.00
Minimum	106.00
Maximum	218.00
Sum	17652.00

Source: Calculated from grouped data.

Figure 4.6.0 - Total Customer Satisfaction Computation



Each of the 45 items was designed to measure specific SQ attributes which relate to the four CRM components. The total customer satisfaction score for the service determinants were derived from the computation of the ranking of SQ determinants. The respondents were asked to rate their level of satisfaction and agreement for a given service based on a five-point scale.

4.5.0. Ranking of Determinants of SQ

Van Iwaardenm and Van der Wiele (2003) used the mean score to rank the importance of each dimension of SERVQUAL and clustered the aspects of SQ to show how they were compatible with these factors. Maher and Clark (2005) have also used the SERVQUAL ranking of the service determinants which investigate differences in customers' response. The hierarchy ranking were based on the lowest mean score as in selecting the SQ determinants, the respondents were instructed to rank every item (known as SQ determinants) and use each ranking number only once in order of importance. 1 = highest importance and 10 = lowest importance. Table 4.6 illustrates the ranking based on their relative importance scores.

Table 4.6 Descriptive Statistics (Hierarchy Ranking for SQ Determinants)

Ranking	N	Range	Min.	Max.	Sum	Mean*	Std. Deviation	Variance
(a) Reliability	129	9	1	10	404	3.13	2.479	6.147
(b) Competence	129	9	1	10	441	3.42	2.304	5.308
(c) Responsive	129	9	1	10	457	3.54	2.453	6.016
(d) Credibility	129	9	1	10	592	4.59	2.588	6.697
(e) Access	129	9	1	10	626	4.85	2.719	7.392
(f) Communication	129	9	1	10	637	4.94	2.763	7.637
(g) Understanding	130	9	1	10	650	5.00	2.719	7.395
(h) Security	130	9	1	10	659	5.07	2.897	8.391
(i) Courtesy	129	9	1	10	687	5.33	2.927	8.565
(j) Tangibles	129	9	1	10	762	5.91	3.188	10.163

4.5.1 Discussion on SQ Determinants

In determining the relative importance of the determinants of SQ , the lowest mean score and lowest total sum were used as in selection. In using the SQ determinants ranking and total satisfaction score, the finding indicated that the customers surveyed in the study placed great emphasis on the Reliability, Competence and Responsiveness (Table 4.6). These determinants were considered to be very important in the quest to achieve high SQ in the provision of pest services

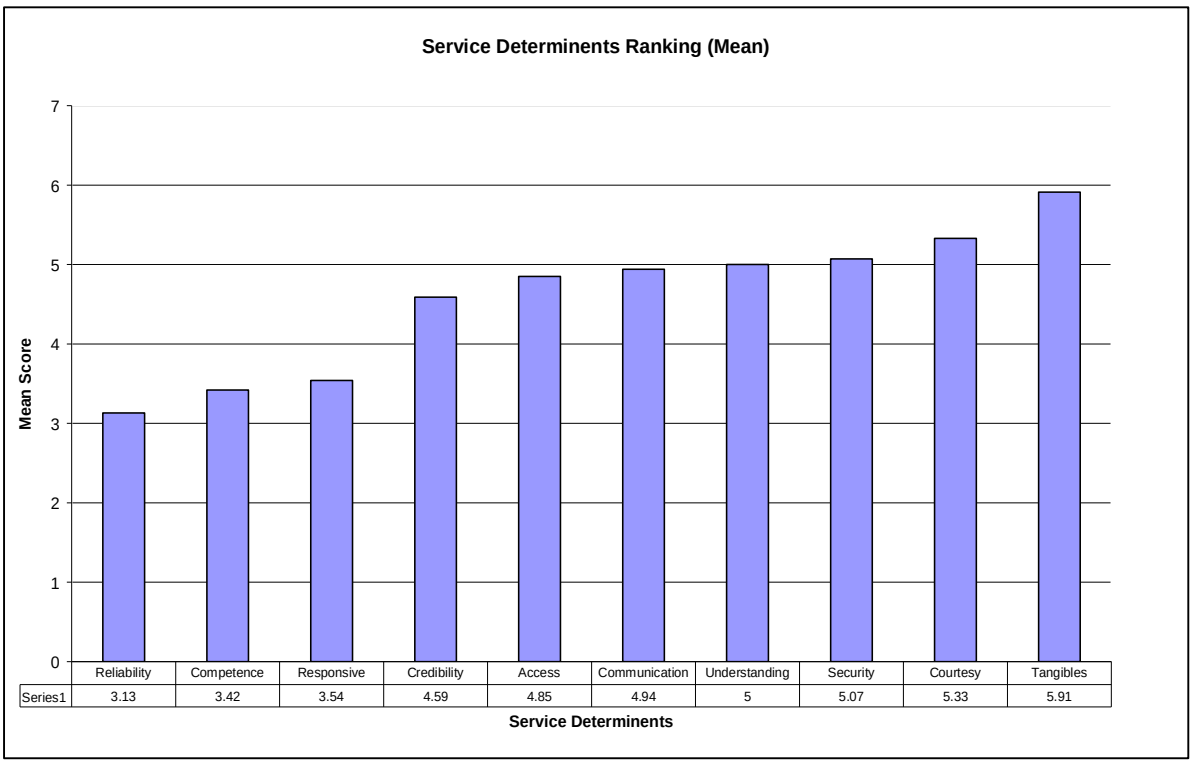


Figure 4.7.0 Rank order of Determinants of SQ .

Figure 4.7.0 showed that **Reliability** scored the lowest mean value of 3.13 and was regarded as the most important SQ attribute in the pest service. The reliability dimension relate to being dependable and "doing what is promised. It is important as it indicated that the pest service company was dedicated, efficient and committed to serve customers which otherwise can cause considerable inconvenience. The finding concurred with that of Gronroos (1990) and Hernon and Nitecki (2001) who reiterated that "customers know that whatever takes place or has been agreed upon, they can rely on the service provider, its employees and systems, to keep promises and perform with the best interest of the customer and defining it as an act to conform which enhances SQ.

The ranking of **Competence** scored a low mean value of 3.42 and was recognized as important by Danciu (2007) who concurred that competence depended upon possession of the required skills and knowledge to perform the service. According to Gronroos (1990), competency was demonstrated when in the pest services industry, staffs need knowledge, skills and considerable experience to carry out their arranged tasks competently so as to satisfy the needs of their clients.

Responsiveness scored a low mean value 3.54 and measured the willingness of staffs to help customers and provide prompt services (readiness of employees) which involved timeliness in keeping of scheduled appointments. Behaviors such as responding promptly to pest complaints and contacting customers for subsequent appointments were good business practices. Such findings concur with those of Gronroos (1990) where the customers appreciate service and interested to solve their problems in a spontaneous way.

An equally important dimension relating to SQ is **Credibility** which scored a mean value of 4.59. Credibility involves trustworthiness, believability and honesty. The companys' reputation and the ability of the pest management company to convey confidence, trustworthiness and integrity is a reflection of the credibility of the company. Szwarc (2005) argued further that "satisfied customers are more likely to 'promote' the company, because satisfaction is something people will talk about". Zairi (2000) reported a similar finding and concluded that satisfied customers were most likely to share their good experiences with others.

Access as a SQ determinant was ranked mid-way with a mean value 4.85. Accessibility enabled customers to deal with the company without much difficulty and staffs were approachable and were contactable by the customers easily for prompt service problems.

Communications dimension scored a mean value of 4.94. Through effective communication it can reduce the customer's uncertainty and assurance that the customer's problems will be attended to promptly thus increasing the customer's satisfaction. From the survey, the respondents appreciated clear and simple information such as the computerized invoices generated provided accurate and clear information in the billing of services.

The dimension of **Understanding** with a mean value 5.00 implied that the staffs showed sincere interest in solving the service problems and were flexible enough to provide services according to customer's need. The study showed that customers appreciate the fact that the company takes the initiative effort to meet service deadlines in order to satisfy customers. This showed understanding on the part of the company.

The findings also showed that **Security** dimension scored a mean value of 5.07. Security relates to physical safety, financial security and confidentiality. It is rather a surprise finding that security relating to safety from danger and physical harm in the operations of services by the employees was not rated highly.

Courtesy scored a mean value of 5.33 and this dimension referred to politeness and friendliness of employees who delivered the services. The respondents expected the employees to have a pleasant behavior, good interpersonal skill and respect for the customer in the process of providing the services.

Tangibles are for the most part irrelevant as a measurement of SQ dimension as the customer usually communicated through email, telecommunications and facsimile. Therefore, the customer does not have an opinion about the physical facilities, equipment's and chemicals used to deliver a service. The act of providence of pest services involved the customer as an active participant in the service process and the pest treatment job carried out at their premise or property.

4.5.2 Relative Importance of the Service Determinants

In analyzing this particular research question, a comparison was made between the attributes of SQ as perceived by the customers surveyed in this research and the ten SQ determinants known as the modified SERVQUAL model. All of the above determinants related to service dimensions were found to be relevant to pest management sector. The findings showed that Reliability, Responsive and Competence occupied the top three ranks in terms of relative importance to the SQ with a mean score 3.13, 3.42 and 3.54 respectively, whilst the mean score for other attributes have wider gaps.

The results indicated that these respondents expected reliable service followed by the responsiveness which measured the promptness in providing service and competence indicating that pest services to be provided will be an effective solution. The findings have shown that these SQ determinants can influence customer satisfaction in the pest management service company and has to be taken into consideration to maintain high SQ standards.

4.6.0 Inferential Statistics

4.6.1 Internal Consistency Reliability (Cronbach's Alpha)

The mean score for these SQ determinants were obtained for comparison purposes. Subsequently, all determinants factors were analyzed and categorized into the various CRM components. Reliability test were conducted for each dimension to obtain the Cronbach's alpha coefficient as the indicator of internal consistency.

One of the reliability statistics used today is that of Cronbach's alpha which was used to determine the internal consistency or average correlation of items in a survey instrument to gauge its reliability (Cronbach, 1951). Cronbach's alpha determines the internal consistency or average correlation of items in a survey instrument to gauge its reliability as it indicated how well the items in the set were positively correlated to one another (Santos, 1999). It is the most common form of internal consistency reliability coefficient used where the Alpha value equals zero when the true score was not measured at all and there was only an error component. Alpha value is equal to 1.0 when all items measure only the true score and there is no error component.

Therefore internal consistency was used to estimate based on the correlation among the variables comprising the 45 questionnaires set. The reliability was actually estimated from the consistency of all items in the sum scales, the reliability coefficient computed in this manner was also referred to as the internal-consistency reliability. Accordingly, Bryman and Cramer (1990) have indicated 0.8 or higher to be an acceptable reliability coefficient. It was considered "acceptable" in most social science research situations but lower thresholds were sometimes used in the literature especially for initial investigations (Nunnaly,1978). Alpha Cronbach test has also been taken for the set of 45 items (SQ dimensions). The resulting coefficient of 0.97 and confirmed the reliability of the survey questionnaire in this study as shown in Table 4.7.

Table 4.7 Results of the Alpha Cronbach Test on 45 Items on the Questionnaires.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
0.970	0.971	45

Research Question 2:
To what extent is the length of service contract dependent on total customer satisfaction in the pest management service company?

The second research question investigated to what extent customer loyalty (determined by service contract length) is dependent on total customer satisfaction. The survey question from the demographics section which was designed to capture the period of pest control contract the respondents have with the pest management company. The variables were measured on five interval scales for selection by the respondents which were selected based on the dependent variable. (See Appendix 3.2 Research tools – Section 2).

The length of the contract offered in terms of the number of years to the pest management company by the customer represents his or her level of loyalty. Pearson correlation was used to ascertain the relationship between customer loyalty (number of years of contractual offer) and customer satisfaction. The length of the contract and loyalty were taken as indication of customer satisfaction and quality of pest services received from the pest management company was high resulting in continuous contraction extension which was regarded as customer retention. This was used as the dependent variable in the analysis.

As described earlier in Table 4.5 the analysis showed that 25.4% of the respondents have service contracts and remained more than 9 years with the company indicating these category of loyal customer remained with the company for reasons of convenience and familiarity with the company indicating some degree of trust and satisfaction for the SQ expectations over the years.

In order to obtain the Total customer satisfaction, the ten individual SQ determinants were used as their score were independently collected by ranking from the respondents and has no distinct relationship with the 45 variables. This hierarchy of service determinants were earlier described in section 4.5.0 (Ranking of determinants of SQ) and these total scores of the service determinants variables were identified as TCS-SD score.

4.6.2 Correlation of Determinants of SQ

The findings of this study shows the dimensions of SQ of importance in influencing customer satisfaction are reliability, responsiveness and competence. A correlation analysis were undertaken to show the relationship between the service determinants (Reliable, Responsive, Competence, Communication, Access, Courtesy, Credibility, Security, Understanding and Tangibles) and Total Customer Satisfaction. **The findings indicated that most of the service determinants were highly correlated with customer satisfaction as depicted in Appendix 7.0.**

The result by the correlation analysis **Spearman's Rho for the top three Service** showed that the dimensions of **Reliability, Responsiveness** and **Competence** were significantly correlated at the 0.01 level (2-tailed). This result as shown in Table 4.8.1 was consistent with the ranking of the determinants of SQ by the respondents discussed earlier in section 4.5.0.

Table 4.8.1 Correlations - Spearman's Rho for the Top Three Service Determinants

		Reliability	Responsive	Competence
Reliability	Correlation Coefficient	1.000	.607(**)	.668(**)
	Sig. (2-tailed)	.	.000	.000
Responsive	Correlation Coefficient	.607(**)	1.000	.529(**)
	Sig. (2-tailed)	.000	.	.000
Competence	Correlation Coefficient	.668(**)	.529(**)	1.000
	Sig. (2-tailed)	.000	.	.000

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

4.6.3 Pearson Correlation to Determine the Relationship between Customer Loyalty and Customer Satisfaction

A regression analysis was then conducted to determine to what extent is customer loyalty dependent on customer satisfaction and SQ. Initial investigation using correlation analysis indicated the two variables were correlated (0.029). However, the p-value (0.372) indicated that this correlation was not statistically significant as shown in **Table 4.8.2**. Empirical results corroborated this and were confirmed by the bivariate regression analysis.

Table 4.8.2 Correlations Analysis of Service Contract with Company - Total Customer Satisfaction (SD)

		Service contract with company	Total customer satisfaction (SD)
Pearson Correlation	Service contract with company	1.000	.029
	Total customer satisfaction (SD)	.029	1.000
Sig. (1-tailed)	Service contract with company	.	.372
	Total customer satisfaction (SD)	.372	.
N	Service contract with company	127	127
	Total customer satisfaction (SD)	127	127

Analysis using Bivariate Correlation (SPSS) were tested on the ten SQ dimensions to determine the strength of each of the correlation between the independent variables as shown in Appendix 7.0 – Total Correlation Summary of Service Determinants. The Pearson Correlation output of these independent variables showed that all the Correlation was significant at the 0.05 level (2-tailed).

The Model Summary shown in Table 4.8.3 indicated that both the R2 (0.01) and the F-statistics (0.744) indicated no statistical significant relationship.

Table 4.8.3 Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.029[a]	.001	-.007	1.845

Change Statistics

R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
.001	.107	1	125	.744	1.650

a. Predictors: (Constant), Total customer satisfaction (SD)

b. Dependent Variable: service contract with company

A one-way analysis of variance showed that no statistically significant mean difference existed for the two variables **[F(1,125)=0.107, p<000.1]** as indicated in Table 4.8.4.

Table 4.8.4 ANOVA[b]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	.364	1	.364	.107	.744[a]
	Residual	425.337	125	3.403		
	Total	425.701	126			
a. Predictors: (Constant), Total customer satisfaction (SD)D						
b. Dependent Variable: service contract with company						

Looking at the regression results, the coefficient of the independent variable shown in Table 4.8.5 (Service contract) indicated that it was positively related to Total Customer Satisfaction (SD). However, the t-test indicated that the coefficient is not different from zero. i.e., the relationship was not statistically significant.

Table 4.8.5 Coefficients[a]					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	Std. Error	Beta		
Constant	3.354	.419		7.996	.000
Total Customer Satisfaction (SD)	.003	.008	.029	.327	.744
a. Dependent Variable: service contract with company					

The results indicated that the length of the service contract was not dependent on Total Customer Satisfaction (SD). The implication of this was that the length of the contract may depend on other factors such as homogeneity of the pest industry, customer mind set, low pricing, and a volatile market.

The Pest Management industry is homogenous as being a traditional in service; a majority of the providers have not adopted technology in their business operations. This low usage should be a concern since these technological tools enabled organizations to collect and store vast amount data on customers and their transactions. While, standardization in the pest management industry means the offering similar scope of services, approach to pest treatment protocol, market segmentation and low prices were prevalent to remain competitive in the industry.

Another factor was likely to be a homogenous market where pest services were provided at low prices and "consumers respond in a similar way to such a given set of

marketing stimuli of low prices." This was possible because each pest management firm was so small relative to the whole industry that it has no power to influence prices. The firm faces a horizontal demand curve at the market price. There is also freedom of entry into the pest services market. This means that there are relatively no barriers to entry into the business of pest control and the prevailing mushrooming of new competitors in the market place. Due to these factors, pest management companies competed with each other to provide the services at the lowest price.

SQ may build satisfaction and enhance loyalty to some extent, these being the ultimate goal of a pest management company as a marketing strategy. The respondents in this study who were considered loyal customers and having contracts for more than 9 years were not only accustomed to the same pest service organizations for themselves but also may, intentionally or unintentionally, recommend others to purchase the same services. Moreover, their support of the pest management company suggested satisfaction and trust in the service provided. Some loyal customer remained with the company for reasons of convenience and familiarity. In this sense, in a highly competitive and homogenous market, SQ may not have a vital significance to any customer loyalty.

Research Question 3:

What are the key SQ determinants of the CRM components that foster customer relationship in the context of a pest management service company?

In order to establish the relationship of the SQ determinants with the four components of CRM to foster customer relationship, the analysis will attempt to identify important CRM factors that affect quality of pest services and find out what were the key service determinants.

Factor Analysis was conducted on the 45 questionnaire items to examine the relationship between four CRM components (independent variables) and total customer satisfaction (dependent variable). Factor analysis group variables with similar characteristics together and find latent variables or factors among observed variables and subsequently to reduce the number of variables. The reduced factors were also be used for further analysis.

Regression Analysis was used to examine the CRM components and Total Customer Satisfaction. Regression analysis between independent and dependent variables were undertaken to examine the intercorrelation between them. The linkage and correlation among the four CRM components were used to predict customer retention from the outcome of the total customer satisfaction.

4.6.4 Factor Analysis to Ascertain the Relationship between CRM Components and Customer Satisfaction

For the independent variables, the first stage in factor analysis of all the 45 items involved used the principal component extraction method (plus the Varimax method of rotation). This process generated a correlation matrix for all the variables. A correlation matrix is a rectangular array of the correlation coefficients of the variables with one another. These factors were extracted from the correlation matrix based on the correlation coefficients of the variables. To maximize the relationship between the variables, the factors were rotated.

Table 4.9.0 showed the results of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy Test and produced a result of 0.897. This was significantly high and indicating that the distribution of data values in this research study were qualified for the factor analysis. Bartlett's Test of Sphericity, which is a test for multivariate normality of data distribution showed that the correlation matrix of research data were significantly different from the identity (significant value 0.000). This confirmed that the data distribution were approximately multivariate normal and acceptable for factor analysis.

Table 4.9.0 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.897
Bartlett's Test of Sphericity	Approx. Chi-Square	4036.585
	df	45
	Sig.	990
Correlation Matrix	Determinant = .000.	

Table 4.9.1 is a summary of the results of Factor of Analysis for the CRM Components. The Factor analysis yielded nine components (or factors) that could be associated with the four CRM components (independent variables).

Table 4.9.1 Results of Factor Analysis for Independent variables for CRM Components						
Code	CRM components to be measured	Component				
		F1	F2	F3	F4	F5
PP11	PEOPLE	0.823				
CF10	CUSTOMER INFORMATION	0.791				
PP12	PEOPLE	0.773				
PR12	PROCESS	0.742				
CF9	CUSTOMER INFORMATION	0.736				
CF6	CUSTOMER INFORMATION	0.727				
CF12	CUSTOMER INFORMATION	0.695				
CF11	CUSTOMER INFORMATION	0.659				
CF13	CUSTOMER INFORMATION	0.612				
PR2	PROCESS	0.533				
TC7	TECHNOLOGY	0.513				
PP10	PEOPLE	0.492				
CF8	CUSTOMER INFORMATION	0.476				
PR4	PROCESS		0.753			
PP7	PEOPLE		0.699			
PP3	PEOPLE		0.675			
PP4	PEOPLE		0.662			
PP6	PEOPLE		0.657			
PP5	PEOPLE		0.518			
PR3	PROCESS		0.401			
PR6	PROCESS			0.727		
PP8	PEOPLE			0.668		
TC2	TECHNOLOGY			0.460		
TC6	TECHNOLOGY				0.626	
CF7	CUSTOMER INFORMATION				0.600	
PR10	PROCESS				0.576	
PR11	PROCESS				0.530	
CF4	CUSTOMER INFORMATION				0.481	
CF5	CUSTOMER INFORMATION				0.464	
TC5	TECHNOLOGY					0.655
TC3	TECHNOLOGY					0.620
TC1	TECHNOLOGY					0.560
PR5	PROCESS					0.485
Eigenvalues		19.975	2.828	1.801	1.616	1.530
% of Variance		44.389	6.285	4.002	3.592	3.400
Cumulative % of Variance		44.389	50.673	54.676	58.268	61.667
Note: Explanatory notes on extraction method and Legend						
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 18 iterations. All factor loadings above 0.4 are shown						
Abbreviation:						
PP	CRM component of People	PR	CRM component of Customer Information			
TC	CRM component of Technology	CF	CRM component of Process			

All factor loadings above 0.4 were shown and only five components (or factors) need to be selected based on the scree-plot as shown in Figure 4.8.1 which suggested this from the rapid break occurring between component 3 and 7. The factor analysis produced CRM components for People (9), Technology (6), Customer Information (10) and Process (8) resulting in a total of 33 independent variables. All 33 items were retained for further analysis. [See Appendix 8.0]

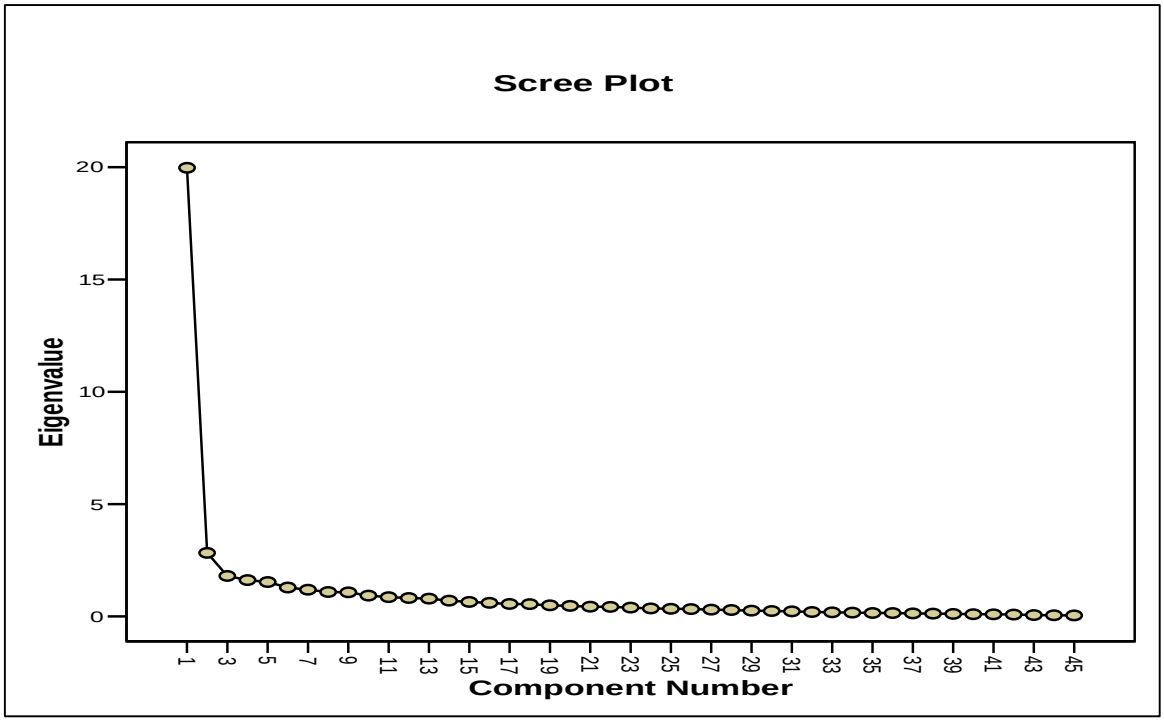


Figure 4.8.1 Scree plot for the eigenvalues of factors for Independent variables

Tables 4.9.1 also showed that all independent variables emerged clean and have the eigenvalues of more than 1.0. The first factor which accounted for 44.9% of the variance consisted of CRM components mainly associated with CUSTOMER INFORMATION (6), PEOPLE (3) and PROCESS (2). The second factor consisted of CRM components mainly associated with PEOPLE (5) and PROCESS (2). The third factor comprised of equally PROCESS, PEOPLE and TECHNOLOGY. The fourth factor that measured the CRM component consisted of CUSTOMER INFORMATION (3), PROCESS (2) and TECHNOLOGY. The fifth factor was made up of TECHNOLOGY (3) and PROCESS.

Some items were noted to be with parallel values within the factors but with heavy loading score will be reasonable to retain them in their respective original factors as it was perceived to be relevant to the measurement of the CRM factors concerned. The selected five factors explained for a cumulative 62.0% to the total variance in the research data. Based on the high percentage obtained and the observations in Table 4.9.1, the construct validity of the independent variables were useful.

The same process of factor analysis were conducted on the dependent variables consisting of the 10 service determinants which were computed to achieve total customer satisfaction. For these dependent variables, factor analysis was conducted for all the 10 items, using the principal component extraction method (plus the Varimax method of rotation).

The results of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy Test and Bartlett's Test of Sphericity are shown in Table 4.9.2. **A result of 0.859 was produced which was significantly high.** This confirmed that the data distribution were qualified for the factor analysis and similarly the multivariate is normal and acceptable for factor analysis.

Table 4.9.2 KMO and Bartlett's Test

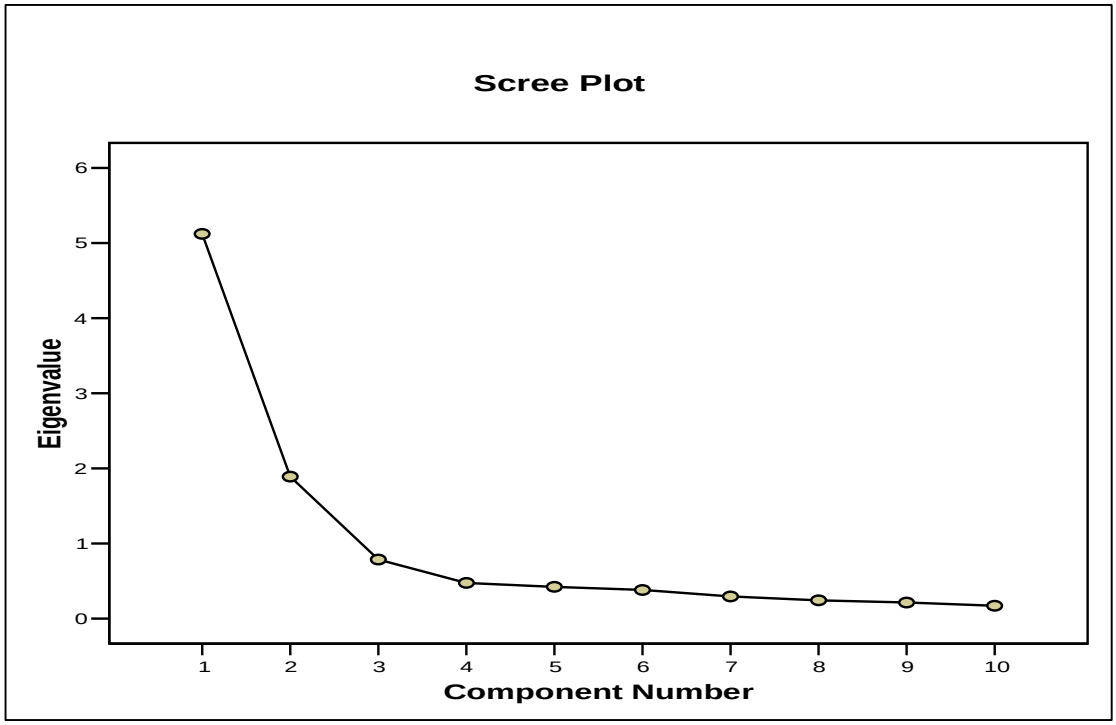
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.859
Bartlett's Test of Sphericity	Approx. Chi-Square	802.704
	df	45
	Sig.	.000
Correlation Matrix	Determinant = .002	

From the results of the Factor Analysis in Table 4.9.3 below, it was noted that two factors were extracted from the factor analysis conducted. The table showed that the dependent variables emerge cleanly and have eigenvalues greater than 1 and explained the high 70% of the variance that were responsible for these data. This strong eigenvalues could be due to previous analysis which showed a significantly high correlation among the service determinants.

