An Empirical study of IT based Knowledge Management Systems Implementation

A comparative study with the Kuwait and the UK public sectors and proposed model for best practice knowledge management

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Submitted for the degree of Doctor of Philosophy

School of Management

University of Bradford

2003

ABSTRACT

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An empirical study of IT-based Knowledge Management Systems Implementation: A comparative study the Kuwait and the UK public sectors, with a proposed model for best practice knowledge management.

Keywords: Knowledge management, knowledge management system, intellectual capital, information technology.

Knowledge Management (KM) helps extend the knowledge of individuals or groups across organisations in ways that directly affect performance. Further, it is a formalised and integrated approach to identify and manage an organisation's knowledge assets.

The study is an exploratory investigation of the implementation of IT-based Knowledge Management Systems. It is also a comparative study of the Kuwait and UK public sectors with the specific aim of building a best practice model for KM implementation in conjunction with IT. This includes examination of the relevant literature, a comprehensive analysis of case studies of KM implementation in 91 organisations presented in the literature, in order to arrive at the most critical factors of KM implementation and their degree of criticality, and an exploratory survey of 68 organisations both in the UK and Kuwait relating to their experiences in implementing initiatives such as KM and the role of IT in that process. In view of the intensive and extensive data for interdependence relationships between variables, statistical techniques were used, and in-depth studies of 16 leading organisations, to understand how the KM implementation processes and the critical factors identified were addressed and implemented.

This study identifies critical factors of success in KM domain that applicable to Kuwaiti organisations. These factors were categorised under four different headings: (1) Technology, (2) KM processes, (3) Change management, (4) Top management commitment. A generic holistic model for effective KM implementation is proposed.

Acknowledgements

I would like to express sincere prayers to our god for giving me the courage and strength to accomplish this work

I would like to take this opportunity to convey my sincere thanks and appreciation to the people who have richly shaped and influenced my life over the course of this study. They deserve very special thanks for their support, encouragement, and good humour.

I owe a debt of gratitude to my supervisor. Professor Mohamed Zairi, for his sustained patience, support and guidance during the design, execution, and completion of this thesis. His encouragement, which extended beyond the requirements of an academic relationship, is deeply appreciated.

Many thanks to Mr. John B. Kitching for the continuous friendly advice, patience, and helpful comments during the period of this work.

My special thanks and appreciation are extended to my sponsor, Ministry of interior, for its financial support and encouragement for my research. Also, Professor Abd almehsen AlMada'age, the entire department of training and scholarships (partially, Col. Hani Sabti and Col.Dr. Waleed Bin-Salama) and the Kuwait Cultural Affairs Office staff (partially Dr. Bader Al-Daihani and Mrs. Majida) for great support, continuous friendly advice and cooperation during the period of this work

Thanks must also be extended to the staff and colleagues at European Centre for Total Quality Management (ECTQM) for their supportive and friendly attitude. In addition, I would like to thank those who devoted some of their valuable time and responded to the study questionnaire, as well as the leaders of the Kuwaiti and UK public sector organisations who accepted to respond to the questionnaire.

My deepest gratitude goes to my brothers and sisters for their support and motivation, which has provided me with the spirit and hope to overcome the natural problems of academic life.

Dedicated

My father
'May Allah bless him'
He was the one who taught me that commitment is the basis of success

My mother
Who always inspires me with her prayer, love and wisdom

My brothers
Mohammed, Hazza'a, Khaled, Ahmed, and Yusef

My sisters
Merriam, and Lollwa

My wife Wadha
Without whose sacrifice and encouragement.
This thesis would not have been possible

My sons and daughters
Abdullah, Musaad, Meshari, Awdah, Aseel, and Yasmin
For what they give to me, their love, understanding and patience

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CHAPTER ONE

Introduction

CHAPTER 1: INTRODUCTION

1.1 Background

Knowledge Management (KM) has in recent times come to feature as one of the most significant activities affecting business quality. KM is thus of rising interest in today's business. With the importance of KM being realised, businesses are viewing KM as a critical success factor in today's dynamic and limitless society.

KM is a relatively new concept, which originated since the early 1990s (Balla et al. 1999). Barclay and Murray, 2000 and Sullivan, 2000 trace the origins of KM to the early 1980s. Sullivan (2000) suggests that the concept was used by Itami in the Japanese literature in 1980. This article however, did not appear in English until 1987. In the early 1990s, Professor Baruch Lev at the Stem School of Management (New York) University, instigated his research into valuing intangibles.

In recent years, the importance of KM has been recognised both in acadamia and in the corporate arena. Organisations have instigated discussions regarding KM, organisational learning or learning organisation, organisational memory, and intangible assets. However, KM as a discipline is going through the maturity phase, and as such is far from an embedded process (Hansen et al., 1999).

APQC (2001c) maintain that knowledge supports the ability of every organisation to prosper. Every action and every output that delivers value must be aligned with one of the three platforms all businesses compete around: cost, time, and differentiation. KM will help the organisation to short-cycle internal processes, cut cost, and operate more effectively, subject to successful implementation.

It could be postulated that KM is necessary for organisations. For Malhotra (1998), it is very important, because what worked yesterday may or may not work tomorrow.

The literature review suggests that several large organisations have spent extensive amounts of capital on applying KM. This then implies that KM is perceived to be important and companies can gain great benefits by managing knowledge properly. For example, Buchman Laboratories, a specialist chemicals company that was an early adopter of a knowledge repository, spends 2.5 % of its revenues on KM. Similarly Ernst &Young spends 6 % of its revenues, and McKinsey & Co. 10 % on managing knowledge (Davenport et al., 1998), Chevron realised $150 million annual saving in power and fuel expenses from knowledge sharing, (O'Dell and Grayson, 1997), and Silicon Graphics reduced sales training costs from $3million to $200,000 by managing its product information communications process (Manasco, 1997).

Grey (1996) mentioned that companies are applying KM to serve customers well, and they must reduce their cycle times, operate with minimum fixed assets and overhead (people, inventory and facilities), shorten product development time, improve customer service, empower employees, innovate and deliver high quality products, enhance flexibility and adoption, capture information, create knowledge, share, and learn.

1.2 Knowledge Management Definition

Ever since KM emerged as a management initiative, there have been various proposed definitions for what knowledge is, and what kind of knowledge needs to be managed (Nonaka, 1994; Davenport et al., 1996; Alavi and Leidner, 1999)

Different organisations and authors interpret KM meaning and concept differently, they perceive knowledge by different aspect, that why the term knowledge management is not easy to define as because it contains multiple representations and concepts.

Many authors have the same opinion that KM requires a total organisational transformation, including organisational culture, structure, and management style (Sveiby, 1997b; Buchman, 1998; Davenport and Prusak, 1998a).

The basic building block of knowledge is data; the processing of data gets information, and as a result of processing information, knowledge is derived. Knowledge is the next natural progression and valued asset after information (Grey, 1996; Mullins, 1998; Zack, 1998; Newman, 1999)

Many researchers have defined KM from different perspectives, and a large number of debates tend to centre around the difference in meaning between information and knowledge. The present research examines some of the definitions; for example, Snowden (1999) defines KM as "the identification, optimisation, and active management of intellectual assets, either in the form of explicit knowledge held in artefacts or as tacit knowledge possessed by individuals or communities" (Snowden, 2000: 63).

Grey (1996) defines KM as "an audit of 'intellectual assets' that highlights unique sources, critical functions and potential bottlenecks which hinder knowledge flows to the point of use. It protects intellectual assets from decay, seeks opportunities to enhance decisions, services and products through adding intelligence, increasing value and providing flexibility"

Bertels (1996) defines KM as "the management of the organisation towards the continuous renewal of the organisational knowledge base - this means, e.g. creation of supportive organisational structures, facilitation of organisational members, putting IT-instruments with emphasis on teamwork and diffusion of knowledge (as, e.g. groupware) into place."

Finneran (1999) regards KM as a discipline that assists the spread of knowledge of individuals or groups across companies in ways that directly affect performance. KM envisions getting the Right Information within the Right Context to the Right Person at the Right Time for the Right Business Purpose.

Therefore, for Macintosh (1998), knowledge management involves the recognition and analysis of obtainable and required knowledge assets and knowledge asset-related processes, and the ensuing planning and control of actions to develop both the assets and the processes so as to fulfil organisational objectives.

Starr (1999) believes that KM is information or data management with the added process of capturing the tacit experience of the individual to be shared, used and built upon by the organisation, leading to increased productivity.

The short definition of KM is the process of creating value from an organisation's intangible assets. (Liebowitz, 1999b)

The two definitions of Starr (1999) and Liebowitz (1999b) that have almost the same meaning, which is that some processes (creating, capturing, and distributing) are important to get value and give power to organisation productivity.

Newman (1999) said that KM is finding the ways to turn data and information into reusable knowledge, these ways are creating, identifying, capturing, and distribute organisational knowledge to the people who need it. Further, she said that may the consulting company Ernst & Young (one of the leaders in managing internal knowledge) have the best definition of all "What people need to know to do their jobs".

1.3. Problem Definition

The researcher has perceived that most Kuwaiti public sector organisations spend large sums of money and time creating little productivity as well as lost advantages, and although they have wealthy resources they are unable to make total use of KM.

Further, the researcher attempted to examine if the organisations belonging to the Kuwaiti public sector had implemented any structure processes or model for effectively managing knowledge. It is crucial that these organisations understand their knowledge and look for more effective methods to manage and exploit it in order to be successful organisations and to achieve the full benefits of KM.

The researcher try to answer the key question that is "*Why the management in the Kuwaiti public sector organisations is unable to make total use of KM aspects in the way organisations conduct their day-to-day business, despite the vast array of IT resources available to them*".

The research challenge is therefore to determine the gaps associated with the various facets of KM within the Kuwait PSOs. Once the gap areas are identified, then an attempt is made to determine the real degree of the gaps.

It is envisaged that the eradication of these gaps through the process of identification will help the associated PSOs to improve their KM processes and strategy.

1.4 Justification and Significance of the Proposed Research

The justification for the proposed research comes from the increasing interest in KM, as business organisations are beginning to view knowledge as their most important strategic resource (Zack, 1998).

Based on the literature review, there are several organisations which have spent large sums of money on applying KM, which implies that KM is perceived to be very important and necessary by organisations in order to reap great strategic benefits (Grey, 1996; Malhotra, 1998; Manasco, 1999; Hildebrand, 2000; APQC, 2001c; Skyrme, 2001). Grey (1996) mentioned that companies are applying KM to serve customers well, and they must reduce their cycle times, operate with minimum fixed assets and overhead (people, inventory and facilities), shorten product development time, improve customer service, empower employees, innovate and deliver high quality products, enhance flexibility and adoption, capture information, create knowledge, share, and learn. Further, Grey suggested that none of this is possible without a continual concentration on the creation, updating, availability, quality, and use of knowledge by all employees and teams, at work and in the marketplace.

Moreover, Malhotra (1998) believes that KM is very important because what worked yesterday may or may not work tomorrow. People require knowledge at every level of an organisation to execute tasks and to grow as people.

1.5 Research Contribution

The results from this research are expected to be of great benefit to top managers, information system executives, strategic planners, business managers, and others who are implementing or planning to implement KM, and will contribute on the following:

1. Improving the understanding of knowledge management systems (KMS) activities in Kuwait, by presenting empirical and analytical study to expand the existing literature in relation to KM.
2. Increasing awareness of the importance of KM processes, and to attempt to project a better understanding of how KM could be approached effectively.
3. Encouraging policy makers and top management in public sectors to apply and implement KMS to improve the skills of the organisations and make them more effective and efficient.

1.6 Research Question

This research attempts to answer one key question: Why is management in the Kuwaiti public sector unable to make total use of KM systems with aspect to the way organisations conduct their day-to-day business, despite the existing IT resources available to them?

There are some sub-questions:

1. Do Kuwaiti public sector organisations (KPSOs) have a KM system?
2. Do KPSOs have clear plans and policies related to KM activities?
3. What is the current situation regarding the application of information technology (IT) within KM field and other information resources in the Kuwaiti public sector?
4. Do KPSOs face any difficulties and challenges regarding KM implementation?

5. Is there a difference between the Kuwaiti and UK public sectors regarding KM practices?

6. What are the factors that could affect the implementation and success of KM?

7. What are the factors that prevent the KPSO from using technology as KM tools?

1.7 Research Aim

The main aim of this research is exploratory in nature. This study attempts to provide a theoretical and analytical view of the current KM practices and their effectiveness (in the ensuing chapters of the present thesis). To this end, the researcher intends to assess and specify the factors that are related to these practices which affect the implementation of KM in the public sector in Kuwait and the UK. This involves the identification of CSFs related to KM implementation. It also involves the investigation of how KM processes and the critical elements identified are being addressed and implemented in public sectors.

1.8 Research Objectives

To achieve the above aims requires the specification of the following set of objectives:

1. To assess the current levels of application of information technology (IT) support for the implementation of KM and other information resources in the Kuwaiti public sector.

2. To assess the benefits from the effective implementation of IT-based knowledge systems in the Kuwait public sector.

3. To investigate and compare KM best practice in the UK and Kuwait public sectors.

4. To identify through secondary case study analysis the key building blocks for developing an integrated IT/ KM system.

5. To identify the factors that could affect the implementation and success of KM.

6. To propose a model for effective KM based on IT support for the public sector in Kuwait.

1.9 Research Methodology

This study represents an exploratory research that aims to enhance existing theories and understanding and practices of KM system implementation concepts from a holistic perspective. To this end, measurements of 'what' and 'how' are required to understand the processes concerning implementation of KM. The 'what' aspects of the present research require the use of quantitative methods, while the 'how' require the use of qualitative methods. In essence, a triangulation approach, which combines quantitative and qualitative methods, is adopted.

Following the collection of quantitative and qualitative data, analysis and external validation of data using a secondary empirical survey are to be undertaken.

The following sections will overview the data collection methods.

1.9.1 Quantitative Method (Survey)

It was agreed that the most suitable instrument would be 'self-administered, mail survey' – "one of the most frequently used methods for collecting data in research studies" (Bourque and Fielder, 1995). Based on the wide literature review, a standardised questionnaire is developed to collect data from some samples of the Kuwaiti and UK public sectors in order to elicit their experience regarding elements and key factors in holistic KM project implementation, and their effectiveness.

This research will attempt to obtain responses from organisation belonging to the Kuwaiti and UK PSOs, so that generalisation of the findings could be established.

The analysis of the data collected from completed questionnaires will follow a number of basic statistical techniques in order to identify and interpret the ratings of respondents.

1.9.2 Qualitative Methods

1.9.2.1 Interview

The interview is one method for the collection of data to be used in the research. It is one of the most widely used procedures in social research. Jones (1985) gives the following definition of the interview as a research method:

> *"The interview is a social interaction between two people in which the interviewer initiates, and varyingly controls the exchange with the respondent for the purpose of obtaining information relevant to an emerging or stated hypothesis"* (Jones, 1985:138).

There are several types of interview possible for use in this research, as outlined below:

1. Structured Interviews

Structured interviews present a controlled encounter where the interviewer decides what questions will be asked, their precise form, and prescribes the way the response will be heard and recorded.

In structured interviews, the interviewer asks the interviewee specific questions in order to obtain answers to particular topics. Interviewees usually have to choose one fixed optional answer, and therefore they do not have the freedom to expand their answers, unless they are answering open questions. Hitchcock and Hughes (1989:80) suggest that:

> *"The structured interview lies close to the questionnaire in both its form and the assumptions underlying its use. This is one of the most widely used types of interview, largely because of the wide range of uses to which it may be put, both inside and outside the social sciences".*

The use of structured interviews is associated with survey research. This is probably the technique with which most people are familiar. This method relies upon the use of a questionnaire as the data collection instrument. The theory behind this method is that each person is asked the same question in the same way, so that any differences between

answers are held to be real ones and not the result of the interview situation itself. This method is also increasingly popular in telephone interviews for marketing purposes (May, 1997).

2. Semi-structured interviews

This method gives an overtly controlling role to the interviewers who still set the agenda, wanting to know about particular topics. It is widely used, since they appear to give the respondent more scope to digress and yield unexpected insights, although this apparent freedom is often an illusion (Allen, 2001).

Questions are normally specified, but the interviewer has more freedom to probe beyond the answers in a manner which would appear prejudicial to the aims of standardisation and comparability. These types of interviews are said to allow people to answer more on their own terms than the structured interview permits, but still provide a greater structure for comparability over that of the unstructured interview. If a researcher has a specific focus for his/her interviews within a range of other methods employed in his/her study, the semi-structured interview may be useful. As with all of the interviewing methods, the interviewer should not only be aware of the content of the interview, but also be able to record the nature of the interview and the way in which he/she asked the questions. However, in comparison with the structured method, the context of the interview is an important aspect of the process (May, 1997).

3. Unstructured interviews

In unstructured interviews, the interviewer does not ask the interviewee a planned sequence of questions. Sekaran (2000) states that the main aim of unstructured interviews is to reveal a selection of preliminary issues so that the researcher can obtain

an accurate impression concerning the variables that will require further in-depth exploration.

The central difference of this type of interviewing from both the structured and semi-structured interview is its open-ended character. Sometimes referred to as informal and unstandardised, this method accomplishes a different focus for the following reasons. First, it supplies qualitative depth by allowing interviewees to talk about the subject in terms of their own frames of reference. Second, it thereby provides a great understanding of the subject's point of view (May, 1997: 112).

1.9.2.2 Secondary Data

In order to gain a richer picture of the level of importance of the elements that constitute the holistic approach to KM project implementation, and factors that contributed to the success of KM projects, a literature survey is conducted. This includes published literature, reports, and vendor success stories published on the Web.

The degree of criticality of each factor is to be analysed by using a content analysis approach.

1.9.2.3 Primary Data

Since the questionnaire does not help to answer the questions of 'how' and 'why' (Mason, 1984), the case study based on the qualitative method has been chosen. Yin (1989) argues that the case study is a typical research method widely used for qualitative data collection in management research.

Indeed, the purpose of using case studies as a part of this research is to investigate how the KM system is being implemented in public sector organisations. The case study explores how the key elements of implementation are being used to engender the level

of change intended by the organisation in order to improve performance level and achieve a competitive advantage.

All data taken from interviews, observations and document study are consolidated and linked together to create an image of the entire process of KM project implementation undertaken by the organisation.

