THE ROLE OF KNOWLEDGE MANAGEMENT IN ENTREPRENEUR

VENTURE

By

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DEDICATION

This dissertation is dedicated to

my family.

ABSTRACT

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Knowledge is powerful because it controls access to opportunity and

advancement. A valuable asset to the company, it became crucial for company to

harvest knowledge. The process of harnessing knowledge is known as knowledge

management (KM). In today's increasingly competitive business environment,

KM is indeed, vital for any organization. However, the benefits of KM have not

been fully exploited, particularly by entrepreneurs. Therefore, this paper aims to

study KM in small-medium enterprise (SMEs) within Malaysia.

A comprehensive literature review was conducted and the outcome was used in

the questionnaire to explore the critical success factors (CSFs) of KM in

entrepreneurial venture and to identify the relationship between CSFs and KM

success. The CSFs are sorted into following factor groups: Responsibility of

Senior Management, Organizational Culture, Information Technology (IT), KM

Strategy, Human Resource Management (HRM), and Organizational Structure.

Seventy-three (73) SMEs in Malaysia that practice KM in their organizations, participated in the study. All questionnaires were distributed face-to-face. Responses were recollected on the spot. Cronbach Alpha's, descriptive statistics, RII and binary logistics regression were applied to derive the survey results.

The study concludes that good knowledge structure, appropriate IT infrastructure for KM, and strong trust relationship are among the most important CSFs of KM implementation in Malaysia's SMEs. This research also found that support and commitment from top management, collaborative culture, knowledge maintenance, incentives and rewards are among the nine (9) CSFs that are significant to KM success. The findings of this study serve as a guideline for SMEs to succeed in their KM implementation.

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APPROVAL SHEET

This thesis entitled "THE ROLE OF KNOWLEDGE MANAGEMENT IN ENTREPRENEUR VENTURE" was prepared by KWONG YUET MEI and submitted as partial fulfilment of the requirements for the degree of Master of Project Management at Universiti Tunku Abdul Rahman.

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SUBMISSION OF THESIS

It is hereby certified that Kwong Yuet Mei (10ACB01003) has completed this thesis entitled "THE ROLE OF KNOWLEDGE MANAGEMENT IN ENTREPRENEUR VENTURE" under the supervision of Mr Jeffrey Yap Boon Hui from the Department of IPSR, Faculty of Engineering and Science.

I understand that the University will upload softcopy of my thesis in pdf format into UTAR Institutional Repository, which may be made accessible to UTAR community and public.

Yours truly,

(Kwong Yuet Mei)

DECLARATION

I, Kwong Yuet Mei hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UTAR or other institutions.

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LIST OF ABBREVIATIONS

CSF   Critical Success Factor

HRM   Human resource management

IT   Information technology

KM   Knowledge management

RII   Relative importance index

SME   Small and medium enterprise

CHAPTER 1

INTRODUCTION

1.1   Background

In an increasingly competitive business environment, companies must evolve over time to meet changing market needs. This evolution process will need all firm members to put together all their knowledge – whether this is the professional skills or understanding of consumers' needs, to succeed. Such knowledge may come from the employees' experiences, the firm's plans for future activities, or even the results from a market research. The large amount of data and information accumulated throughout these transformation periods is the most valuable asset of a company. Thus, it becomes crucial for the organizations in capturing such knowledge to ensure they are retrievable during times like reinventing, innovating and implementing new product or service strategies, and incorporating them to new business models and challenges. Strategic competitive advantage can be achieved by learning faster than the competitors. The importance of knowledge to achieve competitive advantage is recognized by both scholars and practitioners (Ciganek et al. 2008; De Long & Fahey 2000; Lai & Lee 2007; Leonard-Barton 1995). Thus, to avoid the risk of losing competitive advantage, organizations are eager to effectively manage their knowledge base. The process of harnessing knowledge is known as KM.

As knowledge is the base of core competencies and high performance (Lubit 2001), the concept of KM has become a concern for many organizations. KM allows experience to be shared and information can be made available (Smith 2001). A study by Chong (2006) found that 58.8% of Malaysian IT companies made investments in KM. This shows that the increasing globalization of business sees KM as part of the important factors to succeed.

Despite the urgency in effective and efficient knowledge management, studies by Choi (2000), Chong & Yeow (2005), Chong (2006) and Takeuchi (1998) suggested that the firms are still unclear with most of the KM aspects. Instead, most of the KM solutions are still ad hoc, limited by views of knowledge, and lack of dynamics to achieve knowledge requirements of the firms (Malhotra 1998). Therefore, most of the KM initiatives have failed to achieve the expected results (De Tienne et al. 2004).

1.2 Problem Statement

Research on KM has been intensified as it plays a vital role in this twenty-first century (Albors-Garrigos et al. 2010; Stankosky 2005). However, not all organizations are entirely successful in terms of exploiting full benefits due to the firms' ignorance (Migdadi 2008). A thorough study of CSFs is essential as they are the driving force behind successful KM implementation. As CSFs may help in generating knowledge, they also stimulate the creation of knowledge in all individuals, allowing organizational knowledge to expand concurrently (Ichijo et al. 1998).

As most of the pioneers of KM are large organizations, the available published studies were targeted to large firms. However, due to constraints such as financial resources, human resources, the CSFs proposed for large organizations may not be appropriate for smaller firms. The lack of KM studies in the SME environment (Fink & Ploder 2009; Hutchinson & Quintas 2008; Wong & Aspinwall 2005) provides a rationale for the current research to focus on KM in the small business context as opposed to larger businesses.

1.3   Aim and Objectives

This research aims to study the role of KM in SMEs.

The objectives of this study are outlined below:

i.   To explore the CSFs of KM in entrepreneurial venture

ii.   To identify the correlation between CSFs of KM and KM success

1.4   Research Scope

This research is targeted to Malaysia's SMEs regardless of their industry. The selected respondents must be familiar with KM and have been involved in KM implementation. Their current company too, must be practicing KM.

1.5   Significance of Research

This research is related to project management as KM is one of the project success criteria. By exploring the CSFs of KM implementation, this study can help SMEs in Malaysia to succeed in KM implementation. A successful KM within the company will contribute to project management success.

Results of this study will provide KM implementation guidelines to practitioners. It revisited the CSFs of KM implementation identified in the previous research. As the research reveals which are the most important aspects in implementing KM, practitioners may use it as a guideline to construct their KM implementation plans. This study also highlights the importance of KM success indicators which is essential to assess KM success.

1.6   Research Methodology

This research examines the CSFs of KM in Malaysia. It sought to determine which CSFs are more important and relevant to SMEs in Malaysia. In addition, the study examines the relationship between CSFs and KM success. This research is cross-sectional and descriptive in nature. It will determine the correlation instead of the causal factors.

Quantitative research method will be adopted in this study. A survey will be conducted after the literature review. The collected data will be analyzed accordingly.

1.7   Delimitation

This research will be limited in scope. It will draw and refine the work of the mentioned authors by examining the CSFs of KM implementation in Malaysia's SMEs. Instead of individual level, this research will focus on organizational level. Subunits, teams or individuals resided within a company will not be examined.

1.8　Structure of Dissertation

Chapter 1 – Introduction

Draws a comprehensive picture of the research as a whole and sets out the foundations for the following chapters. This chapter gives an overview of the research background which includes problem statements, aim and objectives, brief description of research methodology, the research scope and the thesis structure.

Chapter 2 – Literature Review

Reviews the previous studies from journals, articles, and books. This chapter will provide an understanding of both knowledge management and entrepreneurial ventures related practices, challenges, and critical success factors.

Chapter 3 – Research Methodology

Provides a justification of the research methodology and details of the research design process used to empirically investigate the theoretical model established in Chapter 2.

Chapter 4 – Results

Reports the results and analysis obtained from the questionnaire. There will also be description on the results.

Chapter 5 – Discussion

There will be discussion based on the observed results.

Chapter 6- Conclusion

Draws conclusions about the research issues by connecting the research questions identified in Chapter 2 with the main findings shown in Chapter 4 and 5. This chapter will also state the possible future research and research limitations.

CHAPTER 2

LITERATURE REVIEW

2.1   Knowledge

Today's economy is driven by the strategic corporate resource – knowledge (Drucker 1993). Liebowitz & Wilcox (1997) define knowledge as "the whole set of insights, experiences, and procedures that are considered correct and true which guide the thoughts, behavior and communication of people".

Knowledge is created throughout a firm's transformation. It plays an important role in firm growth as firms transfer, exploit, augment and build their technological capabilities as they (Berry 2014; Buckley & Casson 1976; Caves 1996; Dunning 1980; Hymer S. 1976; Penrose 1959). Knowledge is also crucial to an organization as it helps the organization to deal with complex problems, improved decision making, and allow organization to have appropriate response to the market (Grangel et al. 2007). The essence of the firm is its ability to combine knowledge and complementary assets in ways so as to create value (Teece 2004). Thus, to achieve sustainable competitive advantage, knowledge has become a business organization's most strategic and valuable asset (Davenport & Prusak 1998).

As important as it is, knowledge is however, disorganized and difficult to manage, developing and static, being situated and abstract, verbal and encoded, distributed and individual, multifaceted and complex (Blackler 1995). This is because in certain perspective, knowledge is a state of mind which is impossible to imitate but

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plays a critical role in enhancing the individual's personal knowledge and experience.

2.1.1 Types of knowledge

Knowledge can be categorized into tacit and explicit knowledge (Sanchez 2004). Explicit knowledge can be documented and communicated with ease (Nonaka et al. 2000; Kikoski & Kikoski 2004). This type of knowledge is widely known and is used by the public which can be transferred in the form of manuals, data etc. Generally, such knowledge can be found in journals, books, internet etc.

The idea of tacit knowledge originated from Polanyi (1967) who suggested that the starting point for understanding a per person's knowledge is that "we know more than we can tell". It is a type of knowledge which is personal and difficult to formalize. Example of tacit knowledge that are often being overlooked are values, gut feelings, hunches, intuitions, insights. Images, metaphors and analogies (Nonaka & Takeuchi 1995). In fact, other than experience sharing and observation, there is no language that allows the communication of tacit knowledge (Hall & Andriani 2002; Kikoski & Kikoski 2004). Hence, it is a knowledge that made up of best experience, unrecordable intellectual property which lives within individuals.

Tacit and explicit knowledge are however, complimentary as they are vital in creating knowledge. Knowledge can only be generated based on the communications between explicit and tacit knowledge (Hall & Andriani 2002; Kikoski & Kikoski 2004). Explicit knowledge as mentioned, is publicly known.

The lack of tacit knowledge in this case, will not give any competitive advantage to the company. Tacit knowledge generates a learning curve that allows imitation of others (Kikoski & Kikoski 2004).

2.2 Knowledge Management

The idea of KM emerged in the early 1990s. It is an elusive concept (Darroch & McNaughton 2003) which many scholars make an attempt to clarify (Cavaleri 2004; Malhotra 2005). However, KM is difficult to define as concepts evolved rapidly through the 1990s. While different researchers define KM according to their personal interest and desire (Chong & Choi 2006), the lack of common understanding on KM theory (Earl 1999) leads to a different set of expected outcomes. The below table shows various definitions in the KM literature.

Table 2.1: Definition of KM

Author	Year	Definitions of Knowledge Management
Alavi and Leidner	2001	"refers to identifying and leveraging the collective knowledge in an organization to help the organization compete (von Krogh 1998)." (p.113)
Schultz and Leidner	2002	"the generation, representation, storage, transfer, transformation, application, embedding, and protecting of organizational knowledge." (p.218)
Ardichvili, Maurer, Li,	2006	"a complex socio-technical system that encompasses various forms of knowledge

Wentling, and Stuedemann		generation, storage, representation and sharing." (p.94)
Lloria	2008	"a series of policies and guidelines that enable the creation, diffusion and institutionalization of knowledge in order to attain the firm's objectives." (p.79)
Jennex	2008	"described by the phrase 'getting the right knowledge to the right people at the right time' and can be viewed as a knowledge cycle of acquisition, storing, evaluating, dissemination, and application." (p.xli)

Source: Adapted from Brandt Jones (2009)

According to Davenport & Prusak (1998), most KM projects have one of the following three aims:

To determine the aspect of knowledge using hypertext tools, yellow pages, and maps;

To promote knowledge sharing and thus develop a knowledge-intensive culture;

To build a knowledge infrastructure where people can connect and interact.

KM helps an organization to gain insight and understanding from its own experience. Therefore, learning takes place when knowledge is used and subsequently improves the stock of knowledge available to the firm.

2.3   KM Process

Each organization tends to adopt its unique KM processes to acquire, store, disseminate, and reuse knowledge effectively. According to Gold et al. 2001, it is a prerequisite towards an effective KM. Generally, KM practices comprise of knowledge acquisition, knowledge storage, knowledge dissemination, and knowledge applications.

The below table presents brief definitions of the KM processes.

Table 2.2: KM Processes

KM Process	Description
Knowledge Acquisition	Selection of accurate and suitable information, from internet search or otherwise, to be included in the documentation
Knowledge Storage	Reference to prior knowledge made; organizing and reorganizing the information
Knowledge Dissemination	The information is not hidden but shared with others freely
Knowledge Application	Knowledge of the use of the tool is applied specifically to the counseling consultation and work environment

Source: Adapted from Kappes & Thomas (1993)

2.4 SME

SMEs are important to the global economy as they are significant to economic growth in all countries. SMEs constitute to 98% of total establishment which provide 65% of employment (SME Info 2016).

The role of SMEs is becoming significant. SMEs can be established in any locality for any kind of business activity in urban or rural area.

Bank Negara Malaysia has issued a Circular on the New Definition of SMEs on 6th of November, 2013 which can be simplified under two categories, namely:

- Manufacturing: Sales turnover not exceeding RM50 million OR full-time employees not exceeding 200 workers; and

- Services and other sectors: Sales turnover not exceeding RM20 million OR full-time employees not exceeding 75 workers.

Source: Adapted from (National SME Developement Council 2013)

The details by size of operation are as follows:

Table 2.3: Details by Size of Operation

Category	Micro	Small	Medium
Manufacturing	Sales turnover of	Sales turnover from RM300,000 to less than RM15 million OR	Sales turnover from RM15 million to not exceeding RM50 million OR

	less than RM300,000 OR full-time employees less than 5	full-time employees from 5 to less than 75	full-time employees from 75 to not exceeding 200
Services & Other Sectors		Sales turnover from RM300,000 to less than RM3 million OR full-time employees from 5 to less than 30	Sales turnover from RM3 million to not exceeding RM20 million OR full-time employees from 30 to not exceeding 75

Source: Adapted from (National SME Developement Council 2013)

2.5   KM in SMEs

Studies on KM has increased lately due to the common agreement on knowledge as an important asset to organizations (Albors-Garrigos et al. 2010; Stankosky 2005). Knowledge management can play a vital role in supporting and creation of organizational entrepreneurship (Madhoshi & Saadati 2011). The success of a SME can be linked to how well they manage their knowledge (Brush 1992; Brush & Vanderwaf 1992; Dollinger 1984; Dollinger 1985). However, very little attention is paid to KM in SMEs (Hutchinson & Quintas 2008). The table below shows the recent studies of KM in SMEs.