Table 4.9.3 Results of Factor Analysis for Dependent Variables for SQ Determinants			
		Component	
Code	**SQ Determinants**	**1**	**2**
SD1	Tangibles	0.875	
SD2	Courtesy	0.818	
SD3	Communication	0.810	
SD4	Security	0.778	
SD5	Understanding	0.773	
SD6	Access	0.624	
SD7	Reliability		0.933
SD8	Competence		0.893
SD9	Responsive		0.768
SD10	Credibility		0.605
Eigenvalues		5.121	1.890
% of Variance		51.213	18.902
Cumulative % of Variance		51.213	70.115
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 18 iterations. All factor loadings above 0.4 are shown			

These dependent variables have high loadings as evident in **Factor 1** with Tangibles (0.875), Courtesy (0.818), Communication (0.818), Security (0.778), Understanding (0.773) and Access (0.624) which accounted for almost 50% of the variance. While it can be observed that Reliability (0.933), Competence (0.893), Responsiveness (0.768) and Credibility (0.605) were substantially loaded on **Factor 2** and were responsible for 19% of the variance.

All factor loadings above 0.4 are shown and only two components (or factors) needed to be selected based on the scree-plot (Figure 4.8.2) which suggested this from the rapid break occurring between component 1 and 3



.**Figure 4.8.2 Scree plot for the eigenvalues of factors for dependent variables**

4.6.5 Regression Analysis of CRM Components and their Contribution in Fostering Customer Relationship

4.6.5.1 Intercorrelation Analysis

Correlation and regression analysis were used to find the association between the CRM components and customer retention. This will initially involve an analysis to determine the association between the independent variables (CRM components) and the dependent variables (SQ Determinants).

4.6.5.2 Intercorrelation between Dependent and Independent Variables

The correlation between pairs of variables was assessed to see the linear relationship between them. The output of the correlation coefficients value varies between -1 and 1, with 0 indicating no relationship, 1 a perfect linear relationship and –1 a perfect negative relationship. The direction for the common in-depth analysis after the factor loadings completed will follow the guidelines from Pareto Chart to ANOVA 1-way to regression analysis (Figure 4.8.3). This approach gave a general view and focused on the smaller areas of significance importance identified in this study and the key potential variables that may require further investigations

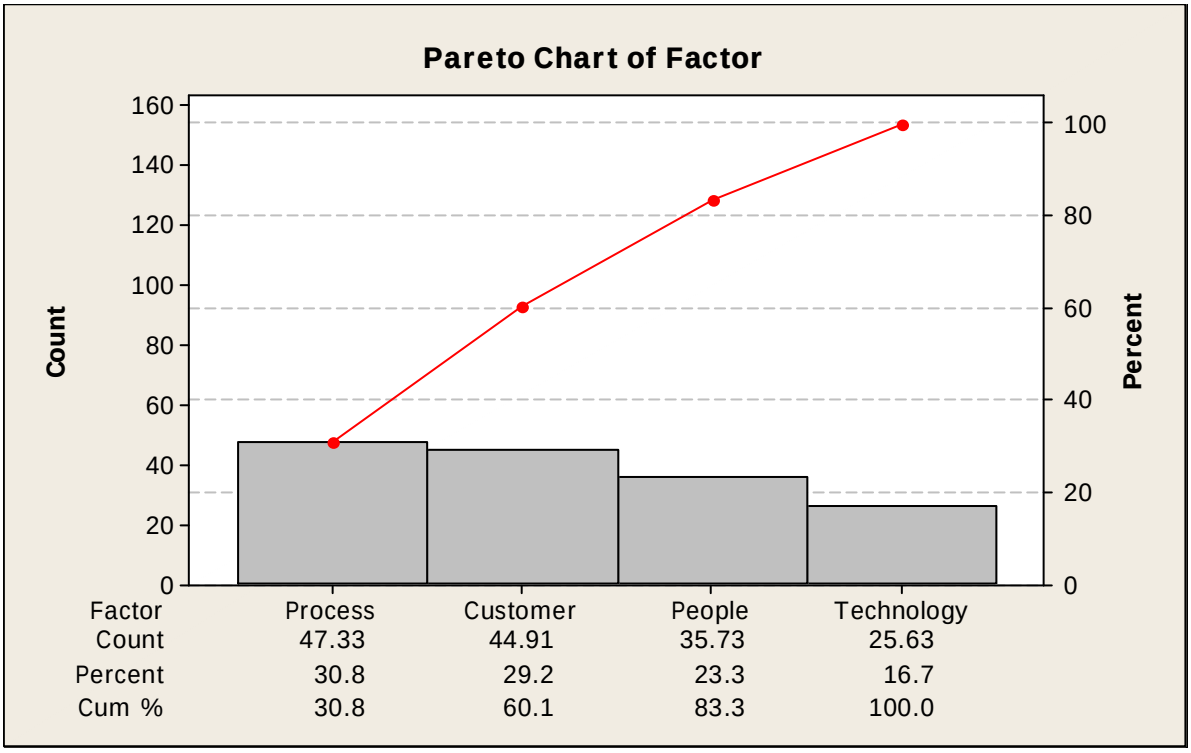


Figure 4.8.3 Pareto Chart of the CRM Factor – PP, PR, TC and CF

In the data analysis, all the 45 items were grouped into the four CRM components (People, Process, Customer Information and Technology). These four components were not equally distributed to provide equal loading to the outcome. After the grouping were carried out, the data were subjected to regression analysis to find out which component will provide statistical significant influence.

The findings showed that the CRM factors and total customer satisfaction (TCS) is highly correlated. Pareto analysis indicated that Process (PR), Customer Information (CF) and People (PP) were more important than Technology (TC). However, the regression analysis indicated that Technology (TC) was most important and People (PP) was removed from the model. This was because all the independent variables - Technology (TC), People (PP), Process (PR) and Customer Information (CF) were highly correlated. This will cause collinearity problem or some covariance that were unrecognized. Therefore, simple analysis like a Pareto chart will not provide in-depth analysis. To establish any relationship of the CRM components, regression analysis was a better choice.

Regression analysis conducted did not provide the model equation that best explains the correlation of the four CRM components. Modification were carried out to the original data contain, N=130 and more than 18 missing response data were observed and one particular outliner (data No 122). The first step was to remove all the no response data totaling 18 and followed by removing the outliner data and new data for analysis N = 111. A graphical Summary of the new data after modification was presented in Figure 4.8.4.

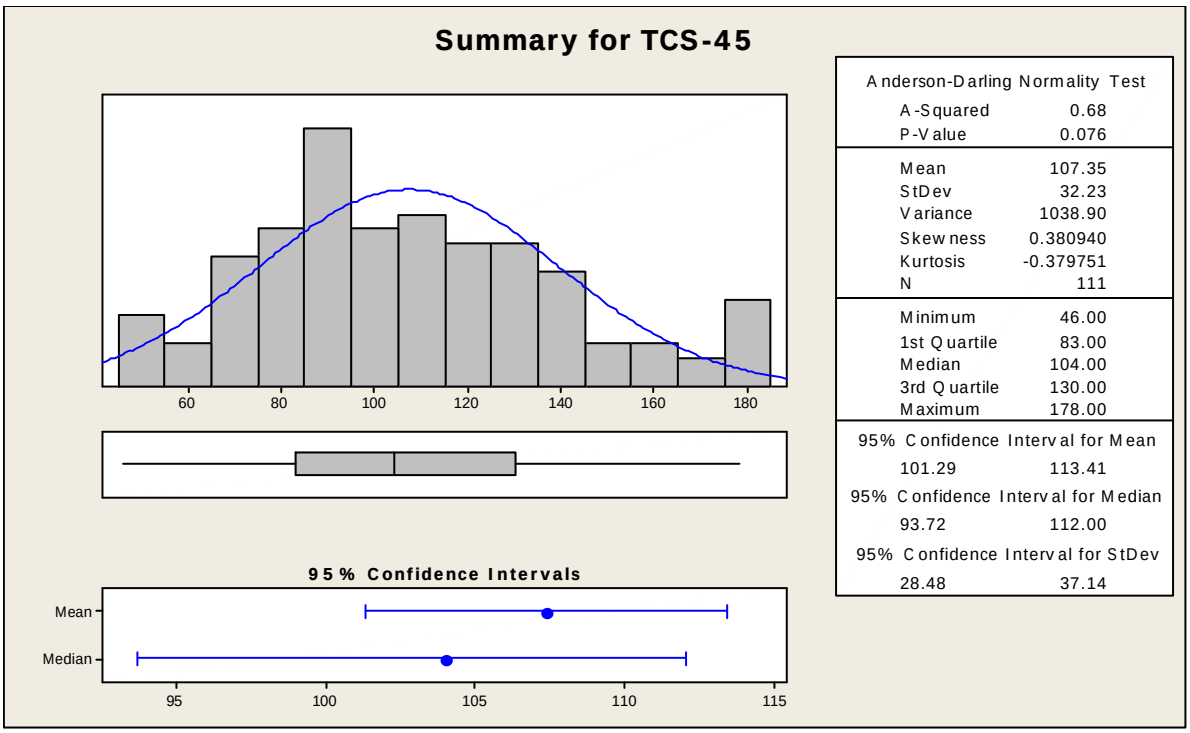


Figure 4.8.4 The Summary for TCS 45 (after Modifications)

The Correlations Matrix Table 4.9.4 below displays the correlation matrix between the independent and dependent variables. The statistical result showed that all the variables were highly correlated. A summary of the output showed the following:

(a) Technology (TC), People (PP), Process (PR) and Customer Information (CF) were highly correlated and statistically significant since p-value< 0.05
(b) Due to the nature of the data which were highly correlated, any model derived will have collinearity or undeclared covariate problem.
(c) **The Matrix plot (Figure 4.8.5)** graphically showed the output of the high correlation among the variables - Technology (TC), People (PP), Process (PR) and Customer Information (CF)

The Correlations Matrix showed that the dependent variable (Total Customer Satisfaction, TCS-45) was significantly and highly correlated with all the four independent variables (CRM components – PP, PR, TC and CF) and the coefficient ranged from 0.776 to 0.783. Similarly, when comparing with all the independent variables - Technology (TC), People (PP), Process (PR) and Customer Information (CF) as they were highly correlated with one another with coefficient ranges from 0.767 to 0.869.

Table 4.9.4 Correlations Matrix: TCS, PP, PR, TC, CF, TCS-10, TCS, TCS-45

	PP	**PR**	**TC**	**CF**
PP				
PR	**0.869** 0.000			
TC	**0.824** 0.000	**0.805** 0.000		
CF	0.814 0.000	0.822 0.000	**0.767** 0.000	
TCS-45	0.776 0.000	0.783 0.000	0.781 0.000	0.778 0.000

In terms of magnitude, TCS-45 had the strongest relationship with Process (0.783) followed by Technology (0.781 Customer Information (0.778) and People (0.776) in decreasing strength of relationship. However, the strength of the correlation obtained were unexpected while the interrelationship between Technology (TC), People (PP), Process (PR) and Customer Information (CF) was positive. This result tended to show that for total customer satisfaction in the pest management company, all four CRM component factors were important. The findings showed that all four CRM components were highly correlated and the key factor was to consider the importance of the SQ determinants that will result in customer satisfaction.

The correlation in Table 4.9.4 indicated that when a comparison was made among the four components, the result showed that People (PP) was highly correlated with Technology (TC). As such, in conducting regression analysis, it was decided to remove People (PP) from the current model and compare the results of the analysis of variance and R-sq.

Regression analysis, was conducted with total customer satisfaction (TCS-45) against Process (PR) and Customer Information (CF) and Technology (TC) and the Analysis of variance shown that this model was statistically significant since p-value <0.05. Besides, R-sq (Adjusted) is 67.6% which was not reducing as compare to previous model. The result suggested that this was a better model. From the model, Technology (TC), Process (PR) and Customer Information (CF) were statistically significant and contributed to total customer satisfaction score (TCS-45)

The output of the high correlation among the variables - Technology (TC), People (PP), Process (PR) and Customer Information (CF) was graphically shown with the aid of the Matrix plot (Figure 4.8.5). The correlation appeared to be strong as indicated by the dots that tend to cluster about the line of true relationship.

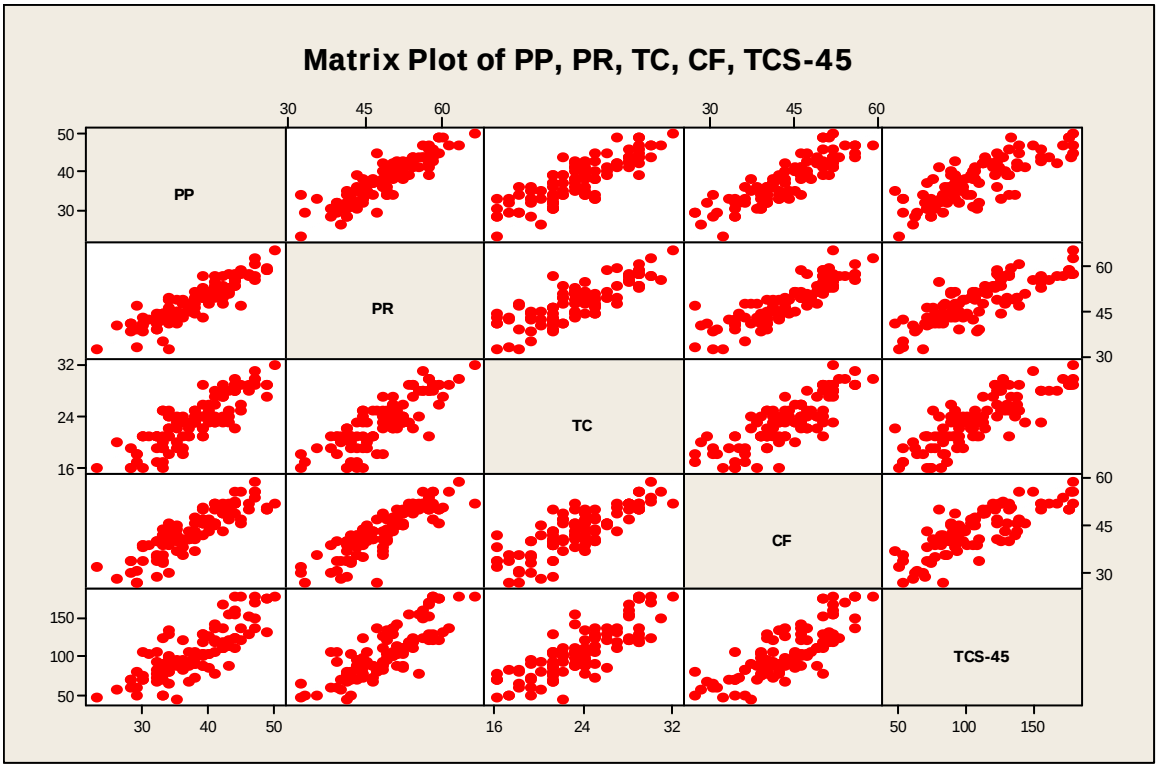


Figure 4.8.5 The Matrix plot for PP, PR, CF, TC and TCS-45

4.6.5.3 Discussion – Customer Satisfaction and Customer Loyalty

The summary of the Residual Plots for TCS-45 showed the that the analysis of residual was to find out where was the source of residual that caused the power of the selected model and was presented in Figure 4.8.6 which can explained all the model variance as below:

(a) Normality Test – residual data should be normal (normal distribution assumption)
(b) Equal variance test – Check whether the data was within same population. Practically to check for any pattern exist, if not then the data was acceptable.
(c) Histogram of residual
(d) Residual order – plot a run chart to show that the data collection is random (p-value >0.05)

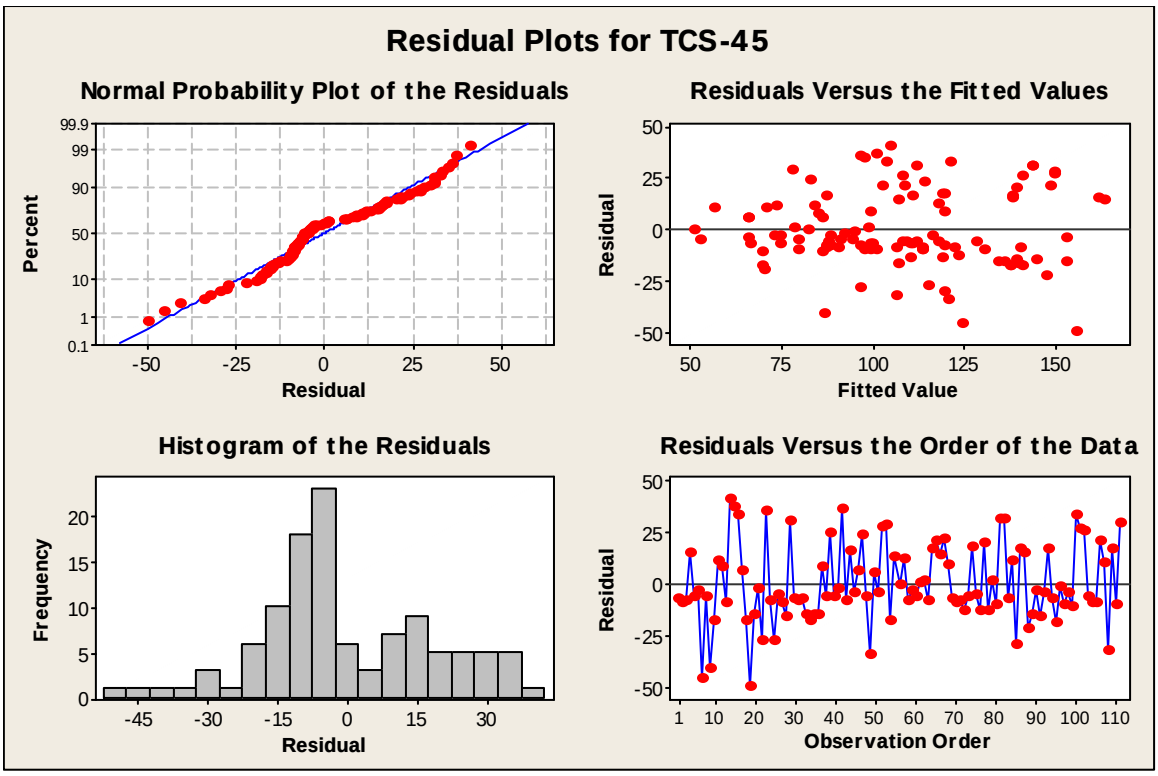


Figure 4.8.6 Summary of the Residual Plots for TCS-45
Note: Generally the Residual data are fulfilled Multiple Linear Regression assumptions

4.6.5.4 Discussion – Regression and General Linear Model (GLM)

From the analysis carried out, both Regression and General Linear Model (GLM) generated the same regression outputs. Overall, the regression model was significant at

the one per cent level. Based on these findings and presented in Table 4.9.5, it may be deduced that **the model TCS-45 = - 69.2 + 1.20 PR + 2.93 TC + 1.14 CF at R-sq (Adj) = 65.6%** was the best to achieve total customer satisfaction and enhance customer relationship. Basically, the model explained that the contribution of Customer Information (CF) to Total Customer Satisfaction was relatively smaller compared to the other two variables of Process (PR) and Technology (TC). This meant that in order to increase customer satisfaction, the pest management company may want to focus on Technology (TC) followed by investing resources in improving the service delivery process (PR) and open communication in sharing information with customers (CF). In the model equation it can be explained that any increase for a unit of Customer Information (CF) and everything else being the same, the Technology (TC) will increase by 1.14 units. Based on these findings, it may be deduced that in order to retain customers, the pest management company s should pay provide more resources in Technology (TC).

Table 4.9.5 General Linear Model: TCS-45 versus

Factor Type Levels Values - Analysis of Variance for TCS-45, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
PR	1	67317	1713	1713	4.79	0.031
TC	1	6999	4031	4031	11.27	0.001
CF	1	1704	1704	1704	4.77	0.031
Error	107	38259	38259	358		
Total	110	114279				

S = 18.9093 R-Sq = 66.52% R-Sq(adj) = 65.58%

Term	Coef	SE Coef	T	P
Constant	-69.16	12.62	-5.48	0.000
PR	1.2028	0.5496	2.19	0.031
TC	2.9303	0.8728	3.36	0.001
CF	1.1424	0.5233	2.18	0.031

The findings of this study were in line with some of the studies in the literature. According to Zhiltsov (2006) an organization gains competitive advantage with the use **technology** in gathering **information** on market demands and communication between

organizations will allow enhanced SQ. Zhiltsov (2006) further emphasized that researchers focus on these components of SQ in their organizations to enhance customer satisfaction, increased profitability and customer retention. The model proposed in this study helped to identify the factors associated with customer retention particularly in the Malaysian pest management industry.

Chen and Popovich (2003) have pointed out that while both technology and business processes were critical to successful CRM initiatives, it was the individual employees (people) who were the building blocks of CRM. Information technology has long been recognized as an enabler to the success of the CRM. Park and Kim (2003) have identified the Internet as a key enabler of CRM, utilizing Internet technology to obtain customer information that provides competitive advantage. The findings in this study indicated that CRM is a strategy that integrated the concept of customer information, data mining, and internet technology and business process in order to support the organization's business process in its customers.

It may be appropriate to view CRM as a management tool that integrated **people, information, processes** and **technology** under one corporate objective and that was encouraging a productive involvement of customers with the organization (Dyer, Liebrenz-Himes and Shamma, 2006). The integration of the four CRM components to produce SQ for customer retention provided an opportunity for Pest Management Company to adopt a strategic approach to customer management.

The third research questioned proposed in this study could be answered according to **Table 4.9.6**. The model proposed in this study can be used to enhance customer satisfaction in a pest management company.

Table 4.9.6 Regression equation - TCS45 = -69.2 + 1.12PR + 2.93TC + 1.14CF
When PR, TC and CF in one unit or in covariates, Coefficient was direct factor to contribute to TCS45. The % of contribution of factor or variable after minus Intercept value are stated below:

	Coefficient	Factor (xi)	% Contribution	Intercept
	1.12	PR	21.6%	-69.2
	2.93	TC	56.5%	-69.2
	1.14	CF	22.0%	-69.2
Total	5.19			

The results in **Table 4.9.6** showed that Technology (TC) alone has a high significant influence of 56.5% contribution to Total customer satisfaction. While the Process (PR) component contributed 21.6% contribution and Customer Information (CF) was responsible for 22.0% contribution to the Total customer satisfaction. This study has identified Technology (TC), Process (PR) and Customer Information (CF) as the key determinants of customer satisfaction that integrated to foster customer relationship. This integration was evident from the high correlation among these CRM components. The data collected from the survey and statistical analysis were able to provide the numerical power to determine the CRM component linkages and the extent of the performance to produce customer retention.

The finding indicated that technology (TC) investments such as CRM solutions were essential for the pest management company's pursuit of the goals in achieving customer satisfaction and retention. The focus is Technology (TC) and aside being the hardware responsible for CRM and has been identified as an enabler of CRM but the software aspect such as human factors (PP) is equally important in the pest management industry.

Overall, this research study indicated that Technology (TC) component has a significant impact on customer satisfaction and the delivery of quality service. The substantial role played by technology in the implementation of CRM has been highlighted in the literature (Karimi et al. 2001; Ryals and Payne, 2001; Sigala 2005). According to Sigala, (2005, p 397), the use of Technology (TC) component enabled organizations to "wade through volumes of information and decipher meaning, patterns and a valuable tool to determine customer demographics, buying patterns, market segments, contribution margins and customer lifetime". Information Technology (IT) was vital in order to provide the organization with critical information about customers' requirements for the effective management of relationship-based interactions. Regardless of an increasing reliance on technology (TC) to improve SQ, the role of customer information (CF) and process (PR) cannot be discounted.

CHAPTER 5.0 CONCLUSION

This study examined the process by which the four CRM components and their linkages led to customer satisfaction and resulting in customer retention in the pest management sector. From the analysis of the data collected using the modified SERVQUAL model the findings showed that Technology (TC) was the prime CRM component which influenced customer satisfaction. Similarly, the main attributes ranking in order of importance were identified to bring customer satisfaction – Reliability, Competence, Responsiveness, Credibility and Access.

The outcome of this study showed similar results with reliability (accuracy), competence and responsiveness (promptness) as service dimensions that were responsible for service quality. Naik et el. (2010) reported customer experienced highest satisfaction for promptness and speed of service along with accuracy of transactions which supported to some extent the outcome of this study.

This study succeeded in providing evidence that with the CRM components integration played a crucial role in improving organizational performance - were consistent with the study by researchers Fox and Stead (2001), Sin et al. (2005) and Yim et al. (2005) which indicated that a strong positive correlation ship in the linkages of the four CRM components are vital - Customer information (knowledge), People (organization), Process and Technology. Organizations need to integrate and make balance between process, people and technology (Jayashree, Shojaee and Pahlavanzadeh, 2010)

This study demonstrated that CRM technology was an important determinant of pest management organization's performance. The study showed that pest management firms must consider investment into technology in order to improve performance on all the dimensions of service quality in order to increase customer satisfaction. This will enable them maintain high level of competitiveness. Thus, CRM technology is supposed to improve an organization's ability to maintain profitable customer relationships through facilitating integration and sharing information that is capable of influencing smooth and efficient organization-customer interactions, effective analysis of customer data, personalize and customize their products and services.

The same scenario was observed in the hospitality sector, due to the timeliness and significance of data offered by CRM technology, many hotels in Malaysia were utilizing CRM technology to enhance their service quality. Similarly, owing to increasing of competition and customer expectation in the hotel industry, hotels have adopted information and communication technology (ICT) as a way for dealing with rapidly changing environments. (Sirirak et al. 2011)

5.1.0 Overview of Objectives and Outcome of Study

This study investigated SQ factors that related to customer loyalty by examining customer satisfaction level of the clientele pest management organizations. It was designed to focus on the ten SQ determinants which were responsible for the level of a customer's satisfaction and to determine the relationship of the four CRM components. The emphasis on the importance of SQ measurement and identification aspect of SQ determinants that enhance services will provide organizations with insights into areas of strengths and weaknesses to increase customers' satisfaction.

The findings will enable pest management organizations to improve areas of specific SQ determinants such as responsiveness, reliability, competence, credibility, accessibility and tangibles in order to increase customer retention.

Prior to exploring which SQ determinant can increase a customer's satisfaction level and enhance customer loyalty, it was necessary to determine a total customer satisfaction score. This was derived from a computation of the ranking of SQ determinants by the respondents. The analysis showed the following rank in order of importance of the ten attributes of SQ - *Reliability, Competence, Responsive, Credibility, Access, Communication, Understanding, Security, Courtesy* and *Tangible.*

These service determinants were considered to be very significant in their contribution to high-quality pest services. This finding supported the substantial research on the importance of services, customer relationship management and the integration of the SQ attributes related to customer satisfaction in the context of CRM.

In determining the relative importance of each of the SQ determinants, the analysis showed that Reliability, Competence, Responsiveness, Credibility and Access are attributes that the respondents considered very significant in contributing high quality pest services. The contribution of each SQ attribute was then discussed.

Customer loyalty, determined by the length and period the customers have pest contracts with the pest management organization, was measured against total customer satisfaction level score to find a relationship. This was to determine which of the SQ attributes contributed significantly to customer retention and resulting loyalty. The outcomes of the findings were not as expected. Preliminary investigation, using correlation analysis indicated that the two variables, length of contract and customer satisfaction were correlated but the p-value showed that the relationship were not statistically significant. Thus, the length of the service contract were not dependent on total customer satisfaction, implying that the length of contract may depend on other factors such as homogeneity of the pest industry, customer mind-set, low pricing and a volatile market.

Prevailing perception suggested that an improvement in SQ attributes will result in a higher level of customer satisfaction. Consequently, improved customer satisfaction was likely to increase the probability of customer retention. Customer loyalty determined by the length of the period of customer contracts with the pest management organization, were probably influenced by the level of customer satisfaction.