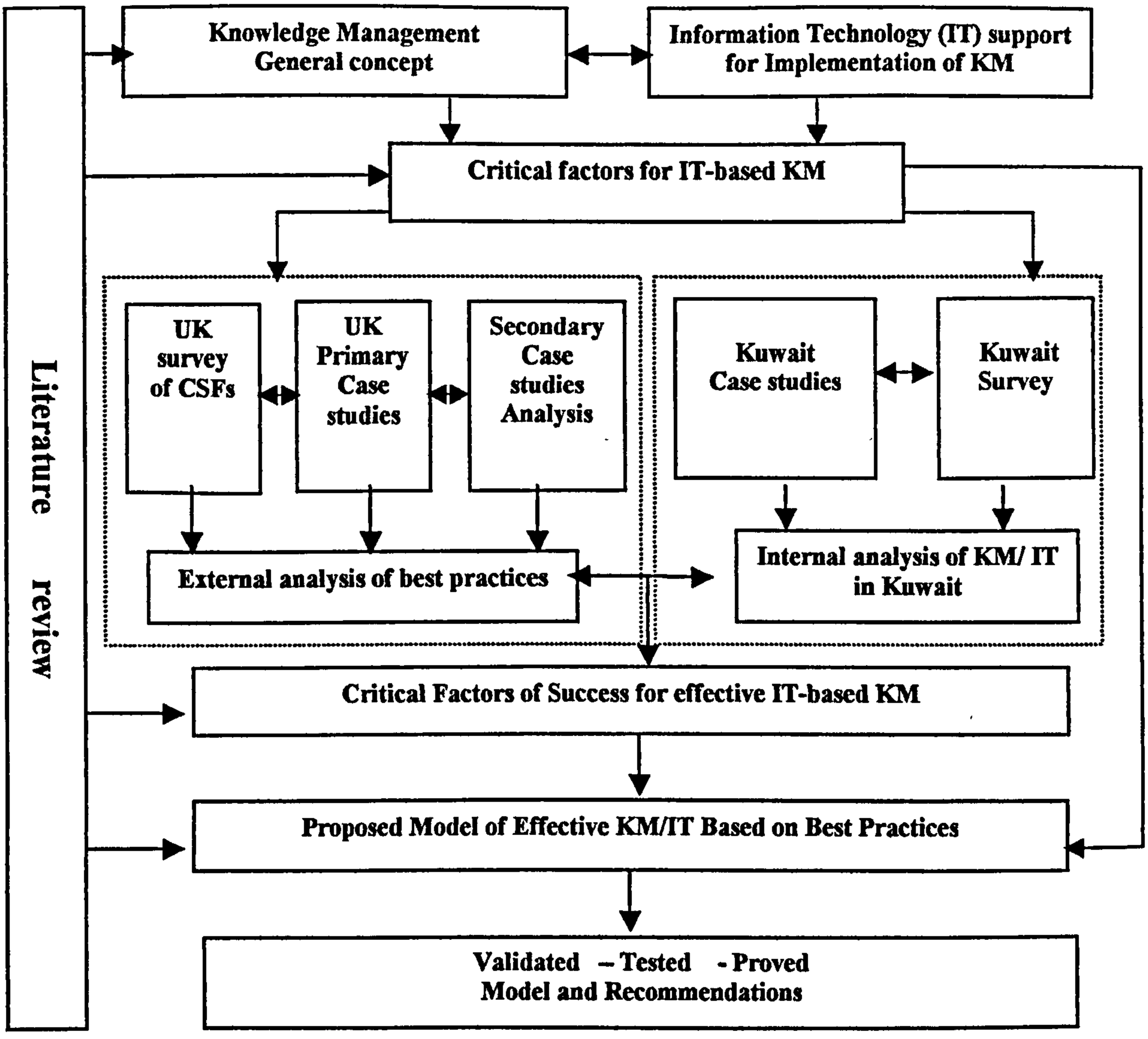
Finally, it is necessary that the organisations selected agree to share the details of their experience in KM project implementation and allow the researcher to have documented data that might support the research. However, it should be noted that all information that is not intended to be known by the public is to be treated with the highest level of confidentiality, and organisations have been made aware of this.

This study identifies various critical success factors (CSFs) that must be carefully considered within KM implementation process. Therefore, the researcher selected two ways to analysis these factors. First, in Chapter 4, where 91 organisations discussed in the literature review (LR) as secondary case studies, 16 factors were identified and categorised under four different headings: (1) Technology, (2) KM processes, (3) Change management, (4) Top management commitment.

Second, Chapter 7 another type of analysis was conducted for 35 factors which been identified from the LR discussed in chapter 2.

As mentioned earlier, both quantitative and qualitative methods of data collection are adopted. Quantitative by means of a questionnaire, and qualitative by means of interviews, as illustrated in Figure 1.2

Figure 2 Research Methodology



1.10. Outline

This thesis contains nine chapters: Introduction, KM concept, IT support KM, secondary case studies, Research design and methodology, qualitative analysis, quantitative analysis, Discussion and Model proposal, and conclusion and recommendations.

1. Chapter 1 provides a general introduction to the nature and intent of the research. It begins with an introduction to KM, defining its concepts, its importance, the role of IT, and its implementation problem. It then explains the purpose and objectives of this study, and its significance to both practitioners and researchers. A research framework is presented to describe both the research problem, and the research methodology that this study has adopted.
2. Chapter 2 presents the first part of the literature review for this study. It gives a detailed review of the relevant literature related to KM fundamentals.
3. Chapter 3 presents the second part of the literature review. It details various issues related to the IT infrastructure support for KM.
4. Chapter 4 describes the process of KM implementation through an analysis of secondary case studies.
5. Chapter 5 discusses the research design and methodology employed in this study. It also explains the reasons for selecting methods of data collection, and describes the design of the research instrument.
6. Chapter 6 discusses and analyses the data collected through the interviews
7. Chapter 7 discusses and analyses the data collected through the questionnaire
8. Chapter 8 provides a comprehensive discussion of both quantitative and qualitative findings using a generic model as an effective model for implementation of KM.
9. Chapter 9 concludes the study and gives directions for future research.

CHAPTER TWO

Literature Review (I) KM Fundamentals

CHAPTER 2: Literature Review (I) KM Fundamentals

2.1 Introduction

The entire literature review, offered in two parts, provides a basis for the hypothetical study and empirical investigation of the research. This chapter is concerned with the first part, namely reviews of the relevant literature from numerous fields of study associated with the essential issues of knowledge management (KM) implementation, and recognises the value of intangible assets. These cover thirteen topics: knowledge and KM definitions (distinguishing data, information and knowledge), knowledge history, knowledge strategy, managing knowledge, knowledge terminologies, knowledge processing, knowledge types, learning organisation and organisation learning, knowledge benefits and importance, knowledge measurements, knowledge critical success factors (CSFs), and future of the KM concept and practice.

2.2 Knowledge Definition

The basic building block of knowledge is data, the processing of data resulting in information, and as a consequence of processing information knowledge is derived. Knowledge is the next natural progression after information; that is, a higher order than information (Grey, 1996; Lynn, 1998; Mullins, 1998; Zack, 1998; Newman, 1999; Bollinger and Smith, 2001)

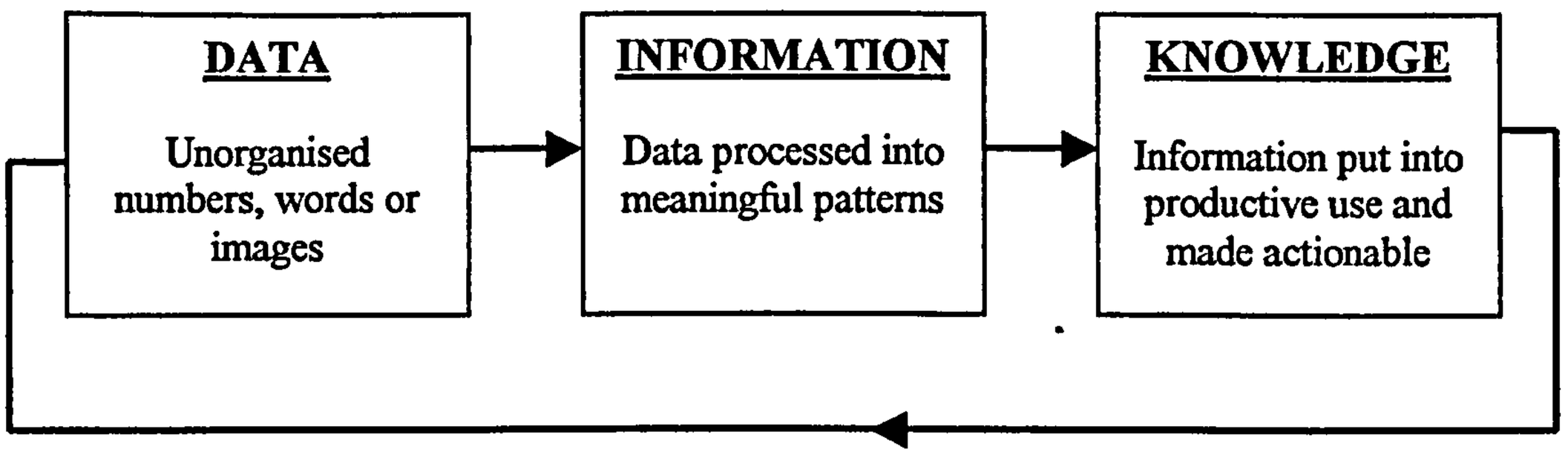
Grey (1996) noted that knowledge is the full utilisation of information and data, coupled with the potential of people's skills, competencies, ideas, intuitions, commitments and motivations. Knowledge is people, money, leverage, learning, flexibility, power, and competitive advantage; it is stored in the individual brain or encoded in organisational processes, documents, products, services, facilities and

systems. It is the result of learning which provides the sustainable competitive advantage.

On the other hand, Zack (1998) added that knowledge is that which we come to believe and value, based on the meaningfully organised accumulation of information (messages) through experience, communication or inference.

Davenport et al. (1998) defined knowledge as "information combined with experience, context interpretation and reflection. It is 'high-value' from information that is ready to apply decisions and actions".

Figure 2.1 Data to Knowledge



Source: Adapted from Newman (1999: 2)

2.3 Knowledge Management (KM) Definition

Ever since the emergence knowledge management (KM) emerged as a management initiative, various definitions have been proposed as to what knowledge is, and what kind of knowledge needs to be managed (Nonaka, 1994; Davenport et al., 1996; Alavi and Leidner, 1999).

There are different definitions of KM (Snyder and Wilson, 2000; Chan, 1999). Unfortunately, the term KM is not easy to define because it contains multiple representations and concepts. Many authors agree that KM requires a total

organisational transformation, including organisational culture, structure, and management style (Sveiby, 1997b; Buchman, 1998; Davenport and Prusak, 1998b).

Many researchers have defined KM from different perspectives, and a large number of debates thus tend to centre around the difference in meaning between information and knowledge. The present research examines some of the definitions, for example Snowden (2000) defines KM as "the identification, optimisation, and active management of intellectual assets, either in the form of explicit knowledge held in artefacts or as tacit knowledge possessed by individuals or communities" (Snowden, 2000: 63).

Poynder (1998) suggests that there are currently three major schools of thought on what KM is. One such school recommends that KM is mainly an IT issue, with networks of computers and groupware being the keys. If one constructs widespread computer networks and adds communication tools that allow group collaboration, people will be more disposed to share information and knowledge

Grey (1996) defines KM as "an audit of 'intellectual assets' that highlights unique sources, critical functions and potential bottlenecks which hinder knowledge flows to the point of use. It protects intellectual assets from decay, seeks opportunities to enhance decisions, services and products through adding intelligence, increasing value and providing flexibility"

Bertels (1996) defines KM as "the management of the organisation towards the continuous renewal of the organisational knowledge base - this means, e.g. creation of supportive organisational structures, facilitation of organisational members,

putting IT-instruments with emphasis on teamwork and diffusion of knowledge (as, e.g. groupware) into place."

Finneran (1999) regards KM as a discipline that assists the spread of knowledge of individuals or groups across companies in ways that directly affect performance. KM envisions getting the Right Information within the Right Context to the Right Person at the Right Time for the Right Business Purpose.

Therefore, for Macintosh (1999), "Knowledge management involves the recognition and analysis of obtainable and required knowledge assets and knowledge asset-related processes, and the ensuing planning and control of actions to develop both the assets and the processes so as to fulfil organisational objectives."

Starr (1999) states that KM is information or data management with the added process of capturing the tacit experience of the individual to be shared, used and built upon by the organisation, leading to increased productivity.

Liebowitz (1999b) give a short definition of KM as the process of creating value from an organisation's intangible assets.

Gupta and Iyer (2000) define KM as process that assists organisations to find, select, arrange, distribute, and transfer important information and expertise essential for activities such as problem solving, lively learning, strategic planning and decision making. Morse (2000) has stated that KM focuses on understanding how knowledge is obtained, created, stored, and utilised within an organisation.

The definitions of Starr (1999), Liebowitz (1999b), Gupta and Iyer (2000), and Morse (2000) have almost the same meaning, which is that some processes (creating,

capturing, and distributing) are important towards deriving value and giving power to organisation productivity.

It is noted in all of these definitions that knowledge is an entity which is different and more than information. Knowledge is seen as a capability, as something that can be said, as information plus something. It only makes sense that the knowledge created for solving problems will be reused whenever the organisation faces the same problems

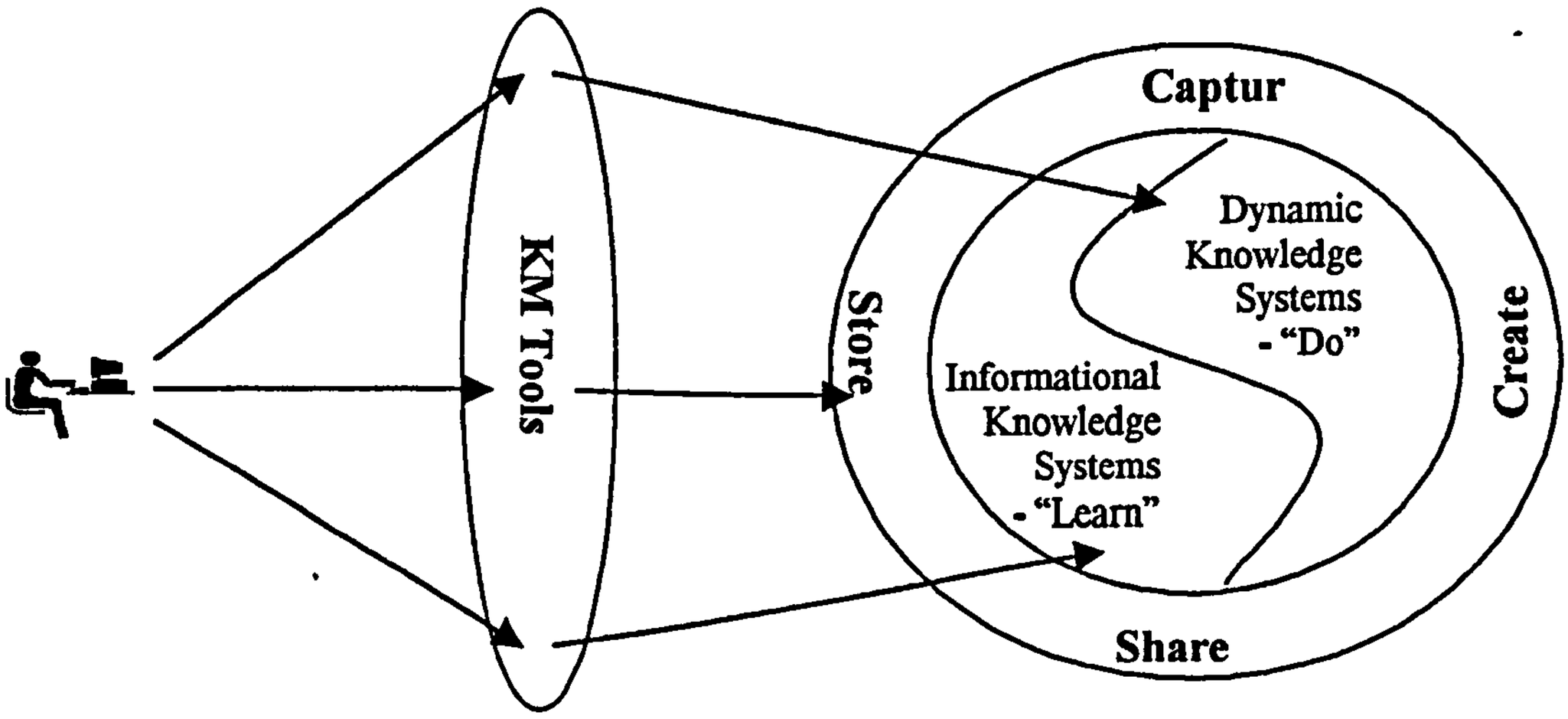
For the purposes of this research, the Newman (1999) definition of knowledge management will be used, with the additional modification, in italics:

Finding ways to create, identify, capture, *transfer and share* organisational knowledge with the people who need it, and what people need to know to do their jobs efficiently, plain and simple, *using information technology as much as possible.*

2.4 Knowledge Management System (KMS)

Pluskowski (2002) divided KM systems into three types: information knowledge systems (IKS), KM tools (KMT), and dynamic knowledge systems (DKS).

Figure 2.2 Balanced KM Systems



Source: Adapted from Pluskowski (2002)

Gupta and Iyer (2000) see KMS as capturing, transferring, storing, controlling, distributing, and archiving knowledge within an organisation. And they state that effectual employed KMS could facilitate an organisation's internal processes to operate easily and quickly, allow a company to take action to customer feedback quickly, supply the ability to react to its competitive situation in a timely manner, and empower workers with critical knowledge.

2.5 History of Knowledge Management

KM is a relatively new phenomenon in the field of management (Chan, 1999; Snyder and Wilson, 2000), and grew from organisational learning theories (Gable et al., 1998; Chan, 1999; Morse, 2000)

Barclay and Murray (2000) and Sullivan (2000) trace the origins of KM to the early 1980s. Sullivan (2000) states that the KM concept was utilised by Itami in the Japanese literature in 1980. This article, however, did not appear in English until 1987. In the early 1990s, Professor Baruch Lev at the Stem School of Management (New York) University, instigated his research into valuing intangibles, as a colleague of David Teece at UC Berkeley's Haas School of Business.

According to Barclay and Murray (2000), the importance of knowledge as a competitive asset was obvious by the mid-1980s, even though classical economic theory ignores knowledge as an asset, and most firms are still short of strategies and methods for managing knowledge.

The development of systems for managing knowledge that relied on work done in artificial intelligence and expert systems seen during the 1980s gave us such

concepts as "knowledge acquisition," "knowledge engineering," "knowledge-based systems", and "computer-based ontology".

According to Barclay and Murray (2000), the International Knowledge Management Network (IKMN) began in Europe in 1989. By the mid-1990s, KM initiatives were prospering, thanks in part to the Internet. Further, the authors mention that by 1990, a number of management consulting companies had investigated an in-house KM programme, and several well-known U.S., European and Japanese firms had embraced a focused KM programme. KM was introduced in the popular press in 1991, when Tom Stewart published "Brainpower" in *Fortune* magazine (Barclay and Murray, 2000)

Finally, Balla et al. (1999) and Morten et al. (1999) support this view further, by arguing that KM as a concept has existed at least since the early 1990s when the large consulting firms, e.g. Andersen Consulting and Ernst & Young, began committing major resources to implement KM practices and technologies. Further, the KM trend began to gain some momentum in the mid-1990s, getting coverage in the trade press, at industry conferences, and in business and academic fields.