Table 2.4: Recent studies of KM in SMEs

Source	Subject	Findings
Wong and Aspinwall (2004)	To redress some of this imbalance in the literature by putting KM into the context of small businesses	Recognition of all these elements is crucial in order to provide a well-suited KM approach for small businesses
Wong and Aspinwall (2005)	UK SMEs	A total of 11 factors, comprising 66 elements were considered in the survey instrument
Salojavi, Furu, and Sveiby (2005)	108 Finnish and thematic interviews with 10 companies	Higher levels of KM-Maturity were found to correlate positively with long term sustainable growth
Gray (2006)	1500 SME owners across regular quarterly SERTeam surveys and from other large scale studies	There were significant age, educational and size effects that influence SME acquisition and assimilation of knowledge
Edvardsson (2006)	uestionnaire sent to the Chief Executive of Icelandic SMEs	Icelandic firms rely on an unsystematic manner of sharing and utilizing knowledge, few have a KM

		strategy and they mainly use unsophisticated ICT technologies
Valkokari and Helander (2007)	Literature review and analysis	Ownership and management structure as well as culture and behavior characteristics of SMEs seem to have a more positive effect than other SMEs characteristics on KM processes
Migdadi (2009)	25 SMEs in Saudi Arabia	Study underlined the positive relationship between CSFS and KM outcomes (i.e., systematic knowledge activities, employee development, customer satisfaction, good external relationships and organizational success)
Steenkamp and Kashyap (2010)	Postal questionnaire sent to New Zealand SMEs	Findings indicated that intangibles are important and are perceived as value drivers of business success. Customer

		satisfaction was ranked as the most important, followed by customer loyalty, corporate reputation, and product reputation
Lee and Lan (2011)	SMEs in Taiwan in six sections	A successful KM implementation depends on a harmonious amalgamation of infrastructure and process capabilities, including technology, culture and organizational structure
Soon and Zainol (2011)	Questionnaire, 110 replies, Malaysia	Learning and T0shaped skills are positively related to the knowledge creation process, enhancing organizational creativity and performance
Wei, Choy and Chew (2011)	Questionnaire, 70 replies from SMEs owners/managers, Malaysia	Some of the highest benefits of KM are related to innovation, improved decision-making processes, competitive advantage,

		efficiency and product/service quality
Liao (2011)	Survey among managers in computer and peripheral equipment manufacturing industries in Taiwan	The findings show that firms emphasizing personalization strategy and HRM behavioral control have a better performance (growth rate, market share, profitability etc.). When codification strategy is used by firms, the combination with output based HRM will improve their performance
Capo-Vicedo, Mula, and Capo (2011)	Case studies among 10 construction firms in Spain	The findings show how establishing these inter-organizational relationships between construction firms improves confidence, communication

Durst and Edvardsson (2012)	Literature review of 36-refereed empirical articles on KM	The areas of KM are relatively well researched topics; whereas those of knowledge identification, knowledge storage/retention and knowledge utilization are poorly understood in the SME context
Edvardsson and Durst (2013)	Literature review	Highlight the benefits of knowledge management in the areas of employee development, innovation, customer satisfaction and organizational success. To identify nine empirical studies which fulfilled the selection criteria

Source: Adapted from Wang & Yang (2016)

Although SMEs are often constrained by limited capital or labor, most of them possess abundant of knowledge in key areas of competencies which they believe that such knowledge can help them to compete in the business world. While having knowledge is important, managing knowledge must not be neglected.

Study shows that KM brings some incentives to SMEs: improved customer service, better communication, faster response times, enhanced innovativeness, greater efficiency in processes and procedures, and reduced risk of loss of critical capabilities (Edvardsson & Durst 2013). Thus, it is important for KM implementation in SMEs to ensure that their valuable resource – knowledge is preserved and can be reuse. Nonetheless, SMEs tend to acquire knowledge externally due to resource constraints (Edvardsson & Durst 2013). Knowledge can be gained externally by hiring external personel with required knowledge and experience to join the company, collecting documentaions like journals, conference proceedings, articles, or partnering companies. In this case, with the help of KM, SMEs can access external sources of knowledge efficiently and effectively.

According to Hutchinson & Quintas (2008), formal KM processes are very unlikely to be identified in SMEs. Studies show that most of the SMEs do not practice KM in their organizations (Hutchinson & Quintas 2008). Nevertheless, the use of terminology "KM" is rare in SMEs given that some of the activities conducted are related to KM processes. This indicates that KM in SMEs, is unaware and possess an informal character. In other words, informal KM does exist in such firms. Hutchinson & Quintas (2008) defines informal KM as knowledge which is managed by organizations, but lack of systemized processes governed by the idea or language of KM. As stated by Jeffcoate et al. (2000)), SMEs are scarce in expertise and knowledge. Additionally, small business tends to have less understanding of KM processes as mentioned by Lim & Klobas (2000).

The sharing of knowledge is often time-consuming and require some level of trust. Studies show that the management team in SMEs try preventing the outflow of knowledge which indirectly block knowledge sharing altogether (Beijerse 2000; Bozbura 2007; Corso et al. 2003; Hutchinson & Quintas 2008; McAdam & Reid 2001). In such case, when key employees leave a company taking the embedded knowledge with them, the firm will thus, suffer from knowledge loss.

2.6   CSFs in KM Implementation

Despite gaining popularity in many companies, KM initiatives fail as much as they succeed (Malhotra 2005). Thus, it became crucial to determine the CSFs of KM implementation.

CSF means "areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization" (Rockart 1979). Numerous research was conducted to determine the CSFs in KM implementation. Despite the differences in terminologies by different researches to indicate the CSFs of KM implementation, they can be represented by generic themes.

2.6.1   Responsibility of Senior Management

By now, the senior management in most of the organizations should acknowledge that knowledge is a valuable asset and can no longer afford to allow it unmanned (Chard 1997). However, the leadership quality remains as a crucial factor to successful KM implementation (Choi 2000).

To succeed in KM, management leadership is an important role that must not be overlooked (Holsapple & Joshi 2000; Horak 2001). Existing literature shows that a

number of researchers agree that leadership can lead KM success (Davenport & Prusak 1998; Grover & Davenport 2001; Hasanali 2002; Liebowitz 1999; Singh 2008; Wong 2005). Singh (2008) stated that there is a relationship between KM practices and delegating styles of leadership. Of various leadership styles, Crawford (2005) mentioned that there exist a strong relationship within transformational leadership. Hence, leadership commitments is essential to succeed in KM implementation (Kalling 2003). The management team should guide, advice and support the employees, and be the lead to KM adoption by modeling their actions through deeds instead of words. Employees will then start to imitate them and become more actively involved in the effort of KM adoption. This is because leaders are the one who establishes the appropriate standard to KM success (Holsapple & Joshi 2000). For example, creating and communicating the knowledge insight of the firm, and shaping a culture that treasure knowledge are the responsibilities of the senior management (Pemberton et al. 2002). In other words, it is up to the top management to provide an appropriate environment to motivate its employee in knowledge creation, sharing, and organization (Abell & Oxbrow 1999). Support and commitment from top management in change and improvement programs are crucial to a KM initiative (Davenport et al. 1998; Jarrar 2002; Lee & Kim 2001; Martensson 2000; Manasco 1996; Sharp 2003; Truch 2001). The senior management should be supportive on knowledge sharing initiatives to encourage a knowledge sharing culture. A consistent practical manner will contribute to the transformation of support into collaborative efforts that will result in KM success. In SMEs, proactive entrepreneurial support and leadership

from senior management will help to succeed in KM implementation (Wong & Aspinwall 2005).

Setting objectives at the right level constitutes to the success of KM implementation (Creech 2005). All employees should understand the objectives, goals and purposes of KM implementation in their respective organization (Wong 2005). The senior management plays an important role in conveying a clear and well-planned KM implementation purpose and strategy to the firm's employee which will result in KM success (Liebowitz 1999). However, it is crucial to have the employees support all established vision, and trust that it can be accomplished.

2.6.2 Organizational Culture

Knowledge effectiveness can be influenced by organizational culture (Chase 1997; Demarest 1997; Holsapple & Joshi 2000; Martensson 2000; Pan & Scarbrough 1998). Each organization has its unique culture which includes values, norms attitudes, behaviors (Ramus 2001). A positive culture will help increase business performance in terms of knowledge sharing, improved teamwork, and greater acceptance of new ideas among workers (Goffee & Jones 1996). Other than that, a good culture is also critical to KM success (Davenport et al. 1998; Martensson 2000; Pan & Scarbrough 1998). The word "culture" is indeed a broad theory. However, collaboration is an important cultural facet in KM implementation. Goh (2002) mentioned that a collaborative culture is a crucial factor in knowledge transfer as it requires individuals to interact and exchange knowledge and ideas. Besides, knowledge creation is also dependent on collaboration (Lee & Choi 2003). While knowledge transfer requires individuals to communicate and exchange ideas, it is

essential to promote both internal and external communication by expanding the communication policies. To be more successful, it is important to build an open culture around the integration of individual skills and experiences into organizational knowledge (Gupta et al. 2000).

To succeed in KM implementation, a knowledge-friendly culture must not be neglected (Chase 1997; Choi 2000; De Long et al. 1996; Galagan 1997; Greengard 1998; Gupta et al. 2000; Jager 1999; McDermott & O'Dell 2001; Ryan & Prybutok 2001; Skyrme & Amidon 1997; Wah 1999; Wild et al. 2002). A knowledge friendly culture could not exist without trust (De Tienne & Jackson 2001; Lee & Choi 2003; Stonehouse & Pemberton 1999) as people will be doubtful of the intentions of others which will cause them to avoid sharing knowledge. Scarborough et al. (1999) mentioned that trust and confidence is essential to promote the use and evolution of knowledge within the firm. In other words, a trust culture will determine how employees use and share knowledge. Nonetheless, a company that is eager to succeed in KM adoption must have a culture that recognizes the value of knowledge. As important as it is to create a knowledge-friendly culture, the environment of the company in terms of culture must be considered before KM implementation (Larson 1999).

Teamwork is another important factor in KM implementation. A team allows firm to use diverse skills and experience which are embedded within individuals to resolve problems (Choi 2000). Thus, teamwork can be seen as an important source in generating knowledge (Choi 2000). Fostering a spirit of trust-based teamwork will lead to KM success.

Benchmarking is a famous tool in KM implementation (Choi 2000; Davis 1996; Day & Wendler 1998; O'Dell 1996). It is a process of acquiring industrywide best practices that will enhance organization performance. Incorporating benchmarking into an organization's culture will help in providing insights on aspects such as customer satisfaction, costs, profits and margins, relationship management (Choi 2000).

2.6.3 Information Technology

Numerous studies reported that IT as one of the CSF to improve KM adaptation (Ruggles 1998). To allow knowledge flow within the knowledge community, a company will require significant support of technology. IT allows one to search, access and retrieve information rapidly. KM processes are thus, supported by IT (Alavi & Leidner 2001; Lee & Hong 2002). Dougherty (1999) mentioned that IT is a tool to assist KM process in organization. However, Wong & Aspinwall (2005) argues that IT is not an ultimate solution for KM implementation. It is, but not more than a tool. Rapid access to external sources will enhance SMEs innovation ability. According to Zack (1999), IT has four different roles in KM:

Acquiring knowledge

Identify, store, sort, index and link knowledge-related digital items

Check for relevant data

Articulate the data based on the various utilization background

IT infrastructure can include hardware, software, middleware, and protocols (Meso & Smith 2000). Savary (1999) argues that it is essential for a firm to possess effective information systems infrastructure for KM implementation. This is due to the ability of IT in eliminating obstacles, help to acquire information, correct flow processes, and determine the location of knowledge carrier and seeker. Hence, it is said that IT is able to provide an edge in harvesting knowledge (Bhatt 2002).

Other than that, it is crucial to consider the simplicity of the technology, and the ease of use of the KM system (Migdadi 2008). The adoption of IT is however, dependent to the size of the firm where larger SMEs are using more IT applications and functions than other smaller firms (Gray 2003). Despite the terminologies used by various researches, all discussed above agrees that an appropriate information technology infrastructure is crucial to succeed in KM implementation.

2.6.4 KM Strategy

A concise strategy is one of the way to succeed in KM (Liebowitz 1999). While the selection of strategy is related to the context and situation of the firm, there is a common understanding in the study that the chosen strategy must be linked with the firm's business strategy (Wong 2005; Zack 1999). This is because the competitive advantage relies on the way they create, share and utilize knowledge (Desouza 2003; Theriou et al. 2011) and a proper KM strategy will help to identify the needs and methods to accomplish an objective. Other than that, a rational strategy will help to define KM initiatives that support its purpose or mission (Wong and Aspinwall 2005; Zack 1999). The value proposition of KM must also be conveyed to the employees. They must be clear with the purposes and goals set

in pursuing KM and shared a common vision in order to succeed in KM implementation.

Arora (2002) and Ahmed et al. (1999) mentioned that "KM must be measured to ensure its envisioned objectives are being attained". Measurement can help firms to follow closely on their development of KM and to identify its performance. According to Ahmed et al. (1999), this will help organization to evaluate KM performance. Despite being under-implemented (Hiebeler 1996), measuring knowledge resources or activities and linking them to financial results is feasible (Lev 1997; Malone 1997; Stewart 1997). There is no absolute way to measure knowledge management within a firm (Gupta et al 2000). It remains as an "open area" that can be examined by scholars (De Gooijer 2000).

2.6.5 Human Resource Management (HRM)

The early stage of KM implementation often requires the management team to go an extra mile in motivating their employees. Without participation from the employees, all amount spent on the technological intervention and infrastructure will be wasted. Thus, it is crucial to establish adequate rewards to increase employees' participation in sharing and using knowledge. Incentives can be used in this case in order to overcome some of the pitfalls (Ardichvilli et al. 2003; Desouza 2003). However, this motivational method must be managed cautiously to avoid overloaded and non-valuable contents.

Other than that, the company can tie KM into annual job performance review to recognize their contribution. This will indirectly show the practice of KM as an important criteria in the organization.

Training, education, and communication are important to implement KM successfully. The firm's members must be aware of the benefits of managing KM and to share a common vision that KM is a key resource for the viability of the firm (Wong 2005). Having a common understanding of KM will help to reduce uncertainty among employees which will lead to acceptance and use of KM (Fidler & Johnson 1984). Giving appropriate trainings to the employees will give them a good overview of the KM concept. It can also help the management to understand how the employees perceive KM and their perspective on "knowledge". Other than that, the trainings should also aim to ensure employees exploit the full potential of KMs and to assume new duties related to knowledge-oriented tasks. Horak (2001) suggested that skills development such as communication must not be neglected to achieve effective KM.

Human is the exclusive creators of knowledge, therefore managing knowledge is managing people and vice versa (Davenport & Volpel 2001). Since people is the main source of knowledge, it becomes a key factor for an organization to meet success by supporting people to interact and exchange knowledge with one another (Nonaka & Takeuchi 1995).

Recruiting employees effectively is vital to bring external knowledge into the company, filling up the gaps which is not readily available within the firm. The ability of candidates to fit into the firm's culture should be the main concern of the

recruitment (Robertson & Hammersley 2000). While recruitment is vital, employee development should not be overlooked. Continuous improvement and development in terms of skills and knowledge of employees must be taken into consideration. As such, organization should invest in its employees to provide the right development courses to the right people at the right time. Investing in employees is also a method of retaining knowledge. This is because experience and knowledge reside in one's mind, particularly in the SME sector. HR practices can be considered to fit the employees personal passion (Berlade & Harman 2000) which can help in employee retention.

2.6.6 Organizational Structure

Gold et al. (2001) stated that organizational structure is one of the most crucial CSFs to KM success. It is indeed a major CSF to KM success that must not be overlooked (Bose 2004; Chourides et al. 2003; Holsapple & Joshi 2000; Liebowitz 1999; Wong 2005). SMEs may have limited resources while implementing KM, but they do have some distinct advantages. SMEs have a much simpler, flatter, and less intricate organization structure which indirectly allow the change initiative across the firm to be attained easily (Rasheed 2005). This is due to the reduced complications with fewer layers of management. Besides, collaboration and sharing of knowledge can be achieved easily with a flexible organizational structure as opposed to rigidity. A bureaucratic structure will decelerate the processes and add complexity on information flow i.e. the amount of time needed for knowledge to be filtered through every level. Therefore, the traditional organizational structure is inappropriate for an organization which adopts KM (Nonaka & Takeuchi 1995). It

is known that the composition of both hierarchical and non-hierarchical structure can help to boost the flexibility dimension.

