

**THE ROLE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
(ICT) IN SUPPLY CHAIN MANAGEMENT (SCM) IN DISTRIBUTOR
PERSPECTIVE - A STUDY OF DISTRIBUTOR COMPANY OF AUTOMOTIVE
PARTS IN KLANG AREA**

MUHAMMAD AMIRUL BIN ZAINAL ABIDIN

BACHELOR OF INDUSTRIAL TECHNOLOGY MANAGEMENT WITH HONS

UNIVERSITY MALAYSIA PAHANG

**THE ROLE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
(ICT) IN SUPPLY CHAIN MANAGEMENT (SCM) IN DISTRIBUTOR
PERSPECTIVE - A STUDY OF DISTRIBUTOR COMPANY OF AUTOMOTIVE
PARTS IN KLANG AREA**

MUHAMMAD AMIRUL BIN ZAINAL ABIDIN

Thesis submitted in fulfillment of the requirements

for the award of the degree of

Industrial Technology Management with Hons.

Faculty of Technology

UNIVERSITY MALAYSIA PAHANG

DECEMBER 2013

SUPERVISOR'S DECLARATION

I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality of the award of the degree of Bachelor of Industrial Technology Management with hons.

Signature :

Name of Supervisor : FADILAH BINTI SIALI

Position : LECTURER

Date : 09 DECEMBER 2013

STUDENT'S DECLARATION

I hereby declare that the work in this thesis is my own, except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted for any degree and is not concurrently submitted for award of another degree.

Signature :

Name : MUHAMMAD AMIRUL BIN ZAINAL ABIDIN

ID Number : PC 10019

Date : 09 DECEMBER 2013

DEDICATION

With this I am proud to dedicate my research to both my parents, Zainal Abidin Bin Ramli and Noorzailiana Chong Binti Abdullah for support and encouragement given by them to me to complete this study properly and successfully. Thank you also for their blessing prayer over the years.

ACKNOWLEDGEMENTS

Bismillahirrahmanirrahim

In the name of Allah the Merciful and Gracious, thanks to the Almighty for divine on my research has been completed successfully.

I, Muhammad Amirul bin Zainal Abidin would like to thank all those who have helped me in completing this study.

First of all I would like to thank to my supervisor and my lecturer, Puan Fadilah Binti Siali for her guidance, her ideas and the support given by her during the throughout this research.

I would also like to thank you and be grateful for the help of both my parents and my family for their support. I also would like to say thank you to my course mates and also my colleagues for their help when having trouble to finish my research. Thank you also to all the respondents who cooperate with me and helped to respond in the questionnaires when collecting data for this study.

Again, I want to say a big thank you to everyone and only Allah S.W.T will repay back on the kindness shown by all of you to me.

ABSTRACT

An increasing number of researches have been made around Supply Chain Management (SCM) and the types of role Information and Communication Technology (ICT) plays towards SCM. SCM initiatives driven by the role of ICT brings along synchronized workflow of the SCM. However, practical insight to addressing the types of role of ICT play in the SCM in distributor perspective based on real world contemporary studies, are limited. This research aims to investigate the relationship between the role of ICT and SCM in distributor perspective. It aims to examine the types of role play in SCM and to identify the three important basic roles of ICT whether they have significant influence on SCM in distributor perspective. The three roles of ICT which are useful aid, competitive advantage and prerequisite are the independent variables. Each of the independent variables was tested to determine its relationship with SCM in distributor perspective. The questionnaires were sent to 103 respondents to fill it. The participating respondents represented a return rate of 100%. Three (3) hypotheses were developed and tested using Pearson Correlation and Regression Analysis. The findings indicate that each of the respondent in distributor companies of automotive parts in Klang, Selangor find that each role is important towards SCM. There is significant correlation between the three roles of ICT and SCM. They feel that when ICT play as a useful aid, competitive advantage and prerequisite in SCM, their company's SCM will be significantly influenced by the three roles of ICT. The implications of these findings are discussed and suggestions for future research are also identified and proposed.

Keywords: Supply Chain Management (SCM), Information and Communications Technology (ICT), Useful Aid, Competitive Advantage, Prerequisite, Distributor Perspective, Distributor Companies of Automotive Parts in Klang, Selangor.

ABSTRAK

Semakin banyak kajian telah dibuat sekitar Pengurusan Rantaian Bekalan (SCM) dan jenis peranan Teknologi Maklumat dan Komunikasi (ICT) memainkan peranan terhadap SCM. Inisiatif SCM didorong oleh peranan ICT membawa bersama aliran kerja serentak SCM. Walau bagaimanapun, gambaran praktikal untuk menangani jenis peranan ICT di dalam SCM dalam perspektif pengedar berdasarkan dunia sebenar kajian kontemporari, adalah terhad. Kajian ini bertujuan untuk mengkaji hubungan antara peranan ICT dan SCM dalam perspektif pengedar. Ia bertujuan untuk mengkaji jenis peranan dalam SCM dan untuk mengenal pasti tiga peranan asas penting dalam ICT sama ada ia mempunyai hubungan yang signifikan dengan SCM dalam perspektif pengedar. Tiga peranan ICT iaitu bantuan berguna, kelebihan daya saing dan prasyarat adalah pembolehubah bebas. Setiap satu daripada pembolehubah bebas telah diuji untuk menentukan hubungan dengan SCM dalam perspektif pengedar. Soal selidik telah dihantar kepada 103 responden. Responden yang mengambil bahagian mewakili kadar pulangan sebanyak 100%. Tiga (5) hipotesis telah dibina dan diuji menggunakan Korelasi Pearson dan Analisis Regresi . Dapatan kajian menunjukkan bahawa setiap responden dalam syarikat-syarikat pengedar alat ganti automotif di Klang, Selangor mendapati bahawa setiap peranan penting terhadap SCM. Terdapat hubungan yang signifikan antara ketiga-tiga peranan ICT dan SCM. Mereka merasakan bahawa apabila peranan ICT sebagai bantuan yang berguna , kelebihan daya saing dan pra-syarat di SCM , SCM syarikat mereka akan dipengaruhi dengan ketara oleh tiga peranan ICT. Implikasi dapatan ini dibincangkan dan cadangan untuk kajian yang akan datang juga dikenalpasti dan dicadangkan.

TABLE OF CONTENTS

	Page
SUPERVISOR’S DECLARATION	ii
STUDENT’S DECLARATION	iii
DEDICATION	iv
ACKNOWLEDGEMENT	v
ABSTRACT	vi
ABSTRAK	vii
TABLE OF CONTENTS	viii
LIST OF TABLES	xii
LIST OF FIGURES	xiv
CHAPTER 1 INTRODUCTION	
1.1 Introduction	1
1.2 Problem Background	4
1.3 Problem Statement	7
1.4 Conceptual Framework	8
1.5 Research Objectives	10
1.6 Research Questions	10
1.7 Research Hypothesis	11
1.8 Research Scope	12
1.9 Significance of Study	12
1.10 Operational Definition	14
1.11 Expected Outcome	16

1.12	Summary of Chapter	17
------	--------------------	----

CHAPTER 2 LITERATURE REVIEW

2.1	Introduction	18
2.2	Supply Chain Management (SCM) Concepts	18
2.3	Information and Communications Technology (ICT) Concepts	19
2.4	Model of The Types of Roles of ICT	21
2.5	Roles of Information and Communications of Technology (ICT) In Supply Chain Management (SCM)	24
2.5.1	Roles of Information and Communications Technology (ICT) as a Useful Aid in Supply Chain Management (SCM)	25
2.5.2	Roles of Information and Communications Technology (ICT) as a Competitive Advantage in Supply Chain Management (SCM)	26
2.5.3	Roles of Information and Communications Technology (ICT) as a Prerequisite in Supply Chain Management (SCM)	26
2.6	Summary of Chapter	26

CHAPTER 3 METHODOLOGY

3.1	Introduction	27
3.2	Research Method	28
3.3	Research Design	28
3.4	Research Process	29
3.5	Population and Sampling	30
3.5.1	Population	32
3.5.2	Sample	32
3.5.3	Measurement of Variable	32
3.6	Data Collection Technique	33
3.6.1	Primary Data	33
3.6.2	Secondary Data	33

3.7	Instrument of Study	34
3.8	Development of Questionnaire	35
	3.8.1 Section A	36
	3.8.2 Section B	37
	3.8.3 Section C	37
3.9	Data Analysis Method	38
	3.9.1 Reliability	38
	3.9.2 Normality Test	39
	3.9.3 Frequency Analysis	40
	3.9.4 Pearson Correlation Analysis	40
	3.9.5 Simple Linear Regression Analysis	41
3.10	Pilot Study	43
3.11	Summary of Chapter	43

CHAPTER 4 RESULTS AND DISCUSSION

4.1	Introduction	44
4.2	Pilot Study	44
	4.2.1 Demographic Analysis	45
	4.2.2 Reliability Analysis	47
4.3	Normality Test	48
	4.3.1 Distribution Analysis	48
	4.3.2 Test for Normality	50
4.4	Goodness of Measure	53
	4.4.1 Reliability Analysis	53
4.5	Demographic Analysis	54
4.6	Correlation Analysis	56
4.7	Regression Analysis	58
	4.7.1 Simple Linear Regression Analysis of the Useful Aid and the SCM performance	59
	4.7.2 Simple Linear Regression Analysis of the	60

	Competitive Advantage and the SCM performance	
4.7.3	Simple Linear Regression Analysis of the Prerequisite and the SCM performance	62
4.8	Research Discussion	64
4.9	Summary of Chapter	65
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS		
5.1	Introduction	66
5.2	Summary	66
5.3	Conclusion	69
5.4	Limitation of the Study	69
5.5	Recommendation for Future Practice	70
5.6	Recommendation for Future Study	72
REFERENCES		73
APPENDICES		77
A	Research Survey Questionnaire	77
B	FYP 1 Gantt Chart	83
C	FYP 2 Gantt Chart	84

LIST OF TABLES

Table No.	Title	Page
2.1	Types of role of ICT and the explanations	21
2.2	Types of role of ICT into more increasing significant roles and the explanation	22
3.1	Sample size from a given population	31
3.2	Aspect of assessment according to section and number of questions	34
3.3	Example of structured scale in the survey questionnaire	35
3.4	Rule of thumb for Cronbach's alpha	39
3.5	Rule of thumb of Pearson correlation	41
4.1	Demographic profiles of the respondents in the pilot study	45
4.2	Reliability analysis for pilot study	47
4.3	Test for normality for the distribution of useful aid	51
4.4	Test for normality for the distribution of competitive advantage	51
4.5	Test for normality for the Distribution of Prerequisite	52
4.6	Test for normality for the distribution of SCM in distributor perspective	52
4.7	Reliability coefficients for the major variables	54
4.8	Demographic profiles of the respondents	55
4.9	Correlation Matrix of All Variables	57
4.10	Model Summary of the useful aid	59
4.11	ANOVA Table	59

4.12	Coefficients of the useful aid	60
4.13	Model Summary of the competitive advantage	60
4.14	ANOVA Table	61
4.15	Coefficients of the competitive advantage	61
4.16	Model Summary of the prerequisite	62
4.17	ANOVA Table	63
4.18	Coefficients of the prerequisite	63

LIST OF FIGURES

Figure No.	Title	Page
1.1	Terms used to describe the management of different parts of the SC	5
1.2	Conceptual framework for the relationship between three independent variables and dependent variable	9
2.1	Models of types of role of ICT	21
2.2	Models of types of role of ICT into more increasing significant roles	22
3.1	The research process	29
3.2	Krejcie and Morgan equation	30
3.3	Equation for finding value of r	41
3.4	Mathematical equation for the general linear model using population parameters	42
4.1	Histogram of Useful Aid	48
4.2	Histogram of Competitive Advantage	49
4.3	Histogram of Prerequisite	49
4.4	Histogram of SCM in distributor perspective	50

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In nowadays global business has been influenced by information and communication technology (ICT) and the application of ICT among business has been developed widely such as the use of ICT in logistics and SCM is in a fast development. In addition, many organizations have applied ICT in their business operations for storing, processing, distributing and exchanging information both within companies and with customers and suppliers in the supply chain (SC).

In the early beginning of integration process, cost, time, quality and the customer demand are some of the business climate that brought them to focus more on the integrations between organizations and at that moment they integrate with single supplier. In the other words, these organizations focused on the integrations only to its suppliers. Besides, in general, SC is consisted of two or more organizations officially separated and they are related to each other. They are separated by information, financial flows and materials such as produces materials, components, final product or service in terms of distribution, storage, wholesale and retail. On the other hand, SC can be defined as the flow of goods into raw materials stage to the final state and the information flows associated with them. The concept of SC is the idea that many organizations used especially for supplier and customer and also represent for the integration of several organizations where SC is the network of organizations (suppliers and other outside organizations) and other

activities are involved in getting the product to the end user (customer). Besides, supply chain SC also is a network of facilities that involve raw materials, transforms them into products and by distribution in the SC network, the products are delivered to customer.

As companies seek to improve SC efficiency through increased integration, ICT is considered as a useful aid for SCM in supporting information-sharing. SCM works simultaneous along with and it is included in the supply chain SC information flow. Information between organizational units in the past decades was based on paper documents and this information in many cases was less accurate and comes with many errors. With the concept of raising the SC, SC members understand the importance of information and information technology (IT) was essential. Furthermore, with the accurate information available, the various activities leading to SC coordination and careful planning and efficient in different fields of application are needs such as planning, production, purchasing and planning material and transportation. Besides, information on the strategic planning goals in a SC, where development of the regions and new markets are included and new facilities are created for desired success in the market. Detailed information can be operational decision making and planning as much too high efficient but may obtain this information and installation cost information systems that providing this information is very heavy.

The success of any SCM depends on how well these system activities are managed. In recent years information has become a key player in determining the productivity of a SC of a company. The company's ability to process information and make rapid but with right decisions, growth can be achieved and the demand need to be forecasted and estimated, the sale locations of the raw materials need to be supplied and also the business structure need to be reorganized if necessary. As a results, the integration of both information and material flow and with the technology advanced need to be done by a system where ICT is important to organizations that act as a useful aid for the advantage of managing the information and activities between the network systems and such a system can aid decision making, provide access to information and execution.

Competitive advantage factor has occurred between organizations and changed from time to time and new idea and concepts have been developed. Due to the many participants of supply chain SC, an important issue in the problematic of SC is also involved its organization itself. Nowadays the competition is between rival supply chains and not just individual companies that compete with each other. The SC that added the most value for customers with the lowest cost in the chain will be make up the winning network of individual companies. Organizations have spread globally as business has become more complex and competition has increased and so, business organizations become desperate for quality information to stay competitive and improve bottom line. The ICT is not only used to provide information to run the SCM but also to continue sufficient support for strategic decisions. ICT is being used for the competitive advantage by the organizations in global. Nowadays, ICT is used as a tool to draw competitive advantage by Malaysians organizations. ICT has allowed the organizations to capture various data and information for the combination of separated valuable information and support strategic decisions.

The use of ICT by organizations and companies is considered as a prerequisite for the effective control of today SC and needed in order to establish organization of SC. Besides, ICT facilitates the management of information among all the management of different parts of SC.

Most of the companies had considerably invested in the development of probable integrated ICT infrastructure solutions for logistics and SCM in terms of computer hardware, software, and connectivity by means of EDI, Intranet, Extranet and Internet and ERP. Therefore, it shows the role of ICT in SCM as ICT is important towards SCM of all management of different parts in SC.

From this research study, the researches is hoping to present related research on the roles of ICT in SCM in distributor perspective and also outline the relationship between the types of role of ICT and SCM in distributor perspective based on the literature review in order for other Malaysian distributor companies or enterprises to take highly measurement about the role of ICT in SCM in order to provide effective and efficiency in their SCM.

This research has been done to identify the relationship between roles of ICT in terms of the three types of roles of ICT in SCM which are useful aid, competitive advantage and prerequisite in SCM in distributor of automotive parts company perspective in Malaysia.