2.6 Knowledge Strategy

Knowledge is considered to be one of the most important strategic resources; many managers naturally believe that strategy advantage can come from knowing more than competitors.

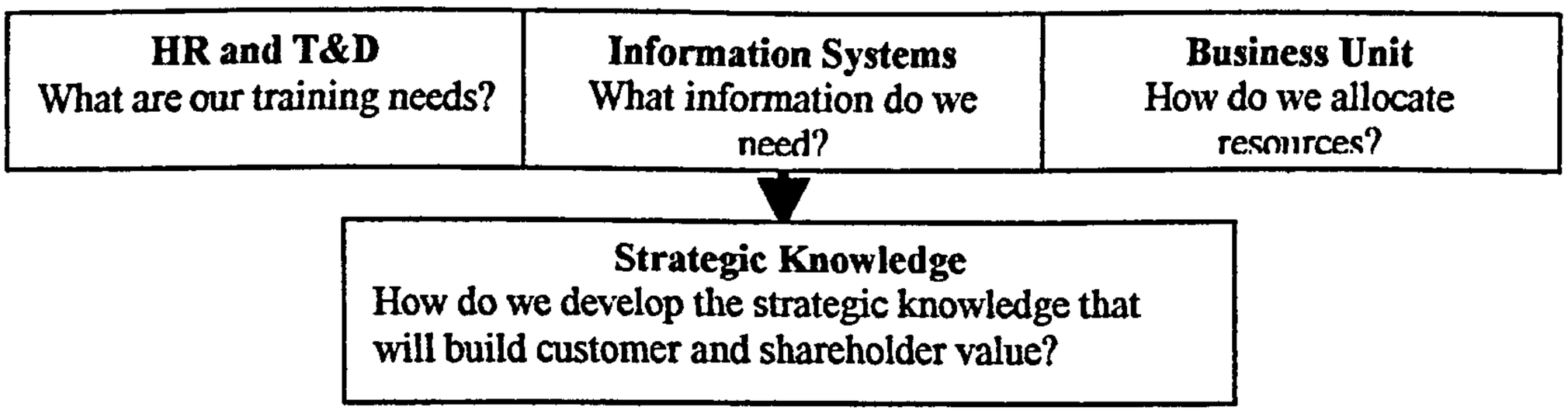
For Radding (1998), KM strategy is the knowledge manager's plan of action for developing, applying, and increasing the organisation's knowledge assets. Knowledge strategy itself defines how the organisation intends to use knowledge to achieve its business objectives. National electronic library for health (2003) stated

that KM strategy is simply a plan that describes how an organisation will manage its knowledge better for the benefit of that organisation and its stakeholders. A good knowledge management strategy is closely aligned with the organisation's overall strategy and objectives.

According to Zack (1998), the most important context for guiding KM is the firm's strategy. This helps to identify KM initiatives that support its purpose or mission, strengthen its competitive position, and create shareholder value. Therefore, the firm that knows more about its customers, products, technologies, markets and their linkages should perform better. Companies that do not have strong strategic models struggle to clarify the relationship between their intellectual resources and capabilities, and their competitive strategy. Moreover, Morten et al. (1999) noted that the consulting business employs two different KM strategies. First, regarding IT infrastructure, such as codifying knowledge and storing it in databases, where it can be accessed and utilised easily by anyone in the organisation, and that is called codification strategy. And second, concerning people, that knowledge is closely tied to the person who developed it and is shared knowledge, mainly through direct person-to-person contact, by face-to-face, over the telephone, by e-mail, and via videoconferences (Morten et al., 1999).

Newman (1999) said that Probe Consulting presents how each of the separate departments of Human Resources (HR) and Training & Development (T&D), Information Systems, and the Business Unit sees its contribution to the organisation. Each of these groups would merge and share the goal of developing strategic knowledge, which builds customer and shareholder value.

Figure 2.3 Merging of separate departments to share knowledge



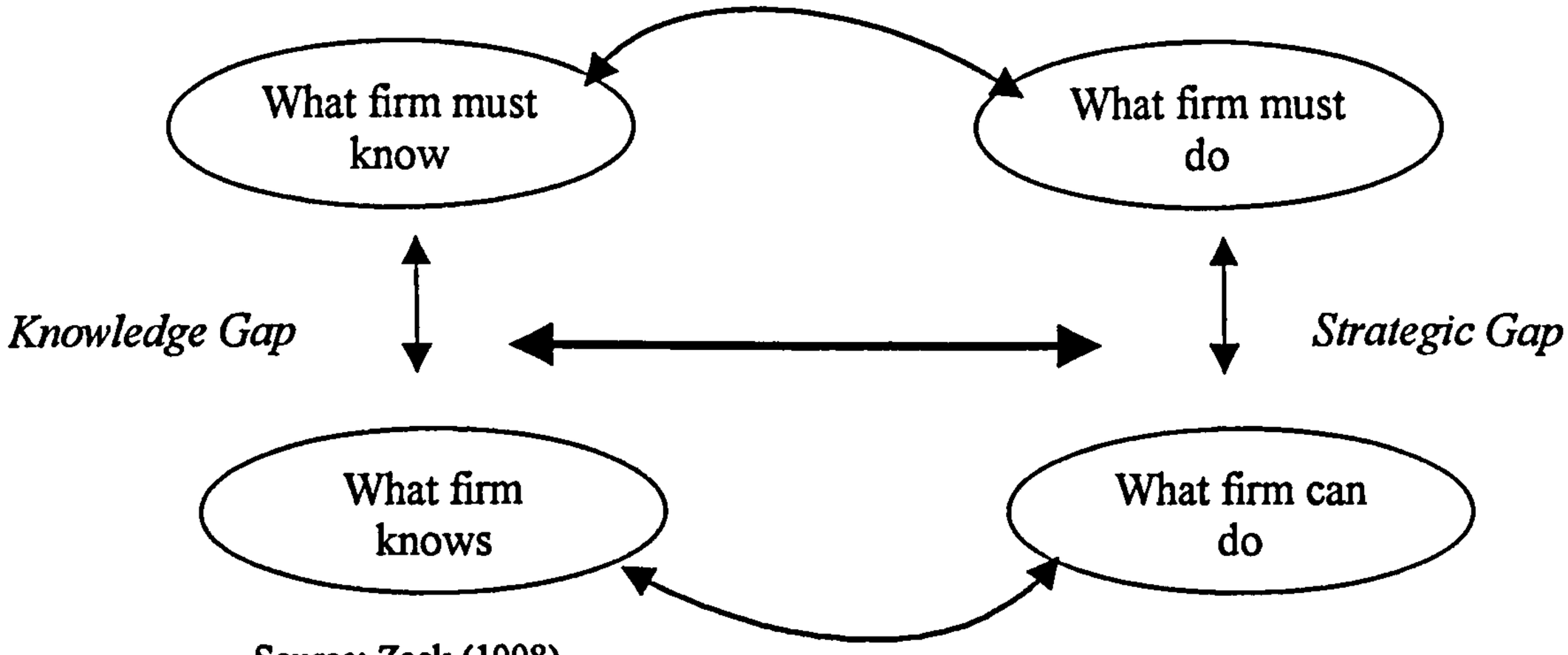
Source: Adapted from Newman (1999:3)

According to Skyrme (2002a), there are two thrusts for strategy. The first is to make better use of the knowledge that already exists within the firm, for example by sharing best practices. The second major thrust of knowledge-focused strategies is that of innovation, creation of new knowledge, and turning ideas into valuable products and services. It is the most difficult, but it ultimately has the best potential for improved company performance. It is effective commercialisation of ideas that has taken companies like Netscape and Formula One to be multi-million dollar corporations in just a few years.

2.6.1 Knowledge as strategy resource

Zack (1998) suggests that there is a strategic gap between what a firm must do to compete and what it is actually does in practice. Strategy, then, represents how the firm balances its competitive "cans" and "musts" to develop and protect its strategic position. In addition, knowledge gap is the gap between what a firm must do to compete and what it can do. Figure 2.4 illustrates the knowledge gap analysis.

Figure 2.4 Knowledge Gap



Source: Zack (1998)

2.7 Managing Knowledge

Knowledge itself cannot be managed, only its processes or systems (Platt, 1998; Newman, 1999). For example, Newman (1999) suggested managing knowledge means finding ways to create, identify, capture, and distribute organisational knowledge to the people who need it. Platt (1998) is certain that only the processes of knowledge or its systems can be managed, such as through sharing knowledge.

Organisations are now starting to look at knowledge as a resource. This means that they need ways for managing their knowledge. These organisations could use techniques and methods that were developed as part of KM to analyse their knowledge sources. While using these techniques, they can perform Knowledge Analysis, which is a necessary step for the ability to manage knowledge and knowledge planning (Sierhuis, 1996).

2.8 Knowledge Management Terminology

As in other disciplines, there are terms and expressions that are unique to KM, such as knowledge assets, capital assets, intellectual capital, repository, Chief Knowledge

Officer, and property capital. This research assumes that knowledge assets, capital assets, and property capital fall under the one name of intellectual capital.

2.8.1 Intellectual capital

Ellyn (1998), Stewart (1998) and Bocij et al. (2003) define intellectual capital as intellectual material, knowledge, information, intellectual property and experience that can be put to use in order to create wealth. It is collective brainpower. Examples are information about customers, information about employees, information about competitors, patents, trademarks, market and technology trends, and those assets protected by law. Ulrich (2000) defined intellectual capital as an equation that is competence × commitment = intellectual capital. Both competence × commitment are complementary, in which case intellectual capital requires both competence and commitment; also, since the equation multiplies rather than sums, a low score on either competence or commitment significantly decreases overall intellectual capital.

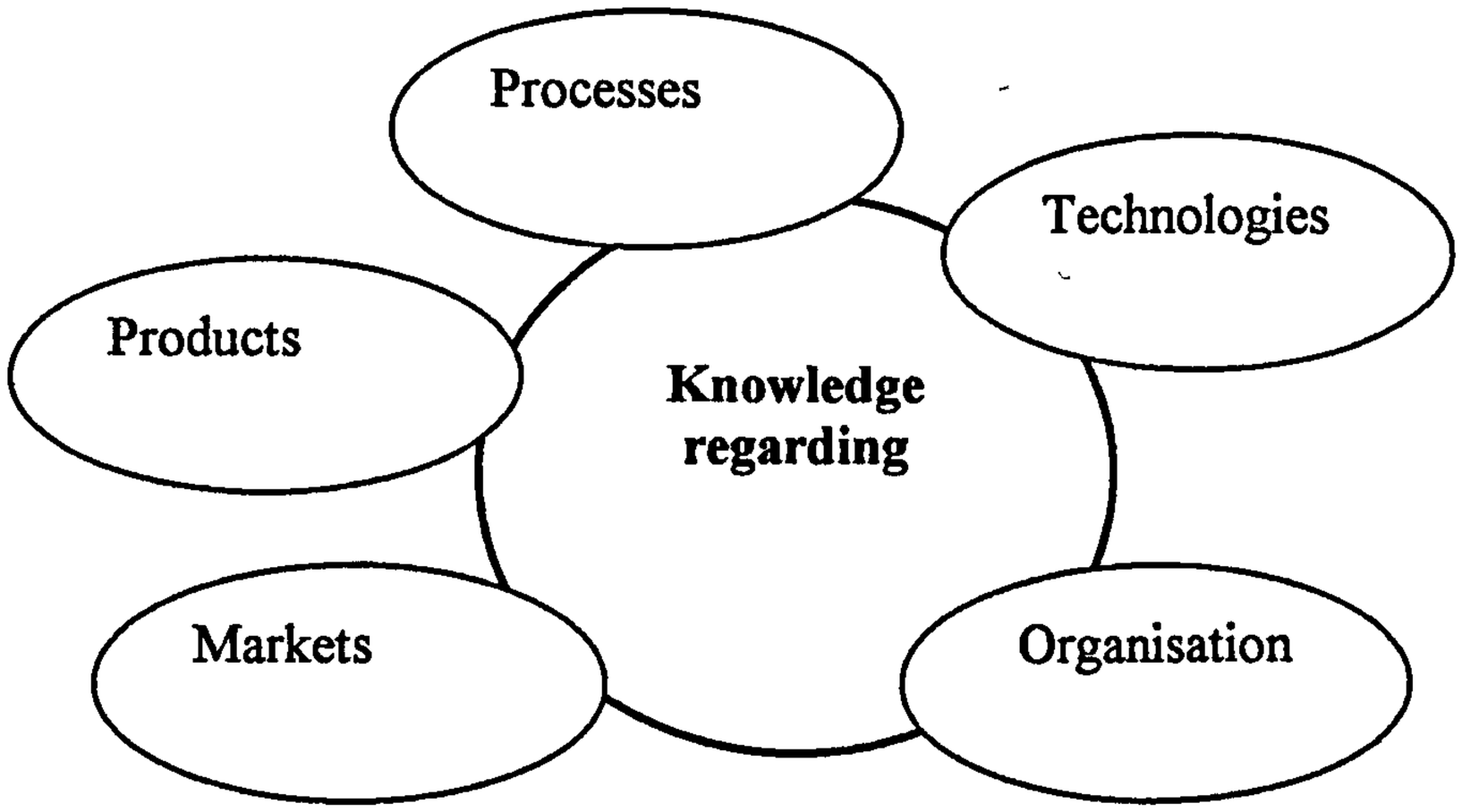
In recent times, organisations have become more focused on KM and are beginning to commit an increased proportion of their revenue towards development and management of intellectual capital(Alazmi and Zairi, 2003).

Therefore, Finneran (1999) proposed that knowledge assets are similar to capital assets. They are usually independent of the people who created them, and they can be used, moved, and leveraged by others to solve broad-based problems and to enhance performance. A knowledge artefact is a specific instance of a knowledge asset. These knowledge artefacts can be presented by a browser-based system. They can be embodied as text, diagrams, graphics, audio, video, or animation.

Hubert (1996), Sveiby (1997a), and Skyrme (2002c) divide intellectual assets into three categories: human capital (minds of individuals: knowledge, competences, experience, know-how, etc.), structural capital (processes, information systems, databases, etc.), and customer capital (customer relationships, brands, trademarks, etc.).

Knowledge assets consist of knowledge regarding markets, products, technologies and organisations that a business owns or needs to own, and which enable its business processes to generate profits, add value, etc., and they reside in many different places, such as databases, knowledge bases, filing cabinets and people's heads, and are distributed right across the enterprise (Macintosh, 1998).

Figure 2.4 Knowledge assets



Source : Adapted from Macintosh (1998)

Alazmi and Zairi (2003) stated that many organisations have accepted that the knowledge of their employees is their most valuable asset. With this in mind, organisations of differing size have actively started to manage their knowledge assets on a broad scale.

2.8.2 Knowledge repository

Davenport et al. (1998) and Finneran (1999) believe that a knowledge repository consist of documents, presentations, databases, charts, graphs, plans, audio files, and/or video files which are made accessible. While, Bock (2002) supposed that there are three types of knowledge repository: structured repositories (databases, expert systems and the like), unstructured repositories (project reports, sales call notes and other sources), and people. The first two repositories are for explicit knowledge and the third is tacit knowledge which resides in the heads of people. Consequently, Finneran (1999) added that knowledge is collected from all existing sources, people, systems, data stores, file cabinets and desktops. All knowledge of worth is stored in the organisational knowledge repository. For virtual teams, this knowledge would be immediately transmitted to those people and systems that could use it. The correct knowledge will go to the correct person or system at the correct time. Present knowledge can be got back from the system at any time in the future. As knowledge becomes outmoded or expires, that knowledge will automatically be removed from the system.

Davenport and Prusak (1998b) considered that information internal knowledge is one of the basic repositories, such as discussion databases full of know-how, sometimes referred to as lessons learned. Most successful knowledge projects involve structuring electronic repositories of knowledge either structured document-based knowledge, informal discussion-type knowledge, or repositories of who knows what

Knowledge repository the software that is a collection of both internal and external knowledge in a KMS (Davenport et al., 1998; Turban et al., 1999; Turban et al., 2002). Davenport et al. (1998) added that he found three basic repositories: 1)

external knowledge, such as competitive intelligence; 2) structured internal knowledge, such as research reports, product-oriented marketing materials, and techniques and methods; 3) information internal knowledge, such as discussion databases full of know-how, sometimes referred to as lessons learned.

Most organisations store knowledge in order to retrieve it when they need it. Radding, (1998) believes that an organisation's knowledge has to be stored in accessible databases, referred to as knowledge bases. Morse (2000) supported this, and states that knowledge should be structured and stored in such a manner, as that the system can find and deliver it quickly and correctly; however he recommended that an organisation first has to determine what it is important to retain and how best to retain it. So it is important to consider how the information will be retrieved by different groups of people.

2.8.3 Chief Knowledge Officer (CKO)

Numerous companies have created chief knowledge officer (CKO) positions to administer KM. Liebowitz and Beckman (1998) noted that many organisations, such as Coca-Cola, Sequent, Hewlett-Packard, Coopers and Lybrand, to mention but a few, have established this new position within their organisations in order to supervise and manage knowledge.

Davenport (1996), Liebowitz and Beckman (1998) and Newman (1999) agree that this position is responsible for creating a knowledge management infrastructure, building a knowledge culture, and making it all pay off economically.

2.8.4 Knowledge Engineer

Larry (1989), Kroenke (1992) and Kroenke, Hatch (1994) and Haag et al. (2002) defined knowledge engineer (KE) as a specialist who uses expert system shells or other tools to develop an expert system. The knowledge engineer works with domain experts to acquire knowledge which is then modelled and encoded using an expert system tool or shell.

2.8.5 Knowledge worker

Knowledge worker is someone whose job role is based around the use, manipulation, and dissemination of information (Larry, 1989). Therefore, Turban et al. (2002) defined knowledge workers as people who use knowledge as a significant part of their work responsibilities.