Hence, in circumstances where SMEs do appreciate the importance of KM, organizational structure will become one of the key drivers for KM adoption.

2.7   Indicator of KM Success

Rowley (2004) describes "knowledge is complex as it is intangible and is presented in a variety of forms". Being the core competence of the organization, knowledge however, is difficult to harness. Traditional methods of quantification must be removed to adequately measure the core competencies and distinctive abilities (Austin & Larkey 2002).

With the absence of measurable success, effort and support for KM is impossible to persist (Ranjit 2004). The ability to measure the results and advantages of KM is important to present the value of KM projects to all stakeholders. Other than using traditional measurement methods which emphasizes on financial performance, the soft non-financial benefits (e.g. learning, creativity etc.) should not be ignored. While using a technique that focuses on financial outcomes may be misleading (Ellis 1997), organizations can adopt non-financial methods to fully evaluate the benefits of KM (Carneiro 2001).

A list of convincing performance indicators have been studied by previous researchers from both quantitative survey (Chong 2006; Chourides et al. 2003; KPMG International 2000) and qualitative description (Allee 1997; Egbu et al. 2005; Ruggles 1998; Wiig 2000). Incorporating the work by Allee (1997), Chong

(2006), Chourides et al. (2003), Egbu et al. (2005), KPMG International (2000), Ruggles (1998), Wiig (2000), listed below are the indicators of KM success. The below table shows the indicators derived from the literatures.

Table 2.5: Indicators of KM Success in Previous Literatures

Indicator	Author
Identifying and sharing best practices	Allee (1997); Chong (2006); Chourides et al. (2003); KPMG International (2000); Ruggles (1998)
Enhanced business development and creation of new business opportunities	Chong (2006); Chourides et al. (2003); Egbu et al. (2005); KPMG International (2000); Wiig (2000)
New or better ways of working	Allee (1997); Chourides et al. (2003); KPMG International (2000); Ruggles (1998)
Better decision making	Chong (2006); KPMG International (2000); Ruggles (1998)
Better customer handling through better client interaction and sharing knowledge with clients	Chong (2006); Egbu et al. (2005); KPMG International (2000)

Faster response to key business issues	Chong (2006); Chourides et al. (2003); KPMG International (2000)
Improved productivity in delivering products and services to clients and by solving emerging organizational problems	Chong (2006); Egbu et al. (2005); KPMG International (2000)
Reduced costs	Chourides et al. (2003); KPMG International (2000); Wiig (2000)
Improved new product development	Chourides et al. (2003); KPMG International (2000); Wiig (2000)
Bette staff attraction/retention	Chong (2006); Egbu et al. (2005); KPMG International (2000)
Increased innovation and creativity	Allee (1997); Chong (2006); Egbu et al. (2005)
Development and constant improvement of competitive long-range service and technology strategies	Chong (2006); Egbu et al. (2005)
Development of entrepreneurial (intrapreneurial) culture for organizational growth and success	Chong (2006); Egbu et al. (2005)

Improved employee skills and quality through capacity building and upskilling	Egbu et al. (2005); KPMG International (2000)
Increased profits	KPMG International (2000); Wiig (2000)
Stimulation and motivation of employees	Chong (2006); Egbu et al. (2005)
Enhanced product or service quality	Chourides et al. (2003); Wiig (2000)
Creation of more value to customers	Chourides et al. (2003); Wiig (2000)
Improved learning/adaption capability	Allee (1997); Ruggles (1998)
Formalized knowledge transfer system established – enhance transfer of knowledge between one employee to another	Chong (2006); Egbu et al. (2005)
Enhanced and streamlined internal administrative processes	Chong (2006); Egbu et al. (2005)
Better on-the-job training for employees	Chong (2006); Egbu et al. (2005)
Intermediate results in solving organizational-wide problems	Egbu et al. (2005)
Increased market share	KPMG International (2000)
Enhanced intellectual capital	Allee (1997)
Improved communication	Allee (1997)

Improved efficiency	Egbu et al. (2005)
Return on investment in KM efforts	Chong (2006)
Increased market size	Wiig (2000)
Entry into different market type	Ruggles (1998)
Increased empowerment of employees	Wiig (2000)
Improved capture and use of knowledge from sources outside the firm	Egbu et al. (2005)
Improved integration of knowledge within the firm	Egbu et al. (2005)
Enabled identification of knowledge gaps	Egbu et al. (2005)
Identified knowledge assets	Egbu et al. (2005)
Identified knowledge flow	Egbu et al. (2005)

The selection of KM success indicators very much depends on the characteristics of the company which include firm size, location, industry etc. In other words, no firm can achieve all listed KM success indicators. This study will discuss KM success in a general context.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Overview

This research has been undertaken to explore the role of KM in entrepreneurial venture. Specifically, this research seeks to determine which factors are important for KM in SME environment. This study attempted to identify the determinants to allow successful KM implementation in SMEs. This chapter highlights the methodology of this research effort and presents the research questions, hypothesis, population, sample, research design. Data collection procedures and data analysis techniques used in this study will also be discussed.

3.2   Research Design

The following figure shows the research design / process for this study.

RESEARCH DESIGN

Research Idea
- Selecting a topic
- Translating topic into question and hypothesis

Research Design
- Selecting research approach
- Literature Review
- Operationalizing variables/items
- Determining samples
- Pilot Testing

Collecting Data

Analyzing Data
- Data preparation
- Analyzing research hypothesis
- Use appropriate test methods to test data

Discussion and Conclusion
- Interpreting results
- Recommendations for future research
- Limitations of study

Figure 3.1: Research Design

3.3   Research Approach

Qualitative and quantitative approaches are widely used while conducting research. The selection of the appropriate approach is dependent on the types of questions being asked in the research (Marczyk et al. 2005). While Aliaga & Gunderson (2000) described "quantitative research is to explain a phenomena by collecting numerical data that are analyzed using mathematically based methods". Qualitative Research Consultants Association (2015) mentioned that "qualitative research is designed to reveal a target audience's range of behavior and the perceptions that drive it with reference to specific topics or issues".

A long-standing debate among researchers on both research approaches (Kerlinger & Howard 1999; Miles & Huberman 1994; Newkirk 1999) shows that these philosophies are rather contradict. This is because qualitative research is believed to be dependent on the principle of subjectivity (Reichardt & Rallis 1994) while quantitative research rests on the principle of objectivity (Miles & Huberman 1994; Reichardt & Rallis 1994). Qualitative researchers trust that the best way to understand a phenomenon is to watch people in their own settings (Kirk & Miller 1986) and become immersed in it (Denzin & Lincoln 1994). They argue that human experience is not describable by numbers. However, quantitative researchers priding themselves in being unbiased (Reichardt & Rallis 1994), criticize the qualitative researchers for being biased as qualitative researches are being shaped by the beliefs of the latter.

The research approach used in this study is quantitative research. Although quantitative research is rough in the beginning, the ease of analysis must not be

overlooked (Collis & Hussey 2003). As stated by Mujis (2010), quantitative research is good at providing information in breadth, from a large number of units. As this study needs to gain insights from a large number of respondents, it is appropriate to apply quantitative methods, as qualitative methods are meant for studies which needs to explore a concept in depth (Mujis 2010). Other than that, quantitative methods are best for looking at correlation (Waters n.d.): The relationship between firm size and KM success. In this research, quantitative methods is also essential to explain an important phenomena: What factors are related to KM success?

3.4   Sources of Data

This study is targeted on SMEs regardless of their industry. The selection of the sample is based on the size of the firm (micro, small, medium). The selected SMEs must reside within Malaysia and are practicing KM in any form. The targeted respondents for the questionnaire survey should hold a position of senior executive and above. All respondents should come from a different company. Seventy-three (73) questionnaire will be distributed face-to-face and responses will be recollected on the spot.

3.5 Conceptual Framework

The conceptual framework for this research is as follow:
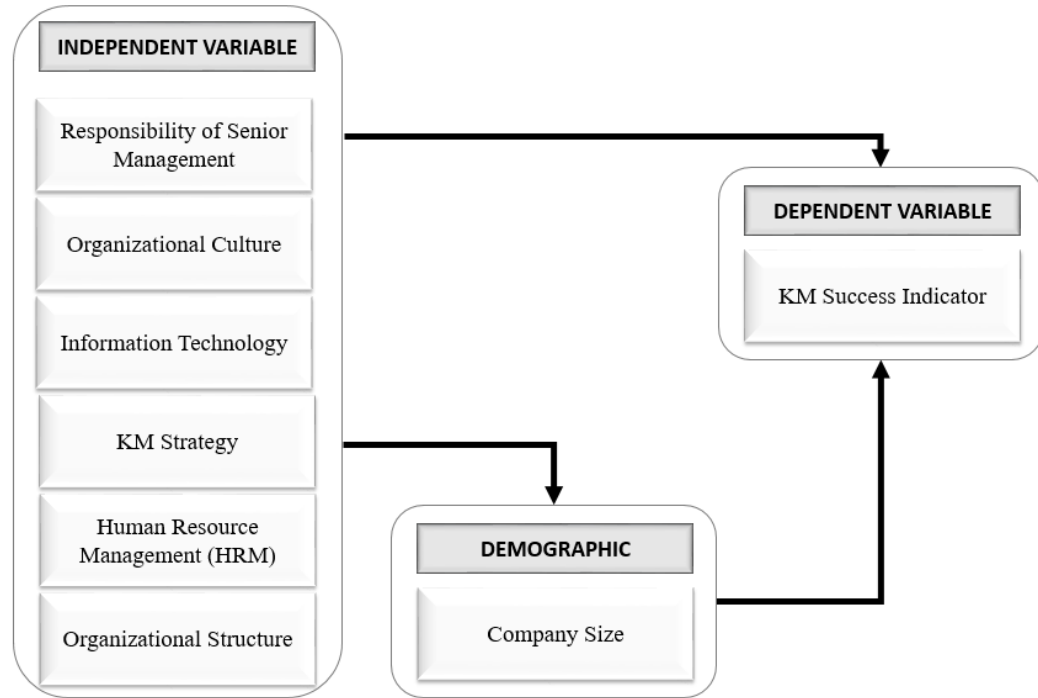
Figure 3.2: Conceptual Framework

3.6 Research Question

The research questions that will be investigated are as follow:

What are the CSFs of KM implementation?

Is there a significant relationship between CSFs and KM success?

Is there a significant relationship between firm size and KM success?

3.6.1 Hypothesis

Table 3.1: Hypothesis of Research Question 2

Research Question 2: Relationship between CSFs and KM success		
Code	**Hypothesis**	
	H$_1$	**H$_0$**
SM1	Leadership / Role Model is significant to KM success	Leadership / Role Model is not significant to KM success
SM2	Support and Commitment from Top Management is significant to KM success	Support and Commitment from Top Management is not significant to KM success
SM3	Establish Clear Vision & Purpose of KM is significant to KM success	Establish Clear Vision & Purpose of KM is not significant to KM success
SM4	Encourage KM Implementation Initiatives is significant to KM success	Encourage KM Implementation Initiatives is not significant to KM success
OC1	Confident to Share Knowledge is significant to KM success	Confident to Share Knowledge is not significant to KM success
OC2	Benchmarking (growth of learning culture) is significant to KM success	Benchmarking (growth of learning culture) is not significant to KM success

OC3	Teamwork is significant to KM success	Teamwork is not significant to KM success
OC4	Knowledge-friendly Culture is significant to KM success	Knowledge-friendly Culture is not significant to KM success
OC5	Collaborative Culture is significant to KM success	Collaborative Culture is not significant to KM success
OC6	Strong Trust Relationship is significant to KM success	Strong Trust Relationship is not significant to KM success
OC7	Open Organizational Culture is significant to KM success	Open Organizational Culture is not significant to KM success
OC8	Promote Internal & External Communication is significant to KM success	Promote Internal & External Communication is not significant to KM success
IT1	Ease of Use is significant to KM success	Ease of Use is not significant to KM success
IT2	Appropriate IT Infrastructure for KM is significant to KM success	Appropriate IT Infrastructure for KM is not significant to KM success
IT3	System Quality is significant to KM success	System Quality is not significant to KM success
KS1	Good Knowledge Structure is significant to KM success	Good Knowledge Structure is not significant to KM success

KS2	Knowledge Maintenance is significant to KM success	Knowledge Maintenance is not significant to KM success
KS3	Establish a set of KM Performance Measurement is significant to KM success	Establish a set of KM Performance Measurement is not significant to KM success
KS4	Systematic Knowledge Process is significant to KM success	Systematic Knowledge Process is not significant to KM success
KS5	KM Strategy is linked with Business Strategy is significant to KM success	KM Strategy is linked with Business Strategy is not significant to KM success
KS6	Integrate KM in Business Process is significant to KM success	Integrate KM in Business Process is not significant to KM success
HR1	Incentives and Rewards is significant to KM success	Incentives and Rewards is not significant to KM success
HR2	Employee Involvement in KM Implementation is significant to KM success	Employee Involvement in KM Implementation is not significant to KM success
HR3	KM Training of Employees is significant to KM success	KM Training of Employees is not significant to KM success
HR4	Workers' Buy-ins is significant to KM success	Workers' Buy-ins is not significant to KM success
HR5	Employee Empowerment is significant to KM success	Employee Empowerment is not significant to KM success

OS1	Formal KM Employees is significant to KM success	Formal KM Employees is not significant to KM success
OS2	Simple, Flat and Less Intricate Organizational Structure is significant to KM success	Simple, Flat and Less Intricate Organizational Structure is not significant to KM success
OS3	Flexibility of Organizational Structure is significant to KM success	Flexibility of Organizational Structure is not significant to KM success

3.7   Instrument

This study adopts questionnaire as an instrument for data collection. This is due to the nature of questionnaire which is said to be standardized as all respondents are exposed to the exact same questions and the same system of coding responses (Siniscalco & Auriat 2005). The use of questionnaire allows the differences in feedback to questions to be examined as reflecting differences among respondents (Siniscalco & Auriat 2005).

The development of the questionnaire in this research will be based on an extensive review of literatures. The items that will be posted in the questionnaire survey will be adapted from previous research with essential modification to tailor the research.

There will be three (3) sections in the questionnaire. The first section will gather all necessary demographic data such as age group, gender, highest education level,

position, firm's size and age. While second section gathers the opinions for CSFs of KM implementation, the third gathers the opinions for KM success indicators.

Questions in section two (2) will be based on a five-point Likert scale. The following figure shows the representation of integers 1 to 5.
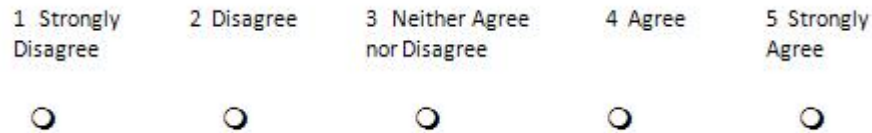
Figure 3.3: Five-point Likert Scale

3.8   Questionnaire Items

The CSFs of KM implementation used in the questionnaire are identified from the previous studies. Relevant CSFs are group together. The below table shows the reference sources for each of the CSFs.