The final research problem of this study was to establish the relationship of the SQ determinants and the linkage of the four components of CRM to foster customer relationship. The intention was to investigate the linkages of the four components to find their relationship performance and influence on total customer satisfaction which, in turn, produce customer retention in the context of the pest management industry.

For this purpose, two levels of statistical analysis were used as described. Firstly, factor analysis was used to reduce the large pool of items and also to determine their homogeneity before the regression analysis was run on the residual data to find the relationship of these four components. The result showed that all four components were highly significant and contributes to the CRM linkages. The findings established that

the contribution of technology (TC) to total customer satisfaction was significant among the four variables in CRM. This would mean that in order to increase customer satisfaction, the pest management organization may want to concentrate efforts and attention to providing more technological resources into the business.

The researchers (Sin et al. 2005; Yim et al. 2005) also argued that CRM cannot be successful even if the organizations enjoy the most advanced technology and adapt a customer - oriented approach, unless the project was completely integrated by them. Further, as a confirmation for this point Ku (2010) stress that CRM success does not only require technological quality or computer systems, but it also required an effective service concept as well as suitable operation procedures.

The advances in technology (TC) have resulted in improvements and change the way service deliveries through operation procedure are made presently. Such changes in technology (TC) has affected the nature of services performance, in particular, with the automation of administrative tasks to enhance productivity and technical processes and provide better services to customers. The developments in information collection which was stored, processed and later transmitted or distributed through computer technology have an influence in all aspects of pest management services to customers resulting in improvements in the quality of services offered

The outcome of the study was consistent with the findings of Rust and Chung (2006). They concluded that delivering of quality service has emerged as a strategic imperative, one that was increasingly linked to a firm's level of technology resources and capabilities. It is also due to advances in technology (TC) that the management of relationships with customers has improved; the overall results was that as pest management organizations were prepared in managing service effectively and efficiently, the outcome being customer satisfaction. The use Information Technology (IT) have, in fact, lowered operating costs and made markets more price-sensitive. Customers are increasingly asking for customized solutions to their pest problems, using comparative shopping services to pit pest management companies against one another.

As such, pest management companies must differentiate their services between the other vendors in this competitive business environment. Galimi (2000) stated that CRM is a business strategy focused on customers to increase satisfaction and customer loyalty by providing a more responsive and customized service to each customer.

After assessing the result of this study on CRM integration, it was determined that the findings of Payne (2006) were consistent with regards to the success of CRM integration which relied on the active involvement of the employees in the organization itself and it is essential that the way they organize their actual business processes for employees and customers must involve these parties. Inevitably, all the organization resources (such as company policies, culture, and organization structure) have to be integrated in order to integrate CRM successfully to improve organizations performance. The CRM technology and software initiatives were broadly designed to enable implementation of a customer-focused business strategy and sometime the business organization needed to re-design the business function process and also re-organized the work flow of the service process.

While organizations today face a competitive marketplace, they would need to note the findings of this study so as to develop insights into the preferences of customers and internal operational factors that can help to attain improved customer management. With available technology, organizations should take measures to improve their ability to capture, assimilate and organize performance data across the entire service spectrum in meeting customer expectations and, ultimately customer satisfaction. SQ can lead to greater customer retention. Customers may feel that they are indebted to the company, and may continue to patronise it.

The concept of linking customer satisfaction and SQ will enable organizations to achieve customer retention. The relationship of the SQ determinants and the linkages of the four CRM components and their influence on total customer satisfaction cannot be ignored by pest management organizations. A customer’s satisfaction with an organization's products or services is often seen as the key to business success and long-term competitiveness. It is within this context of CRM, that customer satisfaction is often viewed as a central determinant of customer retention.

5.1.1 Determinants of Service Quality Influencing Customer Satisfaction in Pest Management Service Companies

This study revealed that customer satisfaction is significantly related with service quality (Malik, 2012), and has shed some light on the importance of focusing efforts on improving SQ in areas of Reliability, Competence, Responsive, Credibility and Access in order to increase continually the level of customer satisfaction among its customers. Management of the pest organization should focus on the technology aspects of the CRM component as a strategy. The research outcome indicated that technology investments such as CRM solutions will be essential for the pest management organization's pursuit of the goals in achieving customer satisfaction, retention and loyalty. Continued improvement in customer satisfaction will mean that pest management organizations were able to stay ahead of their competitors. Customers tend to remain loyal to the pest management organization and this brings continued profitability and business success.

In the pest management services sector, the outcome of the findings on the influence of SQ determinants on customer satisfaction has indicated the following rank order of importance - Reliability, Competence, Responsiveness, Credibility, Access, Communication, Understanding, Security, Courtesy, and Tangibles. The study has shed some light on the importance of focusing efforts on improving SQ in **Reliability, Competenc**e and **Responsiveness** as these attributes are the main service dimensions that influence strongly customer satisfaction in the pest service industry.

In this study, SQ is determined by the difference between customers' expectations of services provided and their evaluation of the services received (Bolton and Drew, 1991 and Oliver, 1980). It investigated the association between SQ and customer satisfaction. The findings of the relative importance and ranking of the service determinants suggested that SQ is an important indicator of customer satisfaction. It is important to consider the basic dimensions of SQ as well as the measurement of these dimensions to establish SQ. Such a concept of SQ indicates that SQ is an assessment by customers as to how well the service fulfils their expectations in terms of perceptions of pest services rendered. Some of the key findings are discussed below:

5.1.1.1 Reliability and its impact on customer satisfaction – A review of the literature in the service industry suggest that reliability has a significant positive impact on customer satisfaction (Beh, 2008 and Rose et al. 2005). The attribute of reliability referred to the ability to perform the proposed service as expectable, dependable and accurate. The outcome of the item response indicated that customers have high regards of the organization which can be depended on are to perform the services. This included such qualities as dependability, consistency, accuracy, and "right first time" (Zeithaml et al. 1990). Therefore, customers in the pest management industry will look for reliable delivery of pest services.

5.1.1.2 Competence and its impact on customer satisfaction - Many researchers in SQ have revealed that competence has strong positive relationship with customer satisfaction (Agus et al. 2007; and Andaleeb and Conway, 2006). Where pest services are concerned, customers expect staff professionalism and experience to guide them in providing pest treatments without mistakes. Therefore, customers in the pest management industry will focus on staff knowledge and qualification to provide support in handling requests for service appointments, serving customers and delivering of pest services. Competence means knowledgeable and confident staff who were able to handle questions and requests effectively and efficiently (Zeithaml *et.al.*, 1990).

5.1.1.3 Responsiveness and its impact on customer satisfaction - Several researchers in the services industry suggested that responsiveness has a significant positive impact on customer satisfaction (Wisniewski and Wisniewski, 2005; Lim and Tang 2000). Responsiveness has been shown to be an important factor, supporting previous work by Bitner et al. (1990) and Avkiran (1994). This suggested that efforts to increase speed of processing information and making schedule appointments for pest services by respondents is likely to have an important and positive effect on customer satisfaction. The attribute relating to responsiveness also included helpfulness, friendliness, warmth, willingness, and openness (Zeithaml et al. 1990). The findings from the study and questionnaire response showed that customers in the pest management industry expected speed in resolving pest problems and handling of pest complaints. Staffs are to be sensitive to customer needs practically on a 24/7 basis.

The study also found that Tangibles was the least important in its contribution to customer satisfaction. This is due, in part, to the services being "consumed" at the customer's premises. Customers regarded Tangibles such as physical equipments, sprayers, vehicles, and staff appearance of during the course of service delivery as not critical. This can be attributed to the infrequent contacts that customer have with their service provider.

However, data analysis showed that these independent variables were highly correlated. This implied that all of the service determinants were relatively important for the dimensions of SQ in the pest management service sector.

In comparison, the results of the study by Naik, *et al* (2010) showed that services offered by retail units have positive impact and were significant in building customer satisfaction. Such findings of this empirical research reiterated the point of view that SQ dimensions are crucial for customer satisfaction in retailing – a burgeoning sector with high growth potential and opportunities in fast growing economies.

In this connection, according to Naik et el. (2010), customers reported highest satisfaction for promptness and speed of service along with accuracy of transactions which supported to some extent the outcome of this study. The outcome of this study showed similar results with reliability (accuracy), competence and responsiveness (promptness) as service dimensions that are responsible for service quality.

Agus, Barker and Kandampully, (2007) conducted an exploratory study of service quality in the Malaysian public service sector and their results supported the conceptual model in demonstrating a strong correlation between SQ dimensions, service performance and customer satisfaction. However, some differences were noted in the order of the significant service attributes as the service providers classified as "excellent" were rated most favorably in terms of *responsiveness, access* and *credibility* as compared to the present study which rated the service attributes favorably in terms of **reliability, competency** and **responsiveness.**

5.1.2 Extent that Customer Loyalty is dependent on Customer Satisfaction and Service Quality in Pest Management Service Companies

An objective of this study was to find out what drives customer satisfaction and to focus on the right drivers to attain customer loyalty and retention which, in turn contributed to business profitability. This research has shown that delighted and satisfied customers will remain loyal to the organization and this in return, will increase revenue and raise the profile of the organization. Thomson (2007) have stated that "with client retention", the cost associated with customer service will ultimately decrease as the organization needs to do less marketing, less new client orientation and staff productivity increases because staffs work with established clients whom they know well. Ultimately, this will contribute towards profitability.

Organizations that consistently satisfy their customers enjoy higher retention levels and greater profitability due to increased customers' loyalty, (Wicks and Roethlein, 2009). For this reason, it is vital to keep customers satisfied and this can be achieved in various different ways. Customer satisfaction will also exert a positive impact on organization's costs through customer retention. Indeed, by satisfying customers, organizations will lower their actual marketing costs to attract new customers and avoiding spending considerable costs to gain new clients. This argument is more important in the Malaysian pest management industry where customers and the pest management organizations were supposed to act for a long-term relationship through annual contract renewal.

The outcome of this finding indicated that the length of the service contract was not dependent on total customer satisfaction. This finding does not support the hypothesis that customer satisfaction influences directly the length of the service contract. Instead, the length of contract may depend on other factors such as homogeneity of the pest industry, customer mind set, low pricing, and a volatile market.

Also, the standardization of rules and regulations governing pest services and the competitive market environment were possible factors. Another observation was that there is freedom of entry in to industry and there were no serious barriers to entry into the pest services market. The systematization of service delivery (non-human element)

in the pest services sector included having a highly standardized and simplified delivery process so that pest services were delivered with minimum hassle so as to facilitate good customer services.

The study also indicated that loyal customers who have a pest contract for more than 9 years were not accustomed to engaging the same pest services for themselves over the years. Some loyal customers remained with the firm for reasons of convenience and familiarity the SQ provided. In this sense, in a highly competitive and homogenous market, SQ may not have any signification relevance to customer loyalty. Customer loyalty and retention issues were important to companies because the costs of acquiring new customers were far greater than the costs of maintaining a relationship with current customers. Increasing the percentage of loyal customers by as little as 5% can increase the profitability by as much as 30% to 85% depending upon the industry (Reichheld and Sasser, 1990).

In defining customer retention, Hoyer and MacInnis (2001) claimed that it is the practice of working to satisfy customers with the intention of developing long-term relationships with them. The relationship factor cannot be separated and the retention factor was considered a commitment in that relationship. Zineldin (2000, p 28), argues that retention can be defined as "a commitment to continue to do business or exchange with a particular company on an ongoing basis".

5.1.3 Determinants of Service Quality influencing the Relationship Between CRM Components and the Fostering of Customer Relationship in the Context of Pest Management Service Companies

This study established the fact that a significant positive correlation ship was observed in the linkages of the four CRM components – People (PR), Process (PP), Customer Information (CF) and Technology (TC). In terms of magnitude, TCS-45 had the strongest relationship with Process (0.783), followed by Technology (0.781), Customer Information (0.778) and People (0.776) in decreasing strength of relationship. This enabled the organization to focus on which of the CRM factors or components caused influence strongly customer satisfaction which resulted in customer retention. The findings indicated that CRM factors can help to identify what were the SQ determinants and key driver which resulted in customer retention.

The findings drew a strong inference from the study by researchers (Fox and Stead, 2001; Sin et al. 2005; Yim et al. 2005) which indicated that a strong positive correlation ship in the linkages of the four CRM components were vital - Customer information (knowledge), People (organization), Process and Technology. It is essential that all of these dimensions must work systematically in an organization to guarantee its improved performance. In this regard, Abdullateef et al. (2010) investigation on the impact of CRM dimensions on call-centers in Malaysia can be taken as a typical example. His assertions that customer orientation, as one of the CRM dimensions, is more comprehensive than key customer focus. Such argument received much support from Wang et al. (2010) that considers customer - orientation as one of the most important dimensions of CRM.

The findings in this study were consistent with the argument put forward by Zahay and Griffin (2004) that to be able to gain meaningful information, organizations must authenticate such data to be able to establish and develop beneficial relationship with their customers. This study showed that CRM is a strategy that integrated the concepts of customer information, data mining, and internet communication technology and business process in order to support the organization's decision-making process to retain long-term and profitable relationships with its customers. It is likely that CRM research has become an essential business tool to help retain and increase customer base. Therefore, incorporating the CRM solution throughout the entire organization will lead to better customer communication and retention. Customer information which related to knowledge about customers plays a vital role in CRM, taking into consideration the fact that the main purpose behind collecting data about customers was to get a clear image about them from different perspectives (Sin et al. 2005).

By adopting innovative CRM business models, upgrading service information and, performance system, adjusting service delivery processes and high utilization of ICT, business organizations can achieve high growth rate and profitability. This study concurred with the findings of previous studies that also declared the positive impact of CRM organization on customer retention (Yim et al. 2005), financial and marketing performance (Akroush et al. 2011; Sin et al. 2005). Similarly, Jayashree, Shojaee and Pahlavanzadeh (2010), described CRM as the collection of Processes, people and technology that seeks to find costumers for organizations and developed customers'

retention and relationship. Their study revealed that progress in Information Technology and organizational changes in customer-centric procedures have positive effect in the development of CRM and will gain customer loyalty and profitability. It can be observed that progressive organizations and fast-growing companies are investing signification resources in marketing strategies and programme that were designed to stimulate customer retention and loyalty.

According to Swift (2001), it is critical for companies to exploit and gain beneficially especially the long term, loyal customers. A strategy proposed is the implementation of CRM which tend to enhance customer retention and loyalty. The costs in doing so were relatively lower in the effort to win new customers. By implementing a CRM strategy, an organization can improve the business processes and technological solutions centered on selling, marketing and servicing functions across all customer touch-points, examples being the Website, e-mail, phone, fax, and face to face. CRM is a customer-focused business strategy designed to optimize revenue, customer retention and profits.

CRM gave the most value to customers by integrating their sales, marketing and support efforts. Its primary objective was to provide the entire organization with a complete 360-degree view of the customer, no matter where the information resides or where the customer touch-point occurred. CRM managed every point of contact with the customer to ensure that each customer gets the best level of service and help business organizations to administer, synchronize and coordinate their interactions with its customers. The outcome of this study supported the findings that CRM helped business organizations to build more profitable customer relationships.

In reality, the CRM strategy and its implementation enabled the sales and marketing professionals of a pest management organization to deliver targeted communications to prospective and existing customers. This ultimately shortened the sales cycle, and improved customer acquisition rates. Once the pest contract was acquired or the sale is secured, the CRM programme will enable the service representatives to track service requests and manage support issues from contact through pest service treatments. The process of delivering consistent and efficient pest service was monitored to ensure customer satisfaction.

According to Gurau (2003), the level of SQ is an essential component of a business organization's CRM strategy, as it takes into consideration customers' satisfaction, customers' benefits, the competitive conditions of the market and company's capabilities. It will be appropriate to view CRM as a management tool that integrated people, information, processes and technology under one corporate objective: that of satisfying the customer's desires so that the customer will continue to have a productive involvement with the organization. (Dyer, Liebrenz-Himes and Shamma, 2006). The integration of the four CRM components to produce SQ for customer retention will provide an opportunity for pest management organization to adopt a strategic approach to customer or client management that will affect the company's operations and functionalities.

5.2 Implications of the Study for the Pest Management Industry

The findings of this study have practical implications for quality management of Malaysian pest management services. This study has demonstrated the usefulness of the modified SERVQUAL approach as a measure of SQ. The results of the study indicated that the modified SERVQUAL scale can make a valuable contribution to enhancing the understanding of perceived SQ of pest management services. The measurement scale also served to identify factors and the underlying problems that inhibit the effective provision of quality services in pest management services. Once the SQ determinants of pest services from the customers' perspective were more clearly known and understood, the pest management companies will be in a better position to anticipate consumer requirements rather than to react eventually to customer dissatisfaction.

The SQ determinants of reliability, competence, responsiveness, credibility and access have been identified by respondents to be among the top most important dimensions of SQ. Although these findings cannot be generalized to the overall customer profile, the pest management companies are encouraged to use it as an impetus to improve their services, particularly in the study of ways and means of improving customer satisfaction.

In view of the intense competition in the pest management services, coupled with homogeneity and volatile prices, it is necessary for the pest management companies to carry out more research to discover any shortfalls in SQ and to take the necessary corrective measures. This will ensure that the SQ provided is amongst the best to its customers in order to compete for a market share. As the customers play a key role in the definition and evaluation of the quality of pest services offered, the pest management companies need to be aware of customer expectations and perceptions in the formulation of effective long-term marketing strategies.

It is not advisable to rely totally on competitive pricing to secure businesses in the pest service industry, given a homogenous market. Instead, business organizations may need to distinguish themselves on the basis of SQ and not rely solely on price alone. The findings of this study indicate that since the pest services offered can be easily duplicated by competitors, it is envisaged that the building up of a good customer relationship is the heart of organizational success.

5.2.1 The Application of Service Quality in Malaysian Pest Control Industry

The findings indicated that CRM factors can help to identify what are the SQ determinants and key drivers which led to customer retention. This study provided new directions for the pest management industry. In the delivery of pest management services, the high SQ dimensions as conceptualized in these findings have significant influence on customer satisfaction. It should be noted that the emphasis is to use the ranking of the SQ determinants, recognize which SQ determinants are relevant to the pest management industry. Clearly, all the service determinants dimension are important to some degrees and have direct influence on customer satisfaction as indicated in the study by Hung et al. (2010) which highlighted that the providence of excellent SQ and high CS is the important issue and challenge facing the contemporary service industry. Sureshchandar et. al., (2002) supports this by arguing that the key to the competitive advantage is to deliver high-quality services that will generate customer satisfaction. SQ and CS concepts have been important topics and the attention directed to these two concepts is mainly due to the harsh competition among private companies on the market, as well as to the pressure of political factors and of the technological savvy consumers (Ueno, 2010).

Implementing of CRM as a strategy to enable the organization to focus on which CRM factors or components can influence strongly customer satisfaction is a major contribution to the industry. This concept of CRM and the linkages of the four components provide a practical and realistic approach to identify the areas of strength and weaknesses in the organization that needs to improve and focus on areas that save costs for the company. Ultimately, this will be mirrored in the profitability of the business and help the organization to establish key processes that constitutes a quality management system for the pest services. The strong performance of the four components is critical to ensure total customer satisfaction and its impact on customer retention.

With respect to practical contribution, the findings of this study was used as a guideline by pest management organizations to improve the service quality program in their organizations and CRM to retain customers. Specifically, the design of the four CRM components and linkage to produce service quality may be improved if managers emphasize on the finding of this study.

The findings of this study concurred with numerous academic scholars which reflected the simple truth that SQ has always flowed from understanding how to deliver quality services based on what the customers need. While CRM can be as a strategy that organizations can use to improve marketing impact to achieve customer retention and loyalty, the real power of CRM can be visualized when all the four components integrated to support effective SQ , manage customer relationship and retention which helped to increase profitability. The linkages of the four CRM components to supported effective SQ are described below:

(a) **Technology** - The findings of the CRM concept have highlighted technology as the prime component which influenced total customer satisfaction. The outcome of this is consistent with the views of Duggal and Siddiqi (2008). Technology has the potential to make the service industries more cost- effective and include the ability to handle large volumes of services, to offer a wider range of services, and potential increased in management efficiencies. In the services sector, with the introduction of technology, the potential benefits from employing new technology will only be realized when benefits of the CRM

technology are favorably perceived by potential customers. Furthermore, several studies, made about the impact of information technology on organization performance reported similar findings about the positive role of information technology in CRM strategy. According to the findings of Minghetti (2003), technologies were considered as the core drivers for CRM and in support with that view, Kasim and Minai (2009) reported that CRM technology dimension was firmly related to hotel performance, because hotels needed to use information technology for improving their performance. With increased global connectivity, integration and interdependence in the areas of economics, social cultural, political and technological domains, special challenges have emerged for the pest management service industry. The industry players were expected to meet customer needs while remaining economically competitive.

(b) **Information** - This can be achieved by knowing about customer needs based on customer information stored in the CRM database. Dutu and Halmajan (2011) are of the opinion that CRM strategy will end in failure if the information technology is not used properly, thus the suitable use of technology was critical in CRM because of the fact that it is important to get the right information so that the right decisions can be made and the services can be rendered. Using the information to create, develop and deliver the expected SQ to sustain customer relationships, rather than to regard them as existing as an end in themselves. The increased importance of SQ is because of competitors, who increasingly see service standards as a competitive weapon to differentiate themselves therefore the need to build closer and more enduring relationships with customers.

(c) **People** – This study showed that people are an essential element of both of the production and delivery of pest control services and SQ is becoming a strategy that can differentiate service organizations, add value and gain competitive advantage for the pest management organizations. While automated **processes** can make an impact, the pest management industry remained labour-intensive. There can be no substitute for high-quality personal interaction between service employees and customers.

(d) **Processes** – Processes are routine procedures and mechanism by which a service is created and delivered to a customer. Processes when taken into consideration with the SQ determinants and function smoothly with CRM components will be a key aspect to determine customer satisfaction. There is a need to continuously identify potential gaps in processes and business organization need to be disciplined in making continuous improvements, to deliver excellent service to customers and cultivate customer loyalty.

The findings of this study suggested that CRM factors can help to identify the SQ attributes and key drivers leading to customer retention. The strong performance of the four components is critical to ensure that total customer satisfaction and impact on customer retention. The contribution of Technology (TC) to Total Customer Satisfaction (TCS) is significant among the four components in CRM and contributes to the CRM linkages. It was anticipated that the results derived from this study will enable the management of pest management organizations to determine which areas they should focus their efforts on continually to increase the customer satisfaction levels to achieve customer retention and continued profitability of the pest control business.

The competitive advantage rested with organizations that can follow successfully SQ standards through a documented quality system (customer information) and provide customer value through the most efficient use of technology and people. SQ standards ensure desirable characteristics of services in pest management are provided to customers, examples being environmental friendliness pesticides, safety, efficiency and effective treatments at an economical cost.

This research provided a deeper understanding of CRM, within the context of customer satisfaction, which contributed to customer retention. This is achieved by exploring, describing and explaining the linkages in the relationship of the four components of CRM. Therefore, the research frame work modified from the work of Kincaid (2003) has been established as a total discipline. This study showed CRM outcome as a strategy involving the process of service delivery, people involvement in the SQ, customer information in the organization and application of information technology. SQ must be implemented systematically and strategically throughout the pest control

organization. From the top down in all processes, namely administrative, technical, sales, marketing and delivery. All these can be achieved with the proper implementation of CRM technology.

The specific advantages of the Internet as a transaction and communication channel present new opportunities for businesses to create a long-term relationship with their customers. Therefore, this specific advantage has become the fundamental factor for the successful CRM in the efficient linking of customer data to fulfill customer needs better. As reported by King and Burgess (2008) that the key success factor is to offer value-added services to customers through understanding and meeting their needs.

It should be noted that the emphasis is to use the ranking of the SQ determinants, recognize which SQ determinants were relevant to the pest management industry. Therefore, the CRM components (which are viewed as a management tool that integrated people, information, processes and technology) can enable organizations to make optimal resources allocations to the appropriate sectors within the organization which requires them. This can be derived from the proposed framework model to improve customer retention, reduce service and operational costs (customer satisfaction) and eventually improved in profits because of growing relationship (customer loyalty and retention). Thus, service effectiveness can be improved significantly at lower costs and this approach is different from the conventional ways of improving customer retention by incurring more costs to increase the standards of SQ.

This study regard CRM as a strategy in which focuses on customers for the purpose of retaining them, increasing their loyalty and subsequently, improving profitability of the organization. In addition, it addressed the question whether the use of CRM components and SQ determinants plays a mediating role in the customer retention and loyalty. To retain customers, the relationship with customers has to be managed in a long-term and trusting manner for mutual benefits.

The originality of this study addressed key relationships between service dimensions in delivering quality service to achieve customer retention within the Malaysian pest management industry. Although previous research has addressed similar issues within the context of the Malaysian services sector in the hospitality, restaurants, health care,

banks, education institutions and the government/public sector, relatively few studies pertain directly to Malaysian pest management industry.

The purpose of measuring customer satisfaction is to access the quality of the existing management practices and identify directions for improvement. The aim of managing satisfaction is to obtain a higher rate of customer retention and improve the company's market share and profits (Gilbert and Horsnell, 1998).

Researchers have suggested that one way is by trying to measure customer satisfaction and to know their expectations and perceptions of services offered by service providers. In this way, the evaluation of the perceived discrepancy between prior expectations and the actual performance of the service as perceived after its consumption, the SQ could be assessed and thereby evaluating customer satisfaction.(Fornell, 199; Tse and Wilton, 1988)

In conclusion, business organizations can benefit from the fact of knowing how customers perceived the service quality and knowing the way of how to measure service quality enabling the management to make sue of the specific data obtained from the measurement of service quality in their strategies and plans. This will help organizations better understand various service quality dimensions that affect overall service customer satisfaction. In this way business organizations can better allocate resources to improve overall service quality for ensuring satisfactions to their customers. In addition, from the strategic perspective, organizations may carefully management different type of employees performance so that each serves as an appropriate cue to service quality (Su, 2004).

Finally, this study mapped out the relationship between the various SQ attributes and their performances to enable the organization to optimize resource allocation and prudent usage of resources for maximum profitability. This strategy to improve customer retention will be seen as increasing customer satisfaction, prompting pest management organizations to deliver a service experience that is tailored to customer needs. The novelty of the research lies in the establishment of a business model that links SQ attribute performance to customer satisfaction which, in turn leads to customer

retention. It is noted that the findings of this study presents the pest management organization with a competitive strategy to consider and implement where appropriate.

5.3 Recommendations for Further Research

Studies on SQ have been carried out in various industries. However, in Malaysia the use of a modified SERVQUAL is considered a relatively new approached in the study on SQ. Thus, this study tends to be exploratory in the use of SQ dimension to integrate with CRM components in achieving customer retention. Nor Aziah and Badriyah (2009) reported that prior empirical studies on CRM in the Malaysian context are still scarce and limited. This study contributed to the limited literature on CRM strategy for the pest management industry since little is known about the use of CRM strategy and their relation with SQ performance in Malaysia.

In the future, research in CRM can be extended to other industries such as the hospitality sector, financial and banking sector and manufacturing industries in Malaysia. Such research can mitigate the lack of generalization of the present research findings to other industries.

5.4 Extending the research. With the rapid development of the pest industry and the emergence of new technology, many developments have got to be covered and **investigated**. The behavioral aspects of customers with regard to total customer satisfaction and also perception of services relating to pest services across each country and region can be **investigated**. There are scant literature and research papers pertaining to the Malaysian pest industry. Most of the researches focused on other aspects of service industry such as supermarket, hospitality, banking, hospitality, e-commerce and e-business. Extending the research to more geographical areas will greatly increase the empirical evidence and understanding of the SQ.

Further research can be conducted on the individual service determinants as the data analysis shows all these independent variables are highly correlated, implying that all of the service determinants are relatively important for SQ in the pest management service sector. The individual contribution and influence of each determinant on the SQ needs further investigation.

Another area for consideration is the notion that improvements in SQ can lead to increased customer satisfaction. This will contribute significantly to business performance (Berry et al. 1985)

5.4.1 CRM Models for the Pest Industry. More research should be conducted to find appropriate models for the pest industry especially in the application of software and integrated systems and processes. It is also clear that, to be effective, a CRM system must integrate seamlessly with the applications such as data warehouse. Daniels' (2001) suggests that a lack of organizational cooperation and coordination remains a major impediment to the success of CRM initiatives.

5.4.2 Standardization of SQ Standards. Not all SQ systems and standards can be transplanted from one country to another without some modifications. The Malaysian pest control service industry needs to **investigate** these challenges in line with the global progress made of SQ. Further study of the suitability of SQ systems under local conditions and industry standards can to be **investigated.**

5.5 Limitation of the Study

(a) This research is industry specific and the SQ measurements are applicable across industries. As such, modification of the SQ measurement scale is necessary. As this research focuses only on the pest management industry, the findings will constrain generalization. The narrow scope limits any kind of generalization as well as the implications.