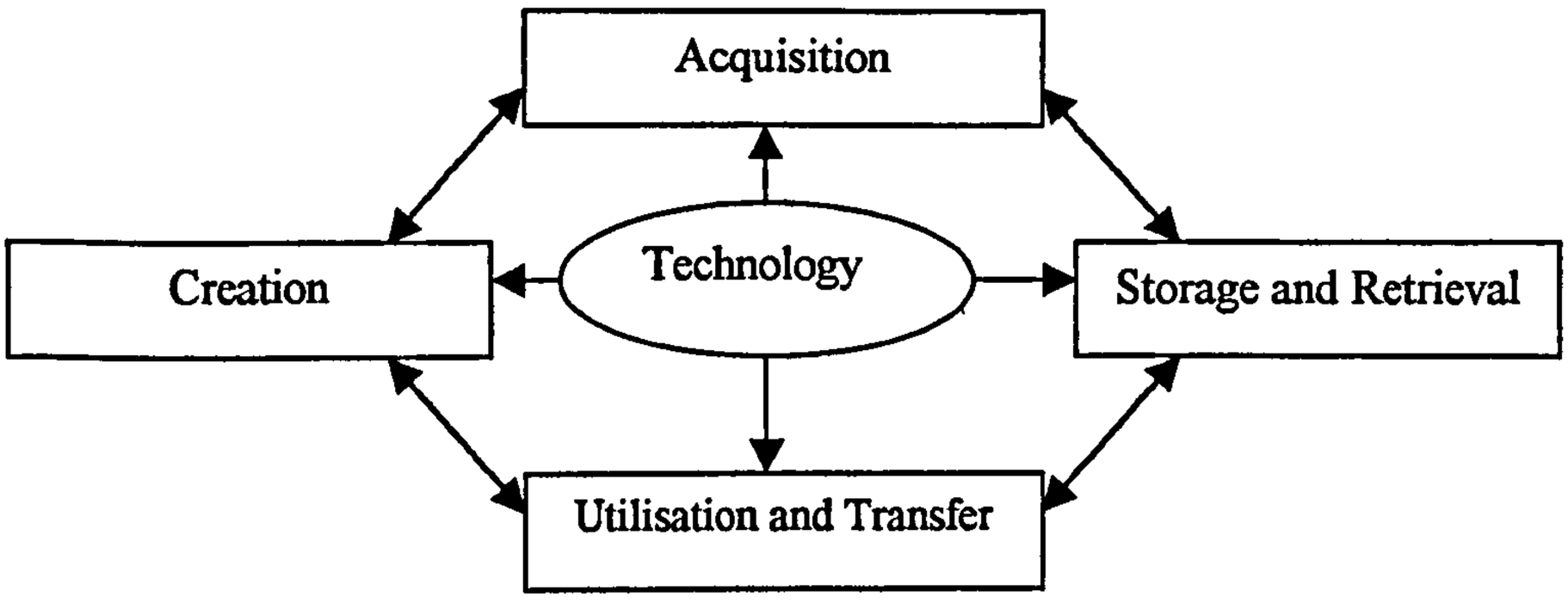
2.9 KM Processes

Radding (1998), Bassi (2000), Bednar, (2000), and Mertins et al. (2001) noted that there are some processes in KM which are useful to focus on in developing a KM strategy. These include creating, capturing, transferring, and sharing knowledge, and Macintosh (1998) added some processes, e.g. developing knowledge, preserving knowledge, and using knowledge. And the success or failure of companies depended on how well they develop and use these processes. Therefore Radding (1998) has added two more, which are storage and processing (storing, comparing, analysing, organising, any of a variety of techniques).

KM focuses on understanding these processes as well as how they are to be acquired, stored and utilised within an organisation. Technology has to support all activities involved in the knowledge life cycle and supporting KM processes suggested by Duffy (2000). Also, Morse (2000) substantiates this view by warning organisations

using technology to provide employees with an environment to learn and share knowledge, with the goal of enhancing their productivity. Figure 3.5 shows a generic KM Model which is based on Morse (2000), but with technology added as an important element.

Figure 3.5 Generic Knowledge Management Model



Source: Adapted from Morse (2000)

The researcher has named these KM processes KM systems, and considers them as the heart of KM, because when an organisation exploits and manages them correctly it will obtain maximum advantage, as well as being a successful company. These processes are the part of the KM CSFs. So, Radding (1998) believes that organisations rely on IT for tools, data and process of KM. Knowledge-based system help users find acceptable solutions to problems. According to Macintosh, 1998,

> *"The Processes are using, enacting, executing, exploiting, etc.; communicating, deploying, disseminating, sharing, etc.; compiling, formalizing, standardizing, explicating, etc.; appraising, evaluating, validating, verifying, etc.; acquiring, capturing, creating, discovering, etc.; evolving, improving, maintaining, refreshing, etc.; storing, securing, conserving, retaining, etc."*

In the best firms, everyone creates, shares, and uses knowledge instead of hoarding it. Confident people transfer knowledge now, already satisfying the role of

knowledge manager, without realising. Too many firms make knowledge the area of a single group (e.g. R&D department), and as such hamper the seamless flow and diffusion of knowledge (Davenport and Prusak, 1998b).

2.9.1 Knowledge Sharing

Sharing knowledge is one the most important elements of KM; it plays a main role for company success, as one of the critical success factors. Zack (1998) believes that sharing of resources must exist in order for KM to succeed. Also, most KM champions agree that focusing on the social aspects of sharing knowledge, such as face-to-face meetings, virtual chat rooms, and building trust through personal communication is key, and building an integrated information management system allows a community to thrive under any circumstances (APQC, 2000).

Daudelin and Hall (2000) proposed knowledge sharing as important for numerous reasons: reformulating the wording of people's insight assists understanding, reporting insight to others also opens chances for feedback that can result in a changed perspective or additional insight, and it also provides an opportunity to influence the learning of others. This step could be termed 'teach'. The authors have considered that the teaching of a topic is one of the ways to master it.

Starr (1999) said success depends on a clear strategic logic for knowledge sharing, and it really depends on culture, that an organisation should make its employees share and use knowledge automatically, and overcome the hoarding and trust issues. These issues can mean the difference between success and failure.

Therefore, organisations should consider that knowledge workers would not "skip through earrings" to share their knowledge, as Morey (1998) puts it, unless they have

a benefit to them. Creating an enveloping, sharing infrastructure helps to streamline the process, but capturing knowledge will have little meaningful success without a sharing culture.

Even though sharing is very important, some people do not do it, and some organisational cultures do not support sharing. The reasons for that could be that some employees in companies feel that people are not rewarded for sharing; they consider it ' a wasting of time' if they are 'just thinking', or they are just talking to someone casually; they feel that they are too busy, it is not worth the time, the timing is not right for sharing unless you need the information right now, or it takes too long to find out where to get the information from, since they do not know where to start the search. If anyone needs help, it looks like he/she cannot do his/her job, and they believe that he/she will not be as valuable to the company (Newman, 1999).

These reasons imply that some employees are lazy, they do not want to spend time to capture the value information, or to transfer and share it. An organisation must take account of these reasons in order to prepare the solution.

Stewart (2000) gave an example of failure in sharing knowledge. Ford and Firestone, he says, had been suffering the death of 1000 cuts, in part because of a catastrophic failure to share knowledge. The author believes that if those companies want to be certain that a failure never happens again, they must find one of the most successful, tried and proven schemes for knowledge-sharing at their own companies. Martinez (2000) has presented an example of the way knowledge sharing works, that established by Buchman Labs International Inc. which is known as 'Buckman's knowledge-sharing philosophy'. This philosophy has seven criteria for the worldwide systems:

- Minimum number of handoffs before a question gets answered. Instead of a question circulating through many levels, everyone in the company can be asked the same question. Employees with best answer need to get asked the questions.
- Provide access to every employee.
- 24-hour daily access available to every employee.
- Each employee has to be encouraged to become involved in contributing questions, comments and solutions to customer concerns and challenges.
- Every word has to be searchable (completely accomplished at the time of writing).
- System updated automatically.
- Multilingual capability available in English, Spanish, Portuguese, French and German. Use of languages of all employees allows easy access and understanding in own language better than in others (Martinez, 2000: 324).

2.9.2 Capturing and Transferring knowledge

Simply, capturing and transferring data are only one part of KM. According to Bednar (2000) and Morse (2000), knowledge could be transferred or captured in many ways, by written communications, training, internal conference, internal publication, job rotation and job transfer, and mentoring. In addition, Bednar (2000) proposed and believed that interviewing (questions), writing (story), and video communication are effective methods of capturing and disseminating knowledge. He mentioutlined, that a growing number of corporations, such as BASF and IBM, understand this, and have hired outside journalists to interview their own people to understand how they made certain decisions which led to a successful or unsuccessful outcome. People properly trained and experienced in interviewing can

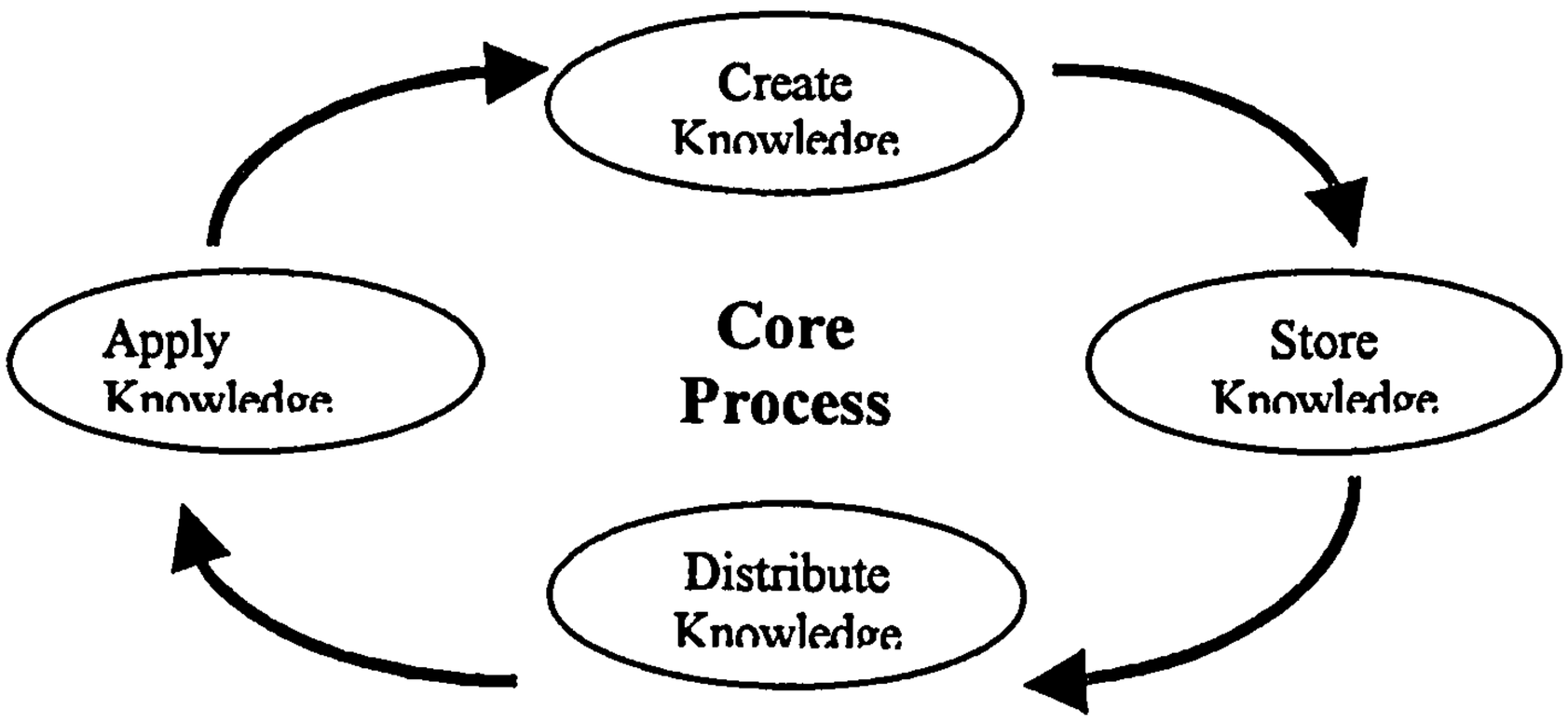
often get more information from someone who may not really wish to part with the information.

In order for an organisation to capture all aspects for effective KM, it must direct attention and take account of four elements of the cost model (customer, organisation, suppliers, and technology) proposed by Pervaiz et al. (1999).

Bednar (2000) comments that the creation of knowledge occurs with the transfer of what is inside a person's mind (tacit or explicit) to other individuals or groups, in such a way that the transfer influences the beneficiary's future actions and decisions. The desired result in this interaction is an increase in the probability of a faster and more accurate decision.

Finally, Figure 2.5 illustrates the KM core process, as presented by Heisig (2001)

Figure 2.5 Core Process of KM



Source: Heisig (2001:28)

2.10 Types of KM

People gain or create new knowledge from numerous activities. Firstly, action-based learning that involves working on problems, and implementation of solutions. Secondly, systematic problem solving, which requires a mindset, disciplined in both reductionism and holistic thinking, attentive to details, and willing to push beyond the obvious to assess underlying causes. Thirdly, learning from past experiences, which reviews a company's successes and failures, to take the way that will be of maximum benefit to the organization, as suggested by Morse (2000).

Hubert (1996), Lim et al. (2000), Nonaka and Konno (2000), Snowden (2000), Bollinger and Smith (2001), Mentzas et al. (2001) and Seubert et al.(2001) have classified KM into two primary types, namely tacit and explicit knowledge. These two types are discussed in the ensuing sections.

2.10.1 Tacit knowledge

Tacit knowledge resides in our mind and cannot be easily shared or it is difficult to communicate with others, as defined by Hubert (1996), Nonaka and Konno (2000), and Seubert et al. (2001). Nonaka and Konno (2000) add that tacit knowledge is deeply rooted in an individual's actions and experience, as well as in the ideals, values, or emotions he or she embraces. It has two dimensions: the first is the technical dimension, which encompasses the kind of informal personal skills or crafts often referred to as "know-how." The second is the cognitive dimension. It consists of beliefs, ideals, values, schemata, and mental models which are deeply ingrained in us and which we often take for granted. While difficult to articulate, this cognitive dimension of tacit knowledge shapes the way we perceive the world.

On the other hand, Snowden (2000) defines tacit knowledge as something that is simply known, possibly without the ability to explain. He illustrates this with reference to team players, stating:

> *"We see it in craftsmen, or in good sporting teams where each player instinctively knows where to pass the ball".*

He believes that the way to understand the difference between tacit and explicit knowledge is to look at the ways that the knowledge is shared and 'stored'. In reality, tacit and explicit are not absolute opposites, rather a spectrum.

Significantly, Snowden (2000) also added that the act of sharing tacit knowledge always creates something new. This is unique, the machine of innovation, and capable of real-time reactivity in decision-making. While explicit knowledge can be purchased, stolen, or re-invented, trust, and curiosity are key words in KM.

Hubert (1996) said tacit knowledge is the skills and 'know-how' which reside in our mind that cannot be easily shared.

A good idea or example of tacit knowledge is amplified by Durrance (2000):

> *"If we could describe how to ride a bike perfectly, describing it would never be the same as doing* it".

2.10.2 Explicit knowledge

Hubert (1996), Nonaka and Konno (2000) and Seubert et al. (2001) defined explicit knowledge as that which can be captured and expressed in words and numbers (i.e. quantitatively) and shared in the form of data by courses or books for self-reading, scientific formulae, specifications, manuals, and the like. This kind of knowledge can be readily transmitted between individuals formally and systematically.

Snowden (2000) agrees with the above and notes that, as its name suggests, it is easier to identify. It is reusable in a consistent and repeatable manner. It may be stored as a written procedure in a manual or as a process in a computer system. The documented procedure of a lesson-learn workshop, the written-up comment of an economist examining a set of financial data, minutes of a meeting, a chain of e-mail correspondence, are all examples of explicit knowledge that we use to support or to make decisions and exercise judgment

Nonaka et al. (1996) have suggested that knowledge is created through four different modes: (1) socialisation: involves conversion from individual tacit knowledge to group tacit knowledge (watching somebody, then doing it), (2) externalisation: involves conversion from tacit knowledge to explicit knowledge (doing it, then describing it), (3) combination: involves conversion from separate explicit knowledge to systemic explicit knowledge (reading about it, then describing it), and (4) internalisation: involves conversion from explicit knowledge to tacit knowledge (reading about it, then doing it). Whenever knowledge translates from one form to another, is liberated energy, innovation, and performance

2.11 Learning Organisation and Organisational Learning

To the organisation, knowledge is defined as what known about customers, products, processes, mistakes, and successes. Wiig (1996) has identified two objectives of KM: to make the organisation act as intelligently as possible in order to safe its viability and overall success, and to otherwise realise the best value of its knowledge assets. If this is the case, the target of KM for an organisation should be to generate a learning organisation that is competent in measuring, storing, and capitalising on the expertise of its workers to create an organisation that is more than the total of its parts.

The two terms learning organisation and organisational learning are used interchangeably, and both of them focus on how important it is for organisations to learn continuously. It is difficult to distinguish between them (McGill et al., 1992; Redding and Catalanello, 1994; Slater and Narver, 1994; Solomon, 1994).

Argyris (1977) defines organisational learning as the process of "detection and correction of errors." In his view, organisations learn through individuals acting as agents for them: "The individuals' learning activities, in turn, are facilitated or inhibited by an ecological system of factors that may be called an organisational learning system" (116).

McGill et al. (1992) define organisational learning as the ability of an organisation to gain insight and understanding from experience, through experimentation, observation, analysis, and a willingness to examine both successes and failures.

Radding (1998) defined a learning organisation as that "organisation where actions and decisions are guided by an appreciation for the importance of communities in organisational life and where management is focused on building and sustaining relationships". Therefore, Pedler et al. (1991) proposed that the learning organisation is able to find out what is effective by refraining from its own experiences and learning from that process; by developing the skills of its employees, it constantly transforms itself.

Organisational learning is defined by Pedler et al. (1991), Probst and Buchell (1997) and Radding (1998) as the process of gaining knowledge and developing skills that empower us to understand. Thus, to improve problem-solving ability and capacity for effective action.

KM researchers claim that the KM paradigm lies beyond the organisational learning boundary (Nevis et al., 1998). Moreover, the increasing importance of knowledge assets or intellectual capital suggests an intensifying need for individuals and organisations to increase their store of knowledge. To enlarge stores of knowledge, organisations have to learn continuously, as Aubrey and Cohen (1995) pointed out. Thus, the concept of organisational learning is a crucial element of KM. Therefore, sharing knowledge means facilitating organisational learning, organisational learning is an important discipline that organisations must learn in order to survive.

2.12 Importance and Benefits of KM

The literature review reveals that there are several organisations that have spent substantial amounts of money on applying KM, which implies that KM is very important to these companies in their pursuit of competitive advantage. Grey (1996) mentioned that companies are applying KM to serve customers well, and they must reduce their cycle times, operate with minimum fixed assets and overhead (people, inventory and facilities), shorten product development time, improve customer service, empower employees, innovate and deliver high quality products, enhance flexibility and adaption, capture information, create knowledge, share, and learn. Further, he suggested that none of this is possible without a continual concentration on the creation, updating, availability, quality, and use of knowledge by all employees and teams, at work and in the marketplace.

Moreover, Malhotra (1998) and Manasco (1999) believe that KM is necessary for companies. For Malhotra (1998), it is very important, because what worked yesterday may or may not work tomorrow. He considered a simplistic example: companies that were manufacturing the best quality of buggy whips became

obsolete, regardless of the efficiency of their processes, since their product definition did not keep up with the changing needs of the market. The same holds for assumptions about the optimal organisation structure, the control and coordination systems, the motivation and incentive schemes, and so forth. To remain aligned with the dynamically changing needs of the business environment, organisations need to assess continuously their internal theories of business for ongoing effectiveness. That is the only feasible means for ensuring that today's 'core competencies' do not become 'core rigidities' of tomorrow (Malhotra, 1998).

Manasco (1999) postulate that organisations' increasing ability to support knowledge (and knowledgeable people) will in turn enable these organisations to practise faster and better quality service for their clients.