Table 3.2: CSFs of KM Implementation Used in the Questionnaire

Factor Group	Code	CSF	Author
Responsibility of Senior Management	SM1	Leadership / Role Model	Crawford 2005; Davenport & Prusak 1998; Grover & Davenport 2001; Hasanali 2002; Holsapple & Joshi 2000; Horak 2001; Liebowitz 1999; Singh 2008; Wong 2005; Wong & Aspinwall 2005

	SM2	Support and Commitment from Top Management	(Abell & Oxbrow 1999; Chard 1997; Choi 2000; Davenport et al. 1998; Greengard 1998; Jager 1999; Kalling 2003; Lee & Kim 2001; Manasco 1996; Martensson 2000; Pemberton et al. 2002; Ryan & Prybutok 2001; Sharp 2003; Truch 2001; Wong 2005)
	SM3	Establish Clear Vision & Purpose of KM	(Creech 2005; Davenport et al. 1998; Wong 2005; Wong & Aspinwall 2005; Zack 1999)
	SM4	Encourage KM Implementation Initiatives	(Holsapple & Joshi 2000)
Organizational Culture	OC1	Confident to Share Knowledge	(Davenport et al. 1998; Liebowitz 1999; Skyrme & Amidon 1997; Wong 2005)
	OC2	Benchmarking (growth of learning culture)	(Choi 2000; Chong & Choi 2005; Davis 1996; Day & Wendler 1998)
	OC3	Teamwork	(Choi 2000; Chong & Choi 2005; Greengard 1998; Ryan & Prybutok 2001)

	OC4	Knowledge-friendly Culture	(Chase 1997; Choi 2000; Chong & Choi 2005; Davenport et al. 1998; De Long et al. 1996; Galagan 1997; Greengard 1998; Gupta et al. 2000; Jager 1999; Liebowitz 1999; McDermott & O'Dell 2001; Ryan & Prybutok 2001; Skyrme & Amidon 1997; Wah 1999; Wild et al. 2002)
	OC5	Collaborative Culture	(Brahma & Mishra 2015; Goh 2002; Lee & Choi 2003; Wong 2005)
	OC6	Strong Trust Relationship	(De Tienne & Jackson 2001; Lee & Choi 2003; Scarborough et al. 1999; Stonehouse & Pemberton 1999; Wong 2005)
	OC7	Open Organizational Culture	(Ryan & Prybutok 2001)
	OC8	Promote Internal & External Communication	(Kavindra 2004)
	IT1	Ease of Use	(Migdadi 2008)

Information Technology	IT2	Appropriate IT Infrastructure for KM	(Alavi & Leidner 2001; Bhatt 2002; Choi 2000; Davenport et al. 1998; Hasanali 2002; Holsapple & Joshi 2000; Lee & Hong 2002; Liebowitz 1999; Manasco 1996; Ryan & Prybutok 2001; Savary 1999; Skyrme & Amidon 1997; Stankosky & Baldanza 2000; Wong 2005)
	IT3	System Quality	(Tan 2013)
KM Strategy	KS1	Good Knowledge Structure	(Choi 2000; Chong & Choi 2005; Davenport et al. 1998)
	KS2	Knowledge Maintenance	(Liebowitz 1999)
	KS3	Establish a set of KM Performance Measurement	(Beijerse 2000; Carneiro 2001; Chong & Choi 2005; Hasanali 2002; Wong 2005)
	KS4	Systematic Knowledge Process	(Skyrme & Amidon 1997)
	KS5	KM Strategy is linked with Business Strategy	(Chourides, Longbottom & Murphy 2003; Skyrme & Amidon 1997; Wong 2005; Zack 1999)

	KS6	Integrate KM in Business Process	(Heising 2001)
Human Resource Management (HRM)	HR1	Incentives and Rewards	(King 2009; Liebowitz 1999)
	HR2	Employee Involvement in KM Implementation	(Bhatt 2002; Chan & Chao 2013; Choi 2000; Chong & Choi 2005; Earl 1999; Hall & Andriani 2002; Ryan & Prybutok 2001; Wong & Aspinwall 2005)
	HR3	KM Training of Employees	(Carneiro 2001; Choi 2000; Chong & Choi 2005; Horak 2001; Wong 2005)
	HR4	Workers' Buy-ins	(Robertson & Hammersley 2000)
	HR5	Employee Empowerment	(Bhatt 2002; Choi 2000; Chong & Choi 2005)
Organizational Structure	OS1	Formal KM Employees	(Liebowitz 1999; Moshari 2013; Wong 2005)
	OS2	Simple, Flat and Less Intricate Organizational Structure	(Rasheed 2005)

Factor Group	Code	Indicators
	OS3	Flexibility of Organizational Structure	(Nonaka & Takeuchi 1995)

Eleven (11) KM success indicators are selected from the literature review. They are selected based on the highest frequency among all identified KM success indicators.

Table 3.3: KM Success Indicators Used in the Questionnaire

Factor Group	Code	Indicators
KM Success Indicator	IN1	Identifying and sharing best practices
	IN2	Enhanced business development and creation of new business opportunities
	IN3	New or better ways of working
	IN4	Better decision making
	IN5	Better customer handling through better client interaction and sharing knowledge with clients
	IN6	Faster response to key business issues
	IN7	Improved productivity in delivering products and services to clients and by solving emerging organizational problems
	IN8	Reduced costs
	IN9	Improved new product development

	IN10	Better staff attraction/retention
	IN11	Increased innovation and creativity

3.9   Validity and Reliability

Internal Reliability

Reliability will be testing using Cronbach's Alpha. Originally developed by Cronbach (1951), coefficient alpha is often used to assess the reliability of the total test scores which has multiple items (Salkind 2007). It is typically adapted to make composite score from several Likert-type items which indicates the internal consistency of a multiple item scale.

Content Validity

To achieve content validity, representative questions extracted from a universal pool and a thorough review on the items by expert are some essential steps (Sedera et al. 2003). The measurement items in the survey questionnaire must adequately cover the content domains or aspects of the concept being measured to achieve content validity (Ahire et al. 1996). However, content validity can only be subjectively judged by the researchers as it could not be assessed numerically (Wong & Aspinwall 2005).

Relationship between Validity and Reliability

Validity and reliability are two very different terms that must not be confused. While reliability in a quantitative research is about the consistency of the results, validity determines if the study truly measures what it was intended to measure.

3.10 Statistical Treatment

Marczyk et al. (2005) mentioned that it is essential to identify the ways to log, enter, transform and organize data into a database which will lead to effective statistical analysis.

3.10.1 Data Collection

All survey questionnaire will be handed out face-to-face and recollection will be done on the spot. Immediate evaluation for completeness of all responses is necessary. The respondents are not required to state their identity on the survey questionnaire. All responses will then be entered into Excel sheet.

3.10.2 Data Preparation

Upon receiving all 73 responses, the data consolidated on the said Excel sheet will be transferred into IBM SPSS Statistics 23 by creating a database with data codebook. A data codebook will contain the variable names, variable types, variable labels, variable values, measures and other formatting variables. The data in the Excel sheet will then be copied to the database accordingly.

3.10.3 Data Analysis

The data collected is now ready for analysis. The types of analysis that will be done in this research are described below:

Descriptive Statistics

Descriptive statistics will be computed to have an overall understanding on the variables and demographic characteristics of the samples. The results will help to describe a circumstance by summarizing information that highlights the important numerical features of the data (Antonius 2003). Mean to measure the central tendency of a variable will be used to assist on the ranking of CSFs. Standard deviation will also be used to calculate the average amount of deviation from the mean (Bryman & Cramer 2005). A large dispersion means larger standard error of the mean.

Kurtosis is often described as the degree of "peakedness" of a distribution (Weisstein 2016). It is used to measure the tail-heaviness of the distribution. Positive Kurtosis values indicate "peakedness" while negative values indicate flatness.

Skewness will be used to describe the measure of a dataset's symmetry. Skewness of 0 is a perfect symmetrical data set. Positive value means data is skewed to the right and negative value to the left.

Table 3.4 Skewness Interpretation

Value	Skewness
$-0.5 \leq x \leq 0.5$	Approximately Symmetrical
$-1 \leq x < -0.5$ or $0.5 > x \geq 1$	Moderately Skewed
$x < -1$ or $x > 1$	Highly Skewed

Source: Adapted from (McNeese 2016)

RII (Relative Importance Index)

This is a statistical model to identify the ranking of various factors. RII will be used to analyze the data to determine the relative effect of each CSFs of KM implementation. The following expression is used to calculate the result of each CSF:-

$$RII = \frac{\sum W}{A * N} \ (0 \leq RII \leq 1)$$

Where:

W = weight given to each factor ranges from 1 to 5

A = the highest weight

N = number of respondents

Source: Adapted from Gunduz et al. (2013)

Figure 3.3: RII Formula

Reliability Test

Reliability will be tested using Cronbach's Alpha. A rule of thumb for interpreting alpha for dichotomous questions (i.e. questions with two possible answers) or Likert scale question is:

Table 3.5: Cronbach's Alpha Acceptance Level

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Source: Adapted from (Andale 2014)

There exists multiple reports about the acceptance level of alpha, ranging from 0.70 to 0.95 (DeVellis 2003; Nunnally & Bernstein 1994). Although the general accepted value of alpha is 0.70 and above, recommended a maximum alpha value of 0.90 as it may suggest that some items are redundant (Streiner 2003).

Binary Logistic Regression

It is used to predict the outcome of a dichotomous variable. In this study, binary logistic regression is needed to evaluate the significance of the CSFs in KM success (True or False). The logistic regression model is said to be statistically significant if $p < 0.05$.

3.10.4 Pilot Study

The term "pilot studies" can be used in two different ways. However, the context of pilot study in this research is the pre-testing of the particular research instrument (Baker 1994), which in this case, a survey questionnaire. It is important to conduct pilot studies for any research (Hutt & Speh 2001). This is because a pilot study can

give an estimate preview of the research in terms of possible failure of main research, instrument appropriateness and the structure of the questions. Although a pilot study does increase the likelihood of success in the main study, it does not guarantee research success.

In this research, the first 20 collected responses will be used for pilot testing to ensure there exists no comprehension problems among respondents. All 20 respondents in the pilot studies should be clear with the questions in the questionnaire. Reliability will be tested using Cronbach's Alpha. In case where the pilot study fails the reliability test, and the question(s) in the questionnaire has to be modified, the 20 collected responses should then be discarded.

CHAPTER 4

RESULTS

4.1   Demographic Profile Analysis

The questionnaire sheets were handed face-to-face to seventy-three (73) targeted respondents who had been notified before arranging for a meetup. The questionnaires were then recollected on the spot. Thus, the response rate is 100%.

This section discusses the demographic profiles of the 73 respondents.

Table 4.1: Result on Demographic Profiles

Description	Number of Respondent(s)	Percentage (%)
1) Age		
< 25	1	1.4
25 – 29	19	26.0
30 – 34	24	32.9
35 – 39	18	24.7
40 – 44	9	12.3
> 44	2	2.7
2) Gender		
Male	46	63.0
Female	27	37.0
3) Highest Education Level		
High School or Equivalent	2	2.7
Certificate	4	5.5
Diploma	16	21.9
Degree	46	63.0
Postgraduate	5	6.8

4) Position		
Founder/ Co-Founder/ CEO	18	24.7
Manager	35	47.9
Senior Executive	14	19.2
Junior Executive	6	8.2
Others	0	0
5) Company Size		
Micro	6	8.2
Small	19	26.0
Medium	48	65.8
6) Company Age (years)		
< 5	20	27.4
5 – 9	8	11.0
10 – 14	12	16.4
15 – 19	16	21.9
> 19	17	23.3

The above table shows that the 91.8% of respondents are in the position of senior executive and above. 72.6% are managers and above who usually make decisions on the company's business processes. This indicates that the results is valid and reliable as more than half of the responses are opinions from top management.

The below figures illustrate the percentage distribution for each demographic factors.
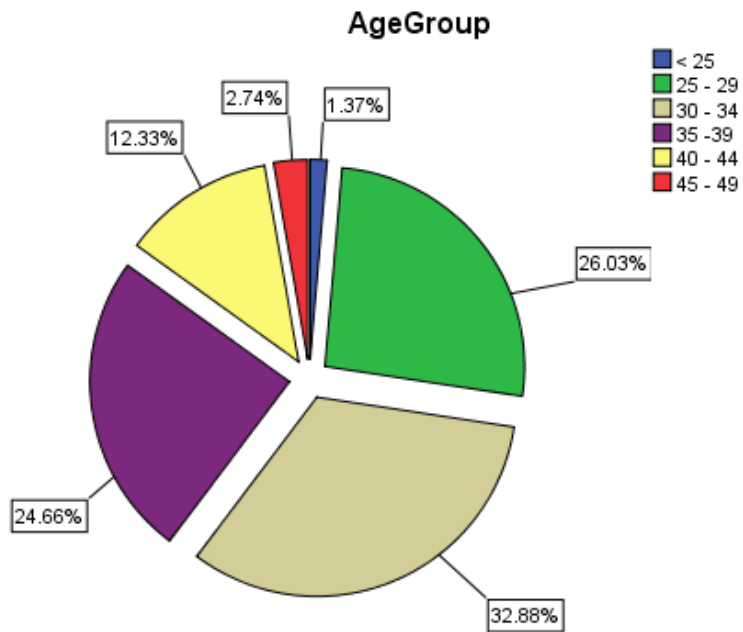
Figure 4.1: Age Group
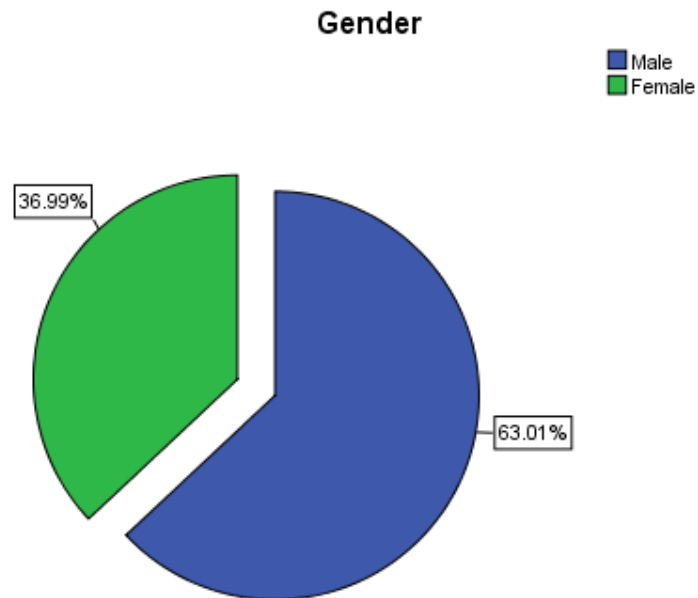
Figure 4.2: Gender
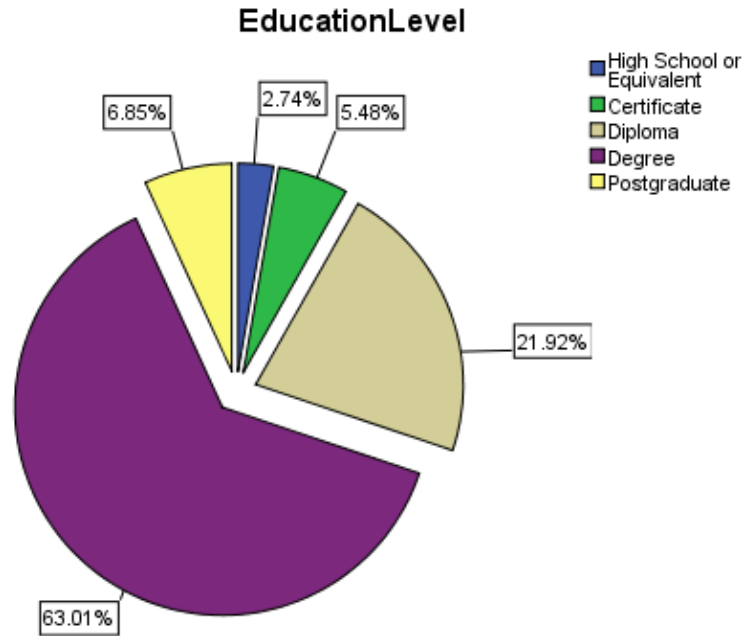
Figure 4.3: Highest Education Level