1.2 PROBLEM BACKGROUND

Recent years, the development of the applications of ICT in SCM has been seen by many parties. The relationship between the two notions in term of the roles of ICT in SCM has been researched and conducted by many researchers and currently being conducted by various researchers. The questions on how ICT can be used to enhance SCM operations in companies and organizations are also included by among these researchers. Evangelista (2002) verified about the relationship between the two “the increase in requirements to offer global logistics service packages to better satisfy customer needs based on the view of SC of automotive industries and shipments and ICT play a key role in this process, assuring the linkage between chain participants as well as a more effective control of time, cost and quality of the services for the flow of the material” and “the introduction of information and communications technology ICT is not equally distributed in the industry”. Next researcher, Sweeney (2005) verifies on how SCM has been developed increasingly in recent years. SCM is an approach which is being viewed by organizations and companies in many sectors as a key source of competitive advantage and they define SCM and outline the role and also the effectiveness of ICT as a key enabler of the process.

In addition, flexibility and adaptability to customer requirements requires a new face of supply chain strategy that will help create both efficiency and value along the length of the chain, from raw materials stage to finished products. As a result, many companies are attempting to find ways to improve their flexibility and responsiveness and in turn competitiveness. ICT has the same terms with IT but in a specific view, information technology is based on hardware and computers usage and ICT has been developed with communications technology. Specific areas that IT affects on SC are evaluated by Fasanghari (2008) and since it is qualitative, the evaluation by Fasanghari (2008) was done and accepted. Today, SCM is viewed as a principle underlying the implementation of electronic business world. In fact, the need for ICT in the current business environment

cannot be underestimated. As a result of this underlying principle, Biniazi (2011) reviewed SCM issues and after expressing its concepts, IT was studied and also has clarified the main concepts of SCM position in the development of IT, especially electronic commerce (e-commerce).

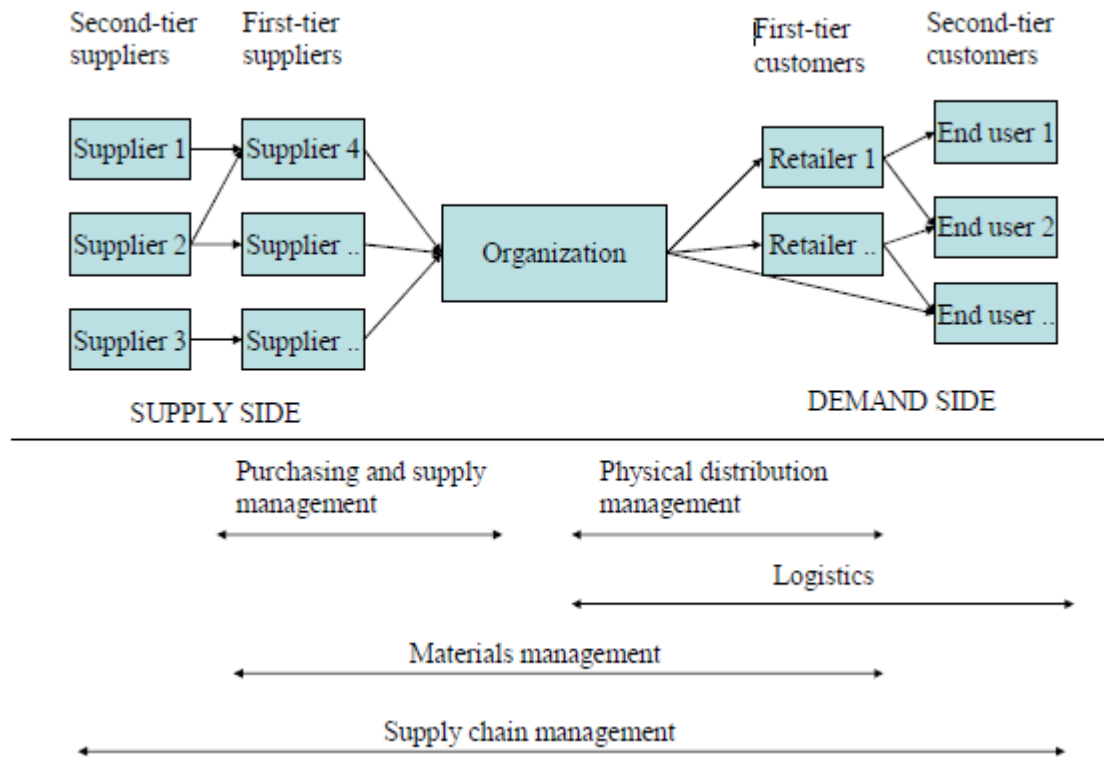


Figure 1.1: Terms used to describe the management of different parts of the SC

Source: Slack et al. (1995) and Kauffman (2002)

Figure 1.1 shows the management of different parts of SC. Purchasing and supply management is more focused on supply side of SC and physical distribution management is focused on demand side of SC. Logistics is an extension of physical distribution management and refers to management of materials and information flow from an organization down to the end customers. Materials management refers to management of the material and information flow through the immediate SC. According to Daft, (2000); Larson and Halldorsson (2002), SCM refers to managing all participants of SC such as the suppliers, distributors and manufacturers which are involved in the process of delivering

goods from supplier to end users. It is important to stress, that SC is not just a new names for logistics (Kauffman, 2002; Cooper et al., 1997; Slack et al., 1995; Lummus et al., 2001). SCM has emerged from all previous concepts for managing SC (Larson et al., 2007)

Nowadays in complex business environment it is very difficult for an organization to act independently on the market. Organizations could be above their competitors if they participating in one or more SC. In fact research has shown that, in recent times, companies are not competed again companies, but rather their SC are competing against other SC as stated by Christopher, M (2005). Therefore membership in one or more SC has become one most important in the global market in order to retain competitive advantage in modern business environment.

Advancement in modern ICT and Internet coupled with the interest for virtuality and virtual design of organizations has a great impact on many business areas. Therefore organization of supply chain (SC) could vary on a continuum from traditional to virtual organization. Besides, information and communications technology ICT is a base for virtual organization of SC and for linking dispersed supply chain SC participants. Shavazi (2009) discuss and has stated that “during the last decade how ICT and SCM have attracted much attention towards many experts”. However, the discussion of the relationship between ICT and SCM has been limited and fragmented. Shavazi (2009) has summarized the discussion of ICT components and SCM based on an extensive literature review are presented. Later, another Shavazi (2009) further discussed the interrelation between ICT and SCM from some major components and applications of ICT perspective and also has introduced e-SCM concept that has arise recently in management literature, in order to cover the whole topic and also look at all of the major components of electronic supply chain management SCM and demonstrate that the future holds tremendous opportunity for those firms that take advantage of all its possibilities. Nowadays with the development and enhancement of technology, ICT developments have strongly affected SCM and had a great impact on all SC processes.

ICT has played an important role for SCM since it has become beneficial to organizations with the SC systems. The relationship of the information and

communications technology ICT implemented by organizations Furthermore, implementations that could be done by the company of distributor of automotive parts to continuously improve SCM operations and to sustain the standards of its SCM are also included in this research project.

There are some issues that showed the role of ICT in SCM. Some of these issues are for the overview of the relationship of role of ICT and SCM in Malaysian organizations and the importance of the role of ICT in SCM. Since the increasing of Malaysian ICT investment, Malaysian businesses have been relatively slow in web adoption (Alam and Ahsas 2007). Tan (2006) argues that ICT in Malaysia is facing big challenges due to the slow adoption of technology by Malaysian enterprise. He also mentioned that organizations must learn to adopt technology to increase their global competitiveness. Most Malaysian organizations perceived the barriers of implementing ICT into their business operation as expensive initiatives, risk, complex, technical expatriate (Yeung et.al. 2003; Chong et. al. 2001; Pires and Aisbett, 2001). Moreover, Mohamed et.al. (2008) mentioned that e-commerce in Malaysia still at infancy stage although country has sufficient infrastructure and technological facilities. Despite various ICT and e-commerce initiatives by Malaysian government, e-commerce penetration among Malaysian firm still very low (Hussin and Noor 2005).

1.3 PROBLEM STATEMENT

After studying the role of ICT to integrate and enable the SCM and what are the relationship, although this is a relevant research subject but it is still a fragmented domain of academic research which has been a lot of writing about SCM, also in combination with organizations in many perspective such as supplier perspective, but no overview of the different factors and this study contributes to distributor perspective where a study on the distributor of automotive parts. Therefore, it would be very interesting to see information flows enabled by the used of ICT will results in a more efficient and effectiveness of SCM with relevant study on the relationship of ICT with the SCM based on the different types of role of ICT in SCM which are the useful aid, competitive advantage and prerequisite.

Based on the arguments above, there is a lack of concentrated knowledge about the innovative use of ICT in SC processes in Malaysian organizations. In related developments, many developed countries such as Germany, Italy, Japan and other countries have invested funds in research programs to study the role and the importance of ICT that can effects SCM in their business world and also they have been more advanced with the technologies in SCM and other activities related to the used of the technologies compared to Malaysia since their technologies is more advance. Furthermore, they have also use ICT in an efficient way with all the knowledge and idea about ICT to improve their SCM operations since nowadays, ICT plays as a prerequisite which means that ICT has become a central construct around which entire SC is built (Nedelko, Z., 2008). On the other words, ICT is assigned as a requirement for SC network. Therefore, these give a boost to their organizations into more optimized and maximize profits and benefits for their organizations performance in terms of their SCM.

It is timely the Malaysian organizations to adopt a serious effort in understanding the roles of ICT that can beneficial their SCM and move towards of implementing ICT in their integration systems as ICT is a requirements for the construction of SCM with outside organizations borders and the useful aids from ICT that may give advantage to their organizations performances such as the growth and the sustainability of their organizations in the network of business and as a competitive advantage towards global markets. For this study, distributor of automotive parts company in Malaysia is used as the subject for this research study as the distributor perspective of SCM.

1.4 CONCEPTUAL FRAMEWORK

Basically, conceptual framework is used to supports the research study by presenting relationships among variables and give limitation to the research study (Diane M. Dusick, 2011). Research can be guided by conceptual framework. Theoretical framework also used to determine what variables to measure and what relationships need to obtained. Besides, conceptual framework is develop for the preliminary information gathering, completing literature review related to the research study and defines the research problem.

In this research study, SCM in distributor perspective is the dependent variable. For the independent variable, it focuses on the role of ICT where three types of role of ICT which are the useful aid, competitive advantage and lastly prerequisite in SCM. Conceptual framework is developed to show the relationship between the two variables that required in this study. The terms of SCM and ICT have been used in previous studies. McKeown P.G. (2000) claimed SCM is the process of managing relationships, information and materials flow across enterprise borders where the enhanced customer service and economic value are delivered through management of the flow of physical goods and associated information from sourcing to consumption. Mohammadzadeh, A. (2009) stated that the strongest drivers among them are appeared to be meeting customer needs and the needs for better communications within and among partners in SC. It shows that there is an integration of information flows across the SC network where ICT play a key factor in SCM. Another researcher, Nedelko, Z. (2008) has developed the framework of the types of role of ICT regarding to the level of ICT usage in SC and another framework related to the three most significant roles of ICT in SC. In this study, distributor perspective towards the role of ICT in SCM are focused where ICT is as an advantage which is the useful aid in SCM, as a tool for the competitive advantage in SCM and as a requirement in terms of prerequisite in SCM based on distributor perspective. Conceptual framework as presented in Figure 1.2 is within the perspective of previous studies that related to the topic of this study.

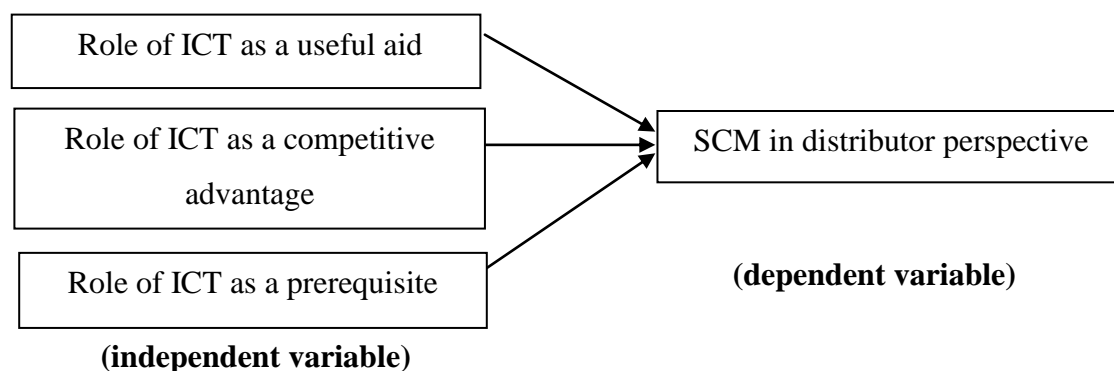


Figure 1.2: Conceptual framework for the relationship between three independent variables and dependent variable

1.5 RESEARCH OBJECTIVES

The objectives of this research study are:

- 1.4.1 To investigate the relationship between role of ICT as a useful aid and SCM in distributor perspective.
- 1.4.2 To investigate the relationship between ICT as a competitive advantage and SCM in distributor perspective.
- 1.4.3 To investigate the relationship between ICT as a prerequisite and SCM in distributor perspective.

1.6 RESEARCH QUESTIONS

The research questions of this research study are:

- 1.5.1 What is the relationship between ICT as a useful aid and SCM in distributor perspective?
- 1.5.2 What is the relationship between ICT as a competitive advantage and SCM in distributor perspective?
- 1.5.3 What is the relationship between ICT as a prerequisite and SCM in distributor perspective?

1.7 RESEARCH HYPOTHESIS

The aim of this study is to investigate the relationship between the independent variables which focus on the relationship between the types of role of ICT which is useful aid, competitive advantage and prerequisite and the dependent variable which is the SCM in distributor perspective. Besides, the hypothesis is constructed to determine whether the relationship between role of ICT as a useful aid, role of ICT as a competitive advantage and role of ICT as a prerequisite and SCM in distributor perspective is significant or not significant. The hypothesis of this research will be tested in this study based on the problem statement, research objectives, and also from research questions.

Hypothesis 1

H1: Relationship between role of ICT as a useful aid and SCM in distributor perspective.

H1: There is a significant relationship between role of ICT as a useful aid and SCM in distributor perspective.

The hypothesis is to test whether the SCM in distributor perspective has been significantly influenced by the role of ICT as a useful aid in SCM and hence will the hypothesis be accepted or rejected.

Hypothesis 2

H2: Relationship between role of ICT as a competitive advantage and SCM in distributor perspective.

H2: There is a significant relationship between role of ICT as a competitive advantage and SCM in distributor perspective.

The hypothesis is to test whether the SCM in distributor perspective has been significantly influenced by the role of ICT as a competitive advantage in SCM and hence will the hypothesis be accepted or rejected.

Hypothesis 3

H3: Relationship between role of ICT as a prerequisite and SCM in distributor perspective.

H3: There is a significant relationship between role of ICT as a prerequisite and SCM in distributor perspective.

The hypothesis is to test whether the SCM in distributor perspective has been significantly influenced by the role of ICT as a prerequisite in SCM and hence will the hypothesis be accepted or rejected.

1.8 RESEARCH SCOPE

The scope of this research is to determine the relationship of roles of ICT and SCM in distributor perspective. The study of this research will focus on automotive parts company that distributes automobile components and parts.

This study will gather important data for the types of role of ICT in SCM as such each role is significant towards the SCM in distributor perspective. The implementation of the technology as such the used of ICT in managing the SCM where the types of role of the technology in the SCM will be discussed and analyzed that contribute to the significantly influencing the SCM in distributor perspective. There are three types of role of ICT that will be discussed and analyzed which are the useful aid, competitive advantage and lastly, prerequisite. The study of this research limited itself to only distributor companies of automotive parts in Klang area and since this study is only towards distributor companies of automotive parts, only the responses from the respondents in the distributor companies of automotive parts will be studied and analyzed.

1.9 SIGNIFICANCE OF THE STUDY

The adoption of ICT within SCM has improved to almost all business processes of organizations in various sectors including the distributor sectors. Besides, implementation of ICT in SCM has impact the competitiveness between these organizations such as the productivity is increased and the costs are lowered along the integrated system of SC,

quality and the products are developed and improved to be more technological and modern, planning and the delivery scheduling or forecasting are more précised and more faster and eventually other related business processes. Therefore, this study is significant where it emphasizes the roles of ICT in SCM in distributor perspective.