Skyrme (2001) focused on knowledge strategy, and said that as a result of developing a knowledge strategy and effective implementation, firms will typically achieve some benefits listed in Figure 2.6.

APQC (2000) believes that knowledge supports the ability of every organisation to prosper. Every action and every output that delivers value must be aligned with one of the three platforms all businesses compete around: cost, time, and differentiation. KM will help the organisation to short-cycle internal processes, cut costs, and operate more effectively and efficiently upon successful implementation.

Hildebrand (1999) refers to the Tennessee Valley Authority's nuclear division, which is the nation's largest public power supplier, which cuts time and errors out of the cycle by creating and focusing on the knowledge management system.

Figure 2.6 summarises some authors' views on the benefits of KM:

Figure 2.6 Knowledge Benefits based on the literature review

Authors	KMBenefit
APQC (1996)	1. Greater customer intimacy and satisfaction. 2. Improve cycle time and operational excellence. 3. Better use of organisational knowledge to improve operations and deliver products and services.
Grey (1996)	1. Serve customers well. 2. Reduce cycle times. 3. Operate with minimum fixed assets and overhead. 4. Shorten product development time. 5. Empower employees. 6. Innovate and deliver high quality products. 7. Enhance flexibility and adaption. 8. Capture information and create knowledge. 9. Share and learn.
Radding (1998)	1. Prevention of knowledge loss. 2. Improved decision. 3. Adaptability and flexibility. 4. Competitive advantage. 5. Assets' development. 6. Product enhancement. 7. Customer management. 8. Leverages of investment in human capital.
Pervaiz et al. (1999)	1. Reduces loss of intellectual capital from employees who leave. 2. Reduces cost of development of new product / services. 3. Increases productivity of workers by making knowledge accessible to all employees. 4. Increases employee satisfaction.
Uit Beijers (1999)	1. Improve efficiency. 2. Improve market position. 3. Enhance continuity of company. 4. Enhance profitability of company. 5. Optimise interaction between product development and marketing. 6. Improve relevant (group) competencies. 7. Make professionals learn more efficiently and more effectively. 8. Provide better foundation for making decisions. 9. Improve communication between knowledge-workers. 10. Enhance synergy between knowledge-workers. 11. Ensure knowledge-workers stay with company. 12. Make company focus on core business and on critical company knowledge.

Figure 2.6 (Continued)

Authors	KM Benefit
APQC (2000)	1. Short-cycle internal processes. 2. Cut cost. 3. Operate more effectively.
Santosus and Surmacz (2001)	1. Foster innovation by encouraging the free flow of ideas. 2. Improve customer service by streamlining response time. 3. Boost revenues by getting products and services to market faster. 4. Enhance employee retention rates by recognising value of Employees' knowledge and rewarding them for it. 5. Streamline operations and reduce costs by eliminating redundant or unnecessary processes.
Skyrme (2001)	1. Faster and better solution to customer problems. 2. Improved innovation and new product development. 3. Early warning of potential market changes. 4. Identify new business opportunities through better (KM). 5. Minimising of duplication of effort and loss of knowledge following organisation restructuring. 6. Improved alignment between business strategy and technology infrastructure for knowledge sharing and development

These benefits undoubtedly depend on the knowledge CSFs that will be detailed in the next section. These benefits could be missing unless the organisation takes account of CSFs, including people's needs, such as how people learn, how they implement what they learn, and how they share their knowledge. It is easy to understand why a multitude of factors become considerations in implementing a KM function

2.13 KM Measurement

Measurement is the foundation through which it is possible to control, evaluate and improve processes. The common reason for measuring is to help monitor the value of KM initiatives and to supply a link to the key performance indicators. In order for organisations to attain goals, they must use measurement (Pervaiz et al., 1999; Lim et

al., 2000). Many of the knowledge heads have now attempted and checked not just one measurement system but a whole range, combining different measures and developing new and better methods for measuring intangible assets (Skyrme, 2003).

On the other hand, O'Dell and Grayson (2000b) focused on the internal benchmarking and knowledge transferring; they said that there are two types of measurement: 1. measuring performance to identify a best practice, and 2. measuring the impact of initiatives and best practices transfer itself.

Gooijer (2000) and APQC (2001a) argue that the measuring of KM is possible; however, it is not simple. Intangible assets need to be processed differently from other business tangible assets, such as classifying the value of information and other intangibles assets.

Since there are a number of methods to measure KM, it can be said that each company has its own perception and a prescribed method of measuring its KM. For example, Ernst & Young measures the amount of knowledge it reuses in the form of proposals, presentations, and deliverables, and the contributions of its knowledge repository to closing sales (Davenport et al., 1998).

Ghalayani and Noble (1996) therefore suggested there are three stages of measurement. The first one, which is believed to have started in the 80s, concentrates heavily on financial measures such as profits, ROI, and productivity. Contained by this system, measures are based on the traditional system of management accounting. Unfortunately, this viewpoint is handicapped by a number of shortcomings. The second is characterised by non-financial measures. Typically, these are measures that are related to manufacturing strategy, and are primarily non-financial measures such

as those related to operational matters that facilitate decision making for managers and workers, foster improvement rather that just monitor performance, and change with the dynamics of the market place. The last stage includes financial and non-financial measures. These include systems to inspect performance from multiple angles and inspect the trade-offs openly in an attempt to guard against sub-optimisation.

It appears that Zairi (1992) does not prefer the traditional measures that focused heavily on financial elements, because he feels they are harmful and incompatible with improvement measures.

However, before offering some of the methods that can measure KM, the objectives of measurement have to be stated precisely and known. As illustrated from the literature review, measurement is a powerful tool to help organisations understand their underlying quality structures and diagnose improvement activities. Drucker (1995) said that the measurement of intangible assets (e.g. expertise, experience, patents) is increasing in importance because these assets are permanent, rather than the tangible assets by which organisations' values have traditionally been evaluated.

Thus, Skyrme and Amidon (1998) propose that there are three main reasons for measuring KM. First, it provides a basis for company valuation, it is very important for trading assets or to price the company in the marketplace, and to earn a proper return for shareholders. Second, it stimulates management to focus on what is important; this is the role of approaches such as the balanced scorecard, which is one of the KM measurement methods that will be examined in the ensuing sections. Third, it justifies investing in KM activities; some of the advocates of KM differ over what measures they can use to convince management of its value.

2.13.1 Measurement methods

Knowledge is information with a process applied to it to give (value-added). It is not clear whether knowledge can be measured, although various researchers (e.g Liebowitz and Wilcox (1997), Liebowitz and Beckman (1998), Liebowitz (1999a), and practitioners (Edvinsson and Malone, 1997) are attempting to develop metrics and models to measure knowledge.. Others like Davenport and Prusak (1998a) believe that knowledge itself cannot be measured, but the actions or results associated with applying knowledge can be measured.

The following are some methods that could be used to measure KM.

2.13.1.1 Balanced Scorecard (BSC)

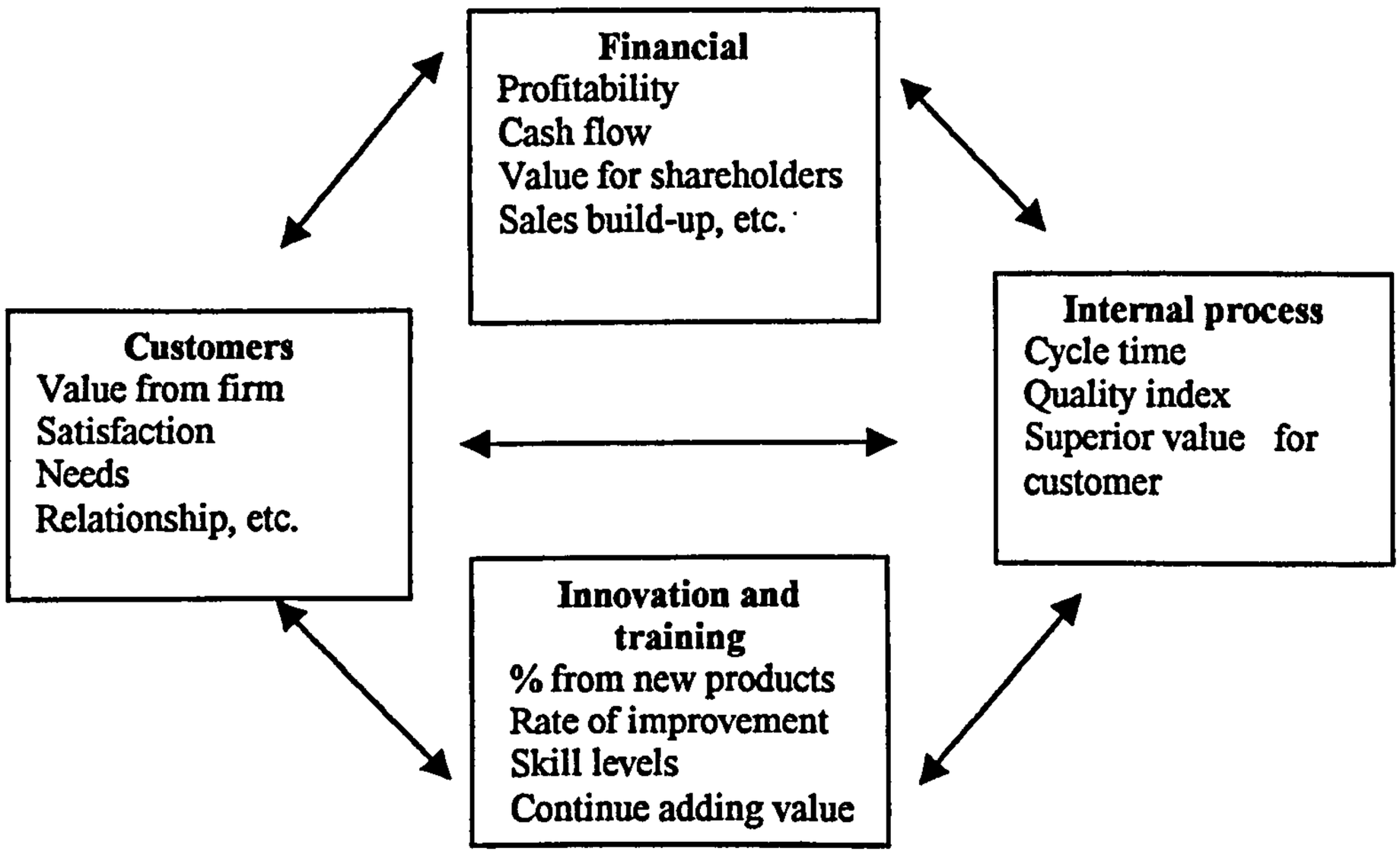
This method was devised by Kaplan and Norton (1992). It consists of four dimensions: customers, financial, internal business processes, and innovation and learning. Also, Barker (1997) and Gooijer (2000) agree, but Gooijer has two models for measuring the KM performance framework which is based on this method, and a KM behaviour framework that identifies levels of practice demonstrated by individuals.

The BSC approach examines performance related to finance, human resources, internal processes, and customers (Kaplan and Norton, 1992; Oliveira, 2001; Brewer, 2002). Because the BSC requires substantial amounts of data, it is a necessity to establish an organisational data warehouse of its perspectives, like human resources, customers, processes, and financial data that can be used in decision support.

Kaplan and Norton (1992) noted that this method helps companies to move from being financially driven to mission driven. In other words, it becomes a key part of the wider management system of planning, monitoring and control.

Also, practitioners report that the BSC forces them to think of the links, and explicitly identify trade-offs between different factors. It also encourages cross-organisational activities (Skyrme and Amidon, 1998). (Figure 2.7).

Figure 2.7 Balanced Scorecard (BSC)



Source: Adapted from Skyrme and Amidon (1998:21)

Oliveira (2001) noted that the unrelated data must be integrated, the data values standardised, and invalid data removed or corrected. The process and information technology to effect the extraction, integration, correction, and transformation of data are best supplied by IT experts. The data are then loaded into the BSC data warehouse. Oliveira believes that organisations must use IT, and as regards a data warehouse, he suggests that the design team should be educated in the principles of the BSC and how a data warehouse can provide the required performance data. Also,

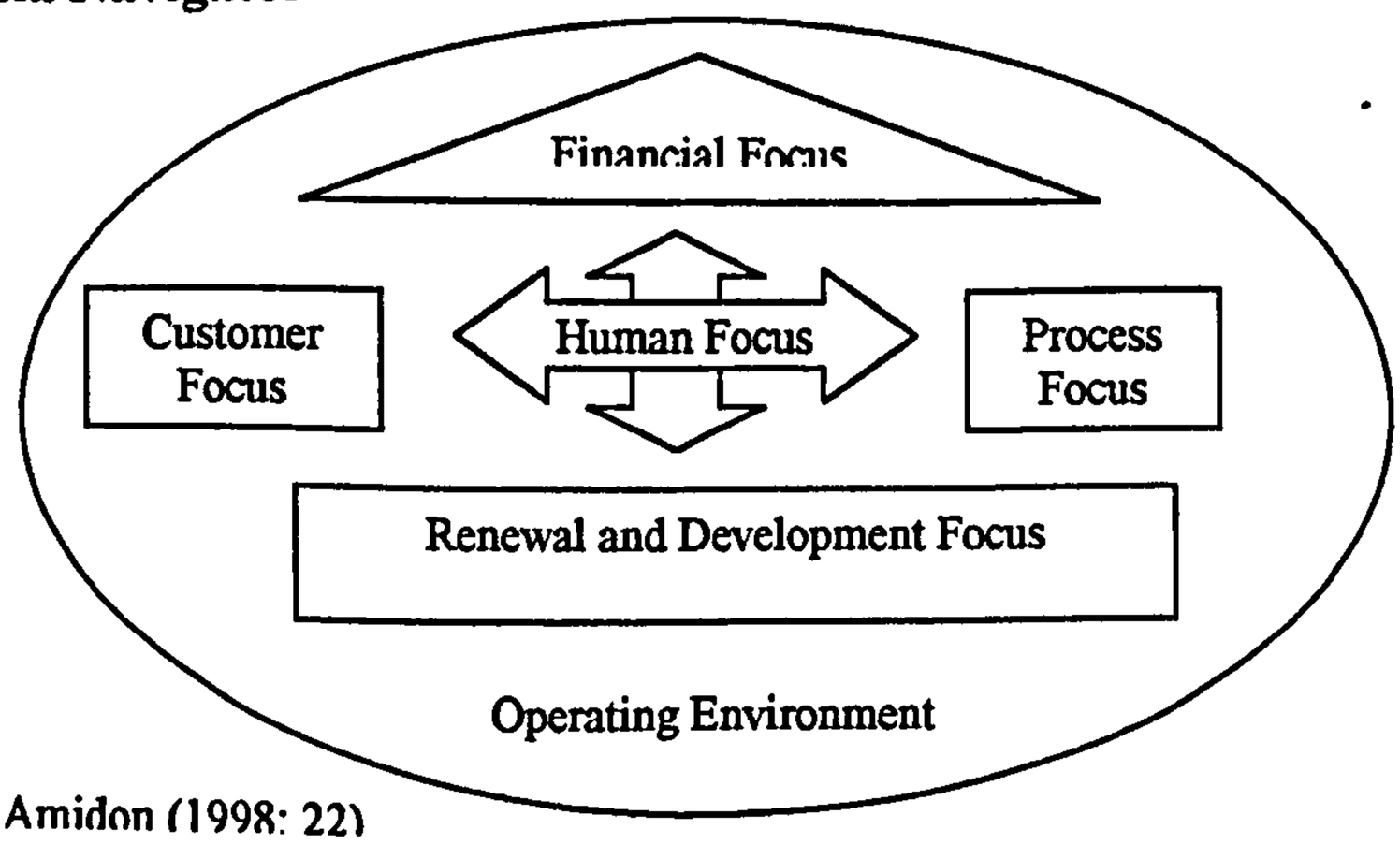
the group should determine the functionality needed and an acceptable price range, prior to selecting and purchasing the appropriate software. .

Brewer (2002) provided an example from the Dell Computer Corporation, a company which uses an IT supporting BSC. He said that Dell invests in the IT infrastructure that supports real-time communication among its customers, its own manufacturing facilities, component suppliers, and airfreight carriers. Also, a number of collaborative customer-solution teams that motivate Dell to collaborate with its customers and jointly create technology solutions that fulfil any unmet customer needs. Furthermore, evaluation of a number of emerging technologies inspires Dell's leaders to stay abreast of technology threats and opportunities that may alter the competitive landscape in the future.

2.13.1.2 Scandia Navigator

This is another method for measuring knowledge. The Navigator is used as a model to drive sustained business development and to ensure that management actions and behaviours are consistent with renewal and development as well as financial performance (Skyrme and Amidon, 1998).

Figure 2.8 Scandia Navigator



Source: Skyrme and Amidon (1998: 22)

Table 2.1 illustrates how the different factors have been quantified and reported utilising the Scandia Navigator. This case was particular to Scandia's direct sales insurance subsidiary.