Figure 4.4: Position

CompanySize

Legend:
- Micro
- Small
- Medium

8.22%

65.75%

26.03%

Figure 4.5: Company Size

CompanyAge

Legend:
- < 5
- 5 - 9
- 10 - 14
- 15 - 19
- > 19

23.29%

27.40%

10.96%

16.44%

21.92%
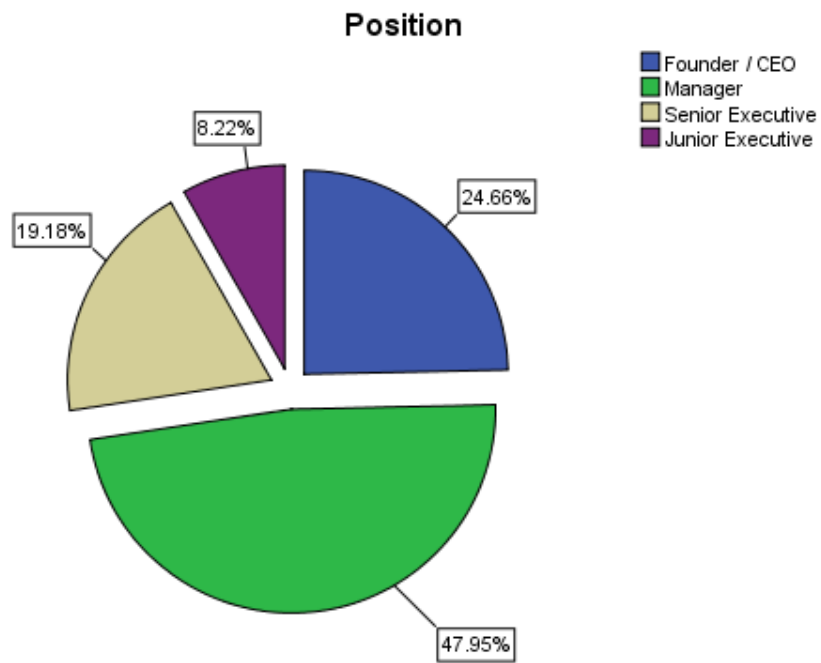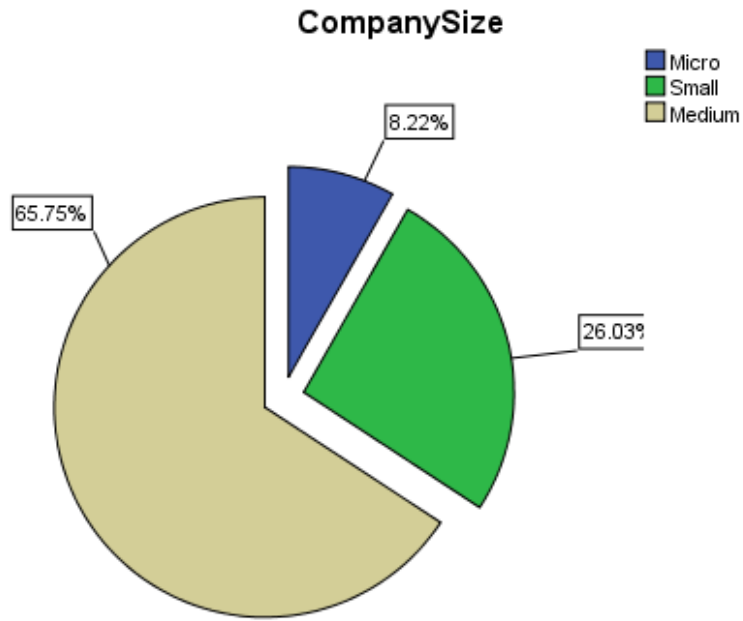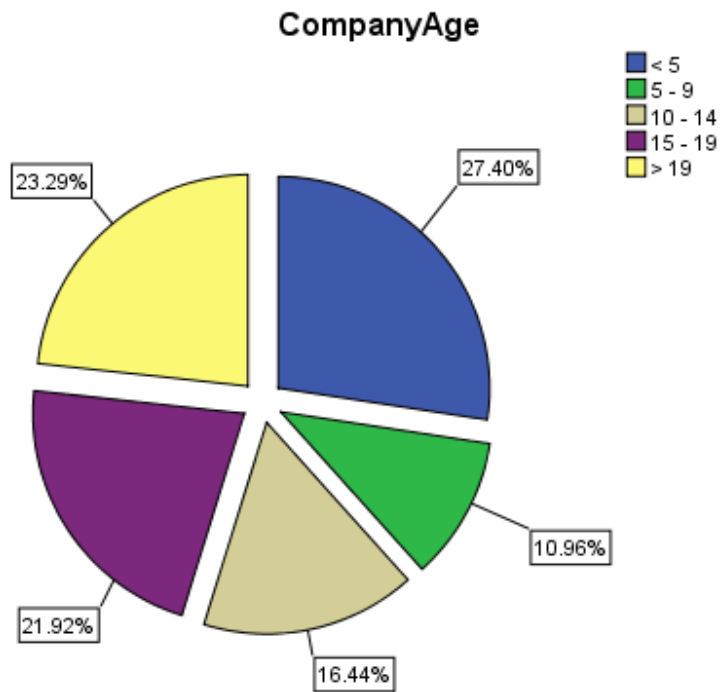
Figure 4.6: Company Age

4.2   Variables Characteristics

Responsibility of Senior Management

Table 4.2: Descriptive Statistics – Responsibility of Senior Management

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
SM1	73	3	5	4.30	.639	-.359	.281	-.653	.555
SM2	73	3	5	4.26	.667	-.352	.281	-.749	.555
SM3	73	3	5	4.23	.677	-.322	.281	-.795	.555
SM4	73	2	5	4.22	.692	-.579	.281	.270	.555
Valid N (listwise)	73								

The above shows that the scores range for this factor group is from 2 to 5 with mean of 4.0 and above for each CSF. This indicates that majority of the respondents agree with the items under this factor group. The standard deviations of the four items are close to one another. While SM1 to SM3 are almost symmetric, SM4 is moderately skewed to the left. A positive Kurtosis value shows that SM4 is peaked when the remaining are rather flat.

Ntoumanis (2001) mentioned that the data is not normally distributed if the ratio of skewness or kurtosis to their respective errors is above 1.96. The table below shows that SM4 has a skewness ratio of 2.060 which indicates that it is not normally distributed.

Table 4.3: Ratio of Skewness and Kurtosis – Responsibility of Senior Management

	Skewness	Kurtosis
SM1	-1.278	-1.177
SM2	-1.253	-1.350

SM3	-1.146	-1.432
SM4	2.060	0.486

Organizational Culture

Table 4.4: Descriptive Statistics – Organizational Culture

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
OC1	73	2	5	4.29	.772	-1.110	.281	1.297	.555
OC2	73	2	5	4.19	.659	-.524	.281	.627	.555
OC3	73	3	5	4.32	.621	-.329	.281	-.619	.555
OC4	73	2	5	4.30	.701	-.994	.281	1.564	.555
OC5	73	2	5	4.26	.782	-1.035	.281	1.019	.555
OC6	73	2	5	4.34	.583	-.653	.281	2.005	.555
OC7	73	3	5	4.21	.645	-.217	.281	-.625	.555
OC8	73	2	5	4.18	.752	-.509	.281	-.388	.555
Valid N (listwise)	73								

The scores range from 2 to 5 for all CSF under this factor group. However, majority of the respondents agree with all CSFs as indicated by mean 4.0 and above. OC5 has the largest dispersion with a standard deviation of 0.782. OC1 and OC5 are highly skewed to the left, OC2, OC3, OC 6 and OC9 moderately skewed to the left, and the rest are approximately symmetric. The positive Kurtosis values show that OC1, OC2, OC4, OC5, OC6 peaked while the others are rather flat.

OC1, OC4, OC5, OC6 have skewness or kurtosis ratios more than 1.96 which indicate that they are not normally distributed.

Table 4.5: Ratio of Skewness and Kurtosis – Organizational Culture

	Skewness	Kurtosis
OC1	-3.950	2.337
OC2	-1.865	1.130
OC3	-1.171	-1.115
OC4	-3.537	2.818
OC5	-3.683	1.836
OC6	-2.324	3.613
OC7	-0.772	-1.126
OC8	-1.811	-0.699

Information Technology

Table 4.6: Descriptive Statistics – Information Technology

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
IT1	73	2	5	4.26	.866	-1.065	.281	.491	.555
IT2	73	2	5	4.34	.837	-1.309	.281	1.305	.555
IT3	73	2	5	4.27	.786	-1.060	.281	1.020	.555
Valid N (listwise)	73								

The above table shows score range from 2 to 5 for all items with majority of respondents agree to the CSFs listed under this factor group. The largest dispersion happens in IT1 with standard deviation 0.866. All CSFs are highly skewed to the left and peaked.

All CSFs under this factor group are not normally distributed.

Table 4.7: Ratio of Skewness and Kurtosis – Information Technology

	Skewness	Kurtosis
IT1	-3.790	0.885
IT2	-3.670	2.351
IT3	-3.772	1.838

Knowledge Structure

Table 4.8: Descriptive Statistics – Knowledge Structure

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
KS1	73	2	5	4.37	.697	-.907	.281	.622	.555
KS2	73	2	5	4.16	.746	-.898	.281	1.198	.555
KS3	73	2	5	4.23	.755	-1.015	.281	1.328	.555
KS4	73	2	5	4.07	.714	-.572	.281	.595	.555
KS5	73	2	5	4.14	.787	-.776	.281	.465	.555
KS6	73	2	5	4.11	.698	-.656	.281	.951	.555
Valid N (listwise)	73								

Each CSFs has a score range from 2 to 5 with mean above 4.0 which indicated the majority of respondents agree to the items listed under this factor group. KS5 has the largest dispersion with standard deviation 0.787. All of the items are skewed to the left and peaked.

All CSFs under this factor group are not normally distributed.

Table 4.9: Ratio of Skewness and Kurtosis – Knowledge Structure

	Skewness	Kurtosis
KS1	-3.228	1.121

KS2	-3.195	2.159
KS3	-3.612	2.393
KS4	-2.036	1.072
KS5	-2.762	0.838
KS6	-2.335	1.714

Human Resource Management

Table 4.10: Descriptive Statistics – Human Resource Management

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
HR1	73	2	5	3.99	.920	-.522	.281	-.618	.555
HR2	73	3	5	4.25	.662	-.317	.281	-.728	.555
HR3	73	1	5	4.07	.822	-1.054	.281	1.990	.555
HR4	73	2	5	3.99	.790	-.322	.281	-.487	.555
HR5	73	1	5	3.92	.812	-.966	.281	1.800	.555
Valid N (listwise)	73								

The above table shows score range from 1 to 5 for the items under this category.
The means of the CSFs in this factor group are approximately 4.0. This indicates
that the majority's opinions are neutral but tend to agree with the items fall under
this category. HR1 has the largest dispersion among the CSFs in HRM factor group.
HR3 is highly skewed to the left and peaked. HR2 and HR 4 are approximately
symmetric and flat. HR1 and HR5 are moderately skewed to the left with flat HR1
and peaked HR5.

HR3 and HR5 are not normally distributed.

Table 4.11: Ratio of Skewness and Kurtosis – HRM

	Skewness	Kurtosis
HR1	-1.858	-1.114
HR2	-1.128	-1.312
HR3	-3.751	3.586
HR4	-1.146	-0.877
HR5	-3.438	3.243

Organizational Structure

Table 4.12: Descriptive Statistics – Organizational Structure

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
OS1	73	1	5	3.93	1.084	-1.003	.281	.257	.555
OS2	73	1	5	3.96	1.020	-.966	.281	.255	.555
OS3	73	1	5	3.84	1.054	-.977	.281	.588	.555
Valid N (listwise)	73								

The scores range from 1 to 5 for all items under organizational structure. The majority of respondents have neutral opinions on items listed under this factor group, but they tend to agree with them as the means are nearer to 4.0. All items have large dispersion. OS1 is highly skewed to the left and peaked. OS2 and OS3 are moderately skewed to the left and peaked.

All CSFs under this factor group are not normally distributed.

Table 4.13: Ratio of Skewness and Kurtosis – Organizational Structure

	Skewness	Kurtosis
OS1	-3.569	0.463
OS2	-3.438	0.459
OS3	-3.477	1.059

4.3 Reliability Test

A pilot survey was conducted to test the questionnaire using a sample size of 20. The collected data is tested for internal reliability.

Table 4.14: Pilot Test – Internal Reliability Test

Factor Group	Cronbach's Alpha	Number of Items
Responsibility of Senior Management	0.791	4
Organizational Culture	0.783	8
Information Technology	0.868	3
KM Strategy	0.802	6
Human Resource Management	0.836	5
Organization Structure	0.881	3
KM Measurement	0.890	11

Upon passing the reliability test, the data collected in the pilot test will also be included to compute the final result. Such result indicates that the identified CSFs from past studies which were used in this study are relevant and applicable to SMEs

in Malaysia. Additionally, the results show that there is no comprehension problems among the respondents.

Reliability test were carried out based on the collected 73 sets of data. All factor groups, including KM success indicator, passed the test.

Table 4.15: Internal Reliability Test

Factor Group	Cronbach's Alpha	Number of Items
Responsibility of Senior Management	0.758	4
Organizational Culture	0.801	8
Information Technology	0.838	3
KM Strategy	0.755	6
Human Resource Management	0.755	5
Organization Structure	0.887	3
KM Measurement	0.834	11

4.4   Validity Testing

The selection of respondents was based on a thorough research. All selected respondents are familiar with KM practices and are practicing KM in their current organization. Thus, the responses are deemed valid.

All items listed in the questionnaire are based on a comprehensive literature review and are validated by pilot studies with the appropriate respondents. Therefore, it is believed that the entire questionnaire has valid contents (content validity).

4.5   Research Question Testing

Research Question 1: What are the CSFs of KM implementation?

All CSFs' RII and mean are computed for overall analysis. The most important CSF of KM implementation can be determined by ranking all CSFs. The below table summarizes RII and mean, and shows the ranking of all CSFs.

Table 4.16: Rank CSFs by Mean and RII

CSF	Code	Mean	RII	Rank
Good Knowledge Structure	KS1	4.37	0.874	1
Appropriate IT Infrastructure for KM	IT2	4.34	0.868	2
Strong Trust Relationship	OC6	4.34	0.868	
Teamwork	OC3	4.32	0.863	4
Knowledge-friendly Culture	OC4	4.30	0.860	5
Leadership / Role Model	SM1	4.30	0.860	
Confident to Share Knowledge	OC1	4.29	0.858	7
System Quality	IT3	4.27	0.855	8
Ease of Use	IT1	4.26	0.852	9
Support and Commitment from Top Management	SM2	4.26	0.852	
Collaborative Culture	OC5	4.26	0.852	
Employee Involvement in KM Implementation	HR2	4.25	0.850	12
Establish a set of KM Performance Measurement	KS3	4.23	0.847	13
Establish Clear Vision & Purpose of KM	SM3	4.23	0.847	

Encourage KM Implementation Initiatives	SM4	4.22	0.844	15
Open Organizational Culture	OC7	4.21	0.841	16
Benchmarking (growth of learning culture)	OC2	4.19	0.838	17
Promote Internal & External Communication	OC8	4.18	0.836	18
Knowledge Maintenance	KS2	4.16	0.833	19
KM Strategy is linked with Business Strategy	KS5	4.14	0.827	20
Integrate KM in Business Process	KS6	4.11	0.822	21
KM Training of Employees	HR3	4.07	0.814	22
Systematic Knowledge Process	KS4	4.07	0.814	
Incentives and Rewards	HR1	3.99	0.797	24
Workers' Buy-ins	HR4	3.99	0.797	
Simple, Flat and Less Intricate Organizational Structure	OS2	3.96	0.792	26
Formal KM Employees	OS1	3.93	0.786	27
Employee Empowerment	HR5	3.92	0.784	28
Flexibility of Organizational Structure	OS3	3.84	0.747	29

It can be observed from the table that the rank derived using both methods is similar, which eliminates any possible error while ranking the CSFs. The result above suggests that good knowledge structure is the most important CSF of KM implementation in Malaysia. Other than that, SMEs in Malaysia think that IT infrastructure and a strong trust relationship are both equally important CSFs of

KM implementation. However, the result shows that the flexibility of organizational structure is the least important CSF in KM implementation.