While at present, ICT improves the sector's performance and profit in terms of labor productivity and economic growth and yet using ICT in SCM has many other challenges and factors such as competition from other organizations, challenges that must be faced when using ICT to manage their SCM for a better and efficient results and so on that these organizations in Malaysia need to undergo. Moreover, although Malaysia government has contribute and support ICT into many areas but still many organizations that using ICT in Malaysia still lacking of knowledge of ICT role and still need to enhance or improve as such the appropriate ICT services meet the role of the technology that will ensure on achieving their objectives with benefits. Example in general, for the distributor companies of automotive parts, using ICT will ensure them to achieve their objectives to improve the order management, improve the communication and collaboration with other business industries.

Integration of ICT may costly and time consuming but it is a key enabler for improving automotive ecosystems. In short, ICT applications have very large potential to enhance performance of the economy and society. However, in order to benefit totally from ICT solutions, ICT developments need to done and make the structural changes to their organizations.

The automotive parts companies have been the subject in this research. Automotive parts companies are of great economic importance to Malaysia, and hence this research project is significant. Besides, it also to ensure Malaysia automotive supply chain (SC) function efficiently through the enhancement of inter-organizational relationships which are built information sharing with the adaptation ICT into SC integration activities for a long period of time.

This study is relevant to address in the interest of other organizations and other relevant party in terms of the relationship between the different roles of ICT and SCM of as

information and ICT is believed being profitable on this day as technology has become more advanced and rapidly adopted by others in global market.

In addition, this study outlined different roles of information ICT in SCM, in order for companies and organizations to render and provide effective and efficient services and also the potential benefits may the study bring such as it present related work on the relationship of the types of role of ICT play in SCM to the future organizations and also explore more business opportunities for all the involved industries.

1.10 OPERATIONAL DEFINITION

1.10.1 Supply chain management (SCM)

SCM is the management of a network of all business processes and activities that involve the procurement of raw materials, distribution of finished goods and also manufacturing.

1.10.2 Supply chain (SC)

A SC is a term that consisted of all parties involved, directly or indirectly, in fulfilling a customer request and interdependent in serving the same consumer or customer. Moreover, SC not only includes the suppliers and manufacturers, but also includes warehouses, transporters, retailers, and customers. SC also is the comprises of vendors that supply raw materials, producers who convert the material into products which is the manufacturers, warehouses that store, distribution centers that deliver to the retailers, and retailers who bring the product to the high value of user.

1.10.3 Role

Role is a function or responsibility of an individual or the obligations and the expected behavior of an individual in a particular matter.

1.10.4 Perspective

Perspective is a particular way of looking at things.

1.10.5 Information and communications technology (ICT)

ICT is the technologies that provide access to information through telecommunications. Information technology (IT) is said to be similar with ICT but ICT focuses primarily on communication technologies where Internet, wireless networks, cell phones, and other communication mediums are included.

1.10.6 Information technology (IT)

IT refers to anything related to computing technology, such as networking, hardware, software, the Internet, or the people that work with these technologies. Many companies or organizations now have IT departments for managing the computers, networks, and other technical areas of their businesses. IT jobs include computer programming, network administration, computer engineering, Web development, technical support, and many other related occupations.

1.10.7 Distributor

Distributor is one of the contribution partners in SC integration. Distributor commonly an entity that buys noncompeting products or product lines, warehouses them, and resells them to retailers or direct to the end users or customers. Moreover, most distributors provide strong manpower and cash support to the supplier or manufacturer's promotional efforts. They usually also provide a range of services such as estimates, product information, technical support, after-sales services, and credit to their customers.

1.10.8 Automotive parts

Automotive parts are components of an automobile and commonly defined as the key driver for automobile business. Besides, it is especially a part that can be separated from or attached to a system where the system is the finished material which is the automobile. Automotive parts also are can be stated as the spare components for cars such engines.

1.10.9 Useful Aid

Useful aid is to provide what is useful or necessary to a subject matter.

1.10.10 Competitive Advantage

Competitive advantages give a company an edge over its rivals and an ability to generate greater value for the firm and its shareholders. The more sustainable the competitive advantage, the more difficult it is for competitors to neutralize the advantage.

1.10.11 Prerequisite

Prerequisite is something must be required or necessary as a prior condition.

1.11 EXPECTED OUTCOME

The current status of linkages between distributor and customer and is evaluated by assessing the distributor capability in responding to customer demands. They could work together closely through integration and achieve better financial results, highest customer service level and good product quality. Furthermore, players in the SC could also deliver their expertise among themselves in certain areas or activities in the SC.

In terms of integration or collaboration between distributor, customers and other partners in the SC network, various activities in SC are being managed such as purchasing, product design, logistics or distribution, which involve the human resources, production capability or other resources. The main factor that needs to be highlighted in this relationship is communication and information. Therefore, the expected result from the findings of this study is organizations especially for those distributors in Malaysia with their suppliers and customers will be given information and the results about the role of ICT in supply chain management SCM. For example, by utilizing the right information along with the capable communication technology, suppliers and customers would have capability to handle the changes in supply-demand and able to make a plan for future transaction. Information visibility also seen as a critical element in maintaining an efficient supply chain which can be obtained through the plan and execution of SC collaboration in both upstream and downstream players.

The expected outcome from this study is it can help other organizations in different sectors and partners in SC networks based on distributor perspective to improve the information sharing using ICT across the SC as there is a relationship between the roles of ICT in terms of the three types of roles and SCM and thereby it can also enhance trust and also to provide practitioners in supply chain management (SCM) to future organizations, managers and employees with a more complex view of this issue. The findings of this study also enable organizations in Malaysia and partners along the network to identify roles or issues of ICT that have priority for supply chain collaboration development. Besides, it would inform the extent of the effects based on the automotive sector in this research has experienced and finally it will reveal the level of awareness of the advantages of adopting ICT. The information obtained through the study will enable standard safety measures for ICT in the SCM in terms of competitive advantage so that Malaysian organizations can attain global standard and also access to world market. The role of ICT as a prerequisite in SCM may also impact the SCM whether in a positive effect or the negative effect in certain cases. Lastly, the expected result from this study is where the information can be publicised and further studies can be conducted in the near future.

1.11 SUMMARY OF CHAPTER

This chapter describes the introduction and the background of the research study. Besides, the statement of problem, the research objectives and the research questions also are being described in this chapter. The research hypothesis is being structured based on the conceptual framework of this study.

Additionally, the scope of the study, the significance of the study and the operational definition involved in this study also are being described in this chapter.

Lastly, the several expected outcomes can be obtained from this research study.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter, the related literature based on the definition of SCM and also the ICT are being reviewed according to this study. The related literature is based on books, articles, journals and models being written and researched by other previous researchers and authors. Besides, the related literature on the roles of ICT between SCM and ICT also are being reviewed. In addition, the relationship of the types of role of ICT and SCM also being reviewed regarding to the topic and the perspectives of this research study. There are 3 independent variables that have relationship with the dependent variables that will be reviewed in this section where the role of ICT as a useful aid in SCM, competitive advantage and as a prerequisite in SCM. This will clearly establish the current state of the knowledge in the subject, its limitations and how this research fits into the general distribution context. Analyzing the literature is aimed at making available a great deal of information to clearly point out to the fact that, there is a strong need for ICT within the SCM in terms of its role in SCM.

2.2 SUPPLY CHAIN MANAGEMENT (SCM) CONCEPTS

Many authors have attempted to define Supply Chain Management (SCM) and yet none have so far been able to suggest a more comprehensive definition. Shavazi et al. (2009) suggested that SCM is a systematic, strategically coordinated organization function within a single business and across the borders of businesses within the SC networking and

also to maintain the continual improvements of the individual partners and the entire company. As claimed by Stevens (1989), SCM is a series of activities that linked with each other as such the activities is planning, coordinating and controlling materials, parts and finished goods from supplier to customer. SCM involves multiple firms, multiple businesses activities, and the coordination of those activities across the firm itself and the partners involved in their supply chain process (McKeown P.G, 2000). In addition, Christopher, M. (2005) claimed SCM as the management of upstream and downstream in relation to deliver higher customer value at less cost to the SC as a whole with supplier and customers to deliver.

2.3 INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) CONCEPTS

Information and communications technology (ICT) as stated by Somuyiwa, (2010) are fast becoming one of the main drivers of change which posing new strategic challenges. Besides, another researcher claimed that ICT has become one among key drivers of recent developments and also has applied every business segment and also every home (Kuppusamy and Santhapparaj, 2005). ICT and other related technologies have changed the way of life of many people, environment, social, global and so on. Some claim that technology is suddenly changing business but Porter (2001) has predicted that new technologies are only facilitating managerial changes and marketing exchanges.

ICT is a collective term for computer-based information systems that support collaboration among groups, markets, hierarchies such as organizations (Howard, 2005) and includes any communication device or application that cover radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them. Another researcher suggests that ICT covers hardware, software, telecommunications, databases and other technologies where organizations could use to improve their performance (Daft, 2000).

The term of information technology (IT) can be defined as information technology is a term that covers all technology utilized to create, capture, manipulate, communicate,

exchange, present, and use information in its various forms such as business data, voice conversations, still images, motion pictures, including those not yet be understood as defined by (Jari S. and Heikki K., 2006). ICT is related to IT in terms of their similarities which ICT and IT are two concepts that related to each other in which their components and applications are similar since those two technologies are for the information flow management. The difference between them is just the concept of using communication equipments and so when using the term IT, it can be used instead of ICT, but with respect to its necessary equipments.

According to Simchi-Levi et al. (2003), the objectives of IT in SCM are:

- Provide information availability and visibility
- Enabling single point of contact of data
- Allowing decisions based on total supply chain (SC) information
- Enabling collaboration with supply chain (SC) partners

For the purpose of the discussion related to the topic of this study, the term of information and communications technology (ICT) is used rather than IT.

2.4 MODEL OF THE TYPES OF ROLES OF ICT

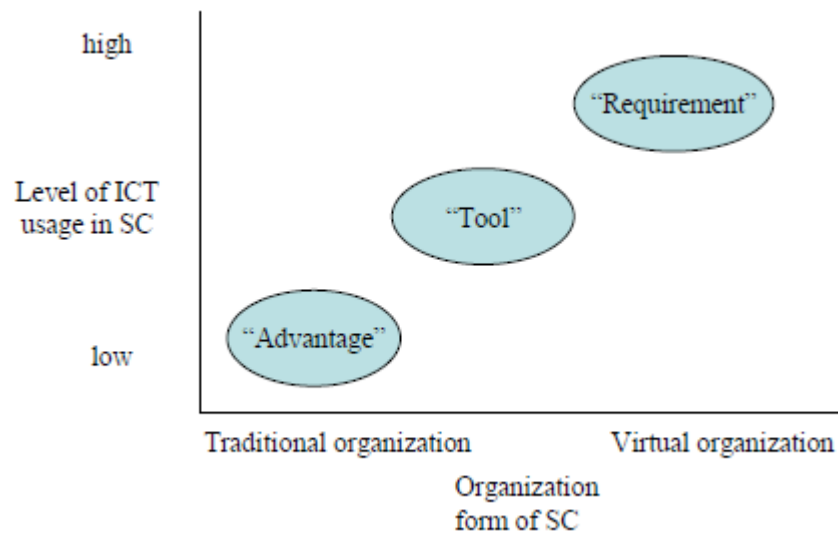


Figure 2.1: Models of types of role of ICT

Source: Nedelko, Z. (2008)

Table 2.1: Types of role of ICT and the explanations

Type of Roles of ICT	Explanation
Advantage	ICT is considered as an advantage, where it could results in realization of some benefits of ICT usage in SCM. Besides, ICT is considered as a possible advantage.
Tool	ICT is now becoming more important as the level of usage of ICT is higher. SCM is considered dependent to ICT and could not exist without it as ICT act as a tool.
Requirement	Role of ICT in SCM has advanced from advantage, though tool to requirement. ICT is now considered as an absolutely needed in order to establish SCM.

So, from the Figure 2.1, the types of role of ICT are advantage, tool and requirements based on SCM and the level usage of ICT in SCM. Therefore, it shows that

there is a relationship of the types of roles of ICT and SCM. Now, as the emphasizing of the role of ICT in SCM where the role of ICT is increased regarding from the previous types of role which are advantage, tool and requirements towards different types of role of ICT in SCM. The three types of role of ICT in Figure 2.1 are developed into more increasing significant role and related to each other as shown in the Figure 2.2. The three most significant roles of ICT in SCM are shown below:

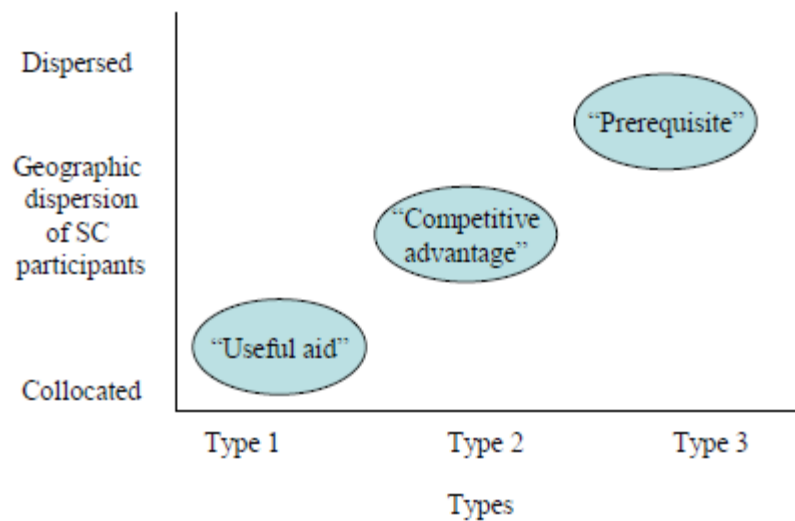


Figure 2.2: Models of types of role of ICT into more increasing significant roles

Source: Nedelko, Z. (2008)

Table 2.2: Types of role of ICT into more increasing significant roles and the explanation

Type of Roles of ICT	Explanation
Useful aid	In relation to advantage, ICT is a useful aid. ICT can bring to important benefits or advantages to organizations which using ICT in their operations. Due to the many transactions such as high value and many items between organizations where business-to-business transactions, ICT could become very useful for participants of SC. Most important advantages

	are to improve order management, improved communication and collaboration.
Competitive advantage	In relation to tool, ICT is a competitive advantage. ICT has now become a base or a foundation for organization of SC. Besides that, medium level of ICT usage enable organizations in SC, easier inter-organizational collaboration and much previously mentioned benefits of ICT usage could be gained. Some of the benefits are organizations are able to establish electronic business with their suppliers and also with the end user, exchange or share of transactional data and flexibility is higher, due to the established connections with SC partners.
Prerequisite	In relation to requirement, ICT is a prerequisite in SCM. ICT role has become to prerequisite because ICT has become a central construct around which entire SC is built. On the other hand, SC participants are now globally dispersed around the globe. Therefore organization of SC is in nowadays business practice only option, for retaining and gaining competitive advantage over competitors. ICT usage level is now very high. Main reason is the need for virtual organization due to the high geographic dispersion of SC participants. Other reasons are: ability to engage in electronic business, ability to share or exchange transactional data and other previously mentioned benefits of virtual organization of SC and ICT usage for inter-organizational collaboration.

So, this research study will cover the types of role of ICT as shown above in order to evaluate whether these types of roles of ICT is related to the SCM.

2.5 ROLES OF INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) IN SUPPLY CHAIN MANAGEMENT (SCM)

There are many literature reviews dealing with ICT in SCM. Sweeney (2005) argued that, there are five functions which are buy, make, store, move and sell, in and this is referred to internal supply chain and these functions are managed traditionally and over the years in many purposes that described the business activities. Sweeney (2005) again has mentioned that, maximizing the supply chain SCM level of effectiveness and efficiency of the flows of material, cash, and information along the full chain should be approached towards integration with the key aim to improve overall service and cost objectives. So, this is shows that the key role that is being played by ICT in SCM. Information and ICT when implement into the SCM, it is said to act as an interface between the various processes within and between the SCM systems. Sweeney (2005) claimed that the flows of raw materials, money, and information from source through the various phases of operations in the chain to the final user are smoothed through information and communications technology (ICT).