Table 2.1 Measures used in Scandia Navigator

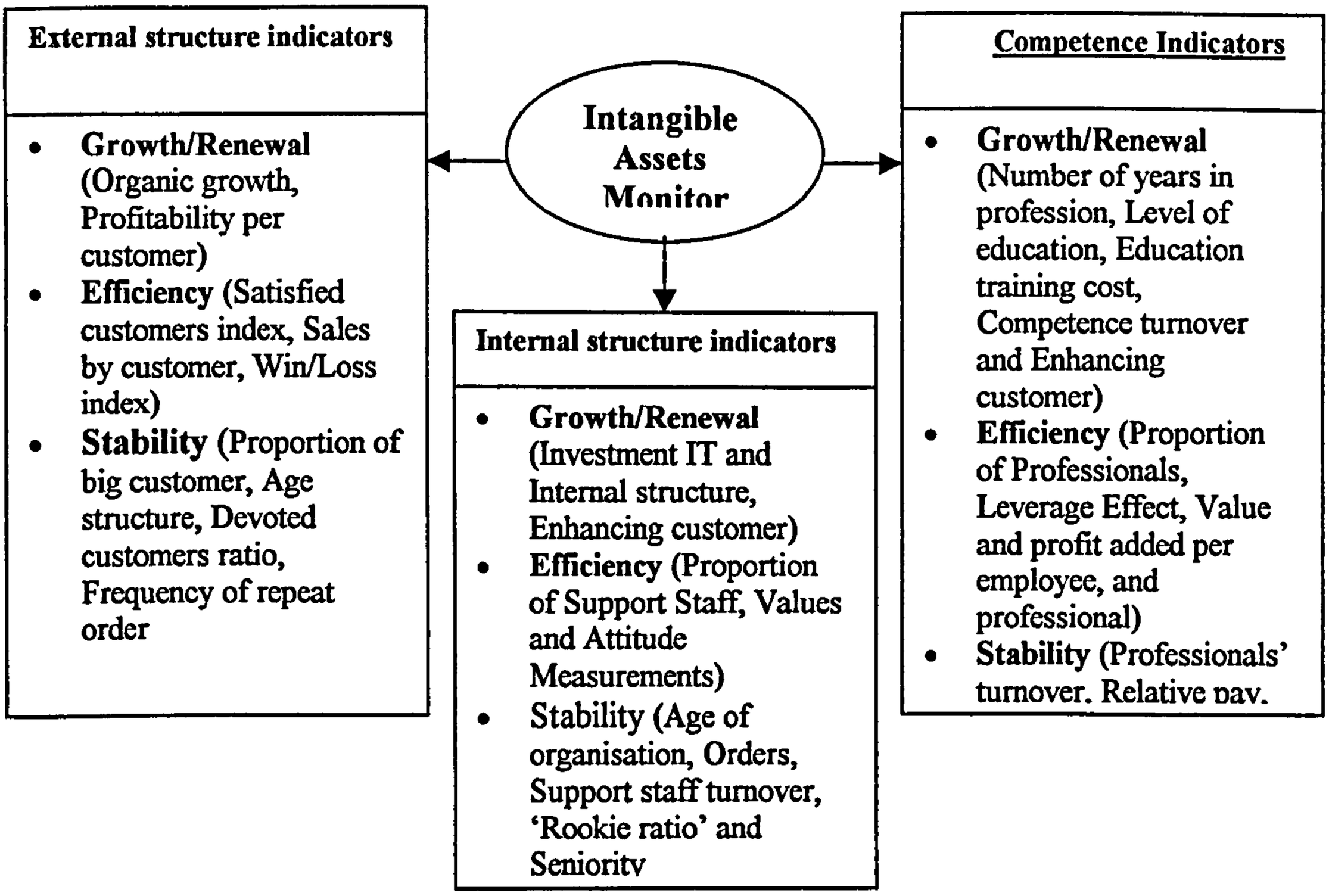
Measure		1994	1995
Financial	Premium income per employee	3,586	3,592
Customer	Telephone Accessibility Satisfied customer index	90 % 4.15	93 % 4.32
Human	Training days per year	3.50	6.0
Process	I/T employees as % of total	8.1 %	7.3 %
Renewal	Increase in premium income	28.5 %	31.9 %

Source: Skyrme and Amidon (1998: 22)

2.13.1.3 Intangible Assets Monitor

This is one of the methods for measuring intangible assets and has a presentation format which displays a number of relevant indicators for measuring intangible assets in an easy style. It consists of three dimensions: external structure indicators, internal structure indicators, and competence indicators. Figure 2.9 details the Intangible Assets Monitor elements suggested by Sveiby (1997a).

Figure 2.9 Intangible Assets Monitor (IAM)



Source: Based on Sveiby (1997)

The authors of both BSC and Scandia Navigator argue that non-financial measures must complement the financial indicators. They also argue that the non-financial ratios and indicators must be lifted from the operational to the strategic level of the firm

Further, a comparison may be made between three concepts of the Scandia Navigator and the Intangible Assets Monitor:

- Customer Focus is Skandia's equivalent of External Structure.
- Process Focus is Skandia's equivalent of Internal Structure.
- Human Focus is Skandia's equivalent of Competence.

Graef (1997) added several approaches for measuring intellectual capital: relative value, competency models, subsystem performance, benchmarking, business worth, business-process auditing, knowledge bank, brand-equity valuation, calculated intangible value, colorised reporting, as well as BSC.

These are some methods to measure intangible assets. But companies must understand that systematic KM must be a means, not an end, and must work to ensure that KM initiatives are linked to their company's strategies.

The American Productivity & Quality Centre (APQC) (2001b) focused on the customer area by creating access to an increasing number of communication channels, including phone, fax, e-mail, and real-time chat, and what barriers could be faced. APQC (2001b) took the first step in understanding this issue by interviewing contact centre professionals from a variety of companies and an industry consultant about their views on the subject matter, and how they have tried to overcome these barriers in their organisations. APQC (2001b) from Response Design Corporation (RDC) carried out the study to assess how contact centres measure success in a new environment of multiple customer access channels.

The following summary in Figure 2.10 represents summarises results of the interviews, which show that these organisations have attempted to overcome these barriers in a variety of ways, including dedicated cross-functional teams, evaluation of CRM packages, and use of intranet and Internet sites

Figure 2. 10 Barriers to Success in Measurement

Title	Company	Key Measures of Success	Barriers	Attempt to overcome
Consultant	Pearl Advisory Group	• Customer satisfaction • Employee Satisfaction • Revenue (Sales Targets) • Efficiency (cost and quality)	• Determine how attributes differ among channels for each key performance metric • Capture appropriate data	• Approach with same rigorous discipline used to measure traditional phone contract
Director Client Services	Industry Canada	• No. of phone inquiries vs. no. of online inquiries • No. of enquiries as % of Internet visits • Response rate across channels	• Encouraging employees to use call centre information	• Get back to client as quickly as possible, regardless of channel • Development of on-demand intranet site
Direct Customer contact	Verizon Logistics	• Revenue, margin, quality, and employee satisfaction	• Systems' capabilities that enable holistic view of customer interaction, sales and service quality across all access channels.	• Building business case for RCM system for long term • Trialling separation of duties by access channel • Metrics' productivity model • Call monitoring to measure FCR • Solicits continual feedback from customers

Figure 2.10 (Continued)

Title	Company	Key Measures of Success	Barriers	Attempt to overcome
Manager Dallas Welcome Centre	The Document Company Xerox	• Solution provided to customer	• Reluctance of customer to use tool that will enable company to measure solution rate using case base Tool on Internet	• Technology to make it easier for customer to state if solution achieved • Dedicated people who call customer to see if they are satisfied and have achieved solution
Resource Allocation Manager	Avaya	• Response rate	• Providing seamless service across access channels • Providing all relevant information on associates' desktops • One measurement system for all types of contacts	• Dedicated process improvement teams

Source: APQC (2001b)

Measuring knowledge is crucial for organisations to guarantee that they are achieving their goals. Measurement provides a significant mechanism to evaluate, control and improve upon existing performance. Measurement generates the basis for comparing performance between different organisations, different processes, and different teams and individuals (Pervaiz et al., 1999).

Zairi (1994) suggests that the function of measurement is to develop a method for generating a class of information that will be useful in a wide variety of problems and situations.

2.13.1.4 Matrix Structure

Lim et al. (2000) have designed a tool referred to as matrix structure, combining four steps for a knowledge (capturing, sharing, measuring, and learning) and cost model. This matrix helps to show how KM impacts upon the organisation as a whole, and forces practitioners to consider all factors, soft as well as hard, and allows them to examine the various aspects of KM implementation. It also forces managers to link KM to the organisation's overall policy and strategy, and presents them with an opportunity to list the important functions that support KM and strategy (Figure 2.11).

Figure 2.11 Matrix Structure

	Capturing	Sharing	Measuring	Learning
Customer Organisation Supplier Technology				

Source: Lim et al. (2000:12)

The following is the explanation of the four elements of the matrix structure by Pervaiz et al. (1999):

1. Customer Matrix: This part could include customer satisfaction, customer retention, and customer relation. The user can be prompted to think of a future measure that would indicate the success or failure of KM activities by comparing horizontally across the matrix. Some of these measures are based on the actual number, and some are simply based on outcomes. Therefore, Edvinsson and Malone

(1997) proposed that market share, number of customers and (annual sales/ customer) are included in the customer matrix.

2. Organisation Matrix: This involves exploration of people within the organisation. The main idea of this step is to establish how to transfer individual knowledge to organisation knowledge. Measures could include number of employees participating and number of employees rotated.

3. Supplier Matrix: The suppliers' knowledge is of vital importance to an organisation. For example, the suppliers' knowledge can be passed on to the customer to permit more informed decisions to be made. This part could be called the foundations of KM, and companies can measure those which can be useful, like supplier meetings, supplier development programmes, and benchmarking activities between suppliers.

4. Technology matrix: This stage is concerned with the system a firm needs to acquire in order to improve its KM.

2.14 Critical Success Factors (CSFs) for KM

KM is of growing interest in today's business. With the importance of KM being realised, businesses are viewing KM as a critical success factor in today's dynamic borderless society. Making knowledge available to the right people at the right time is crucial for building and sustaining an organisation's competencies.

For any business, there are a limited number of areas in which satisfactory results ensure successful competitive performance, and those areas are typically referred to as CSFs. Digman (1990: 247) defined CSFs as the areas where things must go right for the business to flourish. Oakland (1995:325) defined them as what the

organisation must accomplish to achieve the mission by examination and categorisation of the impacts. He adds that they are the minimum key factors or sub-goals that the organisation must have or need, and which together will achieve the mission.

Kanji and Tambi (1999: 137) stated that CSFs are the few things that must go well to ensure success for a manager and/or organisation. They represent those managerial areas that must be given special and continual attention to cause high performance.

There are several methods and techniques for determining CSFs. Leidecker and Bruno (1984) proposed environment scanning, industry structure analysis, opinions of experts in the industry, analysis of competitors, analysis of the industry's dominant firm, a specific assessment of the company, intuitive judgment or 'feel' of insiders, and profit impact of market strategy (PIMS) data.

These definitions see CSFs as points, areas, or goals that have to be given extensive attention, and support by the management to achieve the mission, quality and high performance. Consequently, these areas have to be defined and measured before the organisation starts implementing any project. So, a clear study and understanding of the important areas in the working field environment (secondary case studies), and reviewing the literature published in the area will help to develop better understanding of the CSFs that may affect companies' success in KM.

Successful KM must be founded on an understanding of how people learn, how they implement what they learn, and how they share their knowledge (Bassi, 2000).

On the other hand, Haxel (2001) says that using knowledge in a structured and organised way is one of the key factors that determine corporate success. The goal is to share and apply knowledge faster and more efficiently than your competitors.

Many authors have different elements that they believe contribute towards the successful application of KM with an organisation. Manasco (1999) suggests that there are five keys to learning that could leverage its knowledge (Figure 2.12), while Skyrme (2002b) recommends seven keys to knowledge levers (Figure 2.13).

Figure 2.12 Five Keys to Knowledge Leverage

Keys	Explanations
1. Knowing community	Comprehension of information needs.
2. Creating context	Building environment for learning, knowledge creation, and information sharing.
3. Overseeing content	Quality information, (updating information and sustaining ability to identify and fill knowledge gaps).
4. Supporting infrastructure	Knowledge leader must be fully skilled, knowledge manager has proper technology at its disposal.
5. Enhancing process	Knowledge sharing must be simple, straightforward and efficient for sharing or tapping into knowledge pool. Otherwise, people will be discouraged from contributing to or tapping into enterprise's overall body of knowledge

Source: Based on Manasco (1999)

Figure 2.13 Seven Keys to Knowledge Leverage

Lever	Key Activities	Example
1.Customer knowledge	Developing deep knowledge sharing relationships. Understanding needs of your customers' customers. Articulating unmet needs. Identifying new opportunities	Steel Case (office products manufacturer) has totally redefined its market into knowledge worker productivity through opening a customer knowledge channel from its product end-users into its R&D.
2. Stakeholder relationships	Improving knowledge flows between suppliers, employees, shareholders, community, etc., using this knowledge to form key strategies.	Toshiba collects comparative data on suppliers ranking 200 quantitative and qualitative factors. It has an active suppliers' network and association where knowledge is shared and suppliers are integrated into future strategies.
3. Business environment insights	Systematic environmental scanning, including political, economic, technology, social and environmental trends. Competitor analysis. Market intelligence systems.	Smith Kline Beecham has evolved virtual library that delivers market updates, patent information and wealth of externally sourced material to desk tops of research scientists.
4.Organisational memory	Knowledge sharing. Best practice databases. Directories of expertise. Online documents, procedures and discussion forums. Intranets	Price Waterhouse typical of several consultancies which have knowledge databases to allow sharing of company knowledge. In addition to Knowledge View, knowledge centres that provide human analysts and navigators. Helps to solve customer problems faster.

Figure 2.13 (Continued)

Lever	Key Activities	Example
5. Knowledge in processes	Embedding knowledge into business processes and management decision-making.	CIGNA made best underwriting knowledge available as guidance screens in their computerised underwriting processes. This helped them turn loss into profit.
6. Knowledge in Products and services	Knowledge embedded in products. Surround products with knowledge, e.g. in user guides, and enhanced knowledge-intensive services.	Campbell Soup's 'Intelligent Quisine' (IQ) delivers weekly packages of nutritionally designed, portion-controlled meals to those suffering hypertension or high cholesterol.
7. Knowledge in people	Knowledge-sharing fairs. Innovation workshops. Expert and learning networks. Communities of knowledge practice.	Tetra Pak Converting Technologies has learning networks, where people across the organisation, pool, update and develop their expertise in key technologies such as laminating and printing

Source: Based on Skyrme (2002b)

On the other hand, Finneran (1999) noted that KM practitioners have found that a CSF in the implementation of KM is the creation of a cultural environment that gives confidence to the sharing of information. Experts have estimated that 90 % of success of KM is involved with gaining the buy-in of knowledge users and encouraging knowledge-sharing.

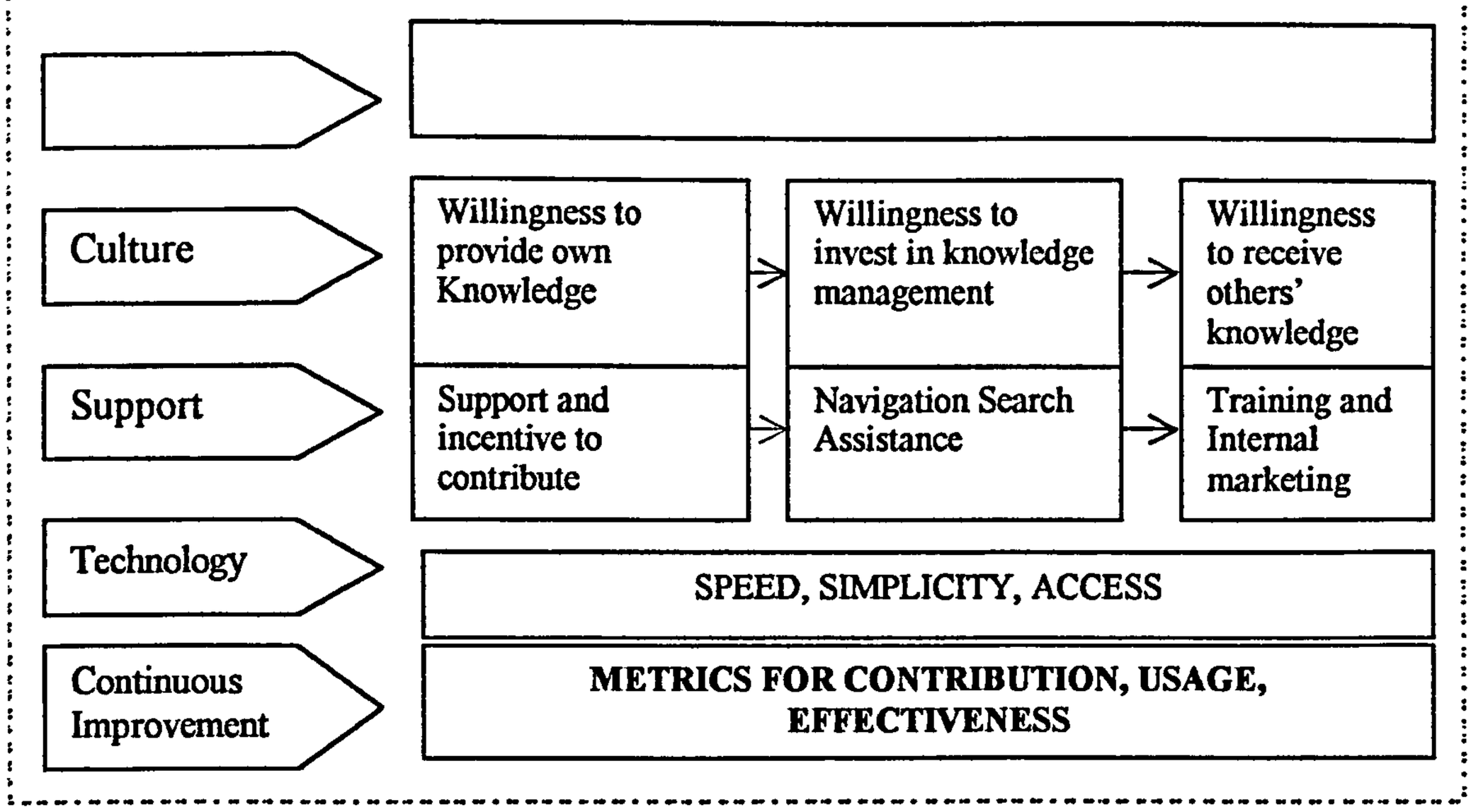
Success of the KM function also requires some issues that must be addressed by the business practice we are designing; the KM process itself must be highly adaptable. The intent of the initiative is to create a growing and competitively superior organisation. This can be undermined if any function that contributes to this is not

able to change to accommodate conditions encountered throughout the organisation's evolution. Certain key activities must be incorporated into the knowledge environment. These include an evolution and acceptance of deeper and better competency understandings over time, and accommodations for new applications that capitalise on key competencies, recognise and incorporate knowledge developed elsewhere, and develop an issue-focused design which understands the required objectives before committing to a solution (Dove, 1998).

British company, Process Edge's product and services are intended to assist users in successfully harnessing knowledge within their organisation. They consider people as the factor that is an important determinant of success of KM systems, and people are advised to support knowledge processing and business decision-making. They implement systems, where this is required, and they supply software tools and techniques for knowledge workers, and for leaders who are creating a new internal culture and business purpose (Process Edge, 1999).

According to Trussler (1998), there are some essential steps in the successful implementation of KM. Figure 2.14 shows some of the key building blocks for a successful KM programme, from leadership and strategic focus to systems and follow-up metrics. Some of the most critical issues start within the culture and support areas e.g. motivating employees to share knowledge so as to leverage the knowledge network. A culture must exist within organisations which encourage employees and virtual team to collaborate in order to share knowledge (Trussler, 1998:18).

Figure 2.14 Building Blocks for Successful KM



Source: Adapted from Trussler (1998: 18)

In the ensuing section, an attempt will be made to highlight the factors that are critical towards the successful implementation of KM.. Table 2.15 summarises the diverse perspectives on CSFs of some authors.

Figure 2.15 CSFs for KM implementation

Authors	CSFs
Wiig (1996)	1. Knowledge assets - to be applied or exploited - must be nurtured, preserved, and used to the largest extent possible by both individuals and organisations. 2. Knowledge-related processes - to create, build, compile, organise, transform, transfer, pool, apply, and safeguard knowledge - must be carefully and explicitly managed in all affected areas.
Davenport et al. (1998)	1. Link to economic performance or industry value. 2. Technical and organisational infrastructure. 3. Standard, flexible knowledge structure. 4. Knowledge-friendly culture. 5. Clear purpose and language. 6. Change in motivational practices. 7. Multiple channels for knowledge transfer. 8. Senior management support.