Research Question 2: Is there a relationship between CSFs and KM success?

Binary Logistic

If p-value < 0.05, the relationship is significant. Based on the Table 4.17, the result of the identified hypothesis is shown in Table 4.18.

Table 4.17: p Values of CSFs and KM success

	IN1	IN2	IN3	IN4	IN5	IN6	IN7	IN8	IN9	IN10	IN11
SM1	0.217	0.608	0.436	0.104	0.835	0.113	0.207	0.973	0.854	0.564	0.51
SM2	0.919	0.351	0.866	0.013	0.647	0.226	0.841	0.602	0.259	0.147	0.113
SM3	0.416	0.155	0.494	0.903	0.191	0.974	0.236	0.485	0.229	0.697	0.585
SM4	0.453	0.148	0.452	0.375	0.91	0.701	0.063	0.194	0.749	0.576	0.716
OC1	0.441	1	0.095	.726	0.324	0.335	0.921	0.701	0.813	0.889	0.469
OC2	0.227	0.104	0.091	0.583	0.276	0.17	0.117	0.962	0.392	0.063	0.211
OC3	0.037	0.506	0.355	0.649	0.886	0.311	0.837	0.428	0.916	0.567	0.558
OC4	0.85	0.812	0.796	0.154	0.934	0.236	0.175	0.445	0.136	0.865	0.744
OC5	0.03	0.075	0.57	0.089	0.081	0.006	0.132	0.279	0.685	0.358	0.283
OC6	0.164	0.096	0.162	0.847	0.431	0.742	0.226	0.163	0.557	0.057	0.508
OC7	0.274	0.118	0.694	0.948	0.941	0.294	0.834	0.87	0.781	0.355	0.512
OC8	0.598	0.4	0.624	0.566	0.056	0.852	0.625	0.818	0.81	0.218	0.27
IT1	0.984	0.474	0.32	0.854	0.501	0.571	0.549	0.886	0.656	0.273	0.421
IT2	0.552	0.363	0.997	0.863	0.975	0.613	0.731	0.217	0.62	0.954	0.932
IT3	0.96	0.568	0.045	0.768	0.624	0.437	0.232	0.435	0.49	0.842	0.908
KS1	0.776	0.992	0.988	0.861	0.647	0.987	0.946	0.604	0.405	0.399	0.739
KS2	0.681	0.535	0.091	0.387	0.118	0.64	0.678	0.009	0.762	0.071	0.579
KS3	0.789	0.955	0.087	0.772	0.244	0.287	0.16	0.808	0.102	0.971	0.328
KS4	0.522	0.267	0.786	0.872	0.079	0.372	0.485	0.669	0.481	0.191	0.893
KS5	0.924	0.518	0.981	0.107	0.965	0.602	0.67	0.67	0.506	0.197	0.522
KS6	0.172	0.257	0.017	0.499	0.915	0.226	0.113	0.075	0.133	0.141	0.992
HR1	0.072	0.16	0.278	0.029	0.423	0.086	0.068	0.051	0.674	0.791	0.077

HR2	0.299	0.769	0.427	0.699	0.567	0.649	0.42	0.28	0.641	0.69	0.465
HR3	0.447	0.511	0.821	0.195	0.516	0.613	0.925	0.466	0.257	0.947	0.468
HR4	0.428	0.66	0.321	0.647	0.715	0.454	0.585	0.424	0.337	0.672	0.89
HR5	0.514	0.331	0.017	0.66	0.828	0.71	0.544	0.059	0.461	0.48	0.264
OC1	0.774	0.894	0.977	0.878	0.458	0.569	0.702	0.478	0.841	0.58	0.301
OC2	0.151	0.374	0.264	0.63	0.869	0.856	0.238	0.677	0.503	0.727	0.784
OC3	0.498	0.275	0.337	0.628	0.611	0.007	0.278	0.513	0.708	0.923	0.219

Table 4.18: Hypothesis Result

Research Question 2: Relationship between CSFs and KM success		
Code	**Hypothesis**	
	H$_1$	**H$_0$**
SM1	REJECTED	Leadership / Role Model is not significant to KM success
SM2	Support and Commitment from Top Management is significant to KM success	REJECTED
SM3	REJECTED	Establish Clear Vision & Purpose of KM is not significant to KM success
SM4	REJECTED	Encourage KM Implementation Initiatives is not significant to KM success
OC1	REJECTED	Confident to Share Knowledge is not significant to KM success
OC2	REJECTED	Benchmarking (growth of learning culture) is not significant to KM success
OC3	Teamwork is significant to KM success	REJECTED

OC4	REJECTED	Knowledge-friendly Culture is not significant to KM success
OC5	Collaborative Culture is significant to KM success	REJECTED
OC6	REJECTED	Strong Trust Relationship is not significant to KM success
OC7	REJECTED	Open Organizational Culture is not significant to KM success
OC8	REJECTED	Promote Internal & External Communication is not significant to KM success
IT1	REJECTED	Ease of Use is not significant to KM success
IT2	REJECTED	Appropriate IT Infrastructure for KM is not significant to KM success
IT3	System Quality is significant to KM success	REJECTED
KS1	REJECTED	Good Knowledge Structure is not significant to KM success
KS2	Knowledge Maintenance is significant to KM success	REJECTED

KS3	REJECTED	Establish a set of KM Performance Measurement is not significant to KM success
KS4	REJECTED	Systematic Knowledge Process is not significant to KM success
KS5	REJECTED	KM Strategy is linked with Business Strategy is not significant to KM success
KS6	Integrate KM in Business Process is significant to KM success	REJECTED
HR1	Incentives and Rewards is significant to KM success	REJECTED
HR2	REJECTED	Employee Involvement in KM Implementation is not significant to KM success
HR3	REJECTED	KM Training of Employees is not significant to KM success
HR4	REJECTED	Workers' Buy-ins is not significant to KM success
HR5	Employee Empowerment is significant to KM success	REJECTED

OS1	REJECTED	Formal KM Employees is not significant to KM success
OS2	REJECTED	Simple, Flat and Less Intricate Organizational Structure is not significant to KM success
OS3	Flexibility of Organizational Structure is significant to KM success	REJECTED

CHAPTER 5

DISCUSSION

Research Question 1: What are the CSFs of KM implementation?

The purpose of this study is to the role of KM in SMEs. It sought to define what CSFs are important to SMEs in Malaysia. In addition, this research explore the relationship between CSFs of KM implementation and KM success.

The results derived from research question one (1) helps to achieve the first objective of this study by exploring the CSFs of KM in SMEs. The ranking of CSFs allows practitioners to identify the most important CSFs of KM implementation in Malaysia. It acts as a guideline for practitioners during KM implementation.

The top three (3) important CSFs in Malaysia are good knowledge structure, appropriate IT infrastructure for KM and strong trust relationship. According to Bolisani & Scarso (1999), IT allows organization to disseminate and share knowledge without geographical boundaries. It gives the employees opportunities to collaborate and share knowledge within the firm (Davenport & Klahr 1998). It is also proven by Liebowitz (1999), Lindner & Wald (2011), Wong & Aspinwall (2005) and Yeh et al. (2006) that IT infrastructure is an important component required for KM implementation.

According to Choi (2000), a good knowledge structure – advantageous, current, reliable knowledge can be harnessed and generated by sharing with clients and vendors. Nowadays, clients play the role in defining the products or services that is able to meet their needs. Besides, vendors too need the information to design products or services that meet customers' requirements. Thus, a well-established knowledge structure is important. Besides, considering the importance of clients and vendors, a strong relationship must be established. For this purpose, many organizations set up extranets with their clients and vendors. Nonetheless, respect and trust is important to achieve the expected results of knowledge sharing (Buckman 1999). With good trust relationship, tacit knowledge can be expressed and shared (Lang 2001). This probably explain why strong trust relationship and good knowledge structure are ranked at the top three most important CSFs in KM implementation.

On the other hand, factors that have lower ranking such as formal KM employees, employee empowerment and flexibility of organizational structure should not be overlooked. An article in Computerworld by Cole-Gomolski (1999) mentioned that most organizations think that having a CKO is not the right way to harness knowledge as they prefer KM experts to be part of the business units. They explained that it is easier to promote KM if the responsibility is on the end users – the workers themselves. As an evidence, the article cites a study by Boston's Delphi Group. Twenty-five companies which practices KM were being studied and was found that knowledge sharing happens within business units. This might

explain the reason of formal KM employees being a less important CSF in KM implementation.

Anahotu (1998) mentioned that employee empowerment allows employees to take extra duties in solving organizational problems which gives them an opportunity to obtain new skills and knowledge. These new skills and knowledge are the assets of the firm which can be documented or shared among the workers. However, Elnaga & Imran (2014) stated that employee empowerment will decelerate processes due to the amount of opinions and inputs. As such, the management team may be less comfortable to implement such policy.

Research Question 2: Is there a significant relationship between CSFs and KM success?

The results derived from research question two (2) helps to achieve the second objective of this study. From the results, it can be concluded that there is a significant relationship between some of the CSFs and KM success.

Support and commitment from top management, teamwork, collaborative culture, system quality, knowledge maintenance, integrate KM in business process, incentives and rewards, employee empowerment and flexibility of organizational structure have are significant to KM success.

A research done by Keramati & Azadeh (2007) shows that top management support and commitment have significant impact on KM success which is similar to the findings of this study. This is due to the ability of senior managers in developing the programs and policies which will affect KM success (Guns &

Valikangas 1998). The role to maintain employee's morale during the change period will also impact on KM success (Salleh & Goh 2002).

Incentives and reward is significant to KM success. According to Gumbley (1998), rewards building in terms of future training and development may affect KM success. However, a long-term reward structure is more preferable to ensure consistent input from employees.

(Nonaka 1991) mentioned knowledge is dynamic. Lack of knowledge maintenance will result in knowledge obsolete which may impact KM success. Activities in knowledge maintenance can include preservation of context, destruction of old knowledge, integration of knowledge and segmenting of knowledge. Desouza & Awazu (2006) mentioned that employees abandon computer-based KM tools (failed KM initiatives) due to the poor maintenance of KM system.

Russell (2005) stated that the integration of KM into business process can boost productivity and effectiveness of decision making. Without integrating KM into business process, KM may be abandoned and in time, it will be forgotten which will result in failure of KM implementation.

Jones & Leonard (2009) mentioned that collaborative culture is significant to KM success. A collaborative culture promotes knowledge sharing which is important in implementing KM (Greengard 1998). Therefore, it plays a significant role in KM success.

CHAPTER 6

CONCLUSION

6.1   Conclusion

This study has reviewed previous literatures on KM in SMEs. Today's fast pace environment, effective KM is one of the main challenges faced by SMEs. Hofer & Charan (1984) mentioned that founders or managers of SMEs are often caught up by business operations which refrains them from confronting the issue. However, as KM is playing an important role in the success of a firm, the management team can no longer ignore the importance of KM.

This paper drew upon and enhance the work of previous scholars and reorganize twenty-nine (29) CSFs of KM implementation with the hope of helping SMEs in Malaysia to have a better KM implementation plan in their organization. According to (Wiig 1997), such research allows firms to understand the best value of their knowledge assets and thus, taking actions to secure viabilities.

Additionally, future research may replicate this study to enhance the CSFs as a contribution to effective KM implementation in SMEs Malaysia.

6.2   Limitations and Future Research

As interesting as it is the results of this study, there are some limitations which must not be forgotten. The number of responses for this study was rather small. Nevertheless, this was inevitable as KM is an emerging field and only a minority

of SMEs have implemented KM. A larger number of responses would probably give a more precise results. Thus, future research in such field should consider drawing responses from a larger sample group. However, the strength of this research methodology lies in its comprehensive review of previous work.

The respondents selected for the questionnaire are either from Klang Valley or Penang. This provides an opportunity for future research as the results in this study may not be generalized to other states in Malaysia. While this study did not target a particular industry, future studies can be industry-focused.

A mixed method approach can be considered for future work as it would allow a more holistic understanding of KM in SMEs than is possible using only quantitative approach. Beside, a longitudinal study should be considered to study the changes of KM overtime as SMEs grow older and face new obstacles.

REFERENCE

Abell, A. & Oxbrow, N., 1999. *People who make knowledge management work: CKO, CKY or KT?* J. Liebowitz, ed., Boca Raton, FL: CRC Press.

Ahire, S.L., Golhar, D.Y. & Walker, M.A., 1996. Development and validation of TQM implementation constructs. *Decision Sciences*, 27(1), pp.23–56.

Ahmed, P., Loh, A. & Zairi, M., 1999. Learning through knowledge management. *Total Quality Management*, 10(4), pp.426–434.

Alavi, M. & Leidner, D.E., 2001. Review: knowledge management and knowledge management systems: conceptual foundations and research issues. *MIS Quaterly*, 25(1), pp.107–136.

Albors-Garrigos, J., Ramos, J.C. & Mas-Machuca, M., 2010. Actional intelligence, a critical competence for innocation performance. A research multi-case analysis. *International Journal Technology and Planning*, 6(3), pp.210–225.

Aliaga, M. & Gunderson, B., 2000. *Interactive Statistics*, Upper Saddle River, NJ: Prentice Hall.

Allee, V., 1997. 12 principles of knowledge management. *Training and Development*, 51(11), pp.71–74.

Anahotu, N.D., 1998. Empowerment and Production Workers: A Knowledge-Based Perspective. *Empowerment in Organizations*, 6(7), pp.177–189.

Andale, 2014. Statistics How To. Available at:

http://www.statisticshowto.com/cronbachs-alpha-spss/.

Antonius, R., 2003. *Interpreting Quantitative Data with SPSS*, London, Thousand Oaks, New Delhi: Sage Publications.

Ardichvilli, A., Page, V. & Wentling, T., 2003. Motivation and barriers to participation in virtual knowledge-sharing communities of practice. *Journal of Knowledge Management*, pp.64–77.

Arora, R., 2002. Implementing KM - a balanced score card approach. *Journal of Knowledge Management*, 6(3), pp.240–249.

Austin, R. & Larkey, P., 2002. *The future of performance measurement: measuring knowledge work*, Cambridge.

Baker, T., 1994. *Doing Social Research* 2nd ed., New York: McGraw-Hill.

Beijerse, R.P., 2000. Knowledge management in small and medium-sized companies: knowledge management for entrepreneurs. *Journal of Knowledge Management*, 4(2), pp.162–179.

Berlade, S. & Harman, C., 2000. Using human resources to put knowledge to work. *Knowledge Management Review*, 3, pp.26–29.

Berry, H., 2014. Global integration and innovation: Multicountry knowledge generation within MNCs. *Strategic Management Journal*, 35, pp.869–890.

Bhatt, G.D., 2002. Management strategies for individual knowledge and organizational knowledge. *Journal of Knowledge Management*, 6(1), pp.31–39.

Blackler, F., 1995. Knowledge, Knowledge Work and Organizations. *Organization Studies*, 16(6).

Bolisani, E. & Scarso, E., 1999. Information technology management: a knowledge-based perspective. *Managing Customer Support Knowledge*, 19, pp.209–217.