Over the last decade, ICT tools and techniques have evolved from just being a support function to an essential tool of decision-making process. However, as a result of this, the use of ICT in businesses is deemed a prerequisite for the effective management of current complex supply chains (Fasanghari , et al., 2008)

In addition, ICT appears to be an important factor for collaborative relationships. Some has believed that information and communications technology ICT can increase the information and communication processing of suppliers, thereby enabling or supporting greater relationship in addition to reducing uncertainty (Subramani, 2004). ICT has decreased the transaction costs between buyers and suppliers and creates a more cooperative governance structure and finally having closer buyer-supplier relationships (Bakos, J.Y. and E. Brynjoolfsson, 1993).

2.5.1 Roles of Information and Communications Technology (ICT) as a Useful Aid in Supply Chain Management (SCM)

The use of ICT has become widespread. The greatest effect of ICT on businesses is where a huge increase in access to services and information causing better and often cheaper communications within and between the SC partners. Besides, with the usage of ICT in the SCM operations new face of business operations is increased. The use of ICT in the SCM has indeed brought about greater coordinated efforts in business processes among SC partners. This has subsequently brought about an improved buyer-supplier relation as a result of process changes leading to reduced variability and uncertainty in information possessed by both parties. (Fasanghari, et al., 2008) argued that, the implementation of ICT in SCM has helped to improve SC agility, reduce cycle time, achieve higher efficiency and deliver products to customers in a timely manner. ICT in SCM has really made information flow across the length and breadth of the chain in quicker time response. ICT has also made SCM operations more efficient and reliable and serves as every organizational key operations enabler. (Shavazi et al., 2009) argued that, the close relationship of the two concepts, SCM and ICT sometimes makes it difficult to assess which one contributes to the benefits of the other.

According to (Shavazi et al., 2009), the companies could successfully utilize the ICT and obtain advantages such as:

- Giving more focus on reducing response time
- Redesigning the business processes
- Streamlining logistic activities across the supply
- chain to reduce cost and improved efficiency
- Developing high valued supply chain relationships
- Enhancing customer services for competitive
- advantage, and
- Trying to attain global standard and access to world market

2.5.2 Roles of Information and Communications Technology (ICT) as a Competitive Advantage in Supply Chain Management (SCM)

Ramanathan, K. (2007) stated that a firm strengthens its competitiveness if it can create greater value for its customer than its competitors. Technology such as ICT can strengthen a firm's competitive advantage by helping it to enhance customer value by:

- Improved quality
- Increased speed of delivery
- Greater customisation of products and services
- Greater convenience for the customer
- Lowered cost through productivity gains

2.5.3 Roles of Information and Communications Technology (ICT) as a Prerequisite in Supply Chain Management (SCM)

According to Nedelko, Z. (2008), ICT role now has develop to prerequisite because ICT has become a central construct around which entire SC is built. On the other hand, SC participants are now globally dispersed around the globe. Therefore virtual organization of SC is in nowadays business practice only option, for retaining or gaining competitive advantage over competitors. ICT usage level is now very high. Besides, the main reason is the need for virtual organization due to the high geographic dispersion of SC participants. Other reasons are ability to engage in electronic business, ability to share/exchange transactional data and other previously mentioned benefits of virtual organization of SC and ICT usage for inter-organizational collaboration (Nedelko, Z., 2008).

2.6 SUMMARY OF CHAPTER

Chapter 2 explains the concepts of ICT and SCM from previous related literature and previous researches done by different researchers. To close the gap in this chapter, the concepts of the three roles of ICT and the benefits from the different types of roles of ICT towards SCM also are being explained in this chapter with the aid from previous literature.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter describes the research methodology where research methodology is a term of methods used to collect and analyze data regarding to the research in this study paper which consists of research methods, research design, population and sample size, data collection techniques and research methods development of measures which is the design of the types of role of ICT in SCM in distributor perspective based on the survey questionnaire. The research design in this section consists of quantitative research design, measurement of variables which consist of development of measures: design of survey questionnaire. This research is to investigate the relationship between the independent variables and the dependent variable as in the theoretical framework and the hypothesis in Chapter 1 since there are three types of role of ICT that are related to the SCM in distributor perspective can be evaluated through the respondents in the company itself. For example, using the designed questionnaire, a few questions can be provided based on the related literature that can be related to the topic of this study paper whether the distributor SCM be affected through the three types of the roles of ICT. Therefore, to have a good result from the findings that can be implemented in the future, this study will apply the survey method by using questionnaire.

3.2 RESEARCH METHOD

Conceptual framework for this study as in Chapter 1 is used as the model in order to answer the research questions and the hypothesis. Based on the conceptual framework, there are three independent variables that focused on the three different types of role of ICT which are the useful aid, competitive advantage and prerequisite whereas the SCM in distributor perspective is the dependent variable for this study. Based on the two variables, a relationship between the two variables is investigated in this study where the relationship between the three different roles of ICT and SCM in distributor perspective. A survey methodology is followed in this study paper to answer the research questions and hypothesis. The methodology has been chosen as such the result of the research on the topic in the chosen company are best suited based on the responses from the respondents of distributor companies of automotive parts.

3.3 RESEARCH DESIGN

Appropriate research design in a research study give an appropriate involvement of a design into the whole research process from the development of a questions to finally analyzing and reporting data. Research design also involves decision-making choices on conducting a research. In this section, decisions will be done regarding to the purpose of this study on statistic, explanatory and the hypothesis testing and also from the related literatures. Besides, the methods and tools used in the research design are quantitative technique and statistical software tool (SPSS). The quantitative research was conducted through the distribution of survey questionnaires to the individual managers or the supervisors of distributor companies of automotive parts are basically the targeted group for the questionnaires. In addition, decision also has been made using sampling design, collection of data, measurements of variables and the concepts and variables are analyzed.

3.4 RESEARCH PROCESS

The process of survey research can be outlined as in Figure 3.1.

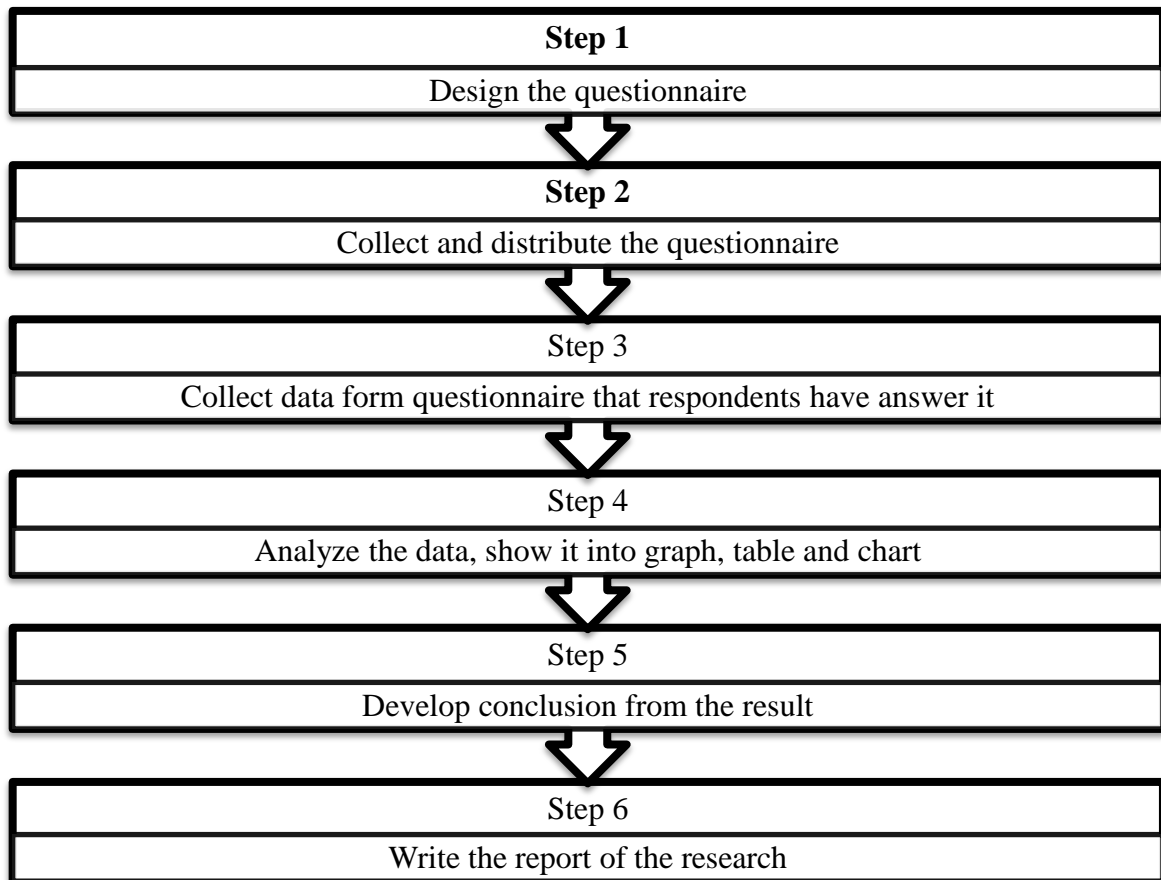


Figure 3.1: The research process

3.5 POPULATION AND SAMPLING

The sample size of any research study must be constructed during the designing stage of the study. The number of population is the first deals before the size of the sample is determined as the sample size is based on the number of population. Besides, the number of samples is determined by four factors. First, how much sampling error can be tolerated. Second, the size of the population. Third, how varied the population is with respect to the characteristics of interest. Fourth, the smallest subgroup within the sample for which estimates are needed.

By using Krejcie and Morgan (1970) theory, the estimation of sample size in this research is a commonly employed method. Hence, this study estimates the sample size using Krejcie and Morgan (1970) equation as shown in Figure 3.5.

$$s = \frac{X^2 NP (1-P)}{d^2 (N-1) + X^2 P (1-P)}$$

Figure 3.2: Krejcie and Morgan equation

Source: Krejcie and Morgan (1970)

s= required sample size

X^2 = the table value of chi-square for one degree of freedom at the desired confidence level.

N=the population size

P=the population proportion (assumed to be 0.50 since this would provide the maximum sample size).

d= the degree of accuracy expressed as a proportion (0.50)

The relationship between total population and sample size is illustrated in Table 3.1. The table shows that when the number of population increases, the sample size also increases based on the researcher consideration towards the sample size whether the size of the sample is enough to provide accuracy to base decisions on the findings with confidence.

Table 3.1: Table for determining sample size from a given population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size
"S" is sample size.

Source: Krejcie and Morgan (1970)

3.5.1 Population

One hundred and forty of distribution companies of automotive parts will be targeted in area of Klang, Selangor to participate in this study. The population targeted for this study included one employee from each of one hundred and forty distributor companies of automotive parts in Klang area where managerial level as such a manager and supervisor that is employed in each of the companies. The total employees in the distributor companies of automotive parts in Klang area is (N=140) respondents.

3.5.2 Sample

The relationship between total population and sample size is shown in Table 3.1. When the number of population is increasing, the sample size also increases. According to Krejcie and Morgan (1970) as in Table 3.1, when the population is N=140, the sample should be chosen is s=103. Convenience sampling from non-probability data also called as haphazard or accidental sampling was chosen because this survey only refer to the respondent who conveniently available to join this survey. Besides that, this sample also is easy to use.

3.5.3 Measurement of variable

Measurement of variable is an integral part of research and it contributes to the survey-based research. Moreover, how variables lend themselves to measurement and questionnaire is used because it is suitable for this research. The questionnaire is divided into two parts mainly:

Part A: Demographic Information

Part B: Question related to the independent variable and dependent variable that need

to be answered by respondent using Likert-scale.

3.6 DATA COLLECTION TECHNIQUE

Data collection is the process of getting subjects and gathering information needed for a research study where methods of collection will vary depending on the study design. For this research study, there are two sources of data that have been used which is primary data and secondary data collection.

3.6.1 Primary Data

Primary data is the data that is collected first hand from the original source for the purpose of making statistical inference and also not changed or converted by human beings and therefore primary data has more validity than secondary data. Primary data is collected by identifying population of interest choosing sample, analyse sample information and draw inference from sample information.

The collection data tool that has been chosen in this study is questionnaire. Questionnaire is commonly used in a survey where a list of questions is structured in it whether in an open-ended or close-ended for which respondents will give an answer. Besides, the quantitative data collected from the respondents were done through the individual respondents e-mail addresses and completed questionnaires returned to the authors through an email address provided on the questionnaire.

3.6.2 Secondary Data

Secondary data is the data that is collected by the method of abstraction and is used to make statistical inference by using primary data already collected by a researcher. Besides, secondary data is data that has been collected by another researcher other than the user. Examples of secondary data include organizational records, research reports, reference books, the Internet, government reports, government statistics, company reports such as annual reports and accounting documents, weather reports (in newspapers, on television, and on the Internet), social security records, focus group transcripts, housing records, interviews, field notes, literature reviews, and case studies. The benefit of using secondary data is that much of the research work has already been completed. This data may be available in the published or unpublished form. Secondary data is collected by

visiting the relevant research organization, request for primary data, collects data from the department of planning research and statistics, analyse primary data collected and make conclusion or inference.

In this study, journals, academics material and web sites are used for obtaining data. Journals are becoming more important as far as data collection is concerned. Journals provide up-to-date information compare book which is sometimes used old information and journals have more information on the specific topic on which the researchers are searching rather than talking about more general topics.

Nowadays, books are available for any topics that want to research. Usually, the books are used before the topics of research have selected. Books provide insight on how much work has already been done on the same topics and then can prepare the literature review.

3.7 INSTRUMENT OF STUDY

The aspect of assessment according to section and number of question statements is illustrated in the Table 3.2 below:

Table 3.2: Aspect of assessment according to section and number of questions

Section	Aspect of assessments	No. of questions
A	Demographic information	5
B	The role of ICT	
	• ICT as a useful aid	5
	• ICT as a competitive advantage	5
	• ICT as a prerequisite	4
C	SCM in distributor perspective	8

Section B and C are measured using Likert-scale because the data can be evaluated and analyzed more easy with Statistical Software tool (SPSS). The example of the structured scale in the survey questionnaire of this study is shown in the Table 3.3 below:

Table 3.3: Example of structured scale in the survey questionnaire

Scale	Explanation
1	Strongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

3.8 DEVELOPMENT OF QUESTIONNAIRE

The questionnaire has been chosen as a tool to collect the data in this study. According to Weires (1998), there are three important signs when using questionnaire which are the cost of the questionnaire is low, structured information in the questionnaire somewhat uncomplicated and the questionnaire give respondent extensive time to answer the question.

Additionally, the questionnaire has a negative impact in collecting the data. According to Sekaren (2000), the main problems encountered are when using questionnaire, there would be poor response levels and the likely of social desirability, validity of responses provided are being questioned and faking.

A total of 103 questionnaires were distributed to 103 employees in each one of distributor companies of automotive parts in Klang area. Each of the questionnaires is provided to the respondents with a cover letter to show the objectives of the study, assurance that anonymity and confidentiality would be protected as no personal information was required, and that the responses would be used for research purposes only. Furthermore, the instructions for completing each the questionnaire were also being

included. The questionnaire is constructed using two languages for the respondents to easily answer the questions in Bahasa Malaysia if they cannot understand the English language. The researcher's telephone number is being included in the cover letter of the questionnaire if the respondents have a problem with the questions provided.

Lastly, the respondent will have 20-30 minutes to answer all questions in the survey questionnaire. Besides, the quantitative data collected from the respondents are also done through the individual respondents e-mail addresses and the completed questionnaires are returned to the researcher through an email address provided on the questionnaire.

A questionnaire for this study is divided into three sections which are section A, section B and section C.

3.8.1 Section A

In section A, based on the sample of the study, a self-developed questionnaire is used to acquire respondent's demographic information. Besides, in this section, there are five (5) questions will be requested by the researcher towards respondents to fill the information about demographic profile in terms of their gender, job title, their designated department, their total years of working for the company and their total years of experience in distributor companies of automotive parts. However, the five (5) questions in section A have different data and both data will be measured in frequency analysis. Both data will compute in mode to see higher frequency.

In section A, the nominal data and ordinal will be used to get the information about background profiles of the respondents. Nominal data is a qualitative data that cannot be ranked such as gender and designated department questions.

For ordinal data, the characteristics of interval measurement are not equally space and have different values such as job title, total years of working for the company and the total years of experience in distributor companies of automotive parts.

3.8.2 Section B

Section B describes the question about the role of ICT in SCM, where adapting Zlatko Nedelko and Ada Scupola, as their research is considerable in this field. 14 questions will be structured in this section regarding role of ICT in SCM. In this study, the role of ICT has three different types that participating in the questionnaire which is useful aid, competitive advantage and prerequisite.