(b) This study confined the respondents to customers of two pest management organizations, their selection and the choice of these two companies for sample selection in Pest Management Service Organization (in Malaysia) were based on the criteria explained in the Research Methodology.

(c) According to Brown and Bond (1995), the gap model is one of the best received and most heuristically valued as a contribution to the service literature. It is accepted that the SERVQUAL measuring tool remains the most complete attempt to conceptualize and measure SQ. Data were collected on both customer's perception and expectation of service provided. In this research, the research instrument and questionnaire was designed to collect data from the customer's expectation of SQ only.

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APPENDICES

Appendix 1.0 **A summary of Malaysian pest management industry market sector is outlined.**

Malaysian Pest Management Industry Market Sector	
Market Segments The major products and services segments offered by pest management organizations in the Malaysian market are: • Control of common ants • Control of termites and white ants • Control of cockroaches • Control of rats and rodents • Mosquitoes, Houseflies and flying insects control • Bird proofing services • Other incidental pest services such as bed bugs, fleas, ticks and mites. • Wildlife intruders - to trap and removal such as birds, bats, hornets/bee nests, civet cats and snakes.	**Marketing Activities** The primary marketing activities of pest management organizations are: • Certified general pest management services/HACCP specifications for pest control • Supply of pest control equipment and technical services • Fumigating services • Construction sites - mosquito eradication and fogging services • Commercial pest control services (except agricultural and forestry) • Soil treatment services and anti -termite control

Appendix 1.1 Significant contribution of the pest management industry to the Malaysian services sectors is detailed below:

(a) Pest control professionals help to protect our society from infectious diseases such as dengue fever and property damaging pests. The Pest control professionals help to locate, identify, control, alleviate pest problems and prevent pests' infestations. The impact of disease vector and distribution –is a major concern, an example being new and resistant virus carried by mosquitoes worldwide. Some disease bearing pests not found before in this country are beginning to appear in Malaysia soil.

(b) The professionals involved in pest management need to have basic skills in reading and writing and multilingual preferably. The work entails extensive interaction with customers and employers prefer to recruit staffs who have good communication and interpersonal skills. The rising incidents leading to a great prevalence of litigation and lawsuits where consumers seek compensation for poor, ineffective, or damaging pest control treatment are issues of concern. The need to place greater importance on service quality for the industry is no longer an option but imperative to avoid such situation involving legal cases.

(c) Pest control professionals work with pesticides that are unavailable to the public. The Pesticide Act 1974 and Pest Control Rules (2004) specify clearly that the pesticides for controlling pest infestations are only available to certified pest control professionals who are knowledgeable and trained insecticide application procedures. These legislations are intended to regulate the safe usage of pesticides in Malaysia.

(d) It is important to note that, increasingly, pest control professionals work with many other tools besides pesticides. They now use a combination of pest management techniques known as Integrated Pest Management (IPM). IPM is a pest control process that exists to eliminate a pest's conducive survival conditions – its food, water and shelter. The IPM approach has gained prominence in the commercial sector in particular the food manufacturing and hotel industry where HACCP and food safety certifications are required.

(e) Pest control professionals use their knowledge of biology and habits of pests, and a variety of pest management techniques such as setting of traps, operating equipment, applying products and even modifying structures in their quests to perform an effective job. Today, the concept of " pest control " includes the application of remedial measures for the purpose of curbing, reducing, preventing, controlling, eradicating, and repelling household pests. Greater responsibility is imposed on the pest management company than before and they involve inspecting, monitoring and reporting of the findings of regular inspections for areas identified where pest activities are detected. It is expected of the pest management company to provide full reports and recommendations or control measures to address the pest issues.

(f) The industry requires pest control professionals to partake in extensive training required for certification to work with various pest control products. Work involving spraying certain pesticide or chemical requires heavy protective gear such as respirators, gloves, and goggles as stipulated under the Occupational Health and Safety Act, 1989 (OSHA). Such measures implemented by the government regulators should be seen as a positive development to create a more positive image for the industry. This will have a bearing on the SQ aspects. The (OSHA 1989 requires employers to provide a healthy and safe work environment in the vicinity of the plant, protective clothing and relevant safety information, and appropriate training. Employees are required under the OSHA Act 1989 to use all personal protective equipment (PPE) in a correct and safe manner, and co-operate with their employers in fulfilling their duties so as not to endanger themselves or others.

(g) Government legislation such as Hydrogen Cyanide (Fumigation) Act 1953, prohibits the carrying out of any such fumigation except by persons licensed to carry out fumigation services. Such existing requirements to qualify as licensed fumigators are mandatory for toxic fumigants. This adds to the pressure to employing professionally trained and experienced pest management professionals. It is also important to have the necessary training and technical knowledge to identify correctly pest problems and recommend the most responsible integrated pest management treatment available. Similarly, in 2004, the government implemented the Pesticides (Pest Control Operator) Rules 2004 which was gazetted in Parliament. This legislation introduced for the pest industry specifically requires a person carrying out any of the activities or engaging in the business of applying pesticide to the property of another for hire must possess the relevant individual Pest Control Operator License (PCO/KUL/9/015) issued by the Pesticide Board of Malaysia under the Pesticide Act 1974. Under the same law, the pest management service organization and every individual staff involved in the application of pesticides have to abide with these requirements. As such, the staff need to qualify for a license by the Pesticide Board of Malaysia which conducts examinations annually for the acquisition of a Pesticide Applicator License (PAL) or an Assistant Pesticide Applicator License

(APAL).

(h) The pest management industry is labour intensive and, in recent times, knowledge-based workers are required. As such, pest control professionals /employees will have to receive both formal and on-the-job training and be on a self-study mode. Given that pest management industry is changing constantly, pest control professionals have to attend classes to maintain their certification. Such mandatory government certifications are subjected to annual renewals. Most pest professional companies prepare their employees for the training and examination required to obtain the Pesticide Applicator License (PAL) /Assistant Pesticide Applicator License (APAL) mandated by the Pesticide Board of Malaysia. This is seen as a positive direction towards professionalism in the industry.

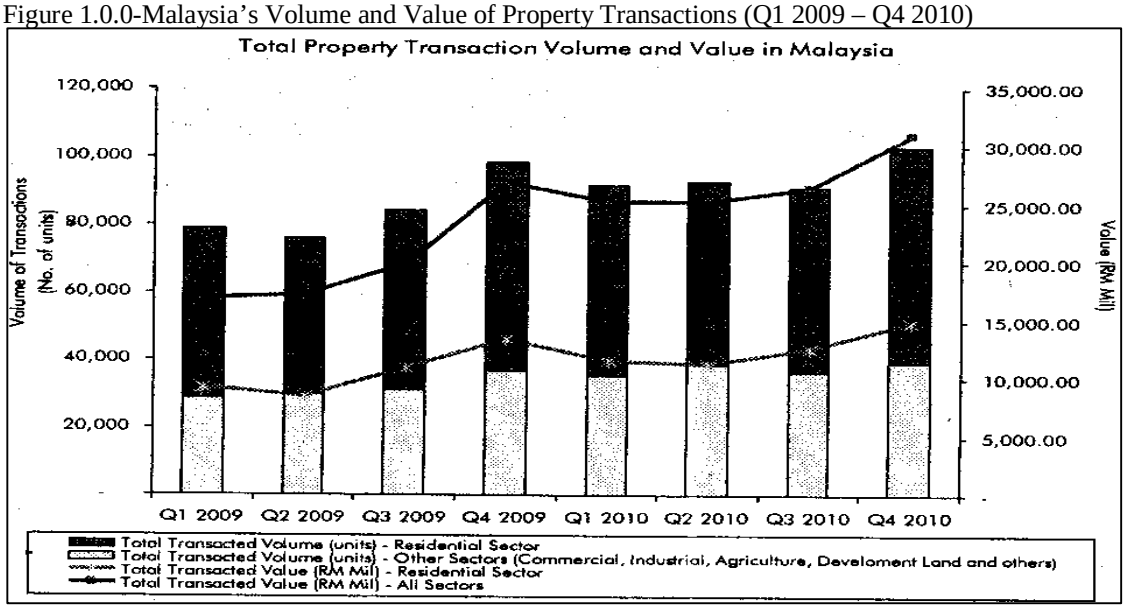
Appendix 1.2 The demand for pest services is projected to grow, details of which are indicated below:

(a) **Positive Economic Outlook for Malaysia.**
The Malaysian economy looks positive and the GDP in real terms is expected to grow at about 6.0% per annum during the 2008 -2010 period. Growth is expected to be driven by domestic demands, particularly the private sector expenditure. Per capita income in current term is projected to increase by 8.8% per annum to RM 29,711 (US $9,285). Such strong growth in the services sector was contributed by the high growth in services sub-sectors such as finance, insurance, real estate and business services. It is anticipated that the strong GDP performances augers well for the Malaysian pest management industry.

(b) **Urbanization and migration factors to seek employment opportunities.**
The population of Malaysia has increased from 26.45 million in 2005 to 27.23 million in 2007. It is estimated that the population in 2010 would have reached 28.24 million. Current trend suggest that there is the movement of people to the urban areas where employment opportunities and quality of life are relatively better than in the rural areas. Population migration to the urban areas has created a demand for housing and residential properties. The impact of urbanization in the Klang Valley can be seen from the data provided by the Valuation and Property Services Department of the Ministry of Finance Malaysia (2009). Property transactions in Kuala Lumpur stood at 25,325 units with a total value of RM 13.79 billion. This strong demand has continued for in the first three quarters of 2010 from January to September, a total of 20,443 property transactions in Kuala Lumpur had been transacted valued at RM 14.50 billion.

Such demand for housing and residential properties can be seen in the performance of the real estate market. Data available from the Valuation and Property Services Department, Ministry of Finance, Malaysia, provide a breakdown according to types of properties transacted Residential Properties made up 62.6% of the total transactions valued at RM 41.84 billion whilst commercial properties recorded 33,329 transactions valued at RM 16.39 billion as shown in by Figure 1.0.0.

Figure 1.0.0-Malaysia's Volume and Value of Property Transactions (Q1 2009 – Q4 2010)



Source: Valuation and Property Services Department, Ministry of Finance Malaysia (2010)

(c) Higher per Capita Income and Gross Monthly Household Income
The standard of living in Malaysia has improved in recent years with the per capita income in current price and in purchasing power has improved between 2006 and 2010. Economic factors contribute to the improvements in the standard of living and higher disposable household income suggests that the demand for such pest services will increase. However, there is a disparity in mean income, in current prices between urban and rural areas. As seen in Figure 1.1.0 which focuses on the average monthly household income in Malaysia for 2009.

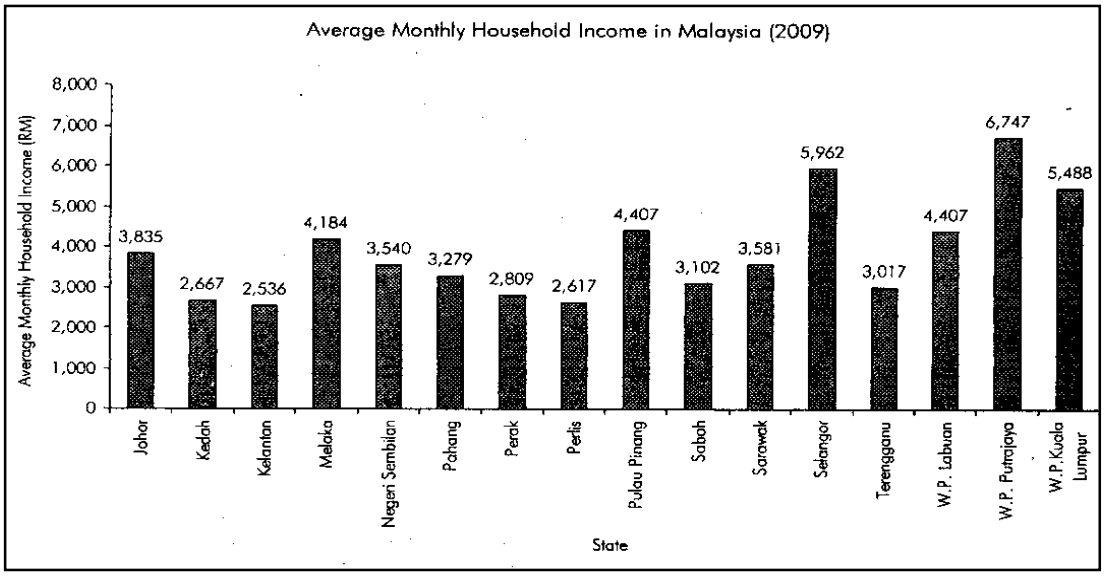


Figure 1.1.0 – Average Monthly Household Income in Malaysia (2009)
Source: Economic Planning Unit and Department of Statistics, Malaysia Household Income Survey (2010).

To illustrate, the urbanized areas of Kuala Lumpur and Putrajaya, and Selangor constituting the Klang valley, have suggested an average monthly household income of RM 5,488, RM 6,747 and RM 5,962 respectively. These income figures are higher than the average monthly household income of RM 4,025 for the country. In contrast, the less urbanized states like Kedah, Perlis and Kelantan have registered an average monthly household income of RM 2,667, RM 2,617 and RM 2,536 respectively. Given this income gap between urbanized and less urbanized states, it is likely that services would be in greater demand in the former than in the later situation.

(d) **Property Development Prospects.**
The property industry in Malaysia is generally categorized into residential, commercial and industrial sectors. Based on data from the Valuation and property Services Department, Ministry of Finance, Malaysia (2010), it is the residential sector which continues to dominate the property market, contributing about 77.68% of the total transaction volume valued at RM1,387,45 million for Kuala Lumpur alone. The property market in the Klang Valley is most vibrant and lucrative for property developers. Demand for properties is supported by the urbanized areas of Kuala Lumpur and Putrajaya, and Selangor constituting the Klang valley population that averages the highest household income in the country as depicted in Figure 1.1.0.

(e) **Government Regulations.**
In the past, the pest management industry has been largely dominated by small companies, a great number of which operated from residential homes or without any formal business registration. The early 1990's witnessed the mushrooming of quite a sizable number of pest management companies which provided inadequate pest services due to their lack of sound operations and inadequate technical background. Consumers were exposed to toxic pesticides, pest treatment provided were not effective, safety and health issues were compromised due to lack of understanding of the proper application of toxic pesticides used. These unethical practices, poor service quality and customer dissatisfaction was seen as some of the unsavory features which culminated in the government's intervention through the enactment of various Acts to regulate the pest management industry. This development has created a change in attitude of the pest management companies towards problems of unfair trade practices and inefficient operations plaguing the industry. Clearly, there has been a significant change observed with the legislative reforms carried out. The regulated and labor intensive industry has created entry barriers with the implementation of the regulations and Acts. These legislations stipulate that toxic pesticides should be handled by certified pest professionals and this will increase demand for more professional pest control services in their approach to ensure high standards of services expected in the competitive environment.

Appendix 2.0 Definition of Services

The service concept has gained much attention from marketing practitioners and researchers with service being variously defined. There are many definitions of the term 'services' from the review of literature. Several writers and researchers have given different definitions of service as shown below:

(a) The American Management Association in 1960 defined 'services' as activities, benefits, or satisfactions which are offered for sale or are provided in connection with the sale of goods.

(b) Kotler (1997) defines service is any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Its production may or may not be tied to a physical product.

(c) A service is a time-perishable, intangible experience performed for customer acting in the role of co-producer. (Fitzsimmons and Fitzsimmons, 2004, p. 4).

(d) According to Berry, (1980) a service is a deed, a performance, an effort", unlike a physical good which is an "object, a device, a thing" and hence, services cannot be seen, tasted, touched, heard or smelt before they are bought.

(e) Grönroos, (2000, p.46) defines a service as a process consisting of a series of more or less intangible activities that normally, but not necessarily always, take place in interactions between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems.

(f) According to Fitzsimmons and Fitzsimmons, (2004, p. 4), a service is intangible and perishable. It is an occurrence or process that is created and used simultaneously or nearly simultaneously. While the consumer cannot retain the actual service after it is produced, the effect of the service can be retained.

(g) Lovelock and Wirtz (2004, p. 9) defined that a service is an act or performance offered by one party to another. Although the process may be tied to a physical product, the performance is transitory, often intangible in nature, and does not normally result in ownership of any of the factors of production.

Appendix 2.1.1 A Summary of the various service characteristics is given below:

(a) **Heterogeneity:** Consistency of quality and service performance from service personnel is difficult to ascertain service performance varies from producer to producer, from customer to customer, and from day to day. Therefore, what the firm intends to deliver may be entirely different from what the consumer receives. A service is considered difficult to be produced consistently and in exact form each occasion the service is performed (Ghobadian et al. 1994). As services are intangible and cannot be duplicated, this means that there is greater scope for variability in the performance of services. The service delivery process can vary from individual employee to customer and or different occasions (Zeithmal, Bitner and Gremler, 2006). It is the result of service typically being co-produced by service company employees and customers as each customer evaluates subjectively the outcome of the service provided. This can mean that a similar and consistent service performance from the company may result in different evaluations from different customer's perspective. In comparison, the physical goods are homogenous. Different persons in the organization can provide the same service and each of them may provide it in their own way. As such, the heterogeneity issue also counts among characteristics of services that differentiate. Therefore, this characteristic makes it relatively difficult to standardize service outcomes. Muddie and Prine (2006) have rightly pointed out that such variability of services creates greater challenges for service quality.

(b) **Intangibility:** In their review of service marketing literature, Edgett and Parkinson (1993) state that intangibility does cause customers problems in evaluating a service offering prior to purchase. Laroche et al., (2001) provides the viewpoint that this means that customers may perceive the risk of purchase higher in services than in goods. According to Bowen and Ford (2002), services are said to be lower in search qualities compared to goods. There is nothing to show, compare or objectively test the service prior to us purchase. The intangibility poses problems of storage, patent protection, communication, display and pricing. Unlike goods that are physical, a service is intangible and purely an act of performance which customers cannot see, taste, smell or touch or feel before the confirmation of the purchase (Zeithamal, 1990; Groth and Dye, 1999 and Ghobadian *et. al.*, 1994). Muddie and Prine (2006) have pointed out that intangibility is the most basic and often quoted as the main difference between goods and services. The intangibility nature of service has caused difficulty in understanding how consumers perceive their services and evaluate SQ (Zeithaml, 1981).

(c) **Inseparability:** The most important characteristics of services and yet the most difficult to separate production from consumption (Gržinić, 2007). Similarly, with the perception that services are difficult to duplicate by service personnel, it can be seen that the production and consumption of services are likewise inseparable. Where labour intensive services are concerned, providence of quality service occurs during the performance or delivery. As a result, it usually involves an interaction between the client and the service personnel from the service firm. In this instance, the input from the client therefore becomes critical to the determination of the quality of service performance. Services are simultaneously produced and consumed, contrasted to the sequential nature of physical goods where production and distribution are separated from consumption. In services, these happen simultaneously and are inseparable, which usually take place in the presence of the customer. It also leads to greater customer interaction as well as customer interference in the service delivery process. According to Muddie and Prine (2006), services are first sold, then produced and consumed simultaneously.

(d) **Customer participation:** In services, the customer is an active participant in the service process. According to Teboul (1988), the presence of the customer must be physically available at least in some point during the service delivery. In the realm of physical goods, the customer just receives the finished product when delivered. In some situations the customer may be an active participant, that is, he may have participated in the design or specification of the product (Gržinić, 2007). In comparison, the service provider cannot hide the mistakes or any shortfall in service quality (Ghobadian et al., 1994).

(e) **Perishability:** Unlike a physical product, services cannot be stored, inventoried, or itemized as compared to goods (Gržinić, 2007; Muddie and Prine, 2006). Therefore, services cannot be saved, stored for reuse or resold which make it difficult to have a centralized production for further distribution as compared to goods. It can create inventory problems (Zeithmal, Bitner and Gremler, 2006). However, in services, carrying costs are low as it is non-existent and is considered as idle production capacity (Ghobadian *et. al.*, 1994). It is impossible to preserve services and this creates a problem of harmonizing offer and demand for services (Gržinić, 2007).

(f) **Transfer of ownership:** The ownership of goods can be moved and transferred when compared to a service. The customer merely owns a right to receive a service. A service is an act or performance offered by one party to another and the process may be tied to a physical product. The performance is transitory and does not normally result in ownership of any of the factors of production (Lovelock and Writz 2004).

(g) **Value production:** In services, the value is determined at the transaction stage with the customer in buyer-seller interactions. While with physical goods, the company creates the value in a factory where the product is manufactured. Lovelock and Writz (2004) described service as an economic activity that creates value and provides benefits for customers at specific times and places by bringing about a desired change on behalf of the recipient of the services.

(h) **Non-returnable:** According to Groth and Dye (1999), a service is not returnable unlike products but a customer may be refunded fully if services rendered are not satisfactory.

Appendix 2.1.2 Summary of Service Characteristics according to various writers

Writers	Service Characteristics
Kerin et al., (2003, p. 323)	There are four unique elements to services: intangibility, inconsistency, inseparability and inventory.
Kotler (2003, p. 446)	Services have four major characteristics that greatly affect the design of marketing programs: intangibility, inseparability, variability and perishability.
Pride and Ferrell (2003, p. 325)	Services have six basic characteristics: intangibility, inseparability of production and consumption, perishability, heterogeneity, client-based relationships, and customer contact
Solomon and Stuart (2003)	Regardless of whether they affect our bodies or our possessions, all services share four characteristics: intangibility, perishability, inseparability, and variability

Appendix 2.2.0 Differences between Services and Physical Goods according to Gronroos (1990)

Physical Goods	**Services**
Tangible	Intangible
Homogeneous	Heterogeneous
Production and distribution separated from consumption	Production and distribution and consumption are simultaneous processes
A thing	An activity or process
Core value produced in factory	Core value produced in buyer-seller interactions
Customers do not (normally) participate in the production process	Customers participate in production
Can be kept in stock	Not can be kept in stock
Transfer of ownership	No transfer of ownership

Appendix 2.3.0 Summary of Six Criteria of Perceived Good Service Quality according to Duggal and Siddiqi (2008)

Criteria	Perceived service quality description
1. Professionalism and Skills	The customers realize that the service provider, its employees, operational systems, and physical resources, have the knowledge and skills required to solve their problems in a professional way (outcome-related criteria).
2. Attitudes and Behavior	The customers feel that the service employees (contact persons) are concerned about them and interested in solving their problems in a friendly and spontaneous way (process-related criteria).
3. Accessibility and Flexibility	The customers feel that the service provider, its location, operating hours, employees, and operational system are designed to provide easy access to the service. They are prepared to adjust to the demands and wishes of the customers in a flexible way (process-related criteria).
4. Reliability and Trustworthiness	The customers know that whatever takes place or has been agreed upon, they can rely on the service provider, its employees and systems, to keep promises and perform with the best interest of the customers at heart (process-related criteria).
5. Recovery	The customers realize that whenever something goes wrong or something unpredictable unexpectedly happens, the service provider will immediately and actively take actions to keep them in control of the situation and find a new, acceptable solution (process-related criteria).
6. Reputation and Credibility	The customers believe that the operations of the service provider can be trusted and give adequate value for money. It stands for good performance and values which can be shared by customers and the service providers (image-related criteria)

Appendix 2.3.1 Summary of some key operational processes which constitute a quality management system for Delivery of Services by pest management organizations according to Duggal and Siddiqi (2008)

Key Processes	Details of the Quality Management System
1. Policy	A policy is a deliberate plan of action to guide decisions and achieve rational outcome(s). The term may apply to government, private sector, organization and the context in which they are made. Broadly, policies are typically instituted in order to avoid some negative effect that has been noticed in the organization or seek some positive benefits.
2. Process	Process is a naturally occurring or designed sequence of changes of properties or attributes of an object or system.
3. Sales Process	Sales process is one of the key processes that must describe how services are sold, who approved the contracts, and provides proper and adequate resources to deliver the service.
4. Inspection	Inspection will show how and when the pest treatment service is inspected to ensure that the scope or protocol is strictly followed. If not, then a recourse has to be available.
5. Procedure	Procedure is a specification of series of actions, acts or operations which have to be executed in the same manner in order to obtain the same results consistently.
6. Document Control / Quality Records	This refers to how data is collected and used in statistical analysis to maximize its effectiveness in the business process. It includes how documents and records are controlled and maintained**.**
7. Continuous Improvement	Improvement is an ongoing effort to improve products, services or processes. These efforts can seek incremental improvement over time or breakthrough improvement all at once.
8. Cost of Quality	Quality is a term widely used and widely misunderstood. The cost of quality is not the price of creating a quality product or service. It is the cost of not creating quality product or service.
9. Customer Satisfaction and Surveys	Organizations of all types and sizes have to come to realize that their main focus is to satisfy their customers. Satisfying the customer from time to time is also an effective tool to improve service quality.
10. Quality Assurance	The terms quality assurance and quality control are often used interchangeably to refer to ways of ensuring quality of a service or product. The terms, however, have different meanings. Assurance is the act of giving confidence, the state of being certain or the act of making certain. Quality assurance is planned and systematic activity implemented in a quality system so that quality requirements for a product or service are fulfilled.
11. Quality Control	Quality control is an evaluation to indicate needed corrective responses. It is the act of guiding a process in which variability is attributable to a constant system of chance causes. Quality control is the observation technique and activities used to fulfill requirements for quality.
12. Supplier Quality	Supplier performance is about more than just a low purchase price. The cost of transactions, communication, problem resolution and switching supplier all impact overall cost. The reliability of supplier delivery as well as the supplier's internal policies such as inventory levels all impact supply –chain performance.

Appendix 2.4.0 Instruments for Measuring Service Quality – SERVQUAL

SERVQUAL Model - The most eminent instrument in attempting to systematize the service quality is "The gap *model*" of service developed by Parshuraman et al (1985).

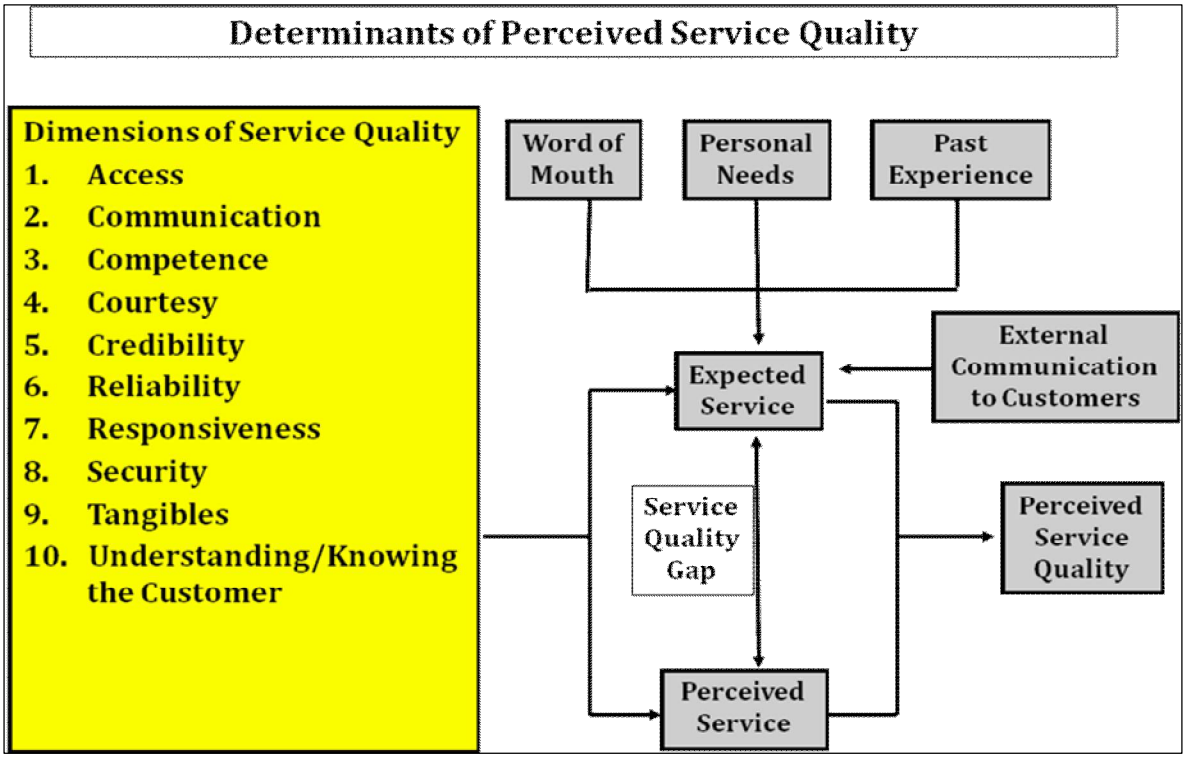


Figure 2.1.0 - Determinants of Perceived Service Quality

Source: A. Parasuraman, A.; (2005) New Ways of Listening to Library Users: New Tools for Measuring Service quality, A Lecture presented on November 4, 2005at the University of Miami, Washington, DC

Although there are several models for the measurement of service quality and customer satisfaction, they are often too generalized or ad hoc. As such, they are not suitable for the Malaysian pest management industry due to the specificities of services. The quality of service largely depends on human behaviour. Therefore, the number of quality dimensions and the items under each dimension to be measured usually varies with service settings leading to great difficulties in defining the quality of service precisely (Saleh and Ryan, 1991).