Figure 2.15 (Continued)

Authors	CSFs
Davenport and Prusak (1998b)	1. Technology (network). 2. Knowledge creation and dissemination. 3. Knowledge sharing. 4. Electronic repositories of knowledge. 5. Intellectual curiosity. 6. Training, Culture and Leadership 7. Operational improvement of an isolated process or function, rather than fundamental transformation of the firm. 8. Issues of trust. 9. Knowledge infrastructure (Address political obstacles and issues of trust before attempting to set up and manage knowledge initiatives – knowledge mapping is one of the best early activities in KM).
Morey (1998)	1. Available (if knowledge exists, is it available for retrieval?). 2. Accurate in retrieval (if available, knowledge retrieved). 3. Effective (knowledge retrieved useful and correct). 4. Accessible (knowledge available during time of need).
Trussler (1998)	1. Appropriate infrastructure. 2. Leadership and strategic (Management commitment). 3. Creating motivation to share. 4. Find right people and data. 5. Culture. 6. Technology (Network). 7. Available to collaborators (Transferring). 8. Training and learning.
Finneran (1999)	1. Creation of cultural 2. Sharing of information and knowledge 3. Creative knowledge 4. Workers' buy-in. (90% of success of KM is involved with gaining buy-in of knowledge users and encouraging knowledge sharing).
Liebowitz (1999b)	1. KM strategy with support from senior leadership. 2. Chief Knowledge Officer (CKO). 3. Knowledge ontologies and knowledge repositories to serve as organisational/corporate memories in core competencies 4. KM systems and tools (Technology) 5. Incentive to motivate employees to share knowledge. 6. Supportive culture for KM.

Figure 15. (Continued)

Authors	CSFs
Manasco (1999)	1. Knowing community. 2. Creating context. 3. Overseeing content. 4. Supporting infrastructure (proper technology). 5. Enhancing process (Creating and sharing knowledge).
Bassi (2000)	1. People learn (how, what). 2. People implement (how). 3. Sharing.
Choi (2000)	1. Employee training 2. Employee involvement 3. Teamwork 4. Employee empowerment 5. Top-management leadership and commitment 6. Organisation constraints 7. Information systems infrastructure 8. Egalitarian climate, benchmarking 9. Knowledge structure.
Skyrme and Amidon (2000)	1. Strong link to a business imperative. 2. Compelling vision and architecture. 3. Knowledge leadership. 4. Knowledge creation and sharing culture. 5. Continuous learning. 6. Well-developed technology infrastructure. 7. Systematic knowledge processes.
Streele (2000)	1. Staff must buy into the new model. 2. Lines of communication must be kept open. 3. Sharing information. 4. Writing weekly updates. 5. Management supporting.
Haxel (2001)	1. Knowledge structured. 2. Knowledge organised (goal is to share and apply knowledge faster and more efficiently than competitors).

Figure 15. (Continued)

Authors	CSFs
Heisig (2001)	1. Keeping it simple, like using video-tapes to store experiences from experts 2. Building on existing processes like underwriting process and exiting e-mail culture (Culture corporate) 3. Internal branding and naming metaphors for internal marketing and achieving commitment of staff. 4. Senior management support. 5. Success as success factor. 6. External recognition helps internal coordination. 7. IT director business-focused and business process-oriented. 8. Integrated among KM processes (create, store, distribute, apply knowledge.) 9. KM tasks must be combined with daily work tasks and integrated into daily business processes
Skyrme (2002a)	1. Top management support. 2. Clear and explicit links to business strategy. 3. Knowledgeable about knowledge. 4. Compelling vision and architecture. 5. Knowledge leadership and champions. 6. Systematic knowledge processes (supported by specialists in information management (librarians) but close partnership between users and providers of information) 7. Well-developed knowledge infrastructure (hard & soft). 8. Appropriate bottom line measures. 9. Creation of culture that supports innovation, learning and knowledge sharing. 10. Technical infrastructure that supports knowledge work

Snyder and Wilson (2000) believe that KM can guide to competitive advantage, and competitive advantage based on KM is greatly valued by the stock market

Therefore, the factors that mentioned above are aimed at creating a KM environment which provides the company with sustainable competitive advantage through the continued creation of knowledge, maintenance of current knowledge resources, and creating an environment in which the KM function can survive and grow. Alazmi and Zairi (2003a) stated that organisations must take account of these factors in order

to exploit as much as possible the KM advantage, as well as how people learn, how they implement what they learn, and how they share their knowledge.

From these factors, some are more important than others, such as technology, top management commitment, culture, and KM processes which contain creating, transferring and sharing of knowledge.

Therefore, organisations must take account of these factors in order to exploit KM-related advantages fully, as well as how people learn, how they implement what they learn, and how they share their knowledge.

2.14.1 Implementation Barriers

During the knowledge application phase, organisations are likely to encounter some host of problems or barriers. Trussler (1998) noted that some barriers that could be faced, either technical, like client-server databases that were slow and not user-friendly, or non-technical, like lack of motivation to share knowledge, resources to capture and synthesise organisational learning, and ability to navigate the knowledge network to find the right people and data.

Therefore, Pervaiz et al. (1999) proposed that what would seem to be the surmounting technology and technically-related barriers are the easiest to overcome. The next sets of barriers are getting people to become involved and understand the critical implications of KM; the most difficult aspect is capturing, by getting people to state whether they are willing to allow capture of their knowledge or expertise, and with turning tacit knowledge to explicit; and the most problematic of all issues is concerned with linking KM to bottom-line results.

Malhotra (1998) and Trussler (1998) have agreed that an organisation should get the overall goals clear, and how the employees do their work should fit within their organisational business. Trussler (1998) explained that the next step is to decide on the appropriate channels for transferring knowledge.

There are also some other hurdles that present themselves, such as the propensity to hoard knowledge, unwillingness to learn from others, lack of motives to share or learn, and low priority and resource for knowledge gathering, as opposed to more urgent day-to-day business needs. But most were cultural and organisational; for instance, people were not ready, willing, or able to share knowledge, and sometimes even structurally prevented from doing so (Trussler, 1998).

Heisig (2001) believes that " I have no time" or "Team has no time" is the most common barrier.

2.14.2 KM implementations

The following are examples of some companies applying measurement of intellectual assets. They get better understanding of the drivers of value, and are improving management and growth of these vital assets

- Skandia AFS uses the Navigator and tools such as the Intellectual Capital Index to set management goals and drive the business forward. It publishes Intellectual Capital Supplements alongside twice-yearly financial reports (APQC, 1996; Skyrme, 2002a). Both APQC (1996) and Stuart (1996) reported that Skandia Insurance cut time in Mexico office from 7 years to 7 months by sharing knowledge.

- Buchman Laboratories, a specialist chemicals company that was an early adopter of a knowledge repository, spends 2.5% of its revenues on KM. Ernst &Young calculates 6 % of its revenues, and McKinsey & Co. 10 % (Davenport et al.1998).

- Dow Chemicals saved $4 million during the first year of its new programme, and expects to generate more than $100 million in licensing revenues that it might otherwise have forgone (Davenport et al., 1998). Also, Manasco (1997a) mentioned that it was increasing annual revenue from licensing by $100 million. Dow Chemicals have generated over $125 million in revenues from licensing and other means of exploiting intangible assets Skyrme, (2002a, 2002c, and 2003).

- Glaxo Wellcome, by focusing on shareholder value, and better understanding of the value of its R&D pipeline, has significantly increased its share price over the last few years (Skyrme, 2002c, 2003).

- Texas Instruments went from last (1992) to first (1994) in on-time delivery satisfaction in customer ranking of suppliers (APQC, 1996), and it saved the $500 million cost of new plant by leveraging internal knowledge and best practices (O'Dell and Grayson, 2000a). Further, Skyrme, (2002a) stated that TI has saved the equivalent of investing in a new plant by sharing best practice between their semiconductor fabrication plants.

- Chevron realised $150 million annual saving in power and fuel expenses from knowledge sharing in energy use management (O'Dell and Grayson, 2000b).
- Silicon Graphics reduced sales training costs from $3million to $200,000 by managing its product information communications process (Manasco, 1997b).

- Kaiser Permanent, in one of its branches (the Northwest Region), was able to implement an open access programme six to twelve months faster than they predicted by transferring in internal best practice from another region (APQC, 1996).
- Price Waterhouse's collaborative behaviour improved circulation of information increased by its implementation of Lotus Notes and the formation of a central group to capture and document best practices, analysis and documentation time was reduced (APQC, 1996).
- Regarding the final report of American Productivity & Quality Center (APQC) (1996), the benefits of KM they have got are greater customer intimacy and satisfaction, improved cycle time and operational excellence, and better use of organisational knowledge to improve operations and deliver products and services.

Nonaka (1991) mentioned that some of the highly successful Japanese organisations like Honda, Canon, Mutsushita, NEC, Sharp and Kao have become famous because of their ability to respond quickly to customers, create new markets, rapidly develop new products, and dominate emergent technologies. The reason for their success is the way that they use management for the creation of new knowledge.

2.15 Future of KM

It is hard to predict the future, but there are some things one can predict with great confidence. KM will be expanded, and it will have a bright future. Some authors believe that, and maintain an optimistic view towards KM. Their suggestions confirm that, such as Davenport (1998) who noted that one reason that KM never ends is that the categories of required knowledge are always changing. New technologies,

management approaches, regulatory issues, and customer concerns are always emerging. Companies change their strategies, organisational structures, and product and service emphasis. New managers and professionals have new needs for knowledge.

In addition, Manasco (1999) expected that there are two reasons for KM to become a gradually more important issue in the corporate world over the next few years. The first is the essential of carrying out " more with less" in the wake of downsizing and restructuring. Second is the need to strengthen relationships with customers. Also, Seubert et al. (2001) noted that Gartner researchers believe that by 2003, intellectual capital will be the primary way in which businesses measure their value.

Therefore, Morey (1998) proposed that the most important factor in the long-term success of information knowledge is an individual and an organisation. He believes that the only source of competitive advantage in the future will be the knowledge that an organisation contains and an organisation's ability to learn faster than the competition..

Davenport (1996) said that since knowledge is information that is highly valued by people and has at some point resided in someone's brain, people are the most important resource in effective KM. In the future, as today, firms that excel at KM will corner the market for people who are adept at creating and using knowledge. These people will be evaluated and rewarded for their knowledge activities. Managers will be evaluated not only on how successful their decisions were, but also on the knowledge used in making them. The most successful firms in the future will make KM every employee's responsibility, not just that of a select few. He also

recommended that if anyone wants to be good at managing knowledge in the future, now is a good time to start.

Finally, Trussler (2000) proposed that the ability to gather and use knowledge effectively would become a most important source of competitive benefit in many businesses over the next few years. Also, Heisig et al. (2001) substantiate this view by warning that North America and Asia named intellectual capital as a critical factor for their future business success.

2.16 Summary

This chapter has presented a survey of KM fundamentals through a comprehensive review of the relevant literature. It has provided a detailed discussion on knowledge and knowledge management definition, and has attempted to distinguish among data, information, and knowledge. The chapter has also discussed KM history, KM terminology, and reviewed KM measurement. Three methods were presented that are effective in measuring KM, namely Balanced Score Card, Scandia Navigator, and Intangible Assets Monitor. This chapter also focused on finding out the CSFs for KM implementation. Previous literature provides some factors that have a great effect on KM success. The chapter ends with a discussion of the future of KM.

CHAPTER THREE

Literature Review (II): IT support for The Implementation of KM

CHAPTER 3: LITERATURE REVIEW (II): IT SUPPORT FOR THE IMPLEMENTATION OF KM

3.1 Introduction

This chapter represents the second part of the literature review for the present research. It is concerned with issues related to the role of information technology (IT) systems to support KM implementation. As with the previous chapter, the purpose of the present chapter is to identify and examine how to exploit technology in order to gain competitive advantage (in the light of critical success factors).

Morten et al. (1999) suggest that KM is based on two types of strategy: codification strategy, centred around the computer, and personalisation strategy, related to people as a way of meeting and communicating. Sveiby (1997b) suggested that for certain segments, KM equates to management of information systems, and as such, knowledge is thus an object that can be identified and handled in information systems, or KM equates to management of people, processes, a complex set of dynamic skills, and the relevant know-how.

This chapter will examine five areas: (1) information systems (IS), (2) information technology (IT), (3) IT effectiveness for KM, (4) IT vendors, and (5) IT in organisations, including IT-based organisational change.

3.2 Information Systems (IS) and Information Technology (IT)

First, it is necessary to define the information term before giving details of IS and IT. Information is derived from data, for instance Larry (1989, p. 10) states, "Data are the raw material from which information is derived. Information is what results from the thoughtful analysis, manipulation, and presentation of data in a form that will

a form that will enhance the decision-making process." Kroenke (1992), Kroenke and Hatch (1994), and Henry and Lucas (1997) defined information as knowledge derived from data. Another definition by them is "information is data placed within a context". Gregory (1978) set out a final definition of information as "a difference that makes a difference". This definition turns out to be surprisingly robust. It reflects much of what people mean when they say they would like to have information.

3.2.1 Information Systems (IS)

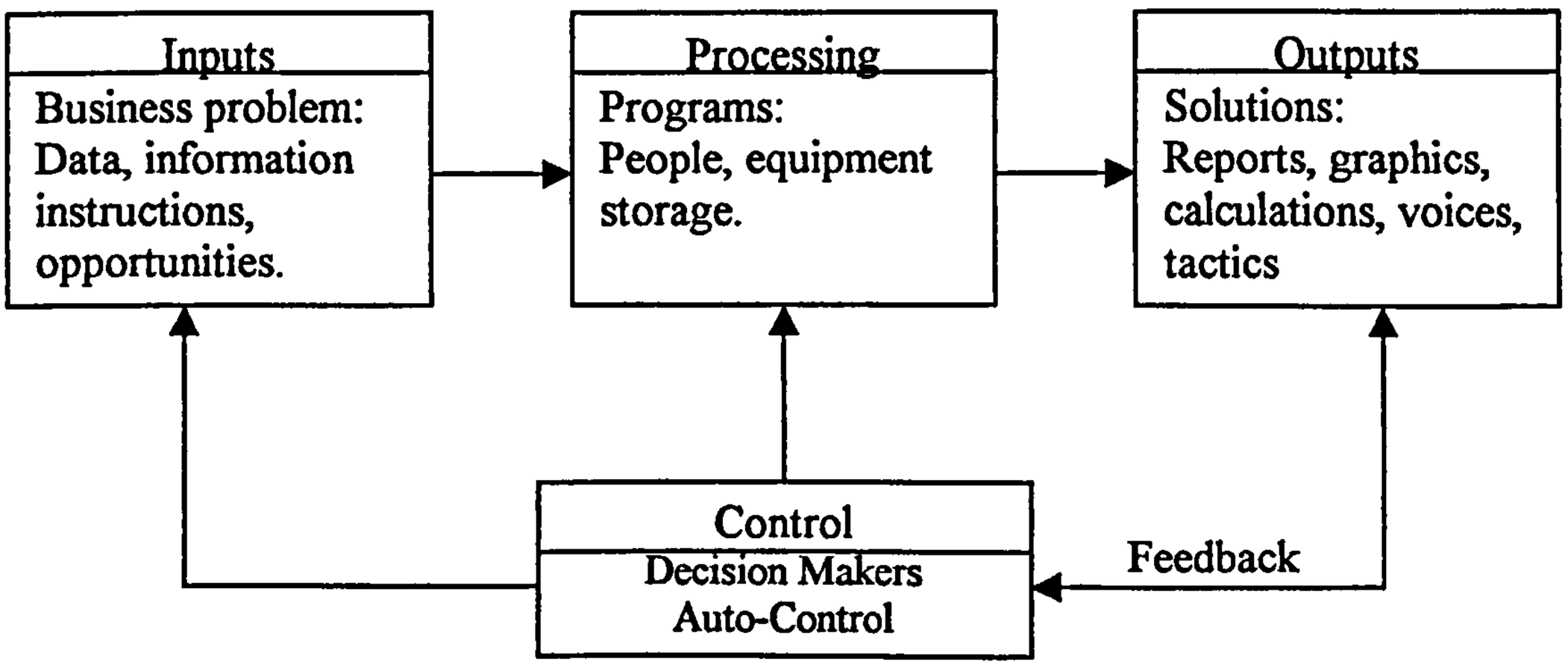
The concept of IS defined by Kroenke (1992), Kroenke and Hatch (1994), and Turban et al. (1999, 2002) is that they collect, process, store, analyse and disseminate information for a specific purpose. Turban et al. (1999, 2002) considered that IS includes input, processes and outputs (see Figure 3.1). Information systems are built to attain several gaols; one of the main goalS of IS is to process data economically into information followed by knowledge. Therefore Larry (1998) deems that IS hardware, software, people, procedures, and data are combined to create a whole information system. The term information system is a generic reference to a computer-based system that supplies data processing capabilities for a department or perhaps an entire company, and information that people need to make better, more informed decisions.

Let us explain these concepts, following Turban et al. (1999):

- Data items refer to a simple explanation of things, actions, and activities that are documented, categorised, and stored, but not prepared for any exact meaning. These data could constitute figures, images or numerics. A database consists of stored data items prepared for withdrawal when needed.

- Information is data organised to have meaning and value for the receiver. The receiver construes the meaning and sketches conclusions and suggestions. Information has a more specific use and a higher value than data. It can vary from an inventory management system or a university online registration system
- Knowledge consists of information processed and organised in a suitable manner to allow easy understanding, experience, accumulated learning and expertise, as they apply to a present concern or activities. Knowledge has a very high potential value.

Figure 3.1 Schematic view of information system



Source: Adapted from Turban et al. (1999, p.18)

3.2.1.1 Information System Infrastructure

Effective and efficient KM is impossible without information systems. Managers need information systems that will enable them in tracking and building the organisation's knowledge framework. For instance, Xerox was able to develop and transfer knowledge after a group of IS infrastructure managers created a way to work together (Storck and Hill, 2000).

Information infrastructure consists of the physical facilities, services, and management that support all computer resources in an organisation. According to Turban et al. (1999, 2002), there are five major components of the infrastructure: (1) computer hardware, (2) general-purpose software, (3) networks and communication facilities (including the Internet and intranet), (4) databases, and (5) information management personnel. In addition to these resources, it also includes their integration, operation, documentation, maintenance, and management.

Savary (1999) insisted that an effective IS infrastructure which includes databases, computer networks, and software is necessary for the organisation to implement the KM process. However, the IS infrastructure involves more than a good relational database or sophisticated e-mail system. As a matter of fact, Davenport et al. (1998) pointed out two broad IS infrastructures. One is based on desktop computing and communications. The other is based upon utilisation of the network technology infrastructure such as the Internet, Lotus notes, and global communications systems for effective transfer of knowledge.