Moreover, the type of questions in section B is the rating scale survey. Rating scale is a measuring instrument that requires the respondent to assign the rated object that has numerals assigned to them. Rating scale also is a set of categories designed to get information about a quantitative attribute. The rating scale has a few types such as ordinal level scale, interval level scale and ratio level scale. In this section, ordinal-level scale is used. Ordinal-level data classifies data into categories that can be ranked but not in equally space value.

There are 14 questions in this section that are divided according to the three roles of ICT in SCM on hypothesis. As for the role of ICT as a useful aid, there are five (5) question statements and the role of ICT as a competitive advantage, there are also five (5) question statements. Another four (4) question statements are structured under role of ICT as a prerequisite. So, the respondents are required to choose one of the five scales using five (5) Likert-scale ranking where scale of one (1) which is strongly disagree to scale of five (5) which is strongly agree for each question statements in this section.

3.8.3 Section C

Section C also uses ordinal-level from scale of one (1) which is strongly disagree to scale of five (5) which is strongly agree. On the other hand, section C is structured with 8 questions that required the respondents to give a scale for the SCM. Five (5) Likert-scale ranking are used in this section as the respondents give a ranking on the SCM where the respondents are required to answer the SCM along with the three different types of role of ICT.

3.9 DATA ANALYSIS METHOD

Data analysis is the process of systematically applying statistical techniques to describe and illustrate and also to evaluate data. According to Shamoo and Resnik (2003), various analytic procedures “provide a way of drawing inductive inferences from data and distinguishing the signal (the phenomenon of interest) from the noise (statistical fluctuations) present in the data”.

An essential component of ensuring data integrity is the accurate and appropriate analysis of research findings. Improper statistical analyses distort scientific findings, mislead casual readers (Shepard, 2002), and may negatively influence the public perception of research. Integrity issues are just as relevant to analysis of non-statistical data as well. Statistical methods can manipulate, interpret, summarize and describe the quantity of data collection. This research data are statistically analyzed by the Statistical Package for the Social Sciences (SPSS) 20. This software will determine the information according to data from the questionnaire.

Each answer from respondents will be label for easier to key in the SPSS. The statistical techniques enable to analyze the raw data precisely obtained from the measuring instruments. The data analysis method can be analyzed according to objectives.

3.9.1 Reliability

Reliability is the ability to which a measurement method produces stable and consistent results. There are several ways to estimate reliability in a research study. In this research study, internal consistency reliability is used where it is to measure how well each item relates to other items in the questionnaire scale, and how well they relate overall. Moreover, reliability is the level of consistency that demonstrates the procedure of the instrument. Kirk and Miller, (1986) indicate that there are three types of reliability referred to in quantitative research which are the level to which a measurement, given repeatedly remains same, the stability of a measurement over time and the similarity of measurements within a given period time.

According to Gliem and Gliem (2003), the individual majority reported correctly that Cronbach's alpha as the measure of internal consistency reliability, but then chooses to conduct data analysis using individual items. According to Gleim and Gliem (2003) again, Cronbach alpha is a technique of reliability test that requires only a single test administration to show a unique estimate of the reliability for a given test. Besides that, the average value of the reliability coefficients one would obtain for all combinations that are possible for items when split into two half tests. Normally, ranges of Cronbach alpha reliability coefficient between 0 and 1.

According to George & Mallory (2003) provides the following techniques:

Table 3.4: Rule of thumb for Cronbach's alpha

Cronbach's alpha value	Internal consistency
> 0.90	Excellent (High-stakes testing)
0.80 - 0.89	Good (Low-takes testing)
0.70 - 0.79	Acceptable
0.60 – 0.69	Questionable
0.50 – 0.59	Poor
< 0.50	Unacceptable

Source: George and Mallory (2003)

3.9.2 Normality Test

Normality refers to the shape of the distribution of data. When the shape forms a 'bell' shape across the 'tops' of the bars in the histogram, a normal curve is formed. Normality test is test to compare the shape of the sampling distribution of the shape of a normal curve. The data can be assumed as normality when the sample is assumed as normal shape and so, the population from which it came is normally distributed.

Normality test is used to determine if a data set is well-modeled by normal distribution and also to determine whether a random variable underlying the data set to be normally distributed. Normality test is conducted based on the distribution analysis and the

test for normality where independent variables are observed distribution whether it fits the normal distribution or not.

3.9.3 Frequency Analysis

The method to analyze the demographic respondent is frequency analysis. The frequency analysis comprises of frequency and percentage of the distribution of respondent who fill the survey of this study. The frequency will be transformed to graph to make an easy to see the distribution of respondent profile. The objective of graphs is to transfer the data to the viewer in pictorial form. The graph is represented using histogram in this study. The graph will be used to analyze data from section A: background of respondents to determine the frequency and percentage of respondents for each answer of question in demographic section.

3.9.4 Pearson Correlation Analysis

Rosnow and Rosenthal (1996) assume that the correlation procedures are used to measure the strength of association between two variables. The correlation coefficient is appraised used for getting an index of the relationship between two variables when the relationship between variables is linear and when two variables correlated are continuous (Cohen & Swerdlik, 2002).

According to McBurney (2001), the relationship between the two variables is very weak when $r \leq 0.20$, when the value of r is in a range between 0.21 and 0.40 ($0.21 \leq r \leq 0.40$), the relationship between the two variables is weak, when the value of r is in a range between 0.41 and 0.60 ($0.41 \leq r \leq 0.60$), the relationship between the two variables is moderate, when the value of r is in a range between 0.61 and 0.80 ($0.61 \leq r \leq 0.80$), the relationship between the two variables is strong and lastly, the relationship between the two variables is very strong when $r \geq 0.81$. The value of correlation to prove that the relationship is strong or not, can refer to Mc Burney (2001) rule of thumb table as shown in Table 3.5.

Table 3.5: Rule of thumb of Pearson correlation

$r \geq 0.20$	Very weak relationship
$0.21 < r < 0.40$	Weak relationship
$0.41 < r < 0.60$	Moderate relationship
$0.61 < r < 0.80$	Strong relationship
$r \geq 0.81$	Very strong relationship

Source : McBurney (2001)

The value of r can be found as illustrated in Figure 3.3 below:

$$r = \frac{\sum XY - \frac{\sum X \sum Y}{N}}{\sqrt{(\sum X^2 - \frac{(\sum X)^2}{N})(\sum Y^2 - \frac{(\sum Y)^2}{N})}}$$

Figure 3.3: Equation for finding value of r

The Pearson Product Moment Correlation Coefficient will be used to test whether there is a significant relationship exists between three different roles of ICT with the SCM in the perspective of distributor. Besides that, this method also will be used to analyze the relationship overall ICT towards SCM in distributor perspective based on distributor companies of automotive parts in Klang, Selangor.

3.9.5 Simple Linear Regression Analysis

Linear regression analysis is statistical procedures which description is move to explanation, prediction, and possibly control. Bivariate linear regression analysis is the simplest linear regression procedure. The procedure is called simple linear regression because the model explores the predictive or explanatory relationship for only two variables and examines only linear relationships. Simple linear regression focuses on explaining or predicting one of the variables on the basis of information on the other variable. The regression model thus examines changes in one variable as a function of changes or differences in values of the other variable.

The regression model labels variables according to their role: 1) Dependent Variable (Criterion Variable) where the variable whose variation to be explained or predicted. 2) Independent Variable (Predictor Variable) where variable used to predict systematic changes in the dependent or criterion variable. In this study, simple linear regression analysis is used to explore the relationship between each of the three roles of ICT with SCM in distributor perspective.

The mathematical equation for the general linear model using population parameters is as shown in Figure 3.4 as below:

$$Y = \beta_0 + \beta_1 X + \epsilon$$

Figure 3.4: Mathematical equation for the general linear model using population parameters

Where:

- Y and X represent the scores for individual_i on the criterion and predictor variable respectively.
- The parameters β_0 and β_1 are constants describing the functional relationship in the population.
- The value of β_1 identifies the change along the Y scale expected for every unit changed in fixed values of X (represents the slope or degree of steepness).
- The values of β_0 identify an adjustment constant due to scale differences in measuring X and Y (the intercept or the place on the Y axis through which the straight line passes. It is the value of Y when X = 0).
- ϵ (Epsilon) represents an error component for each individual. The portion of Y score that cannot be accounted for by its systematic relationship with values of X.

3.10 PILOT STUDY

To do the pilot test, firstly, the questionnaire will be tested on a small sample. If this is not possible, the questionnaire will be tested on 10 respondents of employee to detect any defect in the questionnaire and correct again before distributing it to right respondents. This test also enables to convert an open-ended question into a closed question by determining the range of possible answer. The trial analysis also is able to perform on the pilot test sample and hence the analysis procedures will be tested out. After doing a pilot survey, amendments can be made to help maximize response rate and decrease the error rate on questionnaires.

3.11 SUMMARY OF CHAPTER

This chapter contributes to the research methodology that consist of research method, research, research design, research process, population and sampling, data analysis method and pilot test which can be founded in this study. This followed by development of questionnaire for the study.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 INTRODUCTION

This chapter describes the results from the responses of the questionnaires that have been distributed to the respondents in this research finding. Besides, in this chapter the results are being analysed using the Statistical Software Tool (SPSS). The pilot study, the normality test, reliability, demographic analysis, the correlation between the variables and linear regression between the independent and the dependent variables are tested, being analysed using the Statistical Software Tool (SPSS) in this chapter and are discussed in this chapter.

4.2 PILOT STUDY

According to White (2000), the quality of questionnaire depends on the quality of the questions that have been structured in the questionnaire. Additionally, pilot study helps to find any potential future problematic areas and error rate in the questionnaire and so, further adjustments can be done earlier to the questionnaire before the actual implementation towards the questionnaire during the full study (Z. A.Hassan; P. Schattner and D. Mazza., 2006). White (2000) argued that good and easy going questions will keep the respondents focused and will promote accurate response. In this research study, ten (10) respondents from any of ten (10) distributor of automotive parts companies that using ICT in Kuantan, Pahang area were used to conduct a pilot test on the questionnaire before the questionnaire is being distributed to the targeted population in Klang, Selangor area. This

provided an insight to whether or not the questionnaire will be easy to follow by the respondents. In this section, the demographic profiles of the respondents that contributed towards the questionnaire for the pilot test such as the gender, job title, designated department, total years working for the company and the total years of experience in distributor of automotive parts company are being analysed. The reliability analysis of the pilot study also is conducted to show that whether the questionnaire is reliable or not reliable to be used during the full study. The results of the reliability of the pilot study are based on the value of cronbach's alpha that being conducted in the Statistical Software Tool (SPSS).

4.2.1 Demographic analysis

Table 4.1: Demographic profiles of the respondents in the pilot study

Demographic	Characteristic	Frequency	Percentage
Gender	Male	7	70.0
	Female	3	30.0
Job Title	Manager	6	60.0
	Supervisor	4	40.0
Designated Department	Finance	2	20.0
	Human Resources and Security	2	20.0
	Engineering	1	10.0
	Processing	0	0.0
	Community Relationship	1	10.0
	Health, Safety and Environment	1	10.0
	Others	3	30.0

Total years working for the company	Less than 1 year	0	0.0
	1 – 5 years	8	80.0
	5 – 10 years	2	20.0
	10 – 15 years	0	0.0
	Others	0	0.0
Total years of experience in distributor of automotive parts company	Less than 1 year	0	0.0
	1 – 5 years	7	70.0
	5 – 10 years	3	30.0
	10 – 15 years	0	0.0
	Others	0	0.0

Table 4.1 shows that that 7 males have taken part as the respondents for the pilot test that indicate 60.0% and three (3) females that indicate 30.0%. As for the designated department, Finance Department comes with two (2) respondents (20.0%), Human Resources and Security Department comes with two (2) respondents (20.0%), Engineering Department comes with 1 respondent (10.0%), Community Relationship Department comes with 1 respondent (10.0%), Health, Safety and Environment comes with 1 respondent (10.0%) and other departments comes with 3 respondents (30%). As stated in Chapter 3, the respondents are basically managers and supervisors that being chose as they have more knowledge and understands the ICT and SCM. So, for the job title, six (6) managers (60.0%) have responded and four (4) supervisors (40.0%) have responded to the questionnaires. Moreover, almost all the respondents have worked for their company at the scale of 1 – 5 years which indicates 8 respondents (80.0%) and 2 respondents (20.0%) have worked for 5 – 10 years. Based on the total years of experience in working in the distributor of automotive parts company, seven (7) respondents (70.0 %) have responded to have experiences in distributor of automotive parts company for 1 – 5 years and 3 respondents (3%) to have experiences in distributor of automotive parts company.

4.2.2 Reliability Analysis

The cronbach's alpha values for each major variables obtained in the pilot test are ranged between 0.645 and 0.806, while total cronbach's alpha for all items is 0.794. The reliability of the instrument can be determined when the indicators have a cronbach's alpha of 0.6 or more (Hair et al., 2006). Since the cronbach's alpha values are greater than 0.6, therefore, none of the item is excluded. All the major variables which are the useful aid that represents five (5) questions, competitive advantage represents five (5) questions, prerequisite represents four (4) questions and lastly SCM in distributor perspective that represents eight (8) questions have a cronbach's alpha of more than 0.6. Therefore, the questions that have been constructed in the questionnaire are reliable to be used for the full study. Table 4.2 shows that the value of cronbach's alpha for the pilot test of the three roles of ICT and the SCM in distributor perspective are high.

Table 4.2: Reliability analysis for pilot study

Major Variables	Total Items	Items Dropped	Cronbach's Alpha
Useful Aid	5	-	0.645
Competitive Advantage	5	-	0.669
Prerequisite	4	-	0.770
Supply Chain Management (SCM) in distributor perspective	8	-	0.806
Total Cronbach's alpha			0.794

4.3 NORMALITY TEST

For this study, the normality test is conducted based on the distribution analysis and also the test for normality where the independent variables and the dependent variable are the observed distribution whether it fits the normal distribution or not.

4.3.1 Distribution Analysis

In this section, the analysis of the distribution of the variables is based on the shape of the histogram with the mean and the standard deviation for the number of population. It is always a good step to examine data graphically before analysing the formal tests for normality. So, histogram is plotted to show when histogram's shape approximates a bell-curve, the data may have come for a normal population. The analysis for the distribution of the three independent variables and dependent variable is shown below:

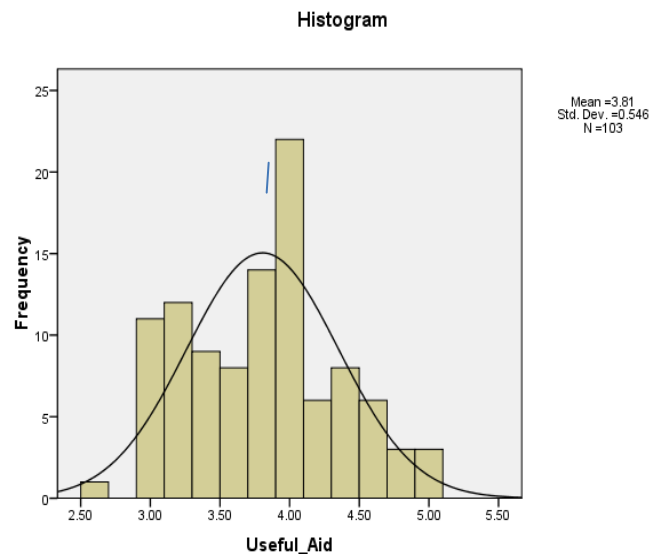


Figure 4.1: Histogram of Useful Aid

Figure 4.1 show that the statistics on the histogram indicate that the standard deviation is 0.546 with a mean of 3.81 for a total N of 103. The shape of the histogram approximates has a bell-curve and so, it suggests that the data may have come for a normal population.