According to Buttle (1996), the SERVQUAL model is a generic instrument widely used to measure service performance in any service industry. It is founded on the view that the customer's assessment of service quality is paramount and it focuses on the concept of service quality gap (Parasuraman et al., 1985). SERVQUAL was developed within the marketing sector and is also is used in a variety of organizational settings, including libraries and information centers (Kettinger and Lee, 1994; Nitecki, 1996). SERVQUAL has served as the basis for measuring service quality in a number of contexts, including higher education institutions (Galloway, 1998), retail apparel specialty stores (Gagliano and Hathcote, 1994), health club (Walker and Baker, 2000), and hospital service (Hwang, Eves, and Desombre, 2003). The SERVQUAL model is the most widely applied instrument for measuring service quality due to ease of usage, a simple structure, and adaptability to generalization (Khan and Mahapatra, 2008).

Based on the findings of Parasuraman et al. (1985) and literature review, SERVQUAL instrument consists of two sets of twenty-two pairs of statements that a service provider delivers. The first set measures the customer's satisfaction by asking each respondent to rate how essential each factor is in the delivery of an excellent service. The second set of twenty-two statements formulates the same factors into descriptions about service actually delivered and ascertains the respondent's perception of the level of service given by the organization. The difference between the ranked perceptions minus the ranked expectations is calculated and the average gap score is the SERVQUAL overall quality score. In their original formulation, Parasuraman et al, (1985) identified **ten** components or determinants of perceived service quality (SQ), a multi dimensional construct as depicted in Figure 2.1.0.

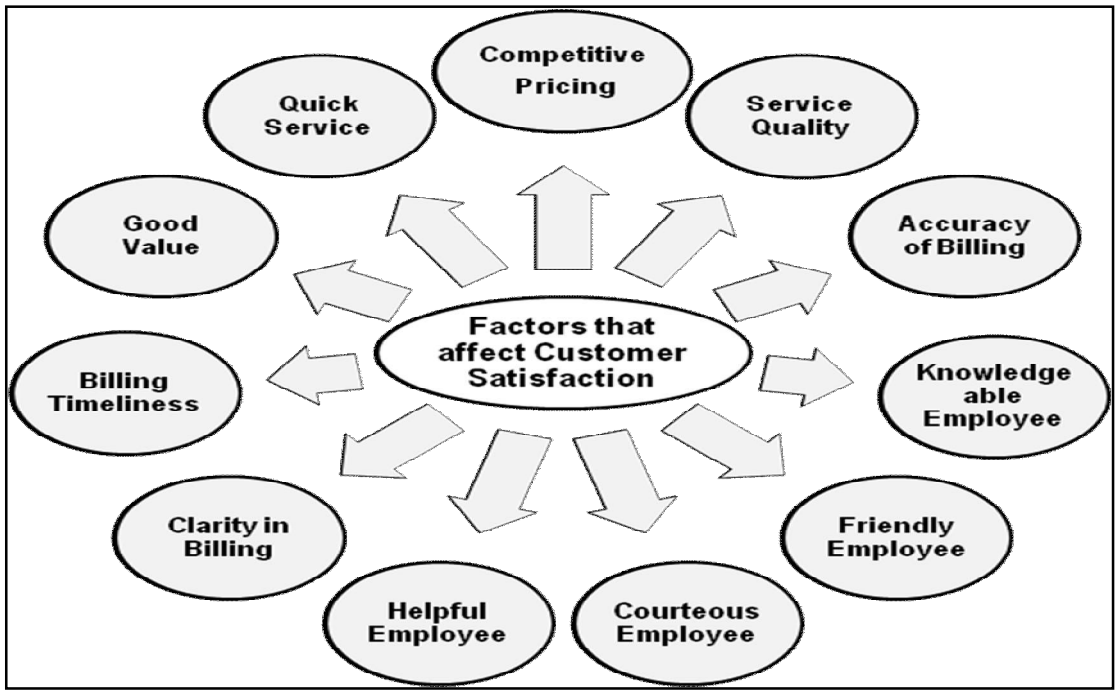
The 10 (ten) components were collapsed into five dimensions (in 1988): reliability, assurance, tangibles, empathy, and responsiveness or acronym for RATER. Reliability, tangibles and responsiveness remained distinct but the remaining seven components were collapsed into two aggregate dimensions, specifically, assurance and empathy. Parasuraman et al, (1985) developed these 22-item instrument with which to measure customers' expectations and perceptions (E and P) of these five dimensions. Four or five numbered items are used to measure each dimension. The instrument was administered twice in different forms, first to measure expectations and second to measure perceptions.

Appendix 2.5.0 The distinction between Customer Satisfaction and Service Quality

Customer Satisfaction	Service Quality
Customer satisfaction can result from any dimension, whether or not it is quality related.	The dimensions underlying quality judgements are rather specific.
Customer satisfaction judgments can be formed by a large number of non-quality issues such as needs, equity, perceptions of fairness.	Expectations for quality are based on ideals or perceptions of excellence.
Customer satisfaction is believed to have more conceptual antecedents.	Service quality has less conceptual antecedents.
Satisfaction judgments do require experience with the service or provider.	Quality perceptions do not require experience with the service or provider.

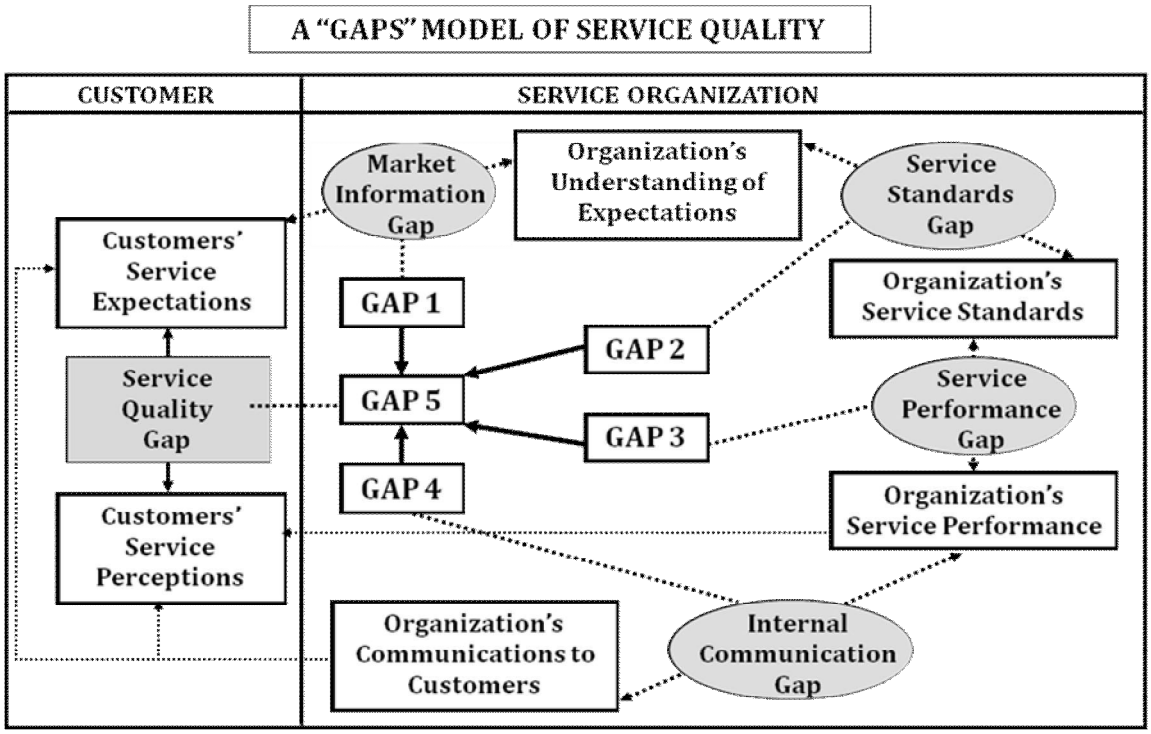
Source: Adapted from various sources (Choi et al, 2004; Grace and O'Cass, 2005; Oliver, 993; Rust and Oliver, 1994; Spreng and Mackoy, 1996; Taylor,1993)

Appendix 3.0.0 - Factors that Affect Customer Satisfaction



Source: Hokanson, S., 1995, The deeper you analyse, the more you satisfy

Appendix 3.1.0 Gap Model of Service Quality



Source: A. Parasuraman, A. (2005) "New Ways of Listening to Library Users: New Tools for Measuring Service Quality", A lecture presented on November 4, 2005at the University of Miami, Washington, DC

Appendix 3.2.0 Research Tools

Section 1.0 Demographics.

Respondent information – For each question below, please mark an **X** in the box that best describes you.

1. Gender ☐ Male ☐ Female

2. Age (years): ☐ Below ☐ 22-30 ☐ 31-40 ☐ 41-50 ☐ Above 51

3. What is your estimated annual service contract value and purchases for pest services with the company? (Please tick as appropriate)

   ☐ Less than RM 1,000.00 per annum
   ☐ RM 1,001.00 – RM 5,000.00 per annum
   ☐ RM 5,001.00 – RM 10,000.00 per annum
   ☐ RM 10,001.00 – RM 30,000.00 per annum
   ☐ RM 30,001.00 – RM 50,000.00 per annum
   ☐ Above RM 50,000.00 per annum

4. How many years do you have a pest control service contract with the pest service company? (Please tick as appropriate)

   ☐ Less than 1 year ☐ 2-3 Years ☐ 4-5 Years ☐ 5-7 Years ☐ 8-9 Years ☐ Above 10

5. Frequency of pest service utilized by customer: (Please tick as appropriate)
   ☐ Weekly Services
   ☐ Fortnightly Services (every two weeks)
   ☐ Monthly Services (every month)
   ☐ Bi-Monthly Services (every two months)
   ☐ Quarterly Services (every three months)
   ☐ Half Yearly Services (every Six months)
   ☐ Yearly Services (once a year)

6. What type of property is under the pest control maintenance by undertaken by the pest service company? (Please tick as appropriate)
   ☐ Shop house Buildings/Office Buildings
   ☐ Commercial Complex /Shopping Mall
   ☐ Business Hotel/Service Apartments/Resort
   ☐ Commercial Apartments/Condominium
   ☐ Warehouse/Factories/Manufacturing plants
   ☐ Private Apartment Units/Private residence/home
   ☐ Food and Beverage outlets/Restaurants
   Others please specify: ☐

7. What type of pest treatment and services most best describes your contract with the pest service company? (Please tick as appropriate)
   ☐ General Pest Control Contract Service - rats/ants/roaches/termites etc.
   ☐ Incidental Pest treatments – Bee/Hornets/Spiders /Bed Bugs/Birds/Wildlife intruders
   ☐ Anti-Termite Treatment/Soil treatment and Corrective Slab Treatment/Baiting System
   ☐ Fumigation Services – Ship/Quarantine Requirements/Warehouse /Soil
   ☐ Warehouse/Factories/Manufacturing plants
   ☐ Supply of Pest Control Equipments /Insecticides
   ☐ HACCP/GMP/ISO standards or certified Pest control services
   Others please specify: ☐

Appendix 3.2.0 - *Continue*

Section 2.0 Ranking of Determinants of Service Quality

2.1. Services provided by Pest Management Service Company. This section will assess the relationship between service provided, perception and expectation from a customer perspective. We are using your responses to understand your perception of the services that the pest management service company has provided to you. Please complete the entire questionnaire to enable us to gather a comprehensive description of this relationship.

In selecting a pest management service company for your needs, please rank in order of importance. **1 = highest importance and 10 = lowest importance.** Please rank every item (***known as Determinants of Service Quality*)** and use each ranking number only once.

Determinants of Service Quality - SERVQUAL	**Ranking**
Reliability – consistency of performance and dependability	
Responsiveness – willingness and readiness to provide service.	
Competence - Technical skills and knowledge to perform service	
Access – approachability and ease of contact for emergency	
Courtesy – politeness, respect, friendliness of contact personnel.	
Communication – listens to customers and acknowledge their comments	
Credibility – Trustworthiness, reputation and honesty of service provider	
Security – freedom from risk or doubt	
Understanding the customer – know the customers and their needs	
Tangibles – appearance of physical facilities, equipment, personnel etc.	

Highest Importance
1
2
3
4
5
6
7
8
9
10
Lowest Importance

Instructions: Please fill out each question as completely as possible by circling your choice for each question. Most of the questions ask for your level of **agreement** for a given service based on a five-point scale. The scale represents a spectrum: 1 signifies that you ***do not agree*** with the statement, and 5 means you ***strongly agree*** with ***that*** statement that best describes your experiences with the company.

Section A. General – Company and Organizational Structure

Please rate your level of satisfaction with the Company and Organizational Structure	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
A1. The pest service company has a good reputation in the market and industry.	**1**	**2**	**3**	**4**	**5**
A2. The pest service company operation is fully computerized to meet customers need.	**1**	**2**	**3**	**4**	**5**
A3. The pest service company is well organized and the top management is integrated internally to serve customers.	**1**	**2**	**3**	**4**	**5**
A4. The pest service company maintains customer information and efficiently updates customer service records.	**1**	**2**	**3**	**4**	**5**
A5. The pest service company provides regular reports on services provided and feedbacks on service recovery.	**1**	**2**	**3**	**4**	**5**
A6. The pest service company is concern about the high service quality and standards provided to serve customers.	**1**	**2**	**3**	**4**	**5**
A7. The pest service company's top management is dedicated, efficient and committed to serve customers.	**1**	**2**	**3**	**4**	**5**
A8. The pest service company staffs are well trained, easy to deal with, competent and knowledgeable in their services	**1**	**2**	**3**	**4**	**5**
A9. The pest service company is flexible enough to provide services according to customer's need.	**1**	**2**	**3**	**4**	**5**

A10. The pest service company staffs respond to problem faced and shows sincere interest in solving the service problem.	**1**	**2**	**3**	**4**	**5**
A11. The pest service company has 24/7 contact for call back service and prompt service recovery for service problem	**1**	**2**	**3**	**4**	**5**
A12. The pest service company staffs are courteous, friendly and polite in responding to customer's request.	**1**	**2**	**3**	**4**	**5**
A13. The pest service company staff instills confidence and makes customers fees safe in the service transaction.	**1**	**2**	**3**	**4**	**5**
A14. The pest service company makes as effort to meet service deadlines in order to satisfy customer.	**1**	**2**	**3**	**4**	**5**
A15. The pest service company has innovative and advance pest management technology for the pest control services .	**1**	**2**	**3**	**4**	**5**

Instructions: Please fill out each question as completely as possible by circling your choice) for each question. Most of the questions ask for your level of **satisfaction** for a given service based on a five-point scale. The scale represents a spectrum: 1 signifies that you are ***not at all satisfied*** with a service, and 5 means you are ***very satisfied*.**

Section B. Marketing and Finance Department.

Please rate your level of satisfaction with the Marketing and Finance Department.	**Very Dissatisfied**	**Dissatisfied**	**Neutral**	**Satisfied**	**Very Satisfied**
B.16 The responsiveness and knowledge level of the sales personnel in marketing the pest services provided.	**1**	**2**	**3**	**4**	**5**
B.17 The computerized proposals generated provide accurate and adequate information about the range of services offered.	**1**	**2**	**3**	**4**	**5**
B.18 The marketing staff is prompt in providing accurate solutions that meets your specific pest problems.	**1**	**2**	**3**	**4**	**5**
B.19 The pricing of the service provided is competitive and good value for the money.	**1**	**2**	**3**	**4**	**5**
B.20 The speed and accuracy in processing your job service confirmation order.	**1**	**2**	**3**	**4**	**5**
B.21 The responsiveness and process of paper work - service contracts and documentations that you need for doing business with us.	**1**	**2**	**3**	**4**	**5**
B.22 The computerized invoices generated provide accurate and clear information in the billing of services.	**1**	**2**	**3**	**4**	**5**

Section C. Customer Service and Operations

Please rate your level of satisfaction with the Marketing and Finance Department.	**Very Dissatisfied**	**Dissatisfied**	**Neutral**	**Satisfied**	**Very Satisfied**
C.23 The responsiveness in confirming with customer about the service schedules and appointment time.	**1**	**2**	**3**	**4**	**5**
C.24 The computerized documentations generated provide accurate and adequate information in advance on the service schedules and appointment time.	**1**	**2**	**3**	**4**	**5**
C.25 The speed in confirming appointment and punctuality for service appointments by the service personnel.	**1**	**2**	**3**	**4**	**5**
C.26 The ability of the service personnel to identify accurately the pest problems and knowledgeable in the services.	**1**	**2**	**3**	**4**	**5**
C.27 Technical support and assistance received for pest problems is excellent.	**1**	**2**	**3**	**4**	**5**
C.28 The pest service company provides accurate reports and feedback regularly after the services provided.	**1**	**2**	**3**	**4**	**5**
C.29 To what extent does, the pest service provided and the quality of services provided meet customer expectations.	**1**	**2**	**3**	**4**	**5**
C.30 I am very satisfied with my decision to use their services and would continue to use this pest service company.	**1**	**2**	**3**	**4**	**5**

C.31 How would you rate your relationship with the company considering all your experiences and service encounter?	**1**	**2**	**3**	**4**	**5**
C.32 Overall, ease of doing business with the customer service and operations personnel.	**1**	**2**	**3**	**4**	**5**
C.33 How well have you been informed by the pest service company about their services or new products/services available?	**1**	**2**	**3**	**4**	**5**

Section D. General - CRM Technology support

Instructions: Please fill out each question as completely as possible by circling your choice for each question. Most of the questions ask for your level of **agreement** for a given service based on a five-point scale. The scale represents a spectrum: 1 signifies that you ***do not agree*** with the statement, and 5 means you ***strongly agree*** with that statement that best describes your experiences with the company

Please rate your level of satisfaction with the CRM Technology support	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
D.34 I have no hesitation and would recommend the pest service company to other companies or friends.	**1**	**2**	**3**	**4**	**5**
D.35 The pest service company frequently and systematically measures customer satisfaction and complaints.	**1**	**2**	**3**	**4**	**5**
D.36 The pest service company spends time with key customers and maintains regular interactions through meetings.	**1**	**2**	**3**	**4**	**5**
D.37 The pest service company commits time and resources in building and maintaining customer relationships.	**1**	**2**	**3**	**4**	**5**
D.38 The pest service company customizes customer interactions to optimize customer value and loyalty.	**1**	**2**	**3**	**4**	**5**
D.39 The pest service company has established clear business goals related to customer retention and loyalty.	**1**	**2**	**3**	**4**	**5**
D.40 The pest service company provides channels to enable communication with key customers and service personnel.	**1**	**2**	**3**	**4**	**5**
D.41 The pest service company makes an effort to find out what the key customer needs and preferences.	**1**	**2**	**3**	**4**	**5**
D.42 The pest service company maintains customer interactions and service experiences to manage customer loyalty.	**1**	**2**	**3**	**4**	**5**
D.43 Building and maintaining long-term customer relationship is the competitive advantage for the pest service company.	**1**	**2**	**3**	**4**	**5**
D.44 The pest service company maintains a comprehensive database of customer's interaction and preferences.	**1**	**2**	**3**	**4**	**5**
D.45 The pest service company has the right CRM software and service resources to succeed in building and maintaining customer relationship.	**1**	**2**	**3**	**4**	**5**

Appendix 3.3.0 Development of the Research Instrument: Questionnaire Construction

(a) The choice of using mailed questionnaires as the research instrument is due to the fact that a questionnaire survey is self-administered, allowing selected respondents to enjoy a high degree of freedom in completing the questionnaires. These mailed questionnaires can also be completed at the respondent's convenience and assurance of greater anonymity. Babbie and Mouton (2001) also pointed out that respondents are more willing to express controversial opinions when they can maintain some degree of anonymity. All the researcher has to do is arrange delivery and collection.

(b) However, the disadvantages or weaknesses of mailed questionnaire surveys that are applicable in this study have been identified. The researcher has no control over whether the correct participant actually completed the questionnaire (De Vos et al. 2002), Other disadvantages are their lack of flexibility, low response rate despite the inclusion of self-addressed stamp envelopes and sending out of reminders (Babbie and Mouton, 2001); lack of control over environment, question order, or answer completion; no recording of spontaneous answers; difficulties in separating bad addresses from no responses; no control over date of response; complexity of questionnaire format; and increased possibility of biased sample. Such mail questionnaire also requires the participants to have the necessary writing skills and reading ability

(c) The questionnaire was developed in English. The sample of questionnaire was provided to the management team of the pest management organizations to ascertain the relevancy of the questions to pest management industry. This is to ensure the ability of selected customers to respond to the questions without experiencing confusion or undue frustration.

(d) The final draft of the questionnaire was analysed to see which ones are related to the variables and service determinants consistent with the research objectives. Detailed care is taken to ensure that questionnaire construction cover the CRM concepts to be studied and is able to promote answers to the research questions. In the process to collect the data, the questionnaire was developed to ensure that all the information required for analysis would be obtained. In this respect, it was important to ensure that there is no duplication or excessive coverage of any one concept, generally relevant, no ambiguous, and non-threatening and has clear answer categories that are easy to respond to. The chief goal of questionnaire construction is to construct an instrument that will not only maximize responses but that will also ensure that the information collected is complete, valid and reliable.

(e) The survey instrument used and questionnaires designed are used as part of survey strategy to collect reliable data In designing the questionnaire, consideration for the wording of individual questions and the order in which they appear have been reported by Saunders et al. (2003). To ensure that reliable data - the order and flow of questions should be logical to the respondents (Saunders et al, 2003). In order to reduce the possibility of getting the data input and analysis wrong, attention needs to be paid to two particular issues in the research design i.e. reliability and validity**.** For this research study to be reliable and valid, the researcher must take precautions in each stage of the research design and process. It is important to ensure that the research problems chosen are based on reliable and valid information after intensive literature reviews. The various questionnaires items are used to assess the determinants of SQ found in this study according to SQ attributes specified in the literature reviews.

(f) Mailing of the Questionnaire - Following the pilot study, the amendments made to the questionnaire relate to rewording of statements for clarity, restructuring of the items in the modified SERVQUAL to facilitate the ranking process, and a few typographical and grammar errors. When the questionnaire was finalized, it was printed for redistribution by post to the sample of this study. Besides the questionnaire, a cover letter was attached in which the purpose of the study was explained and that responses given were assured of confidentiality. A self-addressed envelope was enclosed to facilitate the return of responses on or before the deadline indicated. Further in-depth discussions on the procedures for the mailing of questionnaires are indicated in Appendix 3.7.

Appendix 3.4.0 Description of the Ten (10) SQ Determinants

Dimensions	Definition
1. Access	The access consists in the approachability and ease of contact, i.e. the service is easily accessible by telephone (free lines no holding), the waiting time to receive service is not extensive e.g. at a bank the convenient location of service facility.
2. Communication	The communication means keeping customers informed in language they can understand, listening to them and using networks to communicate. Through effective communication it can reduce the customer's uncertainty and, thereby, increase the customer's satisfaction.
3. Competence	The competence depends upon possession of the required skills and knowledge to perform the service, i.e. knowledge and skill of the contact personnel knowledge and skill of operational support personnel, research capability of the organization.
4. Courtesy	The courtesy is in relation with politeness, respect, consideration and friendliness of contact personnel, clean and neat appearance of public contact personnel.
5. Credibility	The credibility is the result of the trustworthiness, believability, honesty and having the customer best interests at heart. Contributing to the credibility and company name and reputation, personal characteristics of the contact personnel, and the degree of hard sell involved in interactions with the customer.
6. Reliability	The reliability involves consistency of performance and dependability, i.e. the firm performs the service right the first time, accuracy in billing, keeping records correctly, and performing the service at designated time.
7. Responsiveness	The responsiveness concerns the willingness or readiness of employees to provide service. It involves timeliness of service, i.e. mailing a transaction ship immediately, calling the customer back quickly, giving prompt service, e.g. setting up appointments quickly. The willingness to help customers and to provide prompt service
8. Security	The security is viewed as the freedom from danger, risk or doubt, i.e. physically safety while using service, financial security and confidentiality. The knowledge and courtesy of employees and their ability to convey trust and confidence.
9. Tangibles	The tangibles, as element of SQ , are the physical facilities, appearance of personnel, tools or equipment used to provide the service, The appearance of physical facilities, equipment, personnel and communication materials
10. Understanding and knowing the customer	Understanding and knowing the customer are important in terms of customer perceptions and satisfaction. This means to make the effort to understand the customer's needs, i.e. learning the customers' specific requirements, providing individualized attention and recognizing the regular customer.

Source: Adapted from Danciu, (2007); Naumann (1994); Gasvin (1984, 1987); Parasumaran, Berry, Zeithamel, (1985, 1986, and 1991).

Appendix 3.5.0 **Research Framework Mapping to CRM Components and Linkage to SQ Dimensions to be Measured.**

CRM Components and linkage to SQ dimensions	Ten SQ dimensions based on modified SERVQUAL	SQ dimensions to be measured
People (PP) are in reference to staffs or employees and are considered the power supply of the CRM system. The energy source must be set to the right 'voltage' for the entire system to work	**Reliability** – consistency of performance and dependability	Reliability
	Courtesy – politeness, Responsiveness, friendliness of contact personnel.	Courtesy
	Security – freedom from risk or doubt	Security
Process (PR) - Customer-centered processes are the 'product' of CRM. Touch points or the means by which we interact with customers, communicate, and respond to their needs.	**Responsiveness** – willingness and readiness to provide service.	Responsiveness
	Competence - Technical skills and knowledge to perform service	Competence
	Communication – listens to customers and acknowledge their comments	Communication
Technology (TC) is the machinery that enables CRM to work. A software system that integrates database or network applications that enhances the CRM.	**Access** – approachability and ease of contact for emergency	Access
	Tangibles – appearance of physical facilities, equipment, personnel.	Tangibles
Customer Information (CI) is the 'raw material' of CRM. Can the information on customer purchasing behavior enable the organization to respond and understand the customer, which can contribute to loyalty.	**Credibility** – Trustworthiness, reputation and honesty of service provider.	Credibility
	Understanding the customer – making an effort to know the customers and their needs.	Understanding

Appendix 3.6.1 Research Questionnaires Mapping to CRM components and linkage to Service Quality determinants

Research Questions	CRM Components and linkage to Service Quality determinants	Factors to be analyzed will be the determinants of Service Quality - SERVQUAL(Dimensions of SQ)	Attribute to be measured
RQ.1 What are the service quality determinants which influence customer satisfaction in the pest management service company? **RQ.2** To what extent is customer loyalty dependent on customer satisfaction and service quality in the pest management service company? **RQ.3** What are the key service quality determinants of the CRM components that foster customer relationship in the context of a pest management service company?	***People*** are in reference to staffs or employees and are considered the power supply of the CRM system. The energy source must be set to the right 'voltage' for the entire system to work	**1. Reliability** – consistency of performance and dependability	Reliability
		2. Courtesy – politeness, Responsiveness etc, friendliness of contact personnel.	Courtesy
		3. Security – freedom from risk or doubt	Security
	Process - Customer-centered *processes* are the 'product' of CRM. Touch points or the means by which we interact with customers, communicate, and respond to their needs.	**4. Responsiveness** – willingness and readiness to provide service.	Responsiveness
		5. Competence - Technical skills and knowledge to perform service	Competence
		6. Communication – listens to customers and acknowledge their comments	Communication
	Technology is the machinery that enables CRM to work. A software system that integrates database or network applications that enhances the CRM.	**7. Access** – approachability and ease of contact for emergency	Access
		8. Tangibles – appearance of physical facilities, equipment, personnel etc.	Tangibles
	Customer Information is the 'raw material' of CRM. Can the information on customer purchasing behavior enable the organization to respond and understand the customer, which can contribute to loyalty?	**9. Credibility** – Trustworthiness, reputation and honesty of service provider.	Credibility
		10. Understanding the customer – making an effort to know the customers and their needs.	Understanding

Note: The principle purpose of this Research is to establish the correlation between customer satisfaction and customer loyalty and investigate what are the key moderators of the relationship between the CRM components and their performance linkage that fosters customer relationship in the context of a pest management service company. The above research questions have been chosen to understand the research problems from the pest service company's perspective and to enable an understanding of the service quality to be delivered. The questionnaires chosen and the mapping to link them to the research questions and the variables (determinants of service quality) and attributes to be measured are designed for the basis of the data collection and analysis. The SERVQUAL model of *Parasuraman* et al *(1988)* proposed these factors and identified them as determinants of service quality. Refinements and modifications to the model have been carried out to tailor these variables and determinants of service quality in order to suit this research in the pest control industry.