Bose, R., 2004. Knowledge management metrics. *Industrial Management & Data Systems*, 104(6), pp.457–468.

Bozbura, F.T., 2007a. Knowledge management practices in Turkish SMEs. *Journal of Enterprise Information Management*, 20(2), pp.209–221.

Bozbura, F.T., 2007b. Knowledge management practices is Turkish SMEs. *Journal of Enterprise Information Management*, 20(2), pp.209–221.

Brandt Jones, M., 2009. *ORGANIZATIONAL CULTURE AND KNOWLEDGE MANAGEMENT : AN EMPIRICAL INVESTIGATION OF U . S . MANUFACTURING FIRMS By A DISSERTATION Submitted to H . Wayne Huizenga School of Business and Entrepreneurship Nova Southeastern University in partial fulfillment of th*.

Bridge, S., O'Neil, K. & Cromie, S., 2003. *Understanding Enterprise, Entrepreneurship and Small Business* 2nd ed., Basingstoke and New York: Palgrave Macmillan.

Brush, C., 1992. Marketplace information scanning activities of new manufacturing ventures. *Journal of Small Business Management*, 30(4),

pp.41–53.

Brush, C. & Vanderwaf, P.A., 1992. A comparison of methods and sources for obtaining methods estimates of new venture performance. *Journal of Business Venturing*, 7, pp.157–170.

Bryman, A. & Cramer, D., 2005. *Quantitative Data Analysis with SPSS 12 and 13: A Guide for Social Scientists*, London and New York: Routledge.

Buckley, P. & Casson, M., 1976. The future of the multinational enterprise.

Buckman, R., 1999. Collaborative knowledge. *Human Resource Planning*, 22(1), pp.22–33.

Carneiro, A., 2001. The role of intelligent resources in knowledge management. *Journal of Knowledge Management*, 5(4), pp.358–367.

Cavaleri, S.A., 2004. Leveraging organizational learning for knowledge and performance. *The Learning Organization*, 11(2), pp.159–176.

Caves, R., 1996. Multinational enterprise and economic analysis.

Chard, A.M., 1997. *Knowledge management at Ernst & Young*,

Chase, R.L., 1997. The knowledge-based organization: An international survey. *Journal of Knowledge Management*, 1(1), pp.38–49.

Choi, Y.S., 2000. *No TitleAn empirical study of factors affecting successful implementation of knowledge management*. University of Nebraska.

Chong, C.W. & Yeow, P.H.P., 2005. An Empirical Study of Perceived

Importance and Actual Implementation of Knowledge Management Process in the Malaysian Telecommunication Industry. In *Proceedings of ICTM 2005 Conference*. Melaka: Faculty of Business and Law, Multimedia University, pp. 182–192.

Chong, S.C., 2006. KM implementation and its influence on performance: an empirical evidence from Malaysian multimedia super corridor (MSC) companies. *Journal of Information and Knowledge Management*, 5(1), pp.21–37.

Chong, S.C. & Choi, Y.S., 2006. Critical factors of knowledge management implementation success. *Journal of Knowledge Management Practice*, 6(6).

Chourides, P., Longbottom, D., Murphy, W., et al., 2003. Excellence in knowledge management: an empirical study to identify critical factors and performance measures. *Measuring Business Excellence*, 7(2), pp.29–45. Available at: http://www.emeraldinsight.com/doi/full/10.1108/13683040310477977\nhttp://www.emeraldinsight.com/doi/pdfplus/10.1108/13683040310477977.

Chourides, P., Longbottom, D. & Murphy, W., 2003. Excellence in knowledge management: An empirical study to identify critical factors and performance measures. *Measuring Business Excellence*, 7(2), pp.29–45.

Choy, C.S., Yew, W.K. & Lin, B., 2006. Criteria for measuring KM performance outcomes in organisations. *Industrial Management & Data Systems*, 106(7), pp.917–936.

Ciganek, A.P., E., M. & Srite, M., 2008. Organizational culture for knowledge management systems: A study of corporate users. *Internation Journal of Knowledge Management*, 4(1), pp.1–16.

Cole-Gomolski, B., 1999. Knowledge "Czars" Fall from Grace. *Computerworld*, 33(1).

Collis, J. & Hussey, R., 2003. Business Research: A Practical Guide for Undergraduate and Postgraduate Students.

Corso, M. et al., 2003. Knowledge management confirgurations in Italian small-to-medium enterprise. *Integrated Manufacturing Systems*, 14(1), pp.46–57.

Crawford, C.., 2005. Effects of transformational leadership and organizational position knowledge management. *Journal of Knowledge Management*, 9, pp.6–16.

Creech, H., 2005. Success Factors in Knowledge Management. *International Institute for Sustainable Development*, pp.2–7.

Cronbach, L., 1951. *Coefficient alpha and the internal structure of tests*, Psychomerika.

Daft, R.F., 2007. *Understanding the theory and design of organizations*, mason, OH: Thomson South-Western.

Darroch, J. & McNaughton, R., 2003. Beyond market orientation: Knowledge management and the innovativeness of New Zealand firms. *European Journal of Marketing*, 37(3), pp.572–593.

Davenport, T.H. & Klahr, P., 1998. *Managing Customer Support Knowledge*,

Davenport, T.H., De Long, D.W. & Beers, M.C., 1998. Successful knowledge

    management projects. *Sloan Management Review*, 39(2), pp.43–57.

Davenport, T.H. & Prusak, L., 1998. *Working Knowledge : How Organizations*

    Manage What They Know,

Davenport, T.H. & Volpel, S.C., 2001. The rise of knowledge towards attention

    management. *Journal of Knowledge Management*, 5(3), pp.212–221.

Davis, T., 1996. Managing knowledge-work support functions. *Journal of*

    General Management, 22(1), pp.68–86.

Day, J. & Wendler, J., 1998. Best practice and beyond: Knowledge strategies. *The*

    McKinsey Quarterly, 1, pp.19–25.

Demarest, M., 1997. Understanding knowledge management. *Long Range*

    Planning, 30(3), pp.374–384.

Denzin, N.K. & Lincoln, Y.S., 1994. *Handbook of Qualitative Research*,

    Thousand Oaks, CA: Sage Publications.

Desouza, K.C., 2003. Barriers to effective use of knowledge management systems

    in software engineering. *Communications of the ACM*, pp.99–101.

Desouza, K.C. & Awazu, Y., 2006. Knowledge management at SMEs: five

    peculiarities. *Journal of Knowledge Management*, 10(1), pp.32–43.

DeVellis, R., 2003. *Scale development: theory and applications*, Thousand Oaks,

    CA: Sage.

Dollinger, M.J., 1984. Environmental boundary spanning and information processing effects on organizational performance. *Academy of Management Journal1*, 27(2), pp.351–368.

Dollinger, M.J., 1985. Environmental contacts and financial performances of the small firm. *Academy of Management Journal*, 23, pp.24–31.

Dougherty, V., 1999. Knowledge is about people, not databases. *Industrial and Commercial Training*, 31(7), pp.262–266.

Drucker, P., 1993. *Post-capitalist Society*, New York: Harper Collins.

Dunning, J., 1980. Toward an eclectic theory of internaional production: Some empirical tests. *Journal of Internation Business Studies*, 11, pp.9–31.

Earl, M.J., 1999. Opinion: what is a chief knowledge officer? *Sloan Management Review*, 40(2), pp.29–38.

Edvardsson, I.R. & Durst, S., 2013. Does knowledge management deliver the goods in SMEs? *Business and Management Research*, 2(2), pp.52–60.

Egbu, C.O., Hari, S. & Renukappa, S.H., 2005. Knowledge management for sustainable competitiveness in small and medium surveying practices. *Structural Survey*, 23(1), pp.7–21.

Ellis, J., 1997. *The role of knowledge management in enabling competitive advantage for Australian organizations in the global economy*. RMIT, Melbourne.

Elnaga, A.A. & Imran, A., 2014. The Impact of Employee Empowerment on Job

Satisfaction. *American Journal of Research Communication*, 2(1), pp.13–26.

Fidler, L.A. & Johnson, D.J., 1984. Communication and innovation implementation. *Academy of Management Review*, p.701.

Fink, K. & Ploder, C., 2009. Balanced system for knowledge process management in SMEs. *Journal of Enterprise Information Management2*, 22(1), pp.36–50.

Galagan, P., 1997. Galagan, P.Smart companies. *Training and Development*, 51(12), pp.20–26.

Goffee, R. & Jones, G., 1996. What holds the modern company together? *Harward Business Review*, 74(6), pp.138–148.

Goh, S.C., 2002. Managing effective knowledge transfer: an integrative framework and some practice implications. *Journal of Knowledge Management*, 6(1), pp.23–30.

Gold, A.H., Malhotra, A. & Segars, A.H., 2001. Knowledge Management: An Organizational Capabilities Perspective. *Journal of Management Information Systems*, 18(1).

De Gooijer, J., 2000. Designing a knowledge management performance framework. *Journal of Knowledge Management*, 4(4), pp.303–310.

Grangel, R., Chalmeta, R. & C., C., 2007. A modeling framework for sharing knowledge.

Gray, C., 2003. Managing the impact of broadband on microfirms and their

networks. *The European Journal of Teleworking*, 9(1), pp.4–16.

Greengard, S., 1998. Will your culture support KM? *Workforce*, 77(10), pp.93–94.

Grover, V. & Davenport, T.H., 2001. General perspectives on knowledge management: Fostering a research agenda. *Journal of Management Information Systems2*, 18(1), pp.5–21.

Gumbley, H., 1998. Knowledge management. *Work Study*, 47(5), pp.175–177.

Gunduz, M., Nielsen, Y. & Ozdemir, M., 2013. Quantification of delay factors using the relative importance index method for construction projects in Turkey. *Journal of Management in Engineering*, 29(2), pp.133–139.

Guns, W.D. & Valikangas, L., 1998. Rethinking Knowledge Work: Creating Value through Idiosyncratic Knowledge. *Journal of Knowledge Management1*, 1(4), pp.287–293.

Gupta, B., Lakshmi, S. & Iyer, J.E.A., 2000. Knowledge management: Practices and challenges. *Industrial Management & Data Systems*, 100(1), pp.17–21.

Hall, R. & Andriani, P., 2002. Managing knowledge for innovation. *Long Range Planning*, 35(1), pp.29–48.

Hasanali, F., 2002. Critical success factors of knowledge management. *Knowledge Management Advantage*, (September), pp.1–4. Available at: http://polaris.umuc.edu/mts/TMAN/TMAN_636/articles/csfs.pdf.

Hiebeler, R.J., 1996. Benchmarking: Knowledge Management. *Planning Review*,

24(2), pp.22–29.

Hofer, C. & Charan, R., 1984. The transition to professional management: mission impossible? *American Journal of Small Business*, 9(1), pp.1–11.

Holsapple, C.W. & Joshi, K.D., 2000. An investigation of factors that influence the management of knowledge in organizations. *The Journal of Strategic Information Systems*, 9, pp.235–261.

Horak, B.J., 2001. Dealing with human factors and managing change in knowledge management: a phased approach. *Topics in Health Information Management*, 21(3), pp.8–17.

Hutchinson, V. & Quintas, P., 2008. Do SMEs do knowledge management? Or simply manage what they know? *International Small Business Journal*, 26(2), pp.131–154.

Hutt, M.D. & Speh, T.W., 2001. *Business Marketing Management: A Stategic View of Industrial and Organizational Markets* 7th ed., Ford Worth: Dryden Press.

Hymer, S., 1976. The international operations of national firms.

Ichijo, K., Krough, G. & Nonaka, I., 1998. *Knowledge enablers* G. Krough & J. Roos, eds., London: Sage Publications.

Jager, M.D., 1999. The KMAT: Benchmarking knowledge management. *Library Management*, 20(7), pp.367–372.

Jarillo, J.C., 1989. Entrepreneurship and growth: the strategic use of external

resources. *Journal of Business Venturing*, 4(2), pp.133–147.

Jarrar, Y.F., 2002. Knowledge management: learning for organizational experience. *Managerial Auditing Journal*, 17(6), pp.322–328.

Jeffcoate, J., Chappell, C. & Feidnt, S., 2000. Attitudes towards process improvement among SMEs involved in e-commerce. *Knowledge and Process Management*, 7(3), pp.187–195.

Jones, K. & Leonard, L.N.K., 2009. From Tacit Knowledge to Organizational Knowledge for Successful KM. , pp.27–39.

Kalling, T., 2003. Organization-internal transfer of knowledge and the role of motivation: A qualitative case study. *Knowledge and Process Management*, 10(2), pp.115–126.

Kappes, S. & Thomas, B., 1993. A model for knowledge worker information support. *Knowledge Worker Information Managementq*, pp.1–4.

Keramati, A. & Azadeh, M.A., 2007. Exploring the Effects of Top Management's Commitment on Knowledge Management Success in Academia: A case study. *Internation Journal of Social, Behavioural, Educational, Economic,, Business and Industrial Engineering*, 1(3), pp.59–64.

Kerlinger, F.N. & Howard, B.L., 1999. *Foundations of Behavioral Research* 4th ed., Cambridge, MA: International Thomson Publishing.

Kikoski, C.K. & Kikoski, J.F., 2004. *The Inquiring Organization*,

Kirk, J. & Miller, M., 1986. *Reliability and Validity in Qualitative Research*,

London, England: Sage Publications.

KPMG International, 2000. *Knowledge Management: Research Report 2000*, London.

Lai, M. & Lee, G., 2007. Relationships of organization culture toward knowledge activities. *Business Process Management*, 13(2), pp.306–322.

Lang, J.C., 2001. Managerial concern in knowledge management. *Journal of Knowledge Management*, 5(1), pp.43–59.

Larson, M., 1999. Replacing the quality craftsman. *Quality Progress*, 38, pp.48–51.

Lee, H. & Choi, B., 2003. Knowledge management enablers, processes, and organizational performance: an integrative view and empirical examination. *Journal of Management Information Systems*, 20(1), pp.179–228.

Lee, J.H. & Kim, Y.G., 2001. A stage model of organizational knowledge management: A latent contect analysis. *Expert Systems with Applications*, 20, pp.299–311.

Lee, S.M. & Hong, S., 2002. An enterprise-wide knowledge management system infrastructure. *Industrial Management & Data Systems*, 6(4), pp.413–426.

Leonard-Barton, D.A., 1995. *Wellsprings of knowledge: Building and sustaining sources of innovation*, Boston.

Lev, B., 1997. The old rules no longer apply. *Forbes ASAP*, pp.35–36.

Liebowitz, J., 1999. Key ingredients to the success of an organization's

knowledge management strategy. *Knowledge and Process Management*, 6(1), pp.37–40. Available at: http://doi.wiley.com/10.1002/(SICI)1099-1441(199903)6:1<37::AID-KPM40>3.0.CO;2-M.

Liebowitz, J. & Wilcox, L., 1997. Knowledge Management and Its Integrative Elements. *CRC Press*.

Lim, D. & Klobas, J., 2000. Knowledge management in small enterprises. *The Electronic Library*, 18(6), pp.420–433.

Lindner, F. & Wald, A., 2011. Success factors of knowledge management in temporary organizations. *Internation Journal of Project Management*, 29, pp.877–888.

De Long, D.W., Davenport, T.H. & Beers, M.C., 1996. *The processes and practices of knowledge management*,

De Long, D.W. & Fahey, L., 2000. Diagnosing cultural barriers to knowledge management. *The Academy of Management Executive*, 14(4), pp.113–127.

Lubit, R., 2001. Tacit Knowledge and Knowledge Management: The Keys to Sustainable Competitive Advantage. *Organization Dynamics*, 29(4), pp.164–178.