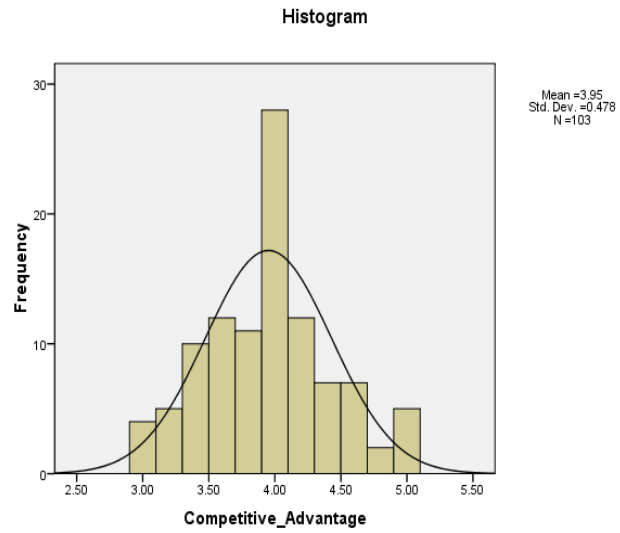


Figure 4.2: Histogram of Competitive Advantage

Figure 4.2 show that the statistics on the histogram indicate that the standard deviation is 0.476 with a mean of 3.95 for a total N of 103. The shape of the histogram approximates has a bell-curve and so, it suggests that the data may have come for a normal population.

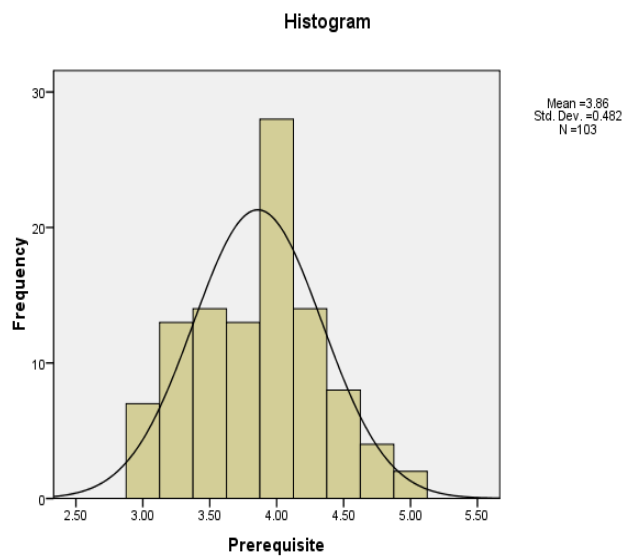


Figure 4.3: Histogram of Prerequisite

Figure 4.3 show that the statistics on the histogram indicate that the standard deviation is 0.482 with a mean of 3.86 for a total N of 103. The shape of the histogram approximates has a bell-curve and so, it suggests that the data may have come for a normal population.

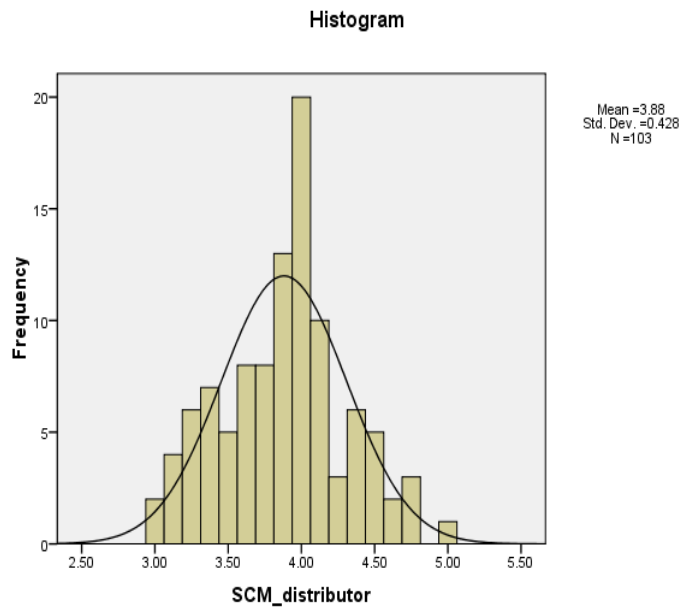


Figure 4.4: Histogram of SCM in distributor perspective

Figure 4.4 show that the statistics on the histogram indicate that the standard deviation is 0.482 with a mean of 3.88 for a total N of 103. The shape of the histogram approximates has a bell-curve and so, it suggests that the data may have come for a normal population.

4.3.2 Test for Normality

Skewness and kurtosis values are two numerical measures of shape that give a more precise evaluation to test for the normality and to determine whether the distribution is normal or nearly normal in this study. A normal distribution has skewness and excess kurtosis of zero (0), so if the distribution is close to those values then it is probably close to normal. According to Hair et al. (1998), the value of skewness and kurtosis should be in the

range of between -1.0 and +1.0 in the normality test. So, if the skewness is greater than 1.0 or less than -1.0, the skewness is substantial and the distribution is far from symmetrical and it is probably not close to normal. Skewness is used to determine the amount and direction of skew (departure from horizontal symmetry), and kurtosis is used to determine how tall and sharp the central peak is, relative to a standard bell curve. The skewness and the kurtosis of each of the predictors (useful aid, competitive advantage, prerequisite) are constructed in a table as shown below:

Table 4.3: Test for normality for the distribution of useful aid

	Skewness	Kurtosis
	Statistic	Statistic
Useful Aid	0.148	-0.612

As shown in Table 4.3, the value of the skewness of the distribution of useful aid is 0.148. Since the value is positive, the distribution is skewed right or positively skewed. The kurtosis for the distribution indicates a value of -0.612 and compared to a normal distribution which indicates a value of 0, its central peak is lower and broader, and its tails are shorter and thinner. The value of skewness and kurtosis should be in the range of between -1.0 and +1.0 in the normality test and therefore, the distribution is closer to the symmetrical and probably close to normal. As a result, the distribution is fit to the normal distribution.

Table 4.4: Test for normality for the distribution of competitive advantage

	Skewness	Kurtosis
	Statistic	Statistic
Competitive Advantage	0.175	-0.178

From Table 4.4, the value of the skewness of the distribution of competitive advantage is 0.175. Since the value is positive, the distribution is skewed right or positively skewed. The kurtosis for the distribution indicates value of -0.178 and compared to a normal distribution which indicates value of 0, its central peak is lower and broader, and its tails are shorter and thinner. The value of skewness and kurtosis should be in the range of between -1.0 and +1.0 in the normality test and therefore, the distribution is closer to the symmetrical and probably close to normal. As a result, the distribution is fit to the normal distribution.

Table 4.5: Test for normality for the Distribution of Prerequisite

	Skewness	Kurtosis
	Statistic	Statistic
Prerequisite	0.069	-0.505

The value of the skewness of the distribution of prerequisite is 0.069 as in the Table 4.5. Since the value is positive, the distribution is skewed right or positively skewed. The kurtosis for the distribution indicates value of -0.505 and compared to a normal distribution which indicates value of 0, its central peak is lower and broader, and its tails are shorter and thinner. The value of skewness and kurtosis should be in the range of between -1.0 and +1.0 in the normality test and therefore, the distribution is closer to the symmetrical and probably close to normal. As a result, the distribution is fit to the normal distribution.

Table 4.6: Test for normality for the distribution of SCM in distributor perspective

	Skewness	Kurtosis
	Statistic	Statistic
SCM in distributor perspective	0.062	-0.262

The value of the skewness of the distribution of SCM in distributor perspective is 0.062 as in the Table 4.6. Since the value is positive, the distribution is skewed right or positively skewed. The kurtosis for the distribution indicates value of -0.262 and compared to a normal distribution which indicates value of 0, its central peak is lower and broader, and its tails are shorter and thinner. The value of skewness and kurtosis should be in the range of between +1.0 and -1.0 in the normality test and therefore, the distribution is closer to the symmetrical and probably close to normal. As a result, the distribution is fit to the normal distribution.

4.4 GOODNESS OF MEASURE

The goodness of measures indicates whether the scales used are reliable and valid. In other words, they indicate to what extent we are accurately and consistently measuring the concept (reliability), and whether we are indeed measuring whatever we are supposed to measure (validity). If the intended concept is not measured accurately, then, the study will not yield the correct results.

Reliability is established by assessing the stability of the measure through test-retest reliability and parallel form reliability, and internal consistency of the measure through Cronbach's alpha. In this study, the reliability is measured through internal consistency and Cronbach's alpha is used to check the internal consistency for reliability in this research study. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. This is often the case with attitude instruments that use the Likert-scale. Therefore, cronbach's alpha is used to test the reliability in this study.

4.4.1 Reliability Analysis

According to Hair et al. (2006), to determine the reliability of the instrument, the indicators should have a cronbach's alpha of 0.6 or more. When the value of each of the major variables is close to 1, the instrument is more reliable and shares a high internal consistency. The cronbach's alpha values for each major variables obtained in this study are ranged between 0.758 and 0.863, while total cronbach's alpha for all items is 0.900. Since

the cronbach's alpha values are greater than 0.6, therefore, none of the item is excluded. Table 4.4 shows that the value of cronbach's alpha for the three roles of ICT and SCM in distributor perspective are high.

Table 4.7: Reliability coefficients for the major variables

Major Variables	Total Items	Items Dropped	Cronbach's Alpha
Useful Aid	5	-	0.863
Competitive Advantage	5	-	0.815
Prerequisite	4	-	0.758
Supply Chain Management (SCM) in distributor perspective	8	-	0.842
Total Cronbach's alpha			0.900

4.5 DEMOGRAPHIC ANALYSIS

The demographic analysis describes the demographic profiles of the respondents and additionally indicates the frequencies followed by the percentage of the respondents based on characteristics information in the questionnaire. The analysis shows that 69 males have taken part as the respondents that indicate 67.0% and 34 females that indicate 33.0%. As for the designated department, Finance Department comes with 18 respondents (17.5%), Human Resources and Security Department comes with 19 respondents (18.4%), Engineering Department comes with 12 respondents (11.7%), Processing Department comes with 4 respondents (3.9%), Community Relationship Department comes with 15 respondents (14.6%), Health, Safety and Environment comes with 16 respondents (15.5%) and others such as Commercial Department and Logistics Department comes with 19 respondents (18.4%). As stated in Chapter 3, the respondents are basically managers and supervisors that being chose as they have more knowledge and understands of ICT and SCM. So, 75 managers (72.8%) have responded and 28 supervisors (27.2%) have

responded to the questionnaires. Furthermore, almost all the respondents have worked for their company at the scale of 1 – 5 years which indicates 77 respondents (74.8%) and 26 respondents (25.2%) have worked for 5 – 10 years. Based on the total years of experience in working in the distributor of automotive parts company, 62 respondents which show 60.2 % have responded to have experiences in distributor of automotive parts company for 1 – 5 years and 41 respondents which show 39.8% to have experiences in distributor of automotive parts company.

Table 4.8: Demographic profiles of the respondents

Demographic	Characteristic	Frequency	Percentage
Gender	Male	69	67.0
	Female	34	33.0
Job Title	Manager	75	72.8
	Supervisor	28	27.2
Designated Department	Finance	18	17.5
	Human Resources and Security	19	18.4
	Engineering	12	11.7
	Processing	4	3.9
	Community Relationship	15	14.6
	Health, Safety and Environment	16	15.5
	Others	19	18.4
Total years working for the company	Less than 1 year	0	0.0
	1 – 5 years	77	74.8
	5 – 10 years	26	25.2

	10 – 15 years	0	0.0
	Others	0	0.0
Total years of experience in distributor of automotive parts company	Less than 1 year	0	0.0
	1 – 5 years	62	60.2
	5 – 10 years	41	39.8
	10 – 15 years	0	0.0
	Others	0	0.0

4.6 CORRELATION ANALYSIS

The correlation analysis is conducted to measure the strength of association between two variables. Using the rule of thumb of Pearson correlation by McBurney as shown in Chapter 3, the strength of the relationship can be described detailed in this study. Besides, the significant correlation between the variables also can be described based on the value of significant correlation between the two variables when the p-value ≤ 0.005 , there is a statistically significant correlation between the two variables and when the p-value > 0.005 , there is no statistically significant correlation between the two variables. Table 4.7 below shows the correlation between the independent variables which are useful aid, competitive advantage and prerequisite and the dependent variables which is the SCM in distributor perspective and also the significant correlation between the variables.

Table 4.9: Correlation Matrix of All Variables

		UA	CA	P
Useful Aid	Pearson	1		
	Correlation Sig. (2-tailed)			
Competitive Advantage	Pearson	0.265**	1	
	Correlation Sig. (2-tailed)	0.007		
Prerequisite	Pearson	0.437**	0.472**	1
	Correlation Sig. (2-tailed)	0.000	0.000	
SCM in distributor perspective	Pearson	0.526**	0.308**	0.440**
	Correlation Sig. (2-tailed)	0.000	0.002	0.000

From this study, the relationship between the role of ICT as a useful aid and the SCM in distributor perspective is moderate because the value of r is 0.526 and it is in a range between 0.61 and 0.80. The analysis indicates that there is a statistically significant correlation between the two variables with p -value is 0.000 when the p -value ≤ 0.005 .

Next, the relationship between the role of ICT as a competitive advantage and the SCM in distributor perspective is weak when the r value indicates 0.308 in a range between 0.21 and 0.40. The two variables have a p -value of 0.002 and hence, there is a statistically significant correlation between the two variables as the p -value ≤ 0.005 .

The Table 4.9 above also shows that the value of r between the role of ICT as a prerequisite and the SCM in distributor perspective is 0.440. The relationship between the two variables is moderate as the r value is in a range between 0.61 and 0.80. Since, the p -value for the variables is 0.000 and it shows the p -value ≤ 0.005 , there is a statistically significant correlation between the two variables.

4.7 REGRESSION ANALYSIS

Simple linear regression is used in this study as simple linear regression performed between one independent variable and one dependent variable. Simple linear regression returns results for the influence of one independent variable on the dependent variable. The result of the analysis is determined by the full regression equation or model that indicates whether the dependent variable is significantly influenced by the independent variable. There are three linear regressions between three independent variables and the dependent variable in this study which are useful aid, competitive advantage and prerequisite with SCM in distributor perspective.

The SPSS reports statistic of strength of relationship are useful for regression analyses with bivariate and multiple predictors. Several correlational indices are presented in the output:

- The multiple correlation coefficient (multiple R), for simple linear regression the R is equal to the Pearson product moment correlation coefficient (r),
- Its squared value (R^2)
- The adjusted R^2 .

Additionally, when Pearson's r is in positive value, it shows that when independent variable increases in value, the dependent variable also increases in value whereas the negative value of Pearson's r will indicates that when the independent variable increases in value, the dependent variable will decreases in value.

4.7.1 Simple Linear Regression Analysis of the Useful Aid and the SCM performance

Table 4.10: Model Summary of the useful aid

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.526	0.277	0.269	0.36597

Based on the Table 4.10 above, the regression analysis yielded a correlation coefficient (R) of 0.526 which means that there was a moderate relationship between the dependent variable (SCM in distributor perspective) and the predictor (useful aid). The predictor is positively correlated to the dependent variable and hence, they have a linear positive relationship (as one variable increases in its values, the other variable also increases in its values via an exact linear rule). Furthermore, the coefficient of determination (R^2) of 0.277 shows that 27.7% of the variation in SCM can be explained by the role of ICT as a useful aid. Meanwhile, the residual of 72.7% is explained by other variables out of the model.

Table 4.11: ANOVA Table

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.172	1	5.172	38.614	0.000
	Residual	13.528	101	0.134		
	Total	18.699	102			

From the Table 4.11 above, in general, the analysis yielded a significant regression model with F value of 38.614 with p-value of 0.000 where the p-value is <0.005 , and so the relationship between the role of ICT as a useful aid and SCM in distributor perspective is significant.

Table 4.12: Coefficients of the useful aid

		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.312	0.255		9.067	0.000
	Useful Aid	0.412	0.066	0.526	6.214	0.000

From the Table 4.12 above, the full regression model can be written as:

$$\text{SCM} = 2.312 + 0.142 (\text{Useful Aid})$$

From the regression model, a 0.142 unit increase because the coefficient is positive. So, a 1 unit increase in the role of ICT as a useful aid is associated with a 0.142 unit increase in the average of SCM in distributor perspective. Therefore, SCM significantly influenced by the role of ICT as a useful aid.

H1 is accepted where there is a significant relationship between role of ICT as a useful aid and SCM in distributor perspective.