Appendix 3.6.2 Mapping between the Questionnaires and the Modified SERVQUAL Model for each SQ determinants and literature sources

Determinants of Service Quality	Questionnaires	References and literature sources
Reliability	**A7**. The pest service company's top management is dedicated, efficient and committed to serve customers. **A14**. The pest service company makes as effort to meet service deadlines in order to satisfy customer. **B19**. The pricing of the service provided is competitive and good value for the money. **C24**. The computerized documentations generated provide accurate and adequate information in advance on the service schedules and appointment time. **C28**. The pest service company provides accurate reports and feedback regularly after the services provided. **C30**. I am very satisfied with my decision to use their services and would continue to use this pest service company. **C32**. Overall, ease of doing business with the customer service and operations personnel. **D37.** The pest service company commits time and resources in building and maintaining customer relationships.	Izuierdo, C.G. and Cillan, J.G. (2005), *The impact of customer relationship marketing on the firm performance: a Spanish case*, Journal of Services Marketing, Vol. 19, No. 4. Li, B., Riley, M.W., Lin, B. and Qi, E. (2006), *A comparison study of customer satisfaction between the UPS and FedEx: An empirical study among university customers.* Journal of Industrial Management and Data Systems, Vol. 106, No. 2. Claycomb, C. and Martin, C.L. (2002), *Building customer relationships: an inventory of service providers' objectives and practices* , Journal of Services Marketing, Vol. 16, No. 7. Olorunniwo, F. and Hsu, M.K. (2006), *A typology analysis of service quality, customer satisfaction and behavioral intentions in mass services*, Journal of Managing Service Quality, Vol. 16, No. 2.
Courtesy	**A8.** The pest service company staffs are well trained, easy to deal with, competent and knowledgeable in their services **A12.** The pest service company's staffs are courteous, friendly and polite in responding to customer's request. **B18.** The marketing staff is prompt in providing accurate solutions that meets your specific pest problems.	Izuierdo, C.G. and Cillan, J.G. (2005), *The impact of customer relationship marketing on the firm performance: a Spanish case.*, Journal of Services Marketing, Vol. 19, No. 4.
Security	**A3**. The pest service company is well organized and top the management is integrated internally to serve customers. **A6**. The pest service company is concern about the high service quality and standards provided to serve customers. **A13**. The pest service company's staff instills confidence and makes customers fees safe in the service transaction. **C31.** How would you rate your relationship with the company considering all your experiences and service encounter? **D34.** I have no hesitation and would recommend the pest service company to other companies or friends.	Izuierdo, C.G. and Cillan, J.G. (2005), *The impact of customer relationship marketing on the firm performance: a Spanish case.*, Journal of Services Marketing, Vol. 19, No. 4. Wong, A. and Sohal, A. (2003), *Service quality and customer loyalty perspectives on two levels of retail relationships*, Journal of Services Marketing, Vol. 17, No. 5. Claycomb, C. and Martin, C.L. (2002), *Building customer relationships: an inventory of service providers' objectives and practices* , Journal of Services Marketing, Vol. 16, No. 7,.

Appendix 3.6.2 (b) - *continue*

Determinants of Service Quality	**Questionnaires**	**References and literature sources**
Responsiveness	**A5**. The pest service company provides regular reports on services provided and feedbacks on service recovery. **A7.** The pest service company's top management is dedicated, efficient and committed to serve customers. **A11**. The pest service company has 24/7 contact for call back service and prompt service recovery for service problem **A12.** The pest service company's staffs are courteous, friendly and polite in responding to customer's request. **B20.** The speed and accuracy in processing your job service confirmation order. **B21.** The responsiveness and process of paper work - service contracts and documentations that you need for doing business with us. **C23.** The responsiveness in confirming with customer about the service schedules and appointment time. **C25.** The computerized documentations generated provide accurate and adequate information in advance on the service schedules and appointment time. **C28**. The pest service company provides accurate reports and feedback regularly after the services provided. **C32.** Overall, ease of doing business with the customer service and operations personnel. **D45.** The pest service company has the right CRM software and service resources to succeed in building and maintaining customer relationship.	Izuierdo, C.G. and Cillan, J.G. (2005), *The impact of customer relationship marketing on the firm performance: a Spanish case*, Journal of Services Marketing, Vol. 19, No. 4. Li, B., Riley, M.W., Lin, B. and Qi, E. (2006), *A comparison study of customer satisfaction between the UPS and FedEx: An empirical study among university customers.* Journal of Industrial Management and Data Systems, Vol. 106, No. 2. Wong, A. and Sohal, A. (2003), *Service quality and customer loyalty perspectives on two levels of retail relationships*, Journal of Services Marketing, Vol. 17, No. 5. Claycomb, C. and Martin, C.L. (2002), *Building customer relationships: an inventory of service providers' objectives and practices* , Journal of Services Marketing, Vol. 16, No. 7. Olorunniwo, F. and Hsu, M.K. (2006), *A typology analysis of service quality, customer satisfaction and behavioral intentions in mass services*, Journal of Managing Service Quality, Vol. 16, No. 2.
Competence	**A2.** The pest service company's operation is fully computerized to meet customers need. **A3.** The pest service company is well organized and top the management is integrated internally to serve customers. **A8.** The pest service company staffs are well trained, easy to deal with, competent and knowledgeable in their services **B20**. The speed and accuracy in processing your job service confirmation order. **B21.** The responsiveness and process of paper work - service contracts and documentations that you need for doing business with us. **C26.** The ability of the service personnel to identify accurately the pest problems and knowledgeable in the services. **C27.** Technical support and assistance received for pest problems is excellent. **C29.** To what extent does, the pest service provided and the quality of services provided meet customer expectations. **D41.** The pest service company makes an effort to find out what the key customer needs and preferences.	Izuierdo, C.G. and Cillan, J.G. (2005), *The impact of customer relationship marketing on the firm performance: a Spanish case*, Journal of Services Marketing, Vol. 19, No. 4. Li, B., Riley, M.W., Lin, B. and Qi, E. (2006), *A comparison study of customer satisfaction between the UPS and FedEx: An empirical study among university customers.* Journal of Industrial Management and Data Systems, Vol. 106, No. 2. Wong, A. and Sohal, A. (2003), *Service quality and customer loyalty perspectives on two levels of retail relationships*, Journal of Services Marketing, Vol. 17, No. 5. Claycomb, C. and Martin, C.L. (2002), *Building customer relationships: an inventory of service providers' objectives and practices* , Journal of Services Marketing, Vol. 16, No. 7.

Appendix 3.6.2 (b) - *continue*

Determinants of Service Quality	**Questionnaires**	**References and literature sources**
Communication	**A4.** The pest service company maintains customer information and efficiently updates customer service records. **A9.** The pest service company is flexible enough to provide services according to customer's need. **B16.** The responsiveness and knowledge level of the sales personnel in marketing the pest services provided. **B17**. The computerized proposals generated provide accurate and adequate information about the range of services offered. **B20**. The speed and accuracy in processing your job service confirmation order. **B22.** The computerized invoices generated provide accurate and clear information in the billing of services. **C23**. The responsiveness in confirming with customer about the service schedules and appointment time. **C24**. The computerized documentations generated provide accurate and adequate information in advance on the service schedules and appointment time. **C33**. How well have you been informed by the pest service company about their services or new products/services available? **C36**. The pest service company spends time with key customers and maintains regular interactions through meetings. **D37.** The pest service company commits time and resources in building and maintaining customer relationships. **D42**. The pest service company maintains customer interactions and service experiences to manage customer loyalty.	Izuierdo, C.G. and Cillan, J.G. (2005), *The impact of customer relationship marketing on the firm performance: a Spanish case*, Journal of Services Marketing, Vol. 19, No. 4. Wong, A. and Sohal, A. (2003), *Service quality and customer loyalty perspectives on two levels of retail relationships*, Journal of Services Marketing, Vol. 17, No. 5. Claycomb, C. and Martin, C.L. (2002), *Building customer relationships: an inventory of service providers' objectives and practices* , Journal of Services Marketing, Vol. 16, No. 7.
Access	**A4.** The pest service company maintains customer information and efficiently updates customer service records. **A11**. The pest service company has 24/7 contact for call back service and prompt service recovery for service problem **C25.** The computerized documentations generated provide accurate and adequate information in advance on the service schedules and appointment time. **CQ31**. How would you rate your relationship with the company considering all your experiences and service encounter? **D36.** The pest service company spends time with key customers and maintains regular interactions through meetings. **D40.** The pest service company has established clear business goals related to customer retention and loyalty.	Izuierdo, C.G. and Cillan, J.G. (2005), *The impact of customer relationship marketing on the firm performance: a Spanish case*, Journal of Services Marketing, Vol. 19, No. 4, 2005 Li, B., Riley, M.W., Lin, B. and Qi, E. (2006), *A comparison study of customer satisfaction between the UPS and FedEx: An empirical study among university customers.* Journal of Industrial Management and Data Systems, Vol. 106, No. 2, 2006 Wong, A. and Sohal, A. (2003), *Service quality and customer loyalty perspectives on two levels of retail relationships*, Journal of Services Marketing, Vol. 17, No. 5, 2003

Appendix 3.6.2 (b) - *continue*

Determinants of Service Quality	**Questionnaires**	**References and literature sources**
Tangibles	**A1**. The pest service company has a good reputation in the market and industry. **A2.** The pest service company operation is fully computerized to meet customers need. **A3.** The pest service company is well organized and top the management is integrated internally to serve customers. **A11**. The pest service company has 24/7 contact for call back service and prompt service recovery for service problem **A15**. The pest service company has innovative and advance pest management technology for the pest control services . **D44.** The pest service company maintains a comprehensive database of customer's interaction and preferences. **D45.** The pest service company has the right CRM software and service resources to succeed in building and maintaining customer relationship.	Izuierdo, C.G. and Cillan, J.G. (2005), *The impact of customer relationship marketing on the firm performance: a Spanish case*, Journal of Services Marketing, Vol. 19, No. 4, 2005 Wong, A. and Sohal, A. (2003), *Service quality and customer loyalty perspectives on two levels of retail relationships*, Journal of Services Marketing, Vol. 17, No. 5, 2003 Claycomb, C. and Martin, C.L. (2002), *Building customer relationships: an inventory of service providers' objectives and practices* , Journal of Services Marketing, Vol. 16, No. 7, 2002 Olorunniwo, F. and Hsu, M.K. (2006), *A typology analysis of service quality, customer satisfaction and behavioral intentions in mass services*, Journal of Managing Service Quality, Vol. 16, No. 2, 2006
Credibility	**A1.** The pest service company has a good reputation in the market and industry. **A5.** The pest service company provides regular reports on services provided and feedbacks on service recovery. **A10**. The pest service company staffs respond to problem faced and shows sincere interest in solving the service problem. **A15.** The pest service company has innovative and advance pest management technology for the pest control services . **B19.** The pricing of the service provided is competitive and good value for the money. **B22**. The computerized invoices generated provide accurate and clear information in the billing of services. **C29**. To what extent does, the pest service provided and the quality of services provided meet customer expectations. **C30.** I am very satisfied with my decision to use their services and would continue to use this pest service company. **D34**. I have no hesitation and would recommend the pest service company to other companies or friends. **D39.** The pest service company has established clear business goals related to customer retention and loyalty. **D43**. Building and maintaining long-term customer relationship is the competitive advantage for the pest service company.	Izuierdo, C.G. and Cillan, J.G. (2005), *The impact of customer relationship marketing on the firm performance: a Spanish case*, Journal of Services Marketing, Vol. 19, No. 4, 2005 Li, B., Riley, M.W., Lin, B. and Qi, E. (2006), *A comparison study of customer satisfaction between the UPS and FedEx: An empirical study among university customers.* Journal of Industrial Management and Data Systems, Vol. 106, No. 2, 2006 Wong, A. and Sohal, A. (2003), *Service quality and customer loyalty perspectives on two levels of retail relationships*, Journal of Services Marketing, Vol. 17, No. 5, 2003 Claycomb, C. and Martin, C.L. (2002), *Building customer relationships: an inventory of service providers' objectives and practices* , Journal of Services Marketing, Vol. 16, No. 7, 2002 Olorunniwo, F. and Hsu, M.K. (2006), *A typology analysis of service quality, customer satisfaction and behavioral intentions in mass services*, Journal of Managing Service Quality, Vol. 16, No. 2, 2006

Appendix 3.6.2 (b) - *continue*

Determinants of Service Quality	**Questionnaires**	**References and literature sources**
Understanding	**A2.** The pest service company's operation is fully computerized to meet customers need. **A4.** The pest service company maintains customer information and efficiently updates customer service records. **A6**. The pest service company is concern about the high service quality and standards provided to serve customers. **A9.** The pest service company is flexible enough to provide services according to customer's need. **A10.** The pest service company staffs respond to problem faced and shows sincere interest in solving the service problem. **A13**. The pest service company staff instills confidence and makes customers fees safe in the service transaction. **A14**. The pest service company makes as effort to meet service deadlines in order to satisfy customer. **B16**. The responsiveness and knowledge level of the sales personnel in marketing the pest services provided. **B17.** The computerized proposals generated provide accurate and adequate information about the range of services offered. **B18**. The marketing staff is prompt in providing accurate solutions that meets your specific pest problems. **D35**. The pest service company frequently and systematically measures customer satisfaction and complaints. **D38**. The pest service company commits time and resources in building and maintaining customer relationships. **D41**. The pest service company makes an effort to find out what the key customer needs and preferences. **D43**. The pest service company maintains a comprehensive database of customer's interaction and preferences.	Izuierdo, C.G. and Cillan, J.G. (2005), *The impact of customer relationship marketing on the firm performance: a Spanish case*, Journal of Services Marketing, Vol. 19, No. 4, 2005 Li, B., Riley, M.W., Lin, B. and Qi, E. (2006), *A comparison study of customer satisfaction between the UPS and FedEx: An empirical study among university customers.* Journal of Industrial Management and Data Systems, Vol. 106, No. 2, 2006 Wong, A. and Sohal, A. (2003), *Service quality and customer loyalty perspectives on two levels of retail relationships*, Journal of Services Marketing, Vol. 17, No. 5, 2003 Claycomb, C. and Martin, C.L. (2002), *Building customer relationships: an inventory of service providers' objectives and practices* , Journal of Services Marketing, Vol. 16, No. 7, 2002

Appendix 3.7.0 – Organization of the research instrument where questionnaire was formulated in two sections, namely, Section 1 and Section 2.

Section 1 – Demographics which relates to customer background and usage of the organization in terms of the kind and value of the contract, frequency of services, property maintained and the treatment provided. The questionnaire survey comprised a general information section (demographics) and the SQ evaluation section that applied the modified SERVQUAL instrument to suit pest management industry. It is also important that the questionnaire is modest in length and standardized wording used to reduce any bias. To achieve the research objectives, the primary data need to be collected via self administrated questionnaire survey. These questionnaires assures confidentially of the respondents that further encourage more truthful responses.

Section 2 – Organization Structure which consists of four subsections (Part A to D) to investigate the SQ and CRM components. Part A deals with the company and Organization structure. Part B is the marketing and Finance Department. Part C focus on customer service and operations and Part D pertains to CRM Technology. As such, the questionnaires for the study are formulated as follows:

Section 1.0: Personal Information – Demographics.
The first section consists of seven general questions to find out the demographic features of the respondents such as gender, age, information on the annual service contract values, length of contract, type of property and types of pest treatments undertaken with the pest management company. This part also enquires the sector of business and types of pest service undertaken and the pest service frequency the respondents have contracted with the pest management company. This section was very essential to find out the relationship of respondents towards the expected SQ . The aim for including such information was to identify whether there was a relationship between the demographic data of customers and customer loyalty and retention.

Section 2.0: Ranking of the Ten SQ Dimensions from the Customer Perceptions.
The second section of the questionnaire is to rate the ten service determinants which are important to the respondents in terms of rank order. This section will assess the relationship between services that are provided based on perception from a customers' perspective. The 10 determinants of SQ to be investigated in this study are Reliability, Responsiveness, Competence, Access, Courtesy, Communication, Credibility, Security, Understanding the customer and Tangibles. Responses on these service dimensions will help to understand their perception of the services that the pest management service company has provided. Participants were asked to rank each item (known as Determinants of SQ) and use each ranking number only once in order of importance. 1 = highest importance and 10 = lowest importance. This is to gather a comprehensive description of customer relationship.

Section 2.1: CRM Components from the Customer Perceptions.
The third section identifies relationship among the four CRM factors (i.e. People, Process, Technology and Customer Information) which influence the SQ . The focus is on factors such as punctuality for service appointment, appearance, knowledge, experience of service personnel providing services, reliability of marketing staffs, attention of the supportive customer service provided, and reputation, trustworthiness and credibility of pest Management Company. This section contains 45 questionnaire attributes to measure quantitatively the customer's perception of the SQ which represent ten dimension factors. These items were customized to evaluate the customers' perception of SQ and service encounter in pest management industry. The questionnaire has four parts which related to the CRM components to be measured and also there is a need to find out the importance of the service dimensions in four areas

To understand the importance and satisfaction of each SQ dimension, a 5 point-scale was used to describe the statement that best describes the participant's experiences with the company. (1 = very unsatisfied, 3 = neutral, 5 = very satisfied).

Appendix 3.8.1 The choice to two companies - Company A (Pest Dynamics (M) Sdn Bhd) and company B (Fog Master Sdn Bhd).

Two pest management organizations have been approached for this research study. Their selection for this study is based on the criteria that the two organizations have implemented CRM software since 1996. A formal request was made in an official letter to the selected two pest management organizations. It sought permission to access their existing customers for the study to be conducted. Official permission has been obtained from the company management as shown in **Appendix 3.8.4 and 3.8.5.**

It was necessary to companies which had installed CRM Software for ease of tracking of customers and their records. The application of these criteria narrowed the choice to two companies. Company A (Pest Dynamics (M) Sdn Bhd) and company B (Fog Master Sdn Bhd**)**, both of which had been using CRM software (Service Pro software systems) since 1996.

Company A - PEST DYNAMICS (M) SDN BHD (PDM) was incorporated on 11th April 1994 (Certificate of Incorporation No: 294844 – x) and is registered with government agencies and fully to provide pest control services. PDM is also a Licensed fumigator (by the Ministry of Health, Malaysia) and has been in the Malaysian pest industry for the past 17 years and is considered one of the major players in the Klang valley market. The staffs are professionally trained, experienced in pest management techniques necessary to correctly identify pest problems and recommend the most appropriate IPM treatment. The company offers a wide range of specialized pest control ranging from anti-termite soil and slab treatment, termite baiting systems, general pest control services for industrial and commercial buildings, offices, factories, shopping malls, apartments, hotels and resorts, restaurants, fast food outlets, food courts, and cinemas. The niche market for the company and competitive edge is in the hospitality and food sector, where the company has maintain a strong market share of the landmark properties and major hotels. The focus of the company is in providing IPM which is a program is a system designed to prevent pests from infesting your property and to get rid of any pests that are present within the property. IPM anticipates and prevents pest activity and infestation by combining several strategies to achieve long-term pest control solutions which include education, proper waste management, structural repair, maintenance, biological and mechanical control techniques and pesticide application.

Company B - FOG MASTER SDN BHD (FMS) was established on 31st October 1994 (Certificate of Incorporation No: 321947-k), having their office at No: 22, Jalan Abiad, Taman Tebrau Jaya, 80400, Johor Bahru, Malaysia and is registered with government agencies and fully to provide pest control services. FMS is also a Licensed fumigator (by the Ministry of Health, Malaysia) and has been in the Malaysian pest industry for the past 17 years and is considered one of the major players in the Southern market. FMS provides IPM Program with the primary objective to exclude the introduction of exotic insect pests and diseases bearing vectors (rats / rodents, Mosquitoes or cockroaches) into the Apartment Building/Property premises or buildings. The secondary objective is to protect and prevent damages to the physical assets/properties by means or regular and routine pest control services. FMS aims to achieve these objectives with the least possible interference to their client's business operations. This requires a careful assessment of the pest infestation levels and regular treatment/services to be carried out, acceptable methods of pest treatment, technically competent and experienced staffs, proper equipments and highly effective insecticides. All pesticides used for pest treatments are all in accordance with the international specification and approved by the Pesticides Board of Malaysia. FMS a member of the National Pest Management Association of America (NPMA) and have a capable team of well trained technicians, supervisors and management support. The staffs are licensed to carry out pest control services with Pesticides Applicator Licenses (PAL) or Assistant Applicator License (APAL).

Appendix 3.8.2 Sampling Size and details - The choice to two companies - Company A (Pest Dynamics (M) Sdn Bhd) and company B (Fog Master Sdn Bhd).

(a) Regarding the research participant sample size, by convention and guided by the rule suggested by Kass and Tinsley (1979), that a research study should have at least 10-15 participants per variable. Comrey and Lee (1992) stated that a sample size of 300 to be sufficient and reported that below 100 is consider as poor and a sample size of 1000 is rated as excellent. Other views expressed by Spector (1992) and Hair et al. (1995) declared that the sample size of 200 is deemed to be sufficient.

(b) The justification of selecting 700 participants is to ensure that approximately 50% response rate and able to provide viable data analysis. A copy of the Information Sheet [see Appendix 3 (a)] providing information to the participants and identifying necessary information for asking research participants to fill and complete the questionnaires will be provided. The aim and purpose of the research study, protection of privacy, risks and how the participants are selected as participants will be made clear to them. The selected participants are assured of their anonymity and freedom to decide whether to participate in the study or not. Clear instructions were given to the respondents regarding the completion of the specific items in the questionnaire.

(c) The questionnaires, administrated in January 2008 and returned by February 2008 were sent to 550 corporate clients and 150 household individuals with cover letters to explain the research objectives and instructions to complete the questionnaires as outlined in Appendix 3.8.6, 3.8.7 and 3.8.8.

(d) Customer records maintained were comprehensive and systematic and legal contracts were in chronological order.

Appendix 3.8.3 Recruitment letter - Correspondence (including organizational permission)

(To seek organizational permission to perform data collection and questionnaire survey)

Date: June 2, 2007

PEST DYNAMICS (M) SDN BHD
No: 80, Jalan 4/91,
Taman Shamelin Perkasa,
Cheras, 56100 Kuala Lumpur,

Atten: Mr. Kulasekran P Rasalingham – Director

Dear Sir,

Subject: Questionnaire Survey - Customer Relationship Management (CRM) - delivering service excellence to achieve customer loyalty

Reference is made to the above matter. I am currently a doctoral candidate of the University Of South Australia, Adelaide, Australia studying for the Doctoral degree in Business Administration at the University. As part of the fulfillment of the doctoral program, I am required to undertake a research study on a subject of my interest, which is Customer Relationship Management (CRM) - delivering service excellence to achieve customer retention and loyalty.

Purpose of my Research Study
My chosen topic is aimed to gain a deeper understanding of the use of ***Customer Relationship Management*** (CRM) within a service orientated pest management service industry. The aim of this DBA Research is to gain a deeper understanding of the use of ***Customer Relationship Management*** (CRM) within the context of a service orientated pest control service industry and to carry out a study into factors that determine customer loyalty.

a) The First objective is to establish the correlation between customer satisfaction and customer loyalty and investigate what are the key moderators of the relationship between the CRM components and their performance linkage that fosters customer relationship.

b) The second objective is from the perspective of managerial contribution and an academic interest to examine the service perception of the service delivery within the pest control industry using an exploratory study and questionnaire survey.

The participation of Pest Dynamics (M) Sdn Bhd in this study will enable me to explore use the CRM components (which is viewed as a management tool that integrates people, information, processes and technology) to enable organizations to make optimal allocations and correct decisions. To achieve these data collection methods, questionnaires will be sent to your existing customers with the objective to measure and identify the various variables associated with the four CRM components. Therefore, the method used will be the quantitative research method, as the data will be collected by questionnaires. Delivery of the survey questionnaire is by email or postal and by personal delivery when the pest control technicians are sent to the client premise for job treatment. A cover letter identifying necessary information for asking participants to fill and complete the questionnaires will be enclosed with the survey questionnaire. For participants from commercial or private sectors, the invitation to participate will be addressed to the person in charge of pest control contracts or decision maker with a return stamped envelope. It is recommended that to encourage response by offering a summary report of this study.

Your participation in this study is strictly voluntary; you may leave at any stage. You can also choose to have any data that your customers have provide in this study destroyed at any stage, either during or after the study. Otherwise, your responses will be kept anonymous and confidential, subject to any legal requirements. As the principal researcher, working on this study and my Supervisor will have access to your responses.

If you would like more information, or have any further questions about any aspect of this study, then please feel free to contact Mr. Raymond Lee at (03) 92833886 or (012) 3178187 or email contact: **raylee@pc.jaring.my.** Thank you for your participation. It is greatly appreciated.

Yours Sincerely



Correspondence Address: No: 11, Jalan N4, Taman Melawati, 56100 Kuala Lumpur
Copy: Research Supervisor: Dr. Leo Ann Mean - Email: drleo@itd.com.my [Telephone: (603) 6203 3880]
ITD.KL, Level 3,Block D, Plaza Mont Kiara, Jalan Bukit Kiara, 50480 Kuala Lumpur, Malaysia

Appendix 3.8.4 Correspondence (organizational permission)

PEST DYNAMICS (M) SDN BHD (294844 -X)
Pest Management Technology Since 1994
No: 80, Jalan 4/91, Taman Shamelin Perkasa, Cheras, 56100 Kuala Lumpur, Malaysia
Tel.: (03) 9283 4008, 9283 3886, 9283 4886
Fac.: (03) 9283 2008
Penang Office : 46-G-11, Greenlane Heights, Jalan Besi, 11600 Penang. Tel.: (04) 656 8995 Fac : (04) 656 7563
Langkawi Office: Lot 15, Langkawi Mall, Jalan Kelibang, Pokok Asam, 07000 Langkawi, Kedah Tel.: (04) 9664533 Fac.: (04) 966 8981
E-mail : gm@pe.jaring.my Website www.epest.com.my
Chartered Member of the Pest Control Association of Malaysia
EXTERRA Termite & Interceptor Baiting Systems
Appointed Applicator - MALAYSIA

June 18th, 2007

Mr. Raymond Lee
Correspondence Address:
No: 11, Jalan N4,
Taman Melawati,
56100 Kuala Lumpur

Dear Mr. Lee,

Subject – Research Study and Questionnaire Survey - Customer Relationship Management (CRM) - delivering service excellence to achieve customer retention and loyalty

We refer to your letter dated June 2, 2007 with regards to your interest to conduct the above research study on the company's customer and clients. The board of Directors have met and discussed on your interest and intentions to carry out the study.

We wish to confirm our agreement and accept your offer to conduct the research study with the intention to carry out an exploratory study into factors that relate to customer retention and loyalty in the pest management service organization. The Board has specifically agreed to allow you to carry out the study subject to the requirement that all datas and information collected by you during the course of this research will be treated with utmost confidentiality. A short summary of the results of this study will be made available to the company management and all responses will not be identified in any way in the DBA report.

We would like to thank you for the interest in our company and should you require any form of assistance with regards to the data collection, please do not hesitate to contact the undersigned or Mr. Ernest Simon (General Manager) at (03) 9283 4008 / 3886 / 4886

Thank you

Yours faithfully,
PEST DYNAMICS (M) SDN BHD

Kulasekran P Rasalingham
Director

ES/DBA-PD-07

Appendix 3.8.5 Correspondence (organizational permission)

11-JUL-2007 12:33 FOG MASTER S/B 07 3331328 P.01

FOG MASTER SDN BHD (Co. No: 321947)
22, Jalan Ablad, Taman Tebrau Jaya, 80400 Johor Baru, Johor Darul Takzim, Malaysia
Telephone: 07 - 3333081, 3333082
Facsimile: 07 - 3331328 E-mail : fogmah@streamyx.com
Authorised Operator
Termite Baiting system

Date: 10th July 2007

Mr. Raymond Lee
Correspondence Address:
No: 11, Jalan N4,
Taman Melawati,
56100 Kuala Lumpur

Dear Mr. Lee,

Subject – Research Study and Questionnaire Survey - Customer Relationship Management (CRM) - delivering service excellence to achieve customer retention and loyalty

We refer to your letter dated June 2, 2007 with regards to your interest to conduct the above research study on the company's customer and clients. The board of Directors have met and discussed on your interest and intentions to carry out the study.