Madhoshi, M. & Saadati, A., 2011. Study of the impact of knowledge management process on organizational entrepreneurship, case study of small and medium-sized businesses of Eastern Mazandaran. *Entrepreneurship Development Jounal*, 3(12), pp.7–26.

Malhotra, Y., 2005. Integrating knowledge management technologies in organizational business processes: getting real time enterprises to deliver real business performance. *Journal of Knowledge Management*, 9(2), pp.7–28.

Malhotra, Y., 1998. TOOLS@WORK: Deciphering the Knowledge Management Hype. *Journal of Quality and Participation: Special Isssue on Learning and Information Management*, 21(4), pp.58–60.

Malone, M., 1997. New metrics for new age. *Forbes ASAP*, pp.40–41.

Manasco, B., 1996. Leading firms develop knowledge strategies. *Knowledge Inc.*, 1(6), pp.26–29.

Marczyk, G., DeMatteo, D. & Festinger, D., 2005. *Essentials of Research Design and Methodology*, New Jersey: John Willey & Sons.

Martensson, M., 2000. A critical review of knowledge management as a management tool. *Journal of Knowledge Management*, 4(3), pp.204–216.

Matlay, H., 2000. Organisational learning in small learning organisations: an empirical overview. *Education + Training*, 42(4), pp.202–211.

McAdam, R. & Reid, R., 2001. SME and large organization perceptions of knowledge management: comparisons and contrasts. *Journal of Knowledge Management*, 5(3), pp.231–241.

McDermott, R. & O'Dell, C., 2001. Overcoming cultural barriers to sharing knowledge. *Journal of Knowledge Management*, 5(1), pp.76–85.

McNeese, B., 2016. Are the Skewness and Kurtosis Useful Statistics. Available

at: https://www.spcforexcel.com/knowledge/basic-statistics/are-skewness-and-kurtosis-useful-statistics#skewness.

Meso, P. & Smith, R., 2000. A resource-based view of organizational knowledge management systems. *Journal of Knowledge Management*, 4(3), pp.224–234.

Migdadi, M., 2008. Knowledge Management Enablers and Outcomes in the Small-and-Medium Sized Enterprises. *Emerald Insight Pulishing Limited*, 109(6), pp.840–858.

Miles, M.B. & Huberman, A.M., 1994. *Qualitative Data Analysis*, Thousand Oaks, CA: Sage Publications.

Mujis, D., 2010. *Doing Quantitative Research in Education with SPSS* 2nd ed., Sage Publications.

National SME Developement Council, 2013. Circular on New Definition of Small and Medium Enterprises (SMEs). Available at: http://www.bnm.gov.my/index.php?ch=en_announcement&pg=en_announcement_all&ac=259.

Newkirk, T., 1999. The politics of composition research: The conspiracy against experience. In R. Bullock & J. Trimbur, eds. *The Politics of Writing Instruction: Postsecondary*. Portsmouth, NH: Heinemann, pp. 119–135.

Nonaka, I., 1991. The knowledge-creating company. *Harvard Business Review*, 69(6), pp.96–104.

Nonaka, I. & Takeuchi, H., 1995. *The knowledge creating company book*,

Nonaka, I., Toyama, R. & Konno, N., 2000. SECI, Ba, and leadership: a unified
model of dynamic knowledge creation. *Long Range Planning*, 33, pp.5–34.

Ntoumanis, N., 2001. *A Step-by-Step Guide to SPSS for Sport and Exercise
Studies*, London: Routledge.

Nunnally, J. & Bernstein, L., 1994. *Psychometric theory*, New York: McGraw-
Hill Higher.

O'Dell, C., 1996. A current review of knowledge management best practices. In
Conference of Knowledge Management and the Transfer of Best Practices.
London: Business Intelligence.

Pan, S.L. & Scarbrough, H., 1998. A socio-technical view of knowledge-sharing
at Buckman Laboratories. *Journal of Knowledge Management*, 2(1), p.55.
Available at:
http://proquest.umi.com/pqdweb?did=34969590&Fmt=7&clientId=23852&
RQT=309&VName=PQD.

Pemberton, J.D., Stonehouse, G.H. & Francis, M.S., 2002. Black and Decker -
towards a knowledge-centric organization. *Knowledge and Process
Management*, 9(3), pp.178–189.

Penrose, E.T., 1959. The theory of the growth of the firm.

Polanyi, M., 1967. *The Tacit Dimension* Anchor Books, ed., New York.

Qualitative Research Consultants Association, 2015. What is Qualitative

Research? Available at: http://www.qrca.org/?page=whatisqualresearch.

Ramus, C.A., 2001. Organizational support for employees: Encouraging creative ideas for environmental sustainability. *California Management Review*, 43(3), pp.85–105.

Ranjit, B., 2004. Knowledge management metrics. *Industrial Management & Data Systems*, 104(6), pp.457–468.

Rasheed, N., 2005. The impact of knowledge management on SMEs.

Reichardt, C.S. & Rallis, S.F., 1994. Qualitative and quantitative inquiries are not compatible: A call for a new partnership. In C. Reichardt & S. Rallis, eds. *The Qualitative-Quantitative Debate: New Perspectives*. San Francisco, CA: Josey-Bass, pp. 85–92.

Robertson, M. & Hammersley, G.O., 2000. Knowledge management practices within a knowledge-intensive firm: the significance of the people management dimension. *Journal of European Industrial Training*, 24(2), pp.241–253.

Rockart, J.F., 1979. Chief executives define their own data needs. *Harvard Business Review*, 57(2), pp.81–93.

Rowley, J., 2004. Partnering paradigms? Knowledge management and relationship marketing. *Industrial Management & Data Systems*, 40(3), pp.80–90.

Ruggles, R., 1998. The state of the nation: knowledge management in practice.

Journal of Knowledge Management, 2(2), pp.59–69.

Russell, L., 2005. *The Fusion of Process and Knowledge Management*, Texas.

Ryan, S.D. & Prybutok, V.R., 2001. Factors affecting knowledge management technologies: a discriminative approach. *Journal of Computer Information Systems*, 41(3), pp.31–37.

Salkind, N.J., 2007. *NEncyclopedia of Measurement and Statistics: Volume 1*, Thousand Oaks, London, New Delhi: Sage Publications.

Salleh, Y. & Goh, W.., 2002. Managing Human Resources toward achieving knowledge management. *Journal of Knowledge Management2*, 6(5), pp.457–468.

Sanchez, R., 2004. "Tacit Knowledge" versus "Explicit Knowledge." *Approaches to Knowledge Management Practice*.

Savary, M., 1999. NoKnowledge management and competition in the consulting industry. *California Management Review*, 41(2), pp.95–107.

Scarborough, H., Swann, J. & Preston, J., 1999. *Knowledge Management: A Literature Review*,

Sedera, D., Gable, G. & Chan, T., 2003. Knowledge management for ERP success. In *Seventh Pacific Asia Conference on Information Systems*. Adelaide, pp. 1405–1420.

Sharp, D., 2003. Knowledge management today: challenges and opportunities. *Information Systems Management*, 20(2), pp.32–37.

Singh, S.K., 2008. Role of leadership in knowledge management: a study. *Journal of Knowledge Management*, 12(4), pp.3–15. Available at: http://search.proquest.com/docview/230318443?accountid=40346\nhttp://hq 8yw8za7q.search.serialssolutions.com/?ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&rfr_id=info:sid/ProQ:abiglobal&rft_val_fmt=info:ofi/fmt:kev:mtx:journal &rft.genre=article&rft.jtit.

Siniscalco, M.T. & Auriat, N., 2005. *Questionnaire design: Module 8; Quantitative research methods in educational planning; 2005* N. R. Kenneth, ed., UNESCO International Institute for Educational Planning. Available at: http://unesdoc.unesco.org/images/0021/002145/214555e.pdf.

Skyrme, D. & Amidon, D., 1997. The knowledge agenda. In *The Knowledge Management Yearbook 1999-2000*. pp. 108–125.

SME Info, ., 2016. Importance of SME. Available at: http://www.smeinfo.com.my/index.php?option=com_content&view=article &id=82&Itemid=57&lang=en.

Smith, A., 2001. A roadmap for knowledge management. *Journal of Knowledge Management2*, 8(3), pp.6–16.

Stankosky, M., 2005. *No TitleCreating the discipline of knowledge management: The latest in university research*, Oxford: Elsevier Butterworth-Heinemann.

Stewart, T., 1997. *Intellectual Capital: The New Wealth of Organizations*, New York.

Stonehouse, G.H. & Pemberton, J.D., 1999. Learning and knowledge management in the intelligent organization. *Participation and Empowerment: An International Journal*, 7(5), pp.131–144.

Streiner, D.L., 2003. Starting at the beginning: an introduction to coefficient alpha and internal consistency. *Journal of personality assessment*, 80(1), pp.99–103.

Takeuchi, H., 1998. Beyond Knowledge Management- Lessons from Japan. Available at: http://www.sveiby.com/ articles/LessonsJapan.htm.

Tan, L.P. & Wong, K.Y., Development of Knowledge Management Measurement Metrics and Their Importance in Performance Measurement. , pp.541–549.

Teece, D.J., 2004. Handbook on Knowledge Management 1: Knowledge Matters. In C. W. Holsapple, ed. Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 129–152. Available at: http://dx.doi.org/10.1007/978-3-540-24746-3_7.

Theriou, N., Maditinos, D. & Theriou, G., 2011. Knowledge management enabler factors and firm performance: An empirical research of the Greek medium and large firms. *European Research Studies Journal*, 14(2), pp.97–134. Available at: http://www.scopus.com/inward/record.url?eid=2-s2.0-84866687392&partnerID=40&md5=f229761875779088728244450467b015d.

De Tienne, K.B. et al., 2004. Toward a model of effective knowledge maangement and directions for future research: Culture, leadership, and CKOs. *Journal of Leadership & Organizational Studies*, 10(4), pp.26–43.

De Tienne, K.B. & Jackson, L.A., 2001. Knowledge management: understanding theory and developing strategy. *Competitiveness Review*, 11(1), pp.1–11.

Truch, E., 2001. Managing personal knowledge: the key to tomorrow's employability. *Journal of Change Management*, 2(2), pp.102–105.

Wah, L., 1999. Making knowledge stick. *Management Review*, 88(5), pp.24–29.

Wang, M. & Yang, T., 2016. Asia Paci fi c Management Review Investigating the success of knowledge management : An empirical study of small- and medium-sized enterprises. *Asia Pacific Management Review*. Available at: http://dx.doi.org/10.1016/j.apmrv.2015.12.003.

Waters, J., Correlational Research Guidelines. Available at: https://www.capilanou.ca/psychology/student-resources/research-guidelines/Correlational-Research-Guidelines/.

Weisstein, E.W., 2016. Kurtosis. *MathWorld - A Wolfram Web Resource*. Available at: http://mathworld.wolfram.com/Kurtosis.html.

Wiig, K., 1997. Knowledge management: where did if come from and where will it go? *Journal of Expert Systems with Applications*, 13(1), pp.1–14.

Wiig, K.M., 2000. Knowledge management: An Emerging Discipline with a Long History. *Knowledge horizons: the present and the promise of knowledge management*, pp.3–26. Available at: http://www.krii.com/downloads/km_emerg_discipl.pdf.

Wild, R.H., Griggs, K.A. & Downing, T., 2002. A framework for e-learning as a

tool for knowledge management. *Industrial Management & Data Systems*, 102(7), pp.371–380.

Wong, K.Y., 2005. Critical success factors for implementing knowledge management in small and medium enterprises. *Industrial Management & Data Systems*, 105(3), pp.261–279.

Wong, K.Y. & Aspinwall, E., 2005. An Empirical Study of the Important Factors for Knowledge Management Adoption in the SME Sector. *Journal of Knowledge Management*, 9(3), pp.64–82.

Yeh, Y.J., Lai, S.Q. & Ho, C.T., 2006. Knowledge management enablers: a case study. *Industrial Management & Data Systems*, 106, pp.793–810.

Zack, M.H., 1999. Developing a knowledge strategy. *California Management Review*, 41(3), pp.125–145.

APPENDICES

Appendix 1: Descriptive Statistics for Responsibility of Senior Management

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
SM1	73	3	5	4.30	.639	-.359	.281	-.653	.555
SM2	73	3	5	4.26	.667	-.352	.281	-.749	.555
SM3	73	3	5	4.23	.677	-.322	.281	-.795	.555
SM4	73	2	5	4.22	.692	-.579	.281	.270	.555
Valid N (listwise)	73								

Appendix 2: Descriptive Statistics for Organizational Culture

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
OC1	73	2	5	4.29	.772	-1.110	.281	1.297	.555
OC2	73	2	5	4.19	.659	-.524	.281	.627	.555
OC3	73	3	5	4.32	.621	-.329	.281	-.619	.555
OC4	73	2	5	4.30	.701	-.994	.281	1.564	.555
OC5	73	2	5	4.26	.782	-1.035	.281	1.019	.555
OC6	73	2	5	4.34	.583	-.653	.281	2.005	.555
OC7	73	3	5	4.21	.645	-.217	.281	-.625	.555
OC8	73	2	5	4.18	.752	-.509	.281	-.388	.555
Valid N (listwise)	73								

Appendix 3: Descriptive Statistics for IT

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
IT1	73	2	5	4.26	.866	-1.065	.281	.491	.555
IT2	73	2	5	4.34	.837	-1.309	.281	1.305	.555
IT3	73	2	5	4.27	.786	-1.060	.281	1.020	.555
Valid N (listwise)	73								

Appendix 4: Descriptive Statistics for Knowledge Strategy

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
KS1	73	2	5	4.37	.697	-.907	.281	.622	.555
KS2	73	2	5	4.16	.746	-.898	.281	1.198	.555
KS3	73	2	5	4.23	.755	-1.015	.281	1.328	.555
KS4	73	2	5	4.07	.714	-.572	.281	.595	.555
KS5	73	2	5	4.14	.787	-.776	.281	.465	.555
KS6	73	2	5	4.11	.698	-.656	.281	.951	.555
Valid N (listwise)	73								

Appendix 5: Descriptive Statistics for HRM

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
HR1	73	2	5	3.99	.920	-.522	.281	-.618	.555
HR2	73	3	5	4.25	.662	-.317	.281	-.728	.555
HR3	73	1	5	4.07	.822	-1.054	.281	1.990	.555
HR4	73	2	5	3.99	.790	-.322	.281	-.487	.555
HR5	73	1	5	3.92	.812	-.966	.281	1.800	.555
Valid N (listwise)	73								

Appendix 6: Descriptive Statistics for Organizational Structure

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
OS1	73	1	5	3.93	1.084	-1.003	.281	.257	.555
OS2	73	1	5	3.96	1.020	-.966	.281	.255	.555
OS3	73	1	5	3.84	1.054	-.977	.281	.588	.555
Valid N (listwise)	73								

Appendix 7: Cronbach's Alpha (Responsibility of Senior Management)

Reliability Statistics

Cronbach's Alpha	N of Items
.758	4

Appendix 8: Cronbach's Alpha (Organizational Culture)

Reliability Statistics

Cronbach's Alpha	N of Items
.801	8

Appendix 9: Cronbach's Alpha IT)

Reliability Statistics

Cronbach's Alpha	N of Items
.838	3

Appendix 10: Cronbach's Alpha (Knowledge Structure)

Reliability Statistics

Cronbach's Alpha	N of Items
.755	6

Appendix 11: Cronbach's Alpha (HRM)

Reliability Statistics

Cronbach's Alpha	N of Items
.755	5

Appendix 12: Cronbach's Alpha (Organizational Structure)

Reliability Statistics

Cronbach's Alpha	N of Items
.887	3

Appendix 13: Cronbach's Alpha (KM Success Indicator)

Reliability Statistics

Cronbach's Alpha	N of Items
.834	11