4.7.2 Simple Linear Regression Analysis of the Competitive Advantage and the SCM performance

Table 4.13: Model Summary of the competitive advantage

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.308	0.095	0.086	0.40937

Based on the Table 4.13 above, the regression analysis yielded a correlation coefficient (R) of 0.308 which means that there was a weak relationship between the dependent variable (SCM in distributor perspective) and the predictor (competitive

advantage). The predictor is positively correlated to the dependent variable and hence, they have a positive linear relationship (as one variable increases in its values, the other variable also increases in its values via an exact linear rule). Furthermore, the coefficient of determination (R^2) of 0.095 shows that 9.5% of the variation in SCM can be explained by the role of ICT as a competitive advantage. Meanwhile, the residual of 90.5 % is explained by other variables out of the model.

Table 4.14: ANOVA Table

ANOVA					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1.773	1	1.773	10.582	0.002
Residual	16.926	101	0.168		
Total	18.699	102			

From the Table 4.14 above, in general, the analysis yielded a significant regression model with F value of 10.582 with p-value of 0.002 where the p-value is <0.005 , and so the relationship between the role of ICT as a competitive advantage and SCM is significant.

Table 4.15: Coefficients of the competitive advantage

Coefficients					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2.791	0.337		8.273	0.000
Competitive Advantage	0.276	0.085	0.308	3.253	0.002

From the Table 4.15 above, the full regression model can be written as:

$$\text{SCM} = 2.791 + 0.276 (\text{Competitive Advantage})$$

From the regression model, a 0.276 unit increase because the coefficient is positive. So, a 1 unit increase in the role of ICT as competitive advantage is associated with a 0.276 unit increase in the average of SCM performance. Therefore, SCM is significantly influenced by the role of ICT as a competitive advantage.

H2 is accepted where there is a significant relationship between role of ICT as a competitive advantage and SCM in distributor perspective.

4.7.3 Simple Linear Regression Analysis of the Prerequisite and the SCM performance

Table 4.16: Model Summary of the prerequisite

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.583	0.340	0.333	0.34959

Based on the Table 4.16 above, the regression analysis yielded a correlation coefficient (R) of 0.583 which means that there was a moderate relationship between the dependent variable (SCM in distributor perspective) and the predictor (prerequisite). The predictor is positively correlated to the dependent variable and hence, they have a positive linear relationship (as one variable increases in its values, the other variable also increases in its values via an exact linear rule). Furthermore, the coefficient of determination (R^2) of 0.340 shows that 34.0% of the variation in SCM can be explained by the role of ICT as a competitive advantage. Meanwhile, the residual of 66.0 % is explained by other variables out of the model.

Table 4.17: ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.356	1	6.356	52.006	0.000
	Residual	12.344	101	0.122		
	Total	18.699	102			

From the Table 4.8.3.2 above, in general, the analysis yielded a significant regression model with F value of 52.006 with p-value of 0.000 where the p-value is <0.005, and so the relationship between the role of ICT as a prerequisite and SCM is significant.

Table 4.18: Coefficients of the prerequisite

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.883	0.279		6.744	0.000
	Prerequisite	0.518	0.072	0.583	7.211	0.000

From the Table 4.8.3.3 above, the full regression model can be written as:

$$\text{SCM} = 1.883 + 0.518 (\text{Prerequisite})$$

From the regression model, a 0.518 unit increase because the coefficient is positive. So, a 1 unit increase in the role of ICT as a prerequisite is associated with a 0.518 unit increase in the average of SCM. Therefore, SCM is significantly influenced by the role of ICT as a prerequisite.

H3 is accepted where there is a significant relationship between role of ICT as a prerequisite and SCM in distributor perspective.

4.8 RESEARCH DISCUSSION

This section of the study presents and discusses the synthesis of the research findings from the survey on the subject matter. The subject of this research finds three main sets of conclusions. These include: the role of ICT as a useful aid in SCM in distributor perspective, the role of ICT as a competitive advantage in SCM in distributor perspective and the role of ICT as a prerequisite in SCM in distributor perspective.

Based on the data and the findings that have analysed in the study, the relationship of the three roles of ICT in the SCM in distributor perspectives is significant. The research clearly depicts that, there is a great deal of consent of the three types of roles ICT by the SCM in distributor perspective as ICT has helped to beneficial their SCM and sustain standards of their SCM.

Based on the three research questions in Chapter 1, it can be concluded that the relationship between ICT as a useful aid, ICT as a competitive advantage and ICT as a prerequisite and SCM in distributor perspective is significant and these three roles are important towards SCM in distributor perspective.

The three hypothesis of the study can be accepted as the findings tend to accept the hypothesis where the three hypothesis of the study is constructed to test whether there is a significant relationship between SCM in distributor perspective with ICT as a useful aid, competitive advantage and prerequisite in SCM.

So, it can be concluded that the basic important role of ICT in SCM is useful aid, competitive advantage and prerequisite. Finally, there is a significant relationship between the three roles of ICT in SCM in distributor perspective. Cognitions presented above present increasing of the important of the role of ICT as a useful aid, competitive advantage and prerequisite in SCM, the higher the SCM will be significantly influenced by those three roles of ICT in distributor perspective.

4.9 SUMMARY OF CHAPTER

This chapter outlines the analysis and results of research findings of the pilot study, normality test, reliability test, demographic analysis, correlation analysis and the regression analysis. The pilot study which consists of distribution analysis and test for normality, pilot study which consists of demographic analysis and the reliability analysis of the pilot test, reliability test study with the reliability analysis, correlation analysis of the independent variables and dependent variables and lastly, the regression analysis where simple linear regression analysis is conducted throughout the analysis of the research findings.

This study ended with the results of the regression equation from the coefficients in order to get the results of whether the dependent variable is significantly influenced by independent variable.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter discusses the summary, conclusion, limitation of the study and also the recommendation of the research study in terms of future practice and further research when this study has been conducted for “The Role of Information and Communications Technology (ICT) in Supply Chain Management (SCM) in Distributor Perspective – A Study of Distributor Company of Automotive Parts in Klang Area”. Besides, this paper has therefore put forth a new face of addressing the role of ICT plays in the SCM in distributor perspective by using the distributor companies of automotive parts located in Klang as the survey research organization to close this gap. In this way, a clear understanding of the level of importance attached to ICT role in the SCM in distributor perspective will be established. This will help ICT and SCM practitioners to understand the trend of the role of ICT in this new environment and become aware of which role of ICT exists and how they relate to their business domains.

5.2 SUMMARY

The main objective of this research study is to study the role of ICT in SCM in distributor perspective. In this study, the questions of what is the relationship between role of ICT as a useful aid and SCM in distributor perspective, what is the relationship between role of ICT as a competitive advantage and SCM in distributor perspective and what is the relationship between role of ICT as a prerequisite and SCM in distributor perspective.

Based on a structured literature review and empirical data obtained through a survey conducted among distributor companies of automotive parts, this study provides an initial understanding of the research on the role of ICT in SCM in distributor perspective. Additionally, it further enriches the knowledge of the underlying mechanisms of those roles of ICT can significantly influence SCM in distributor perspectives.

Chapter 1 of the study describes a conceptual framework that has been developed to provide an integrative view of the studies on the three roles of ICT which are useful aid, competitive advantage and prerequisite has a relationship with SCM in distributor perspective. The framework suggests that the three roles of ICT have a relationship with SCM in terms of measurement of the SCM in distributor perspective. In addition, whether the SCM is significantly influenced by the three roles of ICT can be generated. The relevant research questions are posed on the basis of the framework. Much of the previous research has only studied the direct relationship between ICT and SCM. However, the explanations for basic mechanisms are still in deficit and important questions are not fully understood yet. The absence of a complete answer to the research questions show that there is still a little knowledge about the relationship between the role of ICT and SCM. According to the conceptual framework and research questions identified, the study explored the relationship between the role of ICT in SCM of a systematic and overall perspective from the distributor company and hence, the research hypothesis are constructed as to test the hypothesis of the study whether to accept or reject the relationship between the three types of role of ICT and SCM in distributor perspective.

In Chapter 2 in this study, a possible inconsistency in the reported findings within the survey-based research on the relationship between ICT and SCM are the first to be dealt. Based on a structured literature review of various journals and articles, there are survey-based researches connecting role of ICT and a SCM. The review evaluates current empirical results and aims at explaining the similarities and differences in reported findings in the current literature. The literature review has described a confirmation that there is a positive and significant relationship between the three roles of ICT with SCM. Based on the analysis from the related literatures, there are three main concerns. First of all, the main concepts of ICT and SCM have been conceptualized and measured differently. Secondly,

the role of ICT has been conceptualized in a model and measured between the three roles of ICT which are useful aid, competitive advantage and prerequisite from a related literature. Thirdly, the role of ICT in SCM that describes on the three significant roles of ICT in SCM is constructed and conceptualized.

Chapter 3 contributes to the method that been used to collect and the design of the measurement of data based on the measurement of variables and the correlation relationship between them in this study. The independent variables is the three roles of ICT which is useful aid, competitive advantage and prerequisite while dependent variable is SCM in distributor perspective which is affected by independent variable and a design of a measurement between the two variables if there is any correlation relationship between them.

Chapter 4 explains the relationship between the three different types of role of ICT and SCM in distributor perspective. In addition, Chapter 4 also explains the each of the three types of role of ICT have a significant relationship with SCM, especially the role of ICT as a prerequisite has the most significant influence towards SCM. Hypothesis in this study also are determined based on the significant relationship between the variables where H_0 is accepted. The existing literature is conclusive with respect to the three questions of the relationship between the three types of role of ICT and SCM. As in Chapter 2 in line with the role of ICT-based view, the idea that ICT as a useful aid, as a competitive advantage and as a prerequisite enhanced SCM are supported. More specifically, the results show that each of the three different roles of ICT has correlation relationship with SCM. In other words, there is a significant relationship between the three roles of ICT and the SCM in distributor perspective.

The final Chapter 5 summarizes and integrates the main findings of this research study and it provides final conclusions and suggestions for further research and further practice. Overall, this study contributes to the understanding of the role of ICT in SCM in distributor perspective. To this aim, a number of insights are identified allowing for effective future practices to spur the three roles of ICT in SCM. Above all, the insights

highlight the way in which the role of ICT can increase SCM in which this research shows that SCM is significantly depend on the three significant types of role of ICT.

5.3 CONCLUSION

Based on the conceptual model in Chapter 1, further research is guided and relevant research questions are constructed. Following the conceptual model and the research questions identified, the results of this study can be concluded into three main findings based on the three roles of ICT in SCM in distributor perspective. First, there is a significant relationship between the role of ICT as a useful aid and SCM in distributor perspective. Second, the results also clearly indicate that there is a significant relationship between the role of ICT as a competitive advantage and SCM in distributor perspective. Third, this study also has provided evidence that there is a significant relationship between the role of ICT as a prerequisite and SCM in distributor perspective.

Based on the surveys conducted on respondents from distributor companies of automotive parts respectively, it can be concluded that the role of ICT in SCM in distributor perspective is related to the three dimensions or predictors which are useful aid, competitive advantage and prerequisite. The research clearly describes that, there is a great deal of the role of ICT in the SCM in distributor perspective as ICT has significant influence towards SCM. Besides, this clearly indicates the level of importance that the distributor company sees ICT role towards their SCM. In this study, there is a positive correlation between the three types of role of ICT in SCM in distributor perspective. Cognitions presented above present increasing in SCM when the ICT plays the three roles is heightening. Therefore, SCM is importantly dependent on the role of ICT. The increasing of the important of the role of ICT as a useful aid, competitive advantage and prerequisite in SCM, the higher the SCM will be significantly influenced by those three roles of ICT.

5.4 LIMITATION OF THE STUDY

Finally, a number of important limitations need to be considered in this study:

- a) First, this study relied on one sample, consisting of distributor companies of automotive parts in Klang area. Clearly, having to rely on one sample in one area

may limit the generalization of the findings. Not all companies in Klang area are distributor companies of automotive parts. There are many distributor companies from different sectors in the distribution network of automotive industry that use ICT in Klang area such as the companies that supply automotive parts, automotive parts manufacturing companies and the sellers of automotive parts. So it was hard to find the distributor companies of automotive parts in Klang area.

- b) Second, time was a constraint on collecting data from a bigger group of respondents. The small sample size of 103 respondents may limit the findings of the research.
- c) Third, the data or sampling access was constrained by strict adherence to respondent's company rules and regulations in getting approval to facility survey in the respondent's company. This may have limited the sample size.
- d) Fourth, this study is focused only on three dimensions where limited presentation only to three different types of most significant basic roles of ICT in SCM which is useful aid, competitive advantage and prerequisite (Slack et al, 1995) and not included other roles of ICT as the factors that can influence distributor companies' perception towards their SCM.

5.5 RECOMMENDATION FOR FUTURE PRACTICE

This study recommends that, to make the whole SCM in distributor perspective to be more robust, the three basic roles of ICT which are the useful aid, competitive advantage and prerequisite should be taken into consideration.

The findings of this study have a number of important recommendations for future practice.

First, this study shows that the role of ICT as a useful aid has significant influence on distributor SCM. This finding emphasizes the important role that ICT is useful in the functioning of SCM. The practical implication is that in order to improve SCM and also due to the many transactions such as business-to-business transactions, ICT is useful in their SC network. So, ICT is a useful aid for SCM to share or exchange transactional data among them with other participants in their SC network. As a result, the recommendations for ICT to be a useful aid for the SCM are when the reducing response time is focused

more, streamlining their logistic activities across the SC in reducing the cost and improving efficiency, developing high valued SC relationships among other SC participants in the business networks, enhancing customer services and attain global standard and access to the world market.

Next, the finding of SCM is improved when ICT plays a role as a competitive advantage has provides interesting insights in this study. The finding shows that when ICT plays a role as a competitive advantage, participants of SC are now more scattered around the globe in comparison to previous mentioned role of ICT which is useful aid where the intention to be competitive between the SC participants will occur. Hence, in the case of distributor companies of automotive parts to be more competitive in order to improve their SCM, they should pay more attention to the processes of improving the quality of their products, improving their speed of delivery order where they are alert to start organizing their delivery process when there are order from the customers, increasing their customization of products and services, increasing convenience for their customers and lastly, they should lowered their cost through productivity gains in terms of their rate of productions. Therefore, when ICT plays as a competitive advantage, it can improve SCM towards achieving business growth.

Third, ICT should play a role as a prerequisite in SCM which the finding of this study shows that the ICT plays a significant role as a prerequisite in SCM. On the other hands, it can be described that there is no other option to organize SCM of a distributor sectors without putting ICT as a prerequisite in their SCM. The ICT role has appeared to be prerequisite because ICT has become a central construct around which entire SC is built. On the other hand, SC participants are now globally dispersed around the globe. Therefore, the distributor sectors and their SC participants in nowadays business practice are mainly to retain or gain competitive advantage over competitors and hence, it can be related to ICT to plays a significant role as a prerequisite in their SCM. Recommendations for ICT as a prerequisite might be improve their SCM. Firstly, ICT is suggested to be prerequisite when it is required for them to perform e-business with their other SC participants in their business network. Secondly, the flexibility and sustainability of response to customer also is one of the recommendations for ICT to become prerequisite in their SCM and ICT also

must be required for transactional data sharing or exchanging in their business network. Lastly, the recommendation of ICT as a prerequisite in their SCM is when a process of reducing the paperwork in transactions among them and other SC participants in their SC network is needed and as a result of the usage level of ICT is very high and the requisition of ICT in their SCM also high, their SCM can be improved.

5.6 RECOMMENDATION FOR FUTURE STUDY

Van Den Ende et al. (2001) indicate that the structure, economic institutions and global business environment affect firms' ICT choices and as a result, performance outcomes are generated. Furthermore, in the domain of this study framework, it can be concluded that large scale environment would influence ICT application for SCM. So, the study will have to be replicated on a bigger scale involving various distributor companies in Malaysia to arrive at a typical study about the role of ICT in SCM in different industrial sectors. Different views from various distributor companies in Malaysia will greatly improve the research as this will help researchers to analyze the results of the comparison study of different distributor companies in different industrial sectors more reasonable and the comparative decision analysis on the subject matter is informed. Then, it can finally be confidently stated that, indeed the research findings are truly a representative of the same research studies in other circumstances of which the same outcome will be adapted.