We wish to confirm our agreement and accept your offer to conduct the research study with the intention to carry out an exploratory study into factors that relate to customer retention and loyalty in the pest management service organization. The Board has specifically agreed to allow you to carry out the study subject to the requirement that all datas and information collected by you during the course of this research will be treated with utmost confidentiality. A short summary of the results of this study will be made available to the company management and all responses will not be identified in any way in the DBA report.

We would like to thank you for the interest in our company and should you require any form of assistance with regards to the data collection, please do not hesitate to contact the undersigned.

Thank you

Yours faithfully,
FOGMASTER SDN BHD

Johnny Kang
Director

Appendix 3.8.6 Participant Information Sheet for questionnaire survey

Research Participant Information Sheet:

UNIVERSITY OF SOUTH AUSTRALIA
Division of business, International Graduate School of Management
Adelaide, Australia

Research Title: Questionnaire Survey - Customer Relationship Management (CRM) - delivering service excellence to achieve customer retention and loyalty

Name of Researcher: Mr. Raymond Lee Soon Tuck, Master of Business Administration (E-commerce), CSU Australia.

Contact of Researcher: (603) 92833886 or (012) 3178187 or email contact: raylee@pc.jaring.my

Research Supervisor: Dr. Leo Ann Mean – email contact: drleo@itd.com.my [
Telephone: (603) 6203 3880]
ITD.KL, Level 3,Block D, Plaza Mont Kiara, Jalan Bukit Kiara,
50480 Kuala Lumpur, Malaysia

I am currently a doctoral candidate of the University of South Australia, Adelaide, Australia studying for the Doctoral degree in Business Administration at the University. As part of the fulfillment of the doctoral program, I am undertaking a research study entitled **Customer Relationship Management (CRM) - delivering service excellence to achieve customer retention and loyalty.**

1.0 Invitation
I would like to invite you to participate in this research study. Your participation would involve completing a survey questionnaire, which will take approximately 20 minutes. Your participation will make valuable contribution to my research, which is conducted as part fulfillment of the award of the degree of Doctor of Business Administration (DBA) from the University of South Australia.

1.1 Purpose of my Research Study
My chosen topic is to understand the use of ***Customer Relationship Management*** (CRM) within a service orientated pest management service industry. The study will investigate what are the key moderators of the relationship between the CRM components and their performance linkage that fosters customer relationship. It will identify service dimension and factors that relate to customer satisfaction, which leads to customer loyalty within the context of a service orientated pest control service industry.

2. Benefits of my Research Study
The results of this study will assist pest management industry to assess the service quality provided to its customers. Results of this study will also help pest management industry understand the service dimensions and their impact on service quality dimensions and overall satisfaction levels.

3. Selection and Chosen as respondents
As a part of my dissertation, I am required to collect information on your evaluation of the pest management service company which you have a service contract with. You are one of the participants that have been selected from the address database of the CRM software ***Service Pro software (CRM)***. The enclosed questionnaire takes approximately 20 minutes to answer. The time you invest to answer the survey means a lot to us, as the results of the study are highly dependent upon the number of responses we receive.

4. Privacy protection.
Kindly complete the questionnaire and please return in the attached pre-paid self-addressed envelope provided by **15th December 2007.** All data are treated with utmost confidentiality, immediately being entered into a database in which it will not be possible to identify individual participants. All information collected as part of this study will be retained for **seven years** in a secure location. In addition, all records containing personal information will remain confidential and no information, which could lead to identification of any individual, will be released. The researcher and the participant will be the only two people who have access to the responded questionnaires. No individual response will be identified in the aggregated results of this research.

5. Feedback on Results of research.
As a **participant,** you are entitled to retain the *Research Participant Information Sheet*. If you or someone else at your company would like to receive a short summary of the results (estimated to be ready in the 2008) just complete the detached counterfoil at the end of the questionnaire.

6. General
Participation in this research study is optional or voluntary. You may withdraw at any time you wish to do so. There is no discomfort and risk encountered by you as a participant.

The findings will contribute to marketing literature and practice in the pest service industry. The research will increase awareness of service delivery and possible gaps in service quality. It will help to inform the industry how to improve services to customers.

If you have any further ethical concerns that you will need to discuss, please feel free to contact the person below:

Ms Lan Lac, Executive Officer
IGSB Human Research Ethics Committee
University of South Australia
GPO BOX 2471
Adelaide SA 5000, Australia
Email: Lan.Lac@unisa.edu.au / Tel: +61 8 8302 0475

If you would like more information, or have any further questions about any aspect of this study, then please feel free to contact Mr. Raymond Lee at (03) 92833886 or (012) 3178187 or email contact: raylee@pc.jaring.my. Thank you for your participation. It is greatly appreciated.

Yours Sincerely



Mr. Raymond Lee
No: 80, Jalan 4/91, Taman Shamelin Perkasa,
Cheras, 56100 Kuala Lumpur
Malaysia

Fax: (03) 92832008 / Email: raylee@epest.com.my

RL/DBA-Ethics07

Appendix 3.8.7 - Request To Receive Summary Of Research Report.

Request to Receive Summary of Research Report

UNIVERSITY OF SOUTH AUSTRALIA
Division of business, International Graduate School of Management
Adelaide, Australia

Research Title: Questionnaire Survey - Customer Relationship Management (CRM) – delivering service excellence to achieve customer retention and loyalty

Name of Researcher: Mr. Raymond Lee Soon Tuck, Master of Business Administration
CSU Australia.
Contact of Researcher: (603) 92833886 or (012) 3178187 or email contact: raylee@pc.jaring.my

Research Supervisor: Dr. Leo Ann Mean – email contact: drleo@itd.com.my
[Telephone: (603) 6203 3880]
ITD.KL, Level 3,Block D, Plaza Mont Kiara, Jalan Bukit Kiara,
50480 Kuala Lumpur, Malaysia

Please complete the required information, if you or someone else at your company would like to receive a short summary of the result of this research (estimated to be ready in the 2008) just complete the form with the required detail below:

.

Name		
Company/Address:		Please send me a copy of the Summary Report as indicated below: ☐ By Postal address ☐ By email (soft copy)
Tel.:		
Fax.:		
Email:		

Instructions - Request Form to be mailed back or fax or email back to-

Mr. Raymond Lee
No: 80, Jalan 4/91, Taman Shamelin Perkasa,
Cheras, 56100 Kuala Lumpur
Malaysia

Fax: (03) 92832008 / Email: raylee@epest.com.my

Appendix 3.8.8 Follow-up Letter in English to remind participant for Questionnaire Survey

UNIVERSITY OF SOUTH AUSTRALIA
Division of business, International Graduate School of Management
Adelaide, Australia

Research Title: Questionnaire Survey - Customer Relationship Management (CRM) – delivering service excellence to achieve customer retention and loyalty

Name of Researcher: Mr. Raymond Lee Soon Tuck, Master of Business Administration
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Contact of Researcher: (603) 92833886 or (012) 3178187 or email contact: raylee@pc.jaring.my

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[Telephone: (603) 6203 3880]
ITD.KL, Level 3,Block D, Plaza Mont Kiara, Jalan Bukit Kiara,
50480 Kuala Lumpur, Malaysia

Date:

Dear Sir/Madam,

Subject: Questionnaire Survey - Customer Relationship Management (CRM) - delivering service excellence to achieve customer loyalty

A couple of weeks ago, we sent a questionnaire to you on the subject of **Questionnaire Survey -** customer relationship management (CRM). However, if you have already answered the questionnaire, we would like to thank you very much for your participation, and kindly ask you to disregard this letter.

If you have **not responded** earlier, we would greatly appreciate you answering and returning the questionnaire in the pre-paid return-envelop before **15th December 2007**

If you have any further ethical concerns that you will need to discuss, please feel free to contact the person below:

Ms Lan Lac, Executive Officer
IGSB Human Research Ethics Committee
University of South Australia
GPO BOX 2471
Adelaide SA 5000, Australia
Email: Lan.Lac@unisa.edu.au / Tel: +61 8 8302 0475

If you would like more information, or have any further questions about any aspect of this study, then please feel free to contact Mr. Raymond Lee at (03) 92833886 or (012) 3178187 or email contact: raylee@pc.jaring.my. Thank you for your participation. It is greatly appreciated.

Yours Sincerely



Mr. Raymond Lee
No: 80, Jalan 4/91, Taman Shamelin Perkasa, Cheras, 56100 Kuala Lumpur, Malaysia
Fax: (03) 92832008
Email: raylee@epest.com.my

Appendix 3.9.1 Procedures and steps were taken to ensure the validity and reliability of the research study:

(a) Data collected must be collected from the respondents who selected and met the selection criteria stated.

(b) Survey questionnaires developed must be based on review of the literature and frame of reference to ensure the validity of the result. The questionnaires items have been formulated based on the extensive review of the literature and the data collected are based on the frame of reference that was drawn from the discussed literature reviews.

(c) Survey questionnaire has been pre-tested by the respondents before starting the survey.

(d) Reasonable time frame for the data to be collected through two weeks, within this short period of time no major event has been changed with the related topic.

(e) Survey questionnaires were divided into three parts in order that respondents could concentrate more on each question. Total questionnaires must not be too lengthy and limited to 45 only. The order and sequence of questionnaires must be considered to avoid any biasness and errors due to prior influence of perceptions of preceding questions. According to Kasper et al. (1999) the wording of the question asked should be stated positively or the negatively worded question to avoid artificial results.

Appendix 3.9.2 Procedure adopted on the mailing of questionnaires

(a) Method of mailing and preparation - The questionnaire must be attractive and professional in appearance with a high degree of simplicity and providing a respondent-friendly questionnaire (see Appendix 2- Research Tools). The inclusion of paid return stamped envelope to facilitate the return of these questionnaires has been provided for the convenience of maximizing response and encouraging prompt return.

(b) Should the responses do not achieve expected response rate of 30% after 14 days of the questionnaire being mailed out, a reminder letter will be sent to all participants. (See Appendix 3 (f) – Follow Up reminder Letter).

(c) Time Considerations – It is critical that the researcher should choose an appropriate and convenient time (e.g. avoiding long public holidays) for mailing the questionnaire survey when people are more likely to respond and less likely to put the questionnaire aside and later forgotten.

(d) The offer of a summary report and that is sent with the survey request is considered an incentive to respond. (see Appendix 3 (e) – Request to receive summary report)

(e) The fact that the respondents are current customers of the two organizations ensures that addresses are valid and reduces the non-valid or outdated address that may adversely affect response rates.

(f) Also the fact that the respondents are current customers of the two organizations; it would be considered that the feedback from these respondents are attributed to them having a personal interest in the survey contents. The resulting analysis offers the suggestion that greater attention should be given to SQ and improvement by the organization because of their willingness to respond.

(g) It is noted that the potential respondents in this industry is generally co-operative.

(h) The questionnaires, administrated in January 2008 and returned by February 2008 were sent to 550 corporate clients and 150 household individuals. Enclosed in the mailed questionnaire were the following items:

  (i) Cover letters which provided a brief explanation and background of the research study [Appendix 3.8.6)]

  (ii) Motivation for the respondents to participate in the study and clear instructions on filing of the questionnaire. [Appendix 3.8.6 and 3.8.8]

  (iii) A pre-paid self addressed envelope for the return of the completed questionnaire. [Appendix 3.8.3]

  (iv) A four page questionnaire Form [Appendix 3.2]

  (v) A counter foil on the last page to be filled in if the participants want a summary of the study. [Appendix 3.8.7]

Appendix 4.0 Coding of Data for questionnaire responses

(a) The responses to the demographic variables can be coded from 1 or 2 for Gender/Sex as depending on whether the response was from a male or a female. Codes from 1 to 5 for age depending on the age group category, and codes 1 to 6 for the variables of years of pest control contract depending on which box in the columns was checked by the respondents. Frequency of pest services utilized by customers can be coded from 1 to 7, and type of property and type of pest service under pest control maintenance can be coded from 1 to 8.

(b) The responses to the Section 2.0 where the ranking variables are to assess the relationship between service provided and perception from the customer view point can be coded from 1 to 10 in order of importance where 1 means highest importance selected by the respondents and 10 being the lowest rank in importance as ranking number is used to indicate the order of importance. 1 = highest importance and 10 = lowest importance.

(c) Questionnaire for Section 2 consisting of the four subsections to identify the relationship among the four CRM factors (i.e. People, Process, Technology and Customer Information) which influence the service quality can be coded from 1 to 5 as the Likert scale as used to describe the statement that best describes the participant's experiences with the company. (1 = very unsatisfied, 3 = neutral, 5 = very satisfied).

Appendix 4.1 Statistical Analysis

In the analysis part, the statistical named SPSS ver. 15 will be used. Data will first of all be keyed in on the SPSS worksheet before the analyzing steps begin. SPSS program provides an easy task for researchers in evaluating and managing information gathered from primary data. In addition, it provides a lot of useful statistical tools for evaluating the data collected from the questionnaire survey. Three major statistical analysis tools used in this study are descriptive analysis and internal-consistency reliability analysis (Cronbach's Alpha) and statistical inference analysis.

(a) *Initially, descriptive analysis in the form of frequency counts, percentages, means and standard deviation was checked to obtain an overview of the pattern of respondents provided in Section 1 and 2 of the marked questionnaires. Frequencies and descriptive statistic (mean and percentage) were used to explore information about the distributions of variables. Variance and standard deviation were obtained to measure variability around the mean of a distribution*

(b) *Subsequently, Factor Analysis was used to gain insights into service quality determinants within SERVQUAL and their relationship with demographics. Regression analysis is used to determine the relationship between and among service quality dimensions.*

(c) Respondents were also required to rank the 10 determinants of SERVQUAL. The ranking order of '1" is the highest in order of importance while that of "10" is the lowest. Every item known as determinants of service quality needs to be selected and only permitted to use each ranking number only once.

(d) In order to determine which dimension the customer perceived to be important, this research study will use correlation analysis to determine the strength of the relationship between each individual dimension and overall satisfaction with the services. Correlation analysis and factor analysis were conducted to determine the existence of inter-relationships between dimension and clustering data into identifiable components which were necessary before proceeding further with causal analysis.

(e) Correlations and regression analysis will give information on validity of the service quality attributes and the relationship between them. As the scales used are ordinal, Spearman's Rank Correlation which is a technique used to test the direction and strength of the relationship between two service attributes will be employed. Also one way between groups' analysis of variance test (ANOVA) and the application of multivariate analysis of variance (MANOVA) methods were carried out to compare the mean factor scores for all the contributing dimensions on the demographic variables.

(f) Factor Analysis will be used for the analysis of the relationship of the four CRM components and the relationships between the different service quality attributes. The aim of factor analysis is to condense the number of attributes into smaller set of factors to help understand what impacts on overall customers' perception of the services provided.

Appendix 4.2 Descriptive Statistics and Details Analysis

4.1.0.0 Demographic and Other Profiles

In this study, the analysis will be carried out on the demographic profiles of the respondents which are followed by the descriptive analysis that has been conducted to answer the main objectives of the study. In addition, the data will be analyzed and statistical testing will be conducted in order to assess the relationship of the four CRM components responsible for service quality as outlined in the objective of the study that is, the relationship between the service quality determinants and CRM components in the context of the pest management service in Malaysia. Moreover, the descriptive analysis also serves as the basic foundation for determining the association between the independent and dependent variables of the study.

4.1.0.1 Gender of Respondents by Age

Table 4.0 shows the demographic profile of the respondents and the gender characteristics of the respondents.

Table 4.0. Age and Gender of Respondents

Age of Respondents	Frequency (N)	Percentage (%)	Summary of Respondents by Gender		
26 - 35	38	29.2		N	Percent (%)
36 - 45	35	26.9			
46 - 55	31	23.8	Male	53	43.0
above 55	23	17.7	Female	73	57.0
Total (N)	127	97.7	Total	126	100.0
Missing	3	2.3			
Total	130	100			

The first portion of the analysis illustrates the demographic profile of the respondents as shown in Figure 4.1.0. The majority of the respondents were between 26 to 35 years of age (30 per cent), followed by the age groups of between 36 to 45 years (27 per cent) and those between 46 to 55 years accounts (24%). About 18% of the respondents were above 55 years.

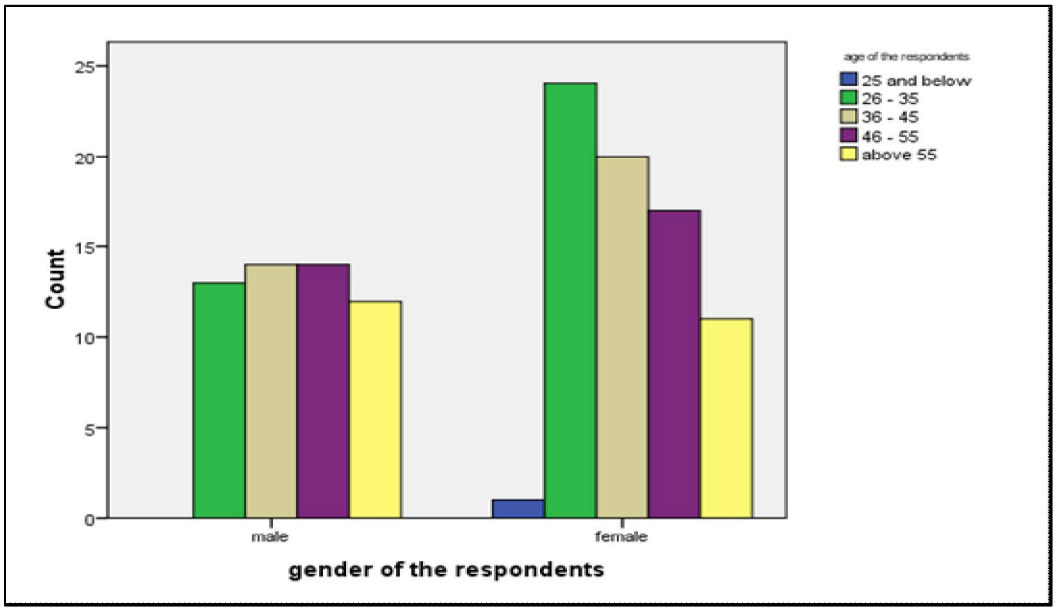


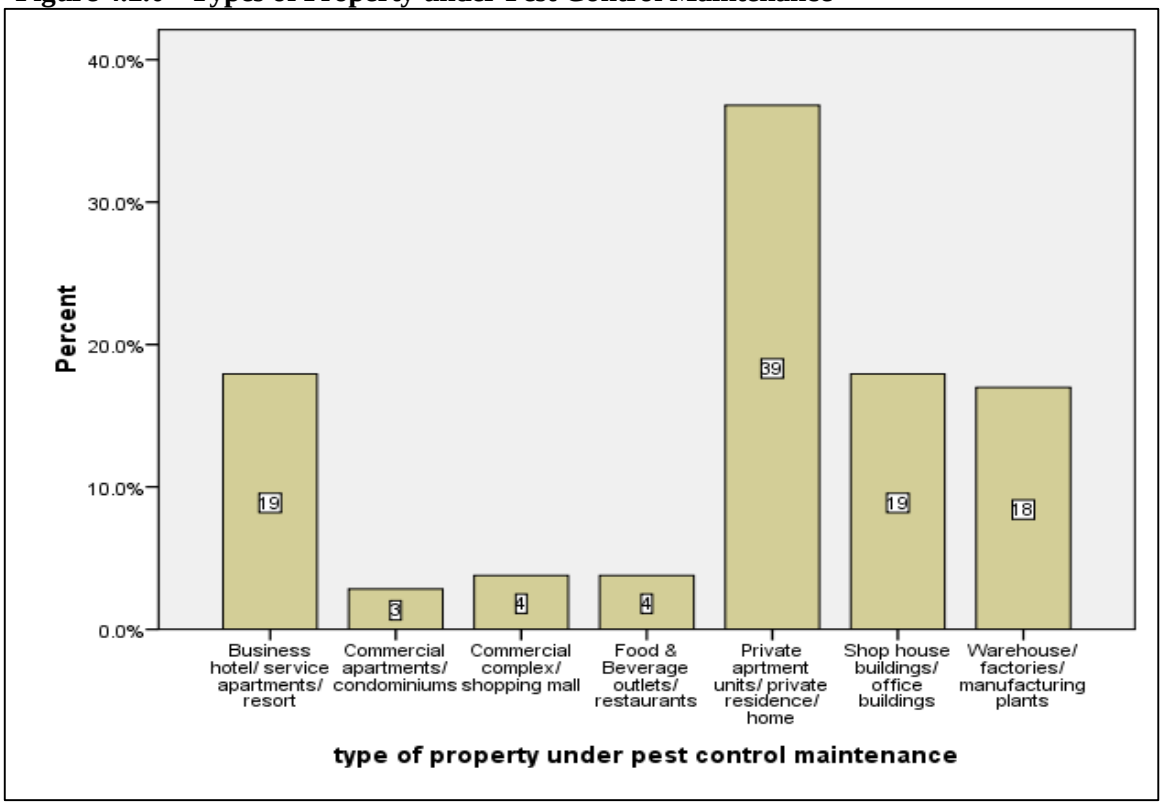
Figure 4.1.0 Gender of Respondents by Age

4.1.0.2 Types of Property under Pest Control Maintenance.

A wide range of properties and buildings are under the pest control maintenance services of the pest management organizations. A third of the respondents who have pest control maintenance contracts with the companies are individual owners of private apartment units, private residence, and home dwellings which accounted for about 36% as shown in Figure 4.2.0

The commercial shop houses and office buildings account for 18% and, similarly, with business hotels and resorts, and commercial service apartment's buildings. Following closely are the warehouses, factories/ and manufacturing plants which make up 17% of the total pest control maintenance contracts. In total, the survey shows that the commercial sector accounts for an estimated 64% while the private and individual property owners account for 36% of the pest control maintenance contracts. In this regards the importance of the commercial sectors expecting high quality services is to be considered seriously.

Figure 4.2.0 - Types of Property under Pest Control Maintenance



4.1.0.3 Type of Pest Treatment and Services

The findings of this study show that 92% of the services provided are basically for General Pest Control Contract Service as shown in Table 4.1. This indicates that the basic nuisance and common pest problems are rats, common ants, cockroaches, termites and mosquitoes and houseflies. These insect pests rank high on the list of General Pest problems, because their presence in the homes, hotel and office buildings is objectionable and implies uncleanness, and because these pests also contaminate food and carry disease organisms. The demands for such General Pest Control Contract Service are very competitive and broad across the wide spectrum of commercial and private individual property owners.

It is noted that 5% of the pest services provided is for Anti-Termite Treatment/Soil Treatment and Corrective Slab Treatment/Baiting System. As indicated by the study, Anti-termite control is ranked second in demand for the pest services as most property owners are not aware of the termite problem until an infestation is detected and it is notoriously difficult to prevent such damages due to the lack of Anti-termite soil treatment by housing developers during the construction stages. Consequently, unknown to property owners, the termite damage is often extensive before any infestations are detected, and also the source (or nest) is normally difficult to locate.

Table 4.1 Type of Pest Treatment and Services Provided

Type of Pest Treatment and Services	Percentage
General Pest Control Contract Service - rats/ants/roaches/termites	92.0
Incidental Pest treatments - Bee/hornets/spiders/bed bugs/birds/wildlife intruders	1.0
Anti-Termite Treatment/Soil Treatment and Corrective Slab Treatment/Baiting System	5.0
Warehouse/Factories/Manufacturing plants	1.0
HACCP/GMP/ISO Standards or Certified Pest Control Services	1.0
Total	**100.0**

4.1.0.4 Frequency of Pest Services

Similarly, the demand for MONTHLY pest services the main choice of the property owners and they account for 43% of the respondents. This is followed by BI-MONTHLY frequency in which pest services are provided once in every two months, a preference of 28% of the respondents. The frequencies of the pest services are also dependent on the types of property, buildings and business sector. Table 4.2 summarizes the frequency of pest service used by customers in the study.

Figure 4.3.0 shows that weekly and fortnightly frequency for the pest services are required by the food and beverage outlets and restaurants due to the high incidence of pest problems associated with the presence of food. The demand for a high frequency of pest services is attributed to certification and standards of HACCP compliance and Goods Manufacturing Practices (GMP) requirements for the food exporting factories which is a growing trend globally. It is recognized that the application of the HACCP to food production and preparation has clear benefits and potential of enhancing food safety and preventing many cases of food borne diseases. These benefits have been well documented. The need to maintain the high level of pest control standards helps to create a demand for quality pest services.

Table 4.2 Frequency of Pest Services used by Customer

Frequency of pest service used by customer	Frequency	Percentage (%)
Weekly Services	6	4.6
Fortnightly Services (every two weeks)	10	7.7
Monthly Services (every month)	56	43.1
Bi-Monthly Services (every two months)	36	27.7
Quarterly Services (every three months)	13	10.0
Total	**121**	**93.1**
Missing System	9	6.9
Total	130	100.0

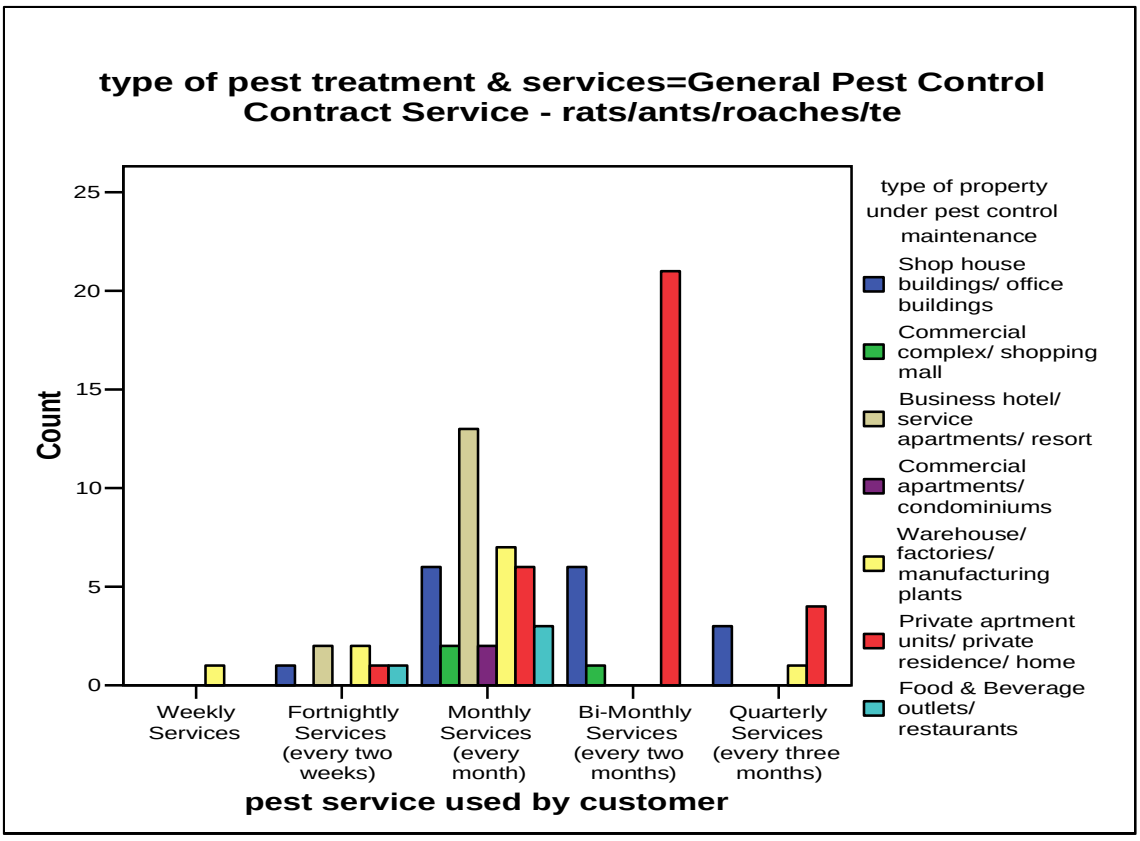


Figure 4.3.0 Frequency of Pest Service used by Customer and Type of Property under Pest Control Maintenance

The descriptive statistics as depicted in Figure 4.3.0 on the frequency of pest service used by customer, shows that the demand for monthly pest services from the hotels, service apartments and resorts are higher. This is due to the fact that any risk of pest issues experienced will affect the reputation of the hospitality sector. Any incidents of pest complaints can be costly and affects the intention of the customers to revisit the hotel or resort. This can have relative influence in determining behavioural intention to revisit, and certainly would better equip the hospitality industry providers to adjust their services and marketing efforts to enhance positive impression should pest issues be brought under control.

The higher frequency of pest services required for the restaurants and hotel sectors can be attributed to the fact that a customer's perceived service quality and satisfaction are predictors of future behavioural intentions. Another reason for the higher frequency associated with the Restaurant and Food sectors, hotels, service apartments and resorts is the compliance which is required by the standards specified by HACCP compliance and Goods Manufacturing Practices (GMP) requirements**.** The higher frequency of pest services is to maintain an acceptable level of Pest Control Treatment in compliance with the local municipal requirements (Ministry of Health, Local Municipal Council, International Authorities and such related governing authorities).

4.1.0.5 Annual Contract Value of Pest Services.

Overall, about 42% of respondents have individual annual contracts of less than RM 1000, followed by 25% of respondents with contract values ranging from RM 1001 to RM 5,000 per annum (Table 4.3). The findings also revealed that the highest contributor (42%) to the total contract value of the company is derived from the category of respondents who has contracts value of less than RM 1,000 per annum. Broadly, the individual customers who have contracts of less than RM 1,000 per annum are located across the company and cannot be ignored where customer satisfaction is concerned.

A cross tabulation of the types of property under pest control maintenance against service contract with the company (Appendix 6.0) shows that 37% of the annual contract is from this category of individual private apartments units and private residence or home owners and this is followed by Shop house buildings and office buildings making up 18% of the respondents. Both the Hospitality sector (consisting of business hotels, service apartments and resorts) and manufacturing industry (consisting of warehouse, factories, manufacturing plants) contributed a total of 34% to the annual contract of the company. The findings revealed that 52% of the annual contracts of the company are entrenched in the commercial sector while individual private customers account for 37%. Such contrasting customer profile will result in different customer expectations of service quality.

Table 4.3 Annual Service Contract Value and Purchases

Annual Service Contract Value	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Less than RM 1000.00	53	40.8	41.7	41.7
RM 1,001.00 - RM 5,000.00	32	24.6	25.2	66.9
RM 5,001.00 - RM 10,000.00	16	12.3	12.6	79.5
RM 10,001.00 - RM 30,000.00	18	13.8	14.2	93.7
RM 30,001.00 - RM 50,000.00	4	3.1	3.1	96.9
Above RM 50,000.00	4	3.1	3.1	100.0
Total	127	97.7	100.0	
Missing System	3	2.3		
Total	130	100.0		

Usually customers assess pest service quality by comparing their expectations prior to the service encounter with the company, develop perceptions during the service delivery process, and then compare their perceptions with the actual service received. Thus, customer expectations are unique, depending on the sectors of industry. This, in turn will have an influence on customer's evaluation of service performance and customer satisfaction. However, a contrasting observation is noted in that a considerable high proportion of respondents (25%) have used the pest services for more than 9 years. The analysis of the data collected shows that a total of 43% of respondents who have pest services exceeding 5 years have remained loyal customers as a result of earning customer satisfaction (see Table 4.4).

Table 4.4 Service Contract (in Years) and Frequency with the Company

Service Contract (years)	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Less than 2	22	16.9	17.2	17.2
2 - 3	25	19.2	19.5	36.7
4 - 5	24	18.5	18.8	55.5
6 - 7	17	13.1	13.3	68.8
8 - 9	7	5.4	5.5	74.2
Above 9	**33**	**25.4**	**25.8**	**100.0**
Total	128	98.5	100.0	
Missing System	2	1.5		
Total	130	100.0		

Continuing to use the pest services, these categories of loyal customers are likely to refer new business and have no hesitation to recommend the pest services to others. As noted in Figure 4.4.0 respondents who have more than 9 years continual service contract constitutes the highest category of this grouping. Satisfied and loyal customers are an asset to any business, not only as an "advocator" but also as a "contributor", their continual patronage of the business contributes to the company profitability.

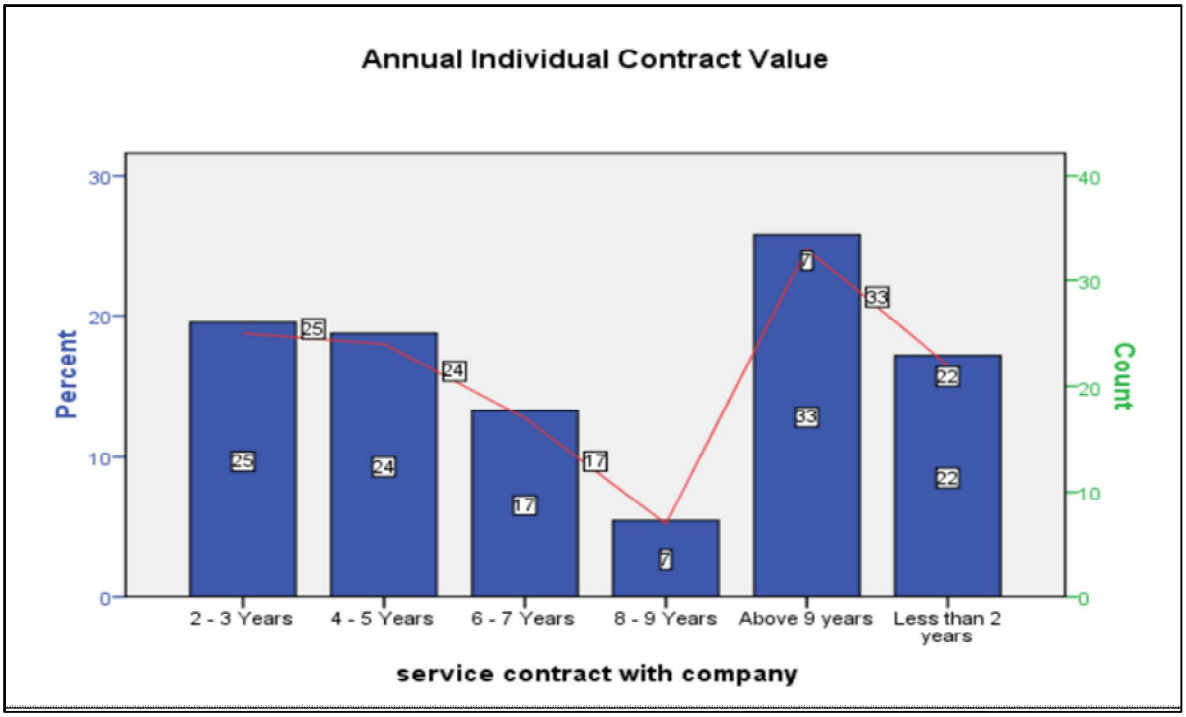


Figure 4.4.0 Annual Service Contract (in Years) and Length of Contract with the Company

Figure 4.5.0 shows the length of service contract with the by private apartment units and private residence, and individual homes category. It is only in the service contract exceeding 9 years that all types of property requiring pest services provided are present. Here, the private apartment units and residence, and individual homes category forming the biggest customer base. This category of customers has remained loyal to the company for more than 9 years and will become repeat customers spreading positively by word-of-mouth their satisfaction of services rendered. It will be benefit the company to invest time and resources in engaging this category of loyal customers.

A greater understanding of the dimensions contributing to the satisfaction of loyal customers will enable the company to be even more focussed in meeting the needs of its clientele. This category of loyal customers may be in the best position to evaluate the quality of pest service delivery. It is important for the company to understand their perception as to why they remain loyal to the company. Though there is a number of a different aspect of pest services involved, this study focuses on only one: to investigate and explore service factors that relate to loyalty in the pest management service organization.

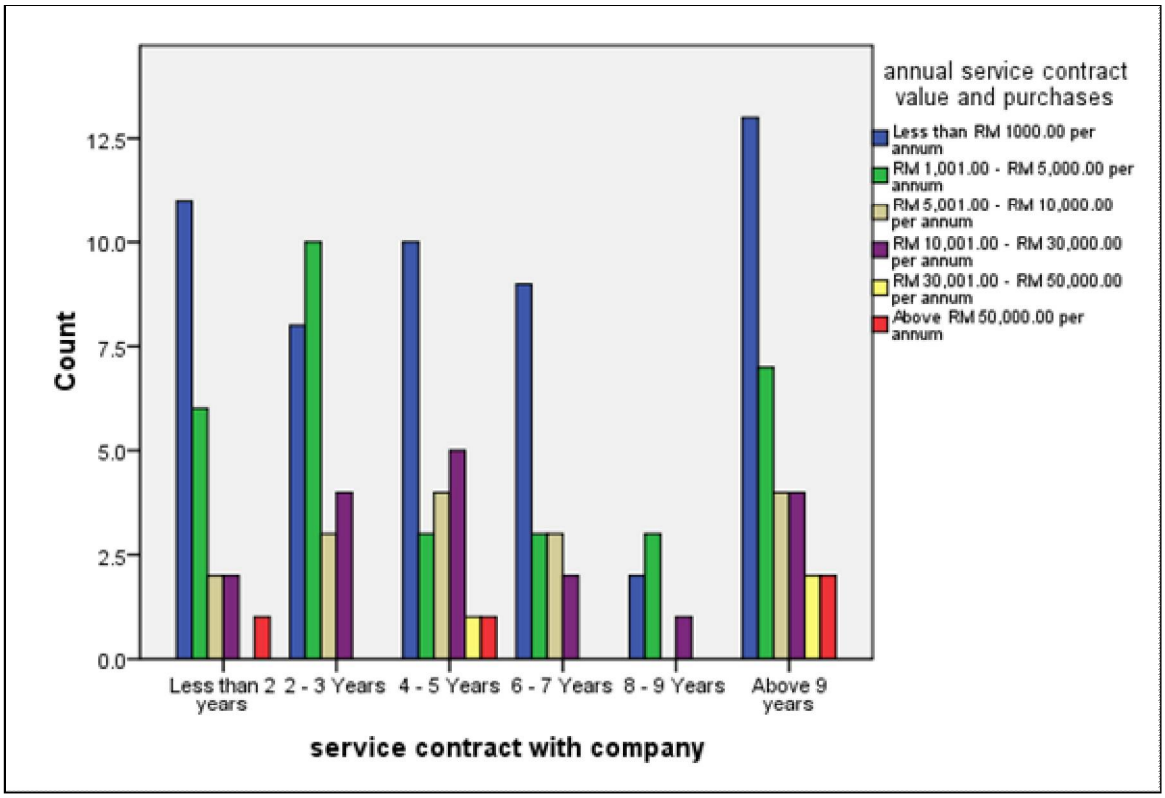


Figure 4.5.0 Individual Annual Service Contract and Length of Contract with Company

4.1.0.6 Service Quality Expectations

The objective of this study is to provide a framework to understand the customers' expectation and its fulfilment in the pest service delivery. Hence, emphasizing the importance of service quality measurement and identifying service quality determinants will enhance service quality. The organizations can seek insights into the strengths and weaknesses of their services and the extent of customers' satisfaction. Due to the ever-changing behaviour of the dynamic business environment, it is vital to measure, understand, maintain, monitor and improve service quality to ensure effective and efficient services in order to retain customers under an intense competitive environment.

Appendix 4.3 Descriptive Statistics for Response of Questions (N=130) and mean Score by Rank

The ranking is based on the **highest mean score as in selecting the service quality, the respondents have been asked to rate their level of satisfaction and agreement for a given service based on a five-point scale. The scale represents: **1** signifies that respondents **do not agree** with the statement, and **5** means they **strongly agree** with **that** statement that best describes their experiences with the pest services.*

Rank	Question**	Variables to be measured	SQ D	Mean*	SD
1	C23.	The responsiveness in confirming with customer about the service schedules and appointment time.	**RESP**	**3.78**	.673
2	A12	The pest service company staffs are courteous, friendly and polite in responding to customer's request.	**COUT**	**3.76**	.693
3	A9	The pest service company is flexible enough to provide services according to customer's need.	**UNDR**	**3.75**	.721
4	B19	The pricing of the service provided is competitive and good value for the money.	**RELB**	**3.73**	.748
5	A1	The pest service company has a good reputation in the market and industry.	**CRED**	**3.69**	.657
6	C30	I am very satisfied with my decision to use their services and would continue to use this pest service company.	**CRED**	**3.66**	.679
7	D34	I have no hesitation and would recommend the pest service company to other companies or friends.	**CRED**	**3.65**	.749
8	C31	How would you rate your relationship with the company considering all your experiences and service encounter?	**SECR**	**3.64**	.675
9	A14	The pest service company makes as effort to meet service deadlines in order to satisfy customer.	**UNDR**	**3.62**	.698
10	C32	Building and maintaining long-term customer relationship is the competitive advantage for the pest service company.	**CRED**	**3.61**	.882
11	D43	Overall, ease of doing business with the customer service and operations personnel.	**RESP**	**3.61**	.691
12	A8	The pest service company staffs are well trained, easy to deal with, competent and knowledgeable in their services	**COUT**	**3.61**	.732
13	A10	The pest service company staffs respond to problem faced and shows sincere interest in solving the service problem.	**UNDR**	**3.59**	.787
14	B22	The computerized invoices generated provide accurate and clear information in the billing of services.	**COMM**	**3.59**	.769
15	A6	The pest service company is concern about the high service quality and standards provided to serve customers	**SECR**	**3.58**	.785
16	B20	The speed and accuracy in processing your job service confirmation order.	**RESP**	**3.54**	.753
17	A13	The pest service company staff instills confidence and makes customers fees safe in the service transaction.	**SECR**	**3.54**	.650
18	C25	The speed in confirming appointment and punctuality for service appointments by the service personnel.	**RESP**	**3.52**	.783
19	A7	The pest service company's top management is dedicated, efficient and committed to serve customers.	**RELB**	**3.52**	.837
20	A4	The pest service company maintains customer information and efficiently updates customer service records.	**COMM**	**3.50**	.790
21	C27	Technical support and assistance received for pest problems is excellent.	**COMP**	**3.46**	.743
22	C24	The computerized documentations generated provide accurate and adequate information in advance on the service schedules and appointment time.	**COMM**	**3.46**	.824

Appendix 4.3 *(Continue)*

Rank	Question**	Variables to be measured	SQ D	Mean*	SD
23	B21	The responsiveness and process of paper work - service contracts and documentations that you need for doing business with us.	**RESP**	**3.45**	.782
24	B16	The responsiveness and knowledge level of the sales personnel in marketing the pest services provided.	**UNDR**	**3.45**	.685
25	A3	The pest service company is well organized and top the management is integrated internally to serve customers.	**TANG**	**3.44**	.706
26	B18	The marketing staff is prompt in providing accurate solutions that meets your specific pest problems.	**COUT**	**3.43**	.636
27	C29	To what extent does, the pest service provided and the quality of services provided meet customer expectations.	**COMP**	**3.43**	.685
28	C26	The ability of the service personnel to identify accurately the pest problems and knowledgeable in the services	**COMP**	**3.42**	.706
29	A5	The pest service company provides regular reports on services provided and feedbacks on service recovery.	**CRED**	**3.38**	.929
30	A15	The pest service company has innovative and advance pest management technology for the pest control services .	**TANG**	**3.33**	.757
31	B17	The computerized proposals generated provide accurate and adequate information about the range of services offered.	**COMM**	**3.23**	.753
32	D45	The pest service company has the right CRM software and service resources to succeed in building and maintaining customer relationship.	**TANG**	**3.23**	.737
33	A11	The pest service company has 24/7 contact for call back service and prompt service recovery for service problem	**ACES**	**3.22**	.819
34	D40	The pest service company provides channels to enable communication with key customers and service personnel.	**ACES**	**3.20**	.899
35	D44	The pest service company maintains a comprehensive database of customer's interaction and preferences.	**TANG**	**3.19**	.748
36	D35	The pest service company frequently and systematically measures customer satisfaction and complaints.	**UNDR**	**3.19**	.830
37	D39	The pest service company has established clear business goals related to customer retention and loyalty.	**CRED**	**3.17**	.804
38	D42	The pest service company maintains customer interactions and service experiences to manage customer loyalty	**COMM**	**3.14**	.817
39	C28	The pest service company provides accurate reports and feedback regularly after the services provided.	**RELB**	**3.14**	.890
40	A2	The pest service company operation is fully computerized to meet customers need.	**TANG**	**3.11**	.745
41	D41	The pest service company makes an effort to find out what the key customer needs and preferences.	**UNDR**	**3.09**	.909
42	D37	The pest service company commits time and resources in building and maintaining customer relationships.	**COMM**	**3.08**	.927
43	D38	The pest service company customizes customer interactions to optimize customer value and loyalty.	**UNDR**	**3.06**	.885
44	D36	The pest service company spends time with key customers and maintains regular interactions through meetings.	**ACES**	**2.91**	.992
45	C33	How well have you been informed by the pest service company about their services or new products/services available?	**COMM**	**2.90**	.928

******* Items linking to each determinant or variable for Service Quality (SQ D) to be measured. Each attribute will have different values attached to them to indicate their importance, which are held from the customer's perspective.*

Appendix 5.0 CRM components - Independent variables for Factor Analysis

The 45 items are listed below according to their respective CRM components after factor analysis. These Independent variables are considered as determinants of service quality associate with CRM components

Summary of items according to their respective variables

Code	Q items*	PEOPLE Component
PP1	**A1**	The pest service company has a good reputation in the market and industry.
PP2	**C28**	The pest service company's top management is dedicated, efficient and committed to serve customers
PP3	**A8**	The pest service company staffs are well trained, easy to deal with, competent and knowledgeable in their services
PP4	**A10**	The pest service company staffs respond to problem faced and shows sincere interest in solving the service problem
PP5	**A12**	The pest service company staffs are courteous, friendly and polite in responding to customer's request.
PP6	**A13**	The pest service company staff instills confidence and makes customers fees safe in the service transaction.
PP7	**A14**	The pest service company makes as effort to meet service deadlines in order to satisfy customer.
PP8	**B18**	The marketing staff is prompt in providing accurate solutions that meets your specific pest problems.
PP9	**C25**	The speed in confirming appointment and punctuality for service appointments by the service personnel.
PP10	**C26**	The ability of the service personnel to identify accurately the pest problems and knowledgeable in the services.
PP11	**D36**	The pest service company spends time with key customers and maintains regular interactions through meetings.
PP12	**D37**	The pest service company commits time and resources in building and maintaining customer relationships.

Code	Q items*	TECHNOLOGY Component
TC1	**A2**	The pest service company operation is fully computerized to meet customers need.
TC2	**A15**	The pest service company has innovative and advance pest management technology for the pest control services
TC3	**B17**	The computerized proposals generated provide accurate and adequate information about the range of services offered.
TC4	**B22**	The computerized invoices generated provide accurate and clear information in the billing of services.
TC5	**C24**	The computerized documentations generated provide accurate and adequate information in advance on the service schedules and appointment time.
TC6	**C27**	Technical support and assistance received for pest problems is excellent
TC7	**D45**	The pest service company has the right CRM software and service resources to succeed in building and maintaining customer relationship.
Code	**Q items***	**PROCESS Component**
PR1	**A3**	The pest service company is well organized and the top management is integrated internally to serve customers.
PR2	**A5**	The pest service company provides regular reports on services provided and feedbacks on service recovery.
PR3	**A6**	The pest service company is concern about the high service quality and standards provided to serve customers

Appendix 5.0 *(Continue)*

PR4	**A9**	The pest service company is flexible enough to provide services according to customer's need.
PR5	**A11**	The pest service company has 24/7 contact for call back service and prompt service recovery for service problem
PR6	**B16**	The responsiveness and knowledge level of the sales personnel in marketing the pest services provided.
PR7	**B20**	The speed and accuracy in processing your job service confirmation order.
PR8	**B21**	The responsiveness and process of paper work - service contracts and documentations that you need for doing business with us.
PR9	**C28**	The pest service company provides accurate reports and feedback regularly after the services provided.
PR10	**C29**	To what extent does, the pest service provided and the quality of services provided meet customer expectations.
PR11	**C32**	Overall, ease of doing business with the customer service and operations personnel.
PR12	**D42**	The pest service company maintains customer interactions and service experiences to manage customer loyalty.
PR13	**D43**	Building and maintaining long-term customer relationship is the competitive advantage for the pest service company.

Code	Q items*	CUSTOMER INFORMATION Component
CF1	**A4**	The pest service company maintains customer information and efficiently updates customer service records.
CF2	**B19**	The pricing of the service provided is competitive and good value for the money.
CF3	**C32**	The responsiveness in confirming with customer about the service schedules and appointment time.
CF4	**C30**	I am very satisfied with my decision to use their services and would continue to use this pest service company.
CF5	**C31**	How would you rate your relationship with the company considering all your experiences and service encounter?
CF6	**C33**	How well have you been informed by the pest service company about their services or new products/services available?
CF7	**D34**	I have no hesitation and would recommend the pest service company to other companies or friends.
CF8	**D35**	The pest service company frequently and systematically measures customer satisfaction and complaints.
CF9	**D38**	The pest service company customizes customer interactions to optimize customer value and loyalty.
CF10	**D39**	The pest service company has established clear business goals related to customer retention and loyalty.
CF11	**D40**	The pest service company provides channels to enable communication with key customers and service personnel.
CF12	**D41**	The pest service company makes an effort to find out what the key customer needs and preferences.
CF13	**D44**	The pest service company maintains a comprehensive database of customer's interaction and preferences.

* Q items - Relates to the Items in the survey to collect data to measure the Service Determinants for the Total Customer Satisfaction. (refer to Appendix 4.0)

Appendix 6.0 Cross tabulation - Type of property under pest control maintenance * Annual service contract value and purchases

Type of property under pest control maintenance		Annual service contract value and purchases						Total
		Less than RM 1000.00 per annum	RM 1,001.00 - RM 5,000.00 per annum	RM 5,001.00 - RM 10,000.00 per annum	RM 10,001.00 - RM 30,000.00 per annum	RM 30,001.00 - RM 50,000.00 per annum	Above RM 50,000.00 per annum	
Shop house buildings/ office buildings	Count	12	5	2	0	0	0	**19**
	% of Total	11.4%	4.8%	1.9%	.0%	.0%	.0%	**18.1%**
Commercial complex/ shopping mall	Count	2	0	2	0	0	0	**4**
	% of Total	1.9%	.0%	1.9%	.0%	.0%	.0%	**3.8%**
Business hotel/ service apartments/ resort	Count	0	3	5	10	1	0	**19**
	% of Total	.0%	2.9%	4.8%	9.5%	1.0%	.0%	**18.1%**
Commercial apartments/ condominiums	Count	0	2	1	0	0	0	**3**
	% of Total	.0%	1.9%	1.0%	.0%	.0%	.0%	**2.9%**
Warehouse/ factories/ manufacturing plants	Count	2	9	3	1	1	1	**17**
	% of Total	1.9%	8.6%	2.9%	1.0%	1.0%	1.0%	**16.2%**
Private Apartment units/ private residence/ home	Count	31	5	0	2	0	1	**39**
	% of Total	29.5%	4.8%	.0%	1.9%	.0%	1.0%	**37.1%**
Food and Beverage outlets/ restaurants	Count	0	3	0	1	0	0	**4**
	% of Total	.0%	2.9%	.0%	1.0%	.0%	.0%	**3.8%**
Total	Count	47	27	13	14	2	2	**105**
	% of Total	44.8%	25.7%	12.4%	13.3%	1.9%	1.9%	**100.0%**

Appendix 7.0 Table Correlations of Service Determinants (Bivirate Correlation)

		Reliability	Responsive	Competence	Access	Courtesy	Communication	Credibility	Security	Understanding	Tangibles
Reliability	Pearson Correlation	1	.681(**)	.775(**)	.305(**)	.195(*)	.300(**)	.561(**)	.221(*)	.204(*)	.003
	Sig. (2-tailed)	.	.000	.000	.000	.026	.001	.000	.012	.020	.977
	N	129	129	129	129	129	129	129	129	129	129
Responsive	Pearson Correlation	.681(**)	1	.594(**)	.543(**)	.400(**)	.471(**)	.492(**)	.291(**)	.356(**)	.271(**)
	Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.001	.000	.002
	N	129	129	129	129	129	129	129	129	129	129
Competence	Pearson Correlation	.775(**)	.594(**)	1	.348(**)	.229(**)	.313(**)	.585(**)	.262(**)	.300(**)	.060
	Sig. (2-tailed)	.000	.000	.	.000	.009	.000	.000	.003	.001	.502
	N	129	129	129	129	129	129	129	129	129	129
Access	Pearson Correlation	.305(**)	.543(**)	.348(**)	1	.578(**)	.584(**)	.420(**)	.360(**)	.527(**)	.464(**)
	Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129	129
Courtesy	Pearson Correlation	.195(*)	.400(**)	.229(**)	.578(**)	1	.710(**)	.537(**)	.521(**)	.578(**)	.636(**)
	Sig. (2-tailed)	.026	.000	.009	.000	.	.000	.000	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129	129
Communication	Pearson Correlation	.300(**)	.471(**)	.313(**)	.584(**)	.710(**)	1	.488(**)	.588(**)	.636(**)	.631(**)
	Sig. (2-tailed)	.001	.000	.000	.000	.000	.	.000	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129	129
Credibility	Pearson Correlation	.561(**)	.492(**)	.585(**)	.420(**)	.537(**)	.488(**)	1	.580(**)	.494(**)	.435(**)
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129	129
Security	Pearson Correlation	.221(*)	.291(**)	.262(**)	.360(**)	.521(**)	.588(**)	.580(**)	1	.614(**)	.680(**)
	Sig. (2-tailed)	.012	.001	.003	.000	.000	.000	.000	.	.000	.000
	N	129	129	129	129	129	129	129	130	130	129
Understanding	Pearson Correlation	.204(*)	.356(**)	.300(**)	.527(**)	.578(**)	.636(**)	.494(**)	.614(**)	1	.548(**)
	Sig. (2-tailed)	.020	.000	.001	.000	.000	.000	.000	.000	.	.000
	N	129	129	129	129	129	129	129	130	130	129
Tangibles	Pearson Correlation	.003	.271(**)	.060	.464(**)	.636(**)	.631(**)	.435(**)	.680(**)	.548(**)	1
	Sig. (2-tailed)	.977	.002	.502	.000	.000	.000	.000	.000	.000	.
	N	129	129	129	129	129	129	129	129	129	129

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

* Correlation is significant at the 0.05 level (2-tailed).

Appendix 8.0 Factor Analysis Extraction. (Total Variance Explained Independent variables for CRM Components)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	19.975	44.389	44.389	8.326	18.503	18.503
2	2.828	6.285	50.673	4.623	10.273	28.776
3	1.801	4.002	54.676	3.164	7.032	35.808
4	1.616	3.592	58.268	3.124	6.941	42.749
5	1.530	3.400	61.667	2.964	6.587	49.336
6	1.285	2.855	64.522	2.805	6.233	55.569
7	1.188	2.639	67.162	2.685	5.967	61.536
8	1.088	2.417	69.579	2.494	5.543	67.079
9	1.072	2.382	71.961	2.197	4.882	71.961
10	.926	2.058	74.019			
11	.857	1.905	75.924			
12	.818	1.818	77.742			
13	.791	1.759	79.500			
14	.700	1.556	81.057			
15	.644	1.431	82.488			
16	.602	1.338	83.826			
17	.552	1.227	85.053			
18	.545	1.212	86.264			
19	.492	1.093	87.357			
20	.467	1.038	88.395			
21	.433	.962	89.356			
22	.425	.944	90.300			
23	.392	.871	91.171			
24	.354	.786	91.958			
25	.340	.755	92.713			
26	.327	.727	93.439			
27	.300	.667	94.106			
28	.284	.632	94.738			
29	.255	.567	95.305			
30	.241	.536	95.841			
31	.223	.497	96.337			
32	.197	.438	96.775			
33	.181	.403	97.178			
34	.167	.371	97.549			
35	.153	.341	97.889			
36	.149	.331	98.220			
37	.132	.294	98.514			
38	.125	.277	98.791			
39	.112	.250	99.041			
40	.099	.221	99.262			
41	.093	.207	99.469			
42	.083	.185	99.654			
43	.061	.135	99.789			
44	.051	.113	99.903			
45	.044	.097	100.000			

Extraction Method: Principal Component Analysis.

Appendix 9.0 Factor Analysis Extraction. Total Variance Explained (Service Quality Determinants)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.121	51.213	51.213	4.075	40.751	40.751
2	1.890	18.902	70.115	2.936	29.364	70.115
3	.786	7.864	77.979			
4	.475	4.747	82.726			
5	.422	4.225	86.951			
6	.381	3.814	90.765			
7	.295	2.950	93.715			
8	.243	2.433	96.148			
9	.214	2.143	98.291			
10	.171	1.709	100.000			

Total Variance Explained
Extraction Method: Principal Component Analysis.