REFERENCES

- Alam Syed Shah, Khatibi Ali, Mohd. Ismail Sayyed Ahmad, Hishamuddin Bin Ismail, (2007), "Factors affecting e-commerce adoption in the electronic manufacturing companies in Malaysia", *International journal of Commerce and Management*, Vol 17 No 1-2, pp 125- 139.
- Cooper, M., Lambert, D. and Pagh, J. (1997) "Supply Chain Management – More than a new name for logistics", *The International Journal of Logistics Management*, Vol. 8, no. 1, pp.1-14.
- E. Sweeney "Managing the Supply Chain: the Role of Information and Communications Technology (ICT) as a Key Enabler of theProcess, *Business Ireland*, Summer Issue, pp.105-109, 2005.
- E. Sweeney "Re-engineering the Supply Chain: Making SCM Work for You in Perspectives on Supply Chain management and Logistics - Creating Competitive Organisations in the 21st Century (Sweeney, E. ed.)", Dublin: Blackhall Publishers, Chapter 16, pp. 295-306, 2007.
- Fasanghari, M., Roudsari, F.H. and Chaharsooghi, K. (2008) "Assessment of the Impact of Information Technology on Supply Chain Mngement", *World Applied Sciences Journal* 4 (1), pp. 87-93.
- Husnayati Hussin and Rafidah Mohamad Noor (2005) "INNOVATING BUSINESS THROUGH E-COMMERCE: EXPLORING THE WILLINGNESS OF MALAYSIAN SMEs" *The Second International Conference on Innovations in IT (IIT'05)*
- Kaufman, F. (1966). Data systems that cross company boundaries. *Harvard Business Review*. Jan-Feb 1966.

- Kuppusamy, M. and Santhapparaj, S. (2005) "Investment in Information and Communication technologies and its Payoff in Malaysia", *Perspectives on Global Development and Technology*, Vol. 4, no. 2, pp. 147-168.
- K. Biniazi, R. Ghahremani, H. Alipour, S.T. Soofi and S. Akhavan "Position and Role of ICT in Supply Chain Management (SCM)", *Australian Journal of Basic and Applied Sciences*, 5(8): 827-831, 2011.
- Lancioni, A.R., et al, *The Role of the Internet in Supply Chain Management*, *Industrial Marketing Management*, 29, pp. 45–56, 2000.
- Larson, P. and Halldorsson, A. (2002) "What is SCM? And, Where is it?", *Journal of Supply Chain Management*, Vol. 38, no. 4, pp. 36- 46
- Larson, P., Poist, R. and Halldorsson, A. (2007) "Perspectives on logistics vs. SCM – a survey of SCM professionals", *Journal of Business Logistics*, Vol. 28, no. 1, pp. 1-24.
- Lummus, R. and Vokurka, R. (1999). "Defining supply chain management – a historical perspective and practical guidelines", *Industrial Management & Data Systems*, Vol. 99, no 1, pp. 11-17.
- Lummus, R., Krumwlede, D. and Vokurka, R. (2001) "The relationship of logistics to supply chain management", *Industrial Management & Data Systems*, Vol. 101, no. 8, pp. 426-431.
- Kauffman, R. (2002) "Supply Management – What's in a Name? Or, Do We Know Who We Are?", *The Journal of Supply Chain Management*, Vol. 38, no. 4, pp. 46- 52.
- McKeown P.G., *Information Technology and the Networked Economy*, Course technology Publishing, Boston, 2000.

- M. Fasanghari, F.H. Roudsari and S. K Chaharsooghi “Assessing the Impact of Information Technology on Supply Chain Management”, *World Applied Sciences Journal*, 4 (1): 87-93, 2008.
- P.Evangelista “The Role of ICT in the Logistics Integration Process of Shipping Lines”, *Pomorski Zbornik* (1),pp. 61-78, 2002.
- R. A.Shavazi, M.Abzari and A. Mohammadzadeh “A Research in Relationship between ICT and SCM”, *World Academy of Science, Engineering and Technology*, 50, pp. 92-101, 2009.
- R. Lancioni, H. J. Schau and M. F. Smith “Internet Impacts on Supply Chain Management”, *Industrial Marketing Management*, 32, pp. 173– 175, 2003.
- Simchi-Levi, D., Kaminsky, P., and Simchi-Levi, E., *Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies*, New York, McGraw-Hill, 2003.
- Slack, N., Chambers, S., Harland, C., Harrison, A. and Johnston, R. (1995) *Operations Management*, Pitman Publishing, London.
- Stock, G., Greis, N. and Kasarda, J. (1999) “Logistics, strategy and structure”, *International Journal of Physical Distribution & Logistics*, Vol. 29, no. 4, pp. 224-239.
- Tan, C., (2006), *Towards Progress*, Computerworld Malaysia, July 2006 Yeung, M.A., Shim, J.P., Lai, A.Y.K. (2003), “Factor Affecting E-Commerce Adoption: An empirical Evidence” *Communication of the ACM*, Vol. 46, No. 9.
- Nunnally, J.C. & Bernstein, I.H. (1994), “*Psychometric theory*”, 3rd edition, McGraw-Hill, New York.

Hair, J.F., Black, W.C., Babin, B.J. & Anderson, R.E. (2009), "Multivariate data analysis",
Prentice Hall, Upper Saddle River, New Jersey.

APPENDICES

APPENDIX A – RESEARCH SURVEY QUESTIONNAIRE



QUANTITATIVE QUESTIONNAIRES

SOAL SELIDIK KUANTITATIF

Dear respondent,

This survey formed for my Bachelor thesis. The purpose of the research is to get a better understanding of the role of Information and Communications Technology (ICT) in Supply Chain Management (SCM) in distributor perspectives among distributor of automotive parts company.

These questionnaires have three sections: section A, section B and section C.

You are invited to participate in this survey. Please answer ALL the questions as best you can. Try to be as honest and accurate as you can basically on your experience. Your answer is very important, as it will contribute to the mentioned purpose above.

Your answer will be keep with utmost confidentiality. Only aggregate data will be reported on. If you have a problem with the question in the survey, you can contact me.

Thank you for your participation and co-operation in this study.

Kepada responden,

Kajian ini dibuat untuk Projek Sarjana Muda saya. Tujuan kajian ini adalah untuk mendapatkan maklumat mengenai peranan ICT dalam SCM dalam perspektif pengedar di kalangan syarikat pengedar bahagian-bahagian automotif.

Soal selidik ini mempunyai tiga bahagian: bahagian A, bahagian B dan bahagian C.

Anda dijemput untuk mengambil bahagian dalam soal selidik ini. Jawab semua soalan dengan sedaya mungkin. Jawab dengan jujur dan tepat berdasarkan pengalaman anda. Jawapan anda adalah penting dalam menyumbang kepada tujuan yang disebutkan di atas.

Jawapan anda akan di simpan dengan penuh kerahsiaan. Hanya data yang perlu yang akan dilaporkan. Jika anda mempunyai sebarang masalah, anda boleh menghubungi saya.

Terima kasih di atas penyertaan dan kerjasama anda dalam kajian ini.

No. Telephone: 012-5694841

Email: amirul_zainalabidin@yahoo.com

Muhammad Amirul Bin Zainal Abidin

Researcher/Pengkaji

SECTION A: Demographic Information

SECTION A: Latarbelakang Responden

This section attempts to gather general information about the respondents in the company. Tick (√) only **ONE** option for each question.

(Bahagian ini adalah untuk mengumpul maklumat umum tentang responden di dalam syarikat. Tandakan (√) pada SATU pilihan sahaja untuk setiap soalan)

1. Gender (Jantina)

- a. Male (*Lelaki*) b. Female (*Perempuan*)

2. What is your job title? (Apakah gelaran jawatan anda?)

.....

3. What is your designated department? (Apakah gelaran jabatan anda?)

- a. Finance (*Kewangan*)
- b. Human Resources and Security (*Sumber Kemanusiaan dan Pengawalan*)
- c. Engineering (*Kejuruteraan*)
- d. Processing (*Pemprosesan*)
- e. Community Relationship (*Perhubungan Komuniti*)
- f. Health, Safety & Environment (*Kesihatan, Keselamatan dan Persekitaran*)
- g. Other (*lain - lain*):

4. How long have you been working for the company? (Berapa lamakah anda sudah bekerja untuk syarikat?)

- a. Less than 1 year (*kurang dari setahun*)
- b. 1 - 5years (*1 - 5 tahun*)
- c. 5 - 10years (*5 - 10 tahun*)
- d. 10 - 15years (*10 - 15 tahun*)
- e. Other (*lain - lain*):

5. How long have you been involved in the distributor of automotive parts company in terms of your experience?

(Berapa lamakah anda sudah melibatkan diri di dalam syarikat pengedar bahagian - bahagian automotif berdasarkan pengalaman anda?)

- a. Less than 1 year (*kurang dari setahun*)
- b. 1 - 5years (*1 - 5 tahun*)
- c. 5 - 10years (*5 - 10 tahun*)
- d. 10 - 15years (*10 - 15 tahun*)
- e. Other (*lain - lain*):

You should rate each statement using these scales below:

(*Anda perlu menilai setiap kenyataan menggunakan skala di bawah*):

Strongly Disagree (<i>Sangat Tidak Setuju</i>)	Disagree (<i>Tidak Setuju</i>)	Neutral (<i>Neutral</i>)	Agree (<i>Setuju</i>)	Strongly Agree (<i>Sangat Setuju</i>)
1	2	3	4	5

SECTION B: The role of Information and Communications Technology (ICT) in Supply Chain Management (SCM)

SECTION B: Peranan Teknologi Maklumat dan Komunikasi (ICT) dalam Pengurusan Rantaian Bekalan (SCM)

This section attempts to gather information on the role ICT as a useful aid, as a competitive advantage and as a prerequisite in SCM. Please read **CAREFULLY** the content of each question to enable you answer the question **ACCURATELY**.

(*Bahagian ini adalah untuk mengumpul maklumat tentang peranan ICT sebagai bantuan yang berguna, sebagai kelebihan daya saing dan sebagai prasyarat dalam SCM. Sila baca dengan TELITI untuk setiap soalan bagi memudahkan anda menjawab soalan dengan TEPAT*)

• **ICT as a useful aid in SCM/ICT sebagai bantuan yang berguna dalam SCM**

1. Giving more focus on reducing response time. (<i>Memberi lebih banyak tumpuan kepada mengurangkan masa tindak balas</i>)	1	2	3	4	5
2. Streamlining logistic activities across the supply chain to reduce cost and improved efficiency. (<i>Memperkemas aktiviti logistik di seluruh rantaian bekalan untuk mengurangkan kos dan meningkatkan kecekapan</i>)	1	2	3	4	5

3. Developing high valued supply chain (SC) relationships. <i>(Membangunkan nilai hubungan rantaian bekalan yang tinggi)</i>	1	2	3	4	5
4. Enhancing customer services. <i>(Meningkatkan perkhidmatan pelanggan)</i>	1	2	3	4	5
5. To attain global standard and access to world market. <i>(Untuk mencapai standard global dan akses kepada pasaran dunia)</i>	1	2	3	4	5

• **ICT as a competitive advantage in SCM/ICT sebagai kelebihan daya saing dalam SCM**

1. Improved quality of products for competitive advantage. <i>(Menambah baik kualiti produk untuk kelebihan daya saing)</i>	1	2	3	4	5
2. Increased speed of delivery for competitive advantage. <i>(Peningkatan kelajuan penghantaran untuk kelebihan daya saing)</i>	1	2	3	4	5
3. Greater customization of products and services for competitive advantage. <i>(Penyesuaian yang lebih besar terhadap produk dan perkhidmatan untuk kelebihan daya saing)</i>	1	2	3	4	5
4. Greater convenience for customer for competitive advantage. <i>(Kemudahan yang lebih besar kepada pelanggan untuk kelebihan daya saing)</i>	1	2	3	4	5
5. Lowered cost through productivity gains in terms of rate of productions for competitive advantage. <i>(Menurunkan kos melalui perolehan produktiviti daripada segi kadar produksi untuk kelebihan daya saing)</i>	1	2	3	4	5

• **ICT as a prerequisite in SCM/ICT sebagai pra-syarat dalam SCM**

1. Engagement in e-business with supply chain (SC) participants <i>(Penglibatan dalam e-perniagaan dengan (SC) peserta rantaian bekalan)</i>	1	2	3	4	5
2. The flexibility and sustainability of response to customer. <i>(Fleksibiliti dan kemampuan tindak balas)</i>	1	2	3	4	5

<i>kepada pelanggan)</i>					
3. Transactional data sharing or exchanging among supply chain (SC) participants. <i>(Berkongsi atau bertukar-tukar data transaksi antara peserta rantaian bekalan)</i>	1	2	3	4	5
4. For reducing the paperwork in transactions. <i>(Untuk mengurangkan kertas kerja dalam urus niaga)</i>	1	2	3	4	5

SECTION C: Supply Chain Management (SCM) in distributor perspective

SECTION C: Pengurusan Rantaian Bekalan (SCM) dalam perspektif pengedar

This section attempts to gather information on the SCM in distributor perspective based on the role of ICT in SCM. Please read **CAREFULLY** the content of each question to enable you answer the question **ACCURATELY**.

(Bahagian ini adalah untuk mengumpul maklumat tentang SCM dalam perspektif pengedar berdasarkan peranan ICT di dalam SCM. Sila baca dengan TELITI untuk setiap soalan bagi memudahkan anda menjawab soalan dengan tepat)

1. Your customer got a better overview of service quality provided by your company. <i>(Pelanggan anda mendapat gambaran yang lebih baik terhadap kualiti perkhidmatan yang disediakan oleh syarikat anda)</i>	1	2	3	4	5
2. Your company being closer to your customers through direct communication. <i>(Syarikat anda menjadi rapat dengan pelanggan anda melalui komunikasi secara langsung)</i>	1	2	3	4	5
3. Your company has a better management decisions based on the total supply chain (SC) information. <i>(Syarikat anda mempunyai keputusan pengurusan yang lebih baik berdasarkan rantaian bekalan keseluruhan (SC) maklumat)</i>	1	2	3	4	5
4. You company can control over budget and activities. <i>(Syarikat anda boleh mengawal ke atas bajet dan aktiviti-aktiviti)</i>	1	2	3	4	5
5. 7-day/24-hour worldwide customer service is provided by your company such as E-mail.	1	2	3	4	5

<i>(7-day/24-hour seluruh dunia perkhidmatan pelanggan yang disediakan oleh syarikat anda seperti E-mel)</i>					
6. The status of orders placed with vendors is checked by the distributor. <i>(Status pesanan yang dibuat dengan pembekal diperiksa oleh pengedar)</i>	1	2	3	4	5
7. Pickups and deliveries are scheduled. <i>(Pengambilan dan penghantaran dijadualkan)</i>	1	2	3	4	5
8. Your company can contact vendors or buyers regarding customer service problems from late deliveries, stock-outs, alterations in scheduled shipment dates, late arrivals, and a wide variety of other service issues. <i>(Syarikat anda boleh menghubungi penjual atau pembeli mengenai masalah perkhidmatan pelanggan dari kelewatan, saham-out, perubahan dalam tarikh penghantaran yang dijadualkan, ketibaan lewat, dan pelbagai isu-isu perkhidmatan lain)</i>	1	2	3	4	5

APPENDIX B – FYP 1 GANTT CHART

Month		February				March				April				May			
WEEK		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ACTIVITY																	
Briefing with FYP's coordinator and Supervisor	Estimate																
	Actual																
Define Problem Background & Problem Statement	Estimate																
	Actual																
Define Research Objective & Research Question	Estimate																
	Actual																
State Scope of Study	Estimate																
	Actual																
Finding Material (journal/articles/etc.)	Estimate																
	Actual																
Writing literature review	Estimate																
	Actual																
Determine research methodology & research instrument	Estimate																
	Actual																
Compile and submit a report	Estimate																
	Actual																
Presentation FYP 1	Estimate																
	Actual																

APPENDIX C – FYP 2 GANTT CHART

MONTH		August				September				October				November				December			
WEEK		1	2	3	4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ACTIVITY																					
Approach Company	Estimate																				
	Actual																				
Visit Company and receive responses	Estimate																				
	Actual																				
Data Entry and Analyzing Data	Estimate																				
	Actual																				
Write the Report Chapter Four: Findings and Analysis	Estimate																				
	Actual																				
Write Report Chapter Five: Conclusion and recommendation	Estimate																				
	Actual																				
Compile and Submit Report	Estimate																				
	Actual																				
Presentation FYP 2	Estimate																				
	Actual																				