3.2.1.2 Information Architecture

Turban et al. (1999, 2002) refer to information architecture as a high-level map of information requirements in an organisation. It assures us that the organisation's IT meets the strategic business needs of an organisation. In organising information architecture, the designer needs comparable information, which can be divided into two parts:

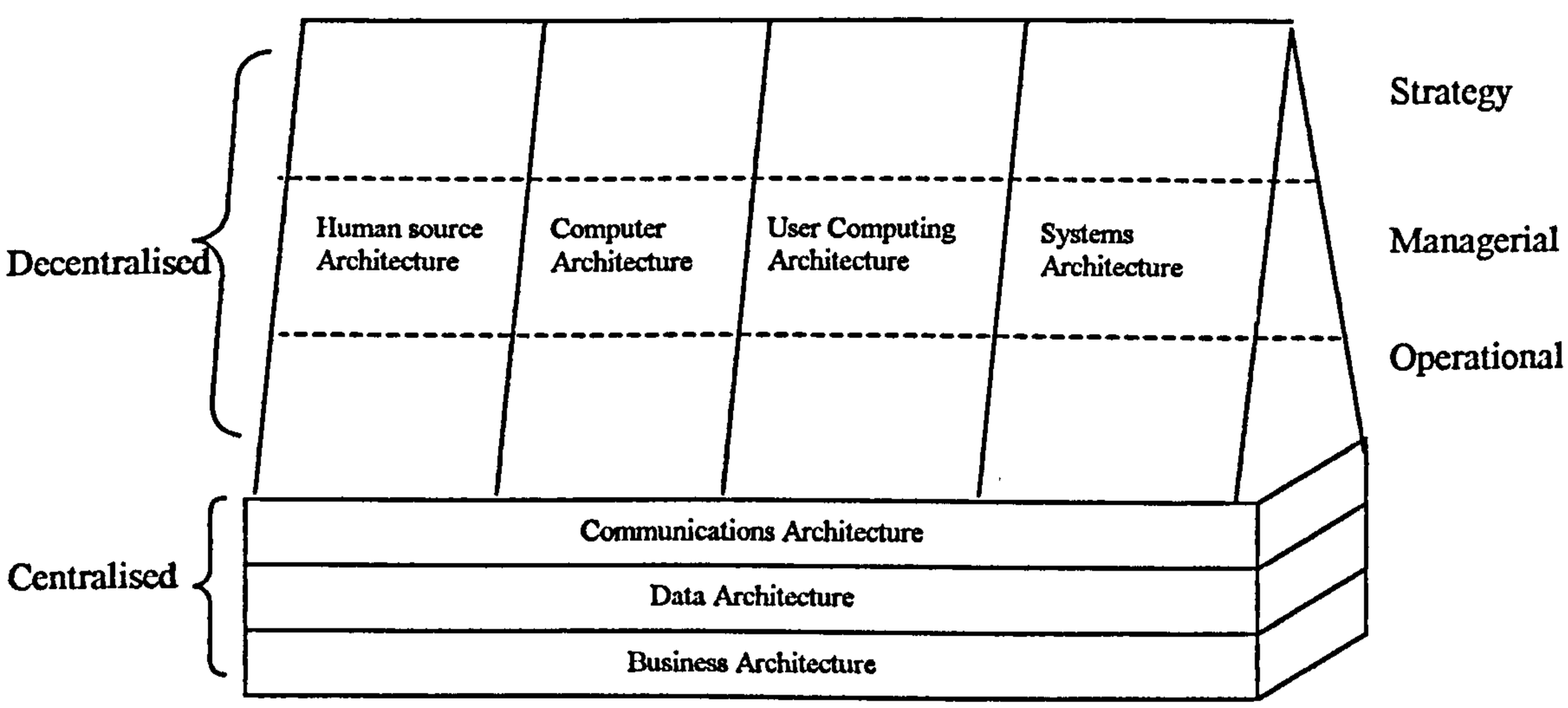
1. The business needs for information that concerns the organisational aims and problems, and the contribution that IT can make. The possible users of IT must

play a critical role in this element of the design process. An architect cannot plan without knowing the purpose of the organisation and the requirements of the leaders.

2. The information systems that already exist in an organisation and how they can be integrated with future systems to support the organisation's information needs.

According to Synnott (1987) and Alter (2002), the information architecture is a conceptual framework for organisational IT infrastructure. It is a plan for the structure and integration of the information resources in the organisation. Synnott (1987) suggests a model for information architecture, shown in Figure 3.2, which divides the architecture into two main parts.

Figure 3.2 Information architecture model



Source: Adapted from Synnott, (1987,p. 199)

The centralised portion serves the complete organisation, and it includes the business architecture (information needs of the organisation), the data architecture, and the communications architecture. The decentralised (upper) portion is concerned with an

organisational function or some service or activity (e.g., human resources, computers, end-user computing, and system). Each entity in the upper part includes operational, managerial and strategic applications. Alter (2002) summarised questions regarding IS architecture: what data are collected? where and how are the data collected?, how are the data transmitted? where are the data stored? what applications use the data? and how are these applications related as an overall system?.

One way to classify information architecture is the role the hardware plays. It is possible to distinguish two extreme cases: a mainframe environment and a PC environment.

Mainframe environment: Larry (1989) said that the concept of mainframe is a large computer that could service many users simultaneously. For Kroenke (1992), and Kroenke and Hatch (1994), a mainframe is the large type of computer normally used to support an enterprise's information system. Turban et al. (1999, 2002) noted that in the mainframe environment, processing is done by mainframe computer. Users work with dumb terminals which change data and access information from the mainframe. This was the dominant architecture in the mid-1980s. Very few organisations use this type of architecture entirely today. But the mainframe is the core of the system as it has powerful storage and computational capabilities. The network computers that were introduced in 1997 are redefining the role of the centralised computing environment.

- PC environment: Turban et al. (1999, 2002) state that only PCs form the hardware information architecture in the PC configuration. It is possible for them to be independent of each other, but normally the PCs are connected by means of an

electronic network. This type is generally designed for small to medium-size companies. Larry (1989), Kroenke and Hatch (1994), and Henry and Lucas (1997) defined the PC as a microcomputer supporting a multiple user at a time. In a networked environment, two or more computers are linked.

- Networked environment: This links two or more computers, which can be all mainframe, all mid-range, or all micros; as well, they can be in one location which is called a local area network (LAN), or in several, known as a wide area network (WAN) (Turban et al., 1999, 2002), e.g. an integration of computer system workstations and communication links (Larry, 1989).

3.2.1.3 Management Information System (MIS)

An IS should be managed in order to reap the benefits from the information, and is the entire set of systems and activities required to manage, process, and use information as a resource in the organisation (Sprague, 1980). Kim (1990) supposes that user information satisfaction has been generally recognised by MIS researchers as one of the more important indicators of success in designing and implementing a MIS. The following definitions are offered to give a feel for what the various authors and practitioners perceive a MIS to be:

MIS is a business that provides past, present, and projected information about a company and its environment (Kroenke and Nolan, 1987; Turban et al., 1999, 2002).

MIS is a formal method of making available to management the accurate and timely information necessary to facilitate the decision-making process and enable the organisation's planning, control, and operational functions to be carried out effectively (Stoner, 1982).

MIS is a formalised computer information system that can integrate data from various sources to supply the information necessary for management decision-making (Hicks, 1987).

MIS is the subsystem of an organisation's information system relevant to managerial decisions for control and strategic planning (Aktas, 1987).

MIS monitors and retrieves data from the environment, captures data from transactions and operations within the firm, filters, organises, and selects data and presents them as information to managers, and provides the means for managers to generate information as desired (Murdick, 1986).

3.2.1.4 Computer-based Information System (CBIS)

Kroenke (1992) and Kroenke and Hatch (1994) suggest that a CBIS is a system comprised of hardware, programs, data, procedures, and people, with the goal of producing information. Turban et al. (2002) noted that CBIS is an information system that uses computer technology to achieve some or all of its planned tasks. Such a system can include personal computers (PC) and software, or it may include some thousand computers of different sizes, with hundreds of printers, plotters, and other devices, as well as communication networks and databases. Larry (1989) believes that computer-based system or knowledge-based system have the same meaning, but this term helps users to make decisions by enabling them to interact with an expert system. According to Turban et al. (1999), there are basic components of an information system:

1. Hardware is a set of devices such as processor, monitor, keyboard, and printer.
2. Software is a set of programs that enable the hardware to process data.

3. A database is a collection of related files, tables, relations, and so on, that store data and create relations among them.
4. A network is a linking system that allows the sharing of resources by different computers.
5. People are those individuals who work with the system or use its output.

Henry and Lucas (1997) consider that an IS can be described by five key components: (1) decisions, (2) transactions and processing, (3) information and its flow, (4) individuals or functions involved, and (5) communications and coordination.

Additionally, all systems have a reason and a social context. A general purpose is to supply a solution to a business problem. Turban et al. (1999) mentioned that in the Harper-Honda case, the system helped in reducing cost, improving communication, and expediting administrative process. The social context of the system consists of the values and beliefs that determine what is permissible and possible within the culture of the people and groups involved.

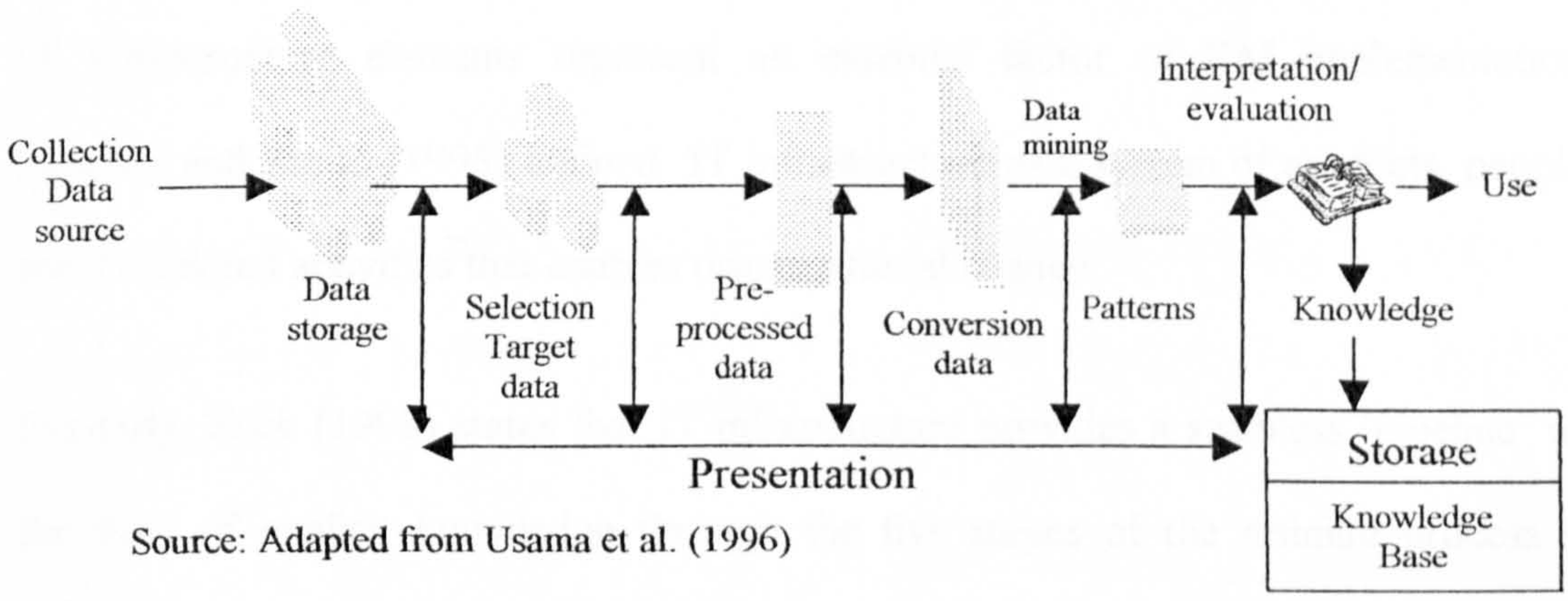
3.2.1.5 Data Life Cycle Process and Knowledge Discovery

Data are the basis of knowledge. To understand how to manage data and knowledge, it is to be established how and where data flow in organisations. Turban et al. (1999) stated, "Businesses do not run on data. They run on information and their knowledge of how to apply that information successfully".

Conversion of data into knowledge can be achieved in numerous ways. Generally, it is a process that starts with data collection from different sources. According to Usama et al. (1996), the data are stored in databases. This data can then be pre-

processed. To discover (or derive) knowledge, the processed data may go through a conversion process that makes them ready for analysis. The analysis is done with a data mining tool, which looks for patterns, and intelligent systems which support data interpretation. The outcome of all these actions is generated knowledge. Both the data, at different times during the process, and the knowledge, derived at the end of the process, may need to be offered to users. Such a presentation can be accomplished by using different presentation tools. The knowledge created may be stored in a knowledge base. This conversion process is illustrated in Figure 3.3.

Figure 3.3 Converting data to knowledge



Source: Adapted from Usama et al. (1996)

3.2.2 Information Technology (IT)

Henry and Lucas (1997) and Turban et al. (1999) state that IT is the technology component of an information system, or the collection of the entire systems in an organisation. It refers to the technological aspects of an information system. Turban et al. (1999) added that, today, IT has become the major facilitator of business activities in the world. It includes the hardware, database, software, networks, and other devices. Further, it can be a subsystem of an information system. Sometimes, the term IT is used interchangeably with IS, or it may even be used in a broad sense

to describe a collection of numerous IS, users, and management of an entire organisation.

APQC (2001b) deems that IT is a necessity in sustaining a successful community of best practice. IT has become an essential enabler of community members in finding, disseminating and applying knowledge. Kotylar and Saks (2001) confirmed this by adding that technology is being effectively employed in the sphere of knowledge transfer. Many companies are already successfully using technology for sharing knowledge and for transferring skills from top performers to other workers. Numerous companies are rethinking their training strategies

IT infrastructure elements represent an essential factor of KM implementation. Mitchell and Zmud (1995) defined IT infrastructure as a system of artefacts, people, and IT-related activities that enables organisational change.

Similarly, Zack (1998) states that IT infrastructure provides a seamless 'pipeline' for the flow of explicit knowledge through the five stages of the refining process to enable capturing knowledge, defining, storing, categorising, indexing, and linking digital objects that correspond to knowledge units; searching for 'pulling', and subscribing to 'pushing' relevant content; and presenting content with sufficient flexibility to make it meaningful and applicable across multiple contexts of use.

Radding (1998) noted that to meet the demand for knowledge, managers ask the IT organisation for tools that can capture, collect, organise, filter, and distribute data and information. Managers depend on IT for tools that will enable them to convert data into information and then into knowledge.

IT provides many capabilities, such as communication and networking capability, high storage capacity, information sharing, performance, and speed, to support the reshaping of business processes. It has the potential to facilitate the flow of information between globally distributed processes, and ensure the availability of instantaneous and consistent information across the business (Tapscott and Caston, 1993; Klenke, 1994).

3.2.2.1 IT Trends

Science and Engineering Indicators (2002) determined that there are four trends in IT: (1) semiconductor technology, (2) information storage, (3) network, and (4) applications of IT.

Semiconductor technology. Gopal and Gagnon (1995) maintain that this is not a new trend, automobiles have been major users of microprocessors since the late 1970s, but as semiconductor chips turn into more powerful and less costly items (economies of scale), they are generally becoming more readily available everywhere. Further, new capabilities are being added to microchips, these include microelectromechanical systems (MEMs), for instance, and sensors and actuators, and digital signal processors that enable cost reductions and extend IT into new types of devices. Examples by Gulliksen (2000) of MEM devices comprise ink-jet printer cartridges and hard disk drive heads. Trends toward improvements in microelectronics and MEMs are expected to continue.

Information Storage. Disk drives and other forms of information storage that reflect alike improvements in cost and performance. As a result, the quantity of information in digital form has expanded tremendously. Approximate guesses of the quantity of

original information (excluding copies and reproductions) suggest that information on disk drives now constitutes the majority of information (Lyman and Varian, 2000). Increasingly, much of this information is available on-line.

Science and Engineering Indicators (2002) noted that because of improvements in semiconductors, storage, and other components, price declines (economies of scale) in computers (adjusted for quality) have actually accelerated since 1995.

Networking. Computers are increasingly connected in networks, including local area networks (LAN) and wide area networks (WAN). Numerous early commercial computer networks, such as automated teller machines (ATMs) and airline reservation systems, used proprietary systems that required specialised software or hardware or both. Kahn and Cerf (1999) noted that as people have been able to interconnect and share information with each other, the value of IT has increased. Further, the Optoelectronics Industry Development Association (2001) mentioned that the growth in networking has been enabled by rapid advances in optical networking. In 1990, a single optical fibre could transmit about 1 billion bits per second; by 2000, a single fibre could transmit nearly 1 trillion bits per second.

Networking is evolving in several ways: more people and devices are becoming connected to the network, the speed and capacity of connections are increasing, and more people are obtaining wireless connections.

Applications of IT. There is a rising display of applications that make IT more useful. Science and Engineering Indicators (2002) suggest that computers were initially used mainly for data processing. As they became more powerful and convenient, applications expanded. Word processing, spreadsheets, and database programs were

among the early minicomputer and PC applications. Over the past two decades, innovations in software have enabled applications to expand to include educational software, desktop publishing, computer-aided design and manufacturing, games, modelling and simulation, networking and communications software, electronic mail, the World Wide Web, digital imaging and photography, audio and video applications, electronic commerce applications, groupware, file sharing, search engines, and many others. The increase and variety of applications greatly increase the utility of IT, leading to its further expansion.

In the past, computers were completely different from now, used primarily in a few applications such as in the offices of large companies and agencies. The expansion of applications at this time has contributed to the rapid diffusion of IT to affect nearly everyone.

Henry and Lucas (1997) pointed out five IT trends, as follows: (1) using technology to transform the organisation, (2) using information processing technology as a part of corporate strategy, (3) technology being a pervasive part of the work environment, (4) using PCs as managerial workstations, and (5) the evolution of the computer from a computational device to a medium for communications. Turban et al. (1999, 2002) show two categories of IT trends. First, general, such as increasing the cost-performance advantage of the computer. In future, graphical and other user-friendly interfaces will dominate PCs, storage capacity will increase dramatically, multimedia use will increase significantly, computers will be increasingly compact, object-oriented programming and document management will be widely accepted, data warehouses will store terabytes of information, and intelligent systems, especially artificial neural computing and expert systems, will increase in importance. Second,

networked computing, such as intelligent software agents, will roam through databases and networks conducting time-consuming tasks for their masters; usage of the Internet will grow, computers will be more portable; mobile and wireless applications will become a major component of IT; intranet will be the dominating network system in most organisations; and home computing will be integrated with the telephone, television, and other electronic services.

3.3 IT/IS Effectiveness for KM

IT effectiveness has been a topic of research for years. Munshi (1996) defines the effectiveness of information system (IS) as the degree to which the business goals, for which the IS was deployed, are actually achieved. Munshi recognises three dimensions for IS effectiveness, which are scope, which explains how broad the application is of the effectiveness concept; measurement, which determines how measurement will be carried out and what data are needed; and social paradigm.

For this study, effective use means that the IS function is acting to support KM goals and objectives; in other words, IS is associated with what the KM is trying to do. Over our entire assessment database, there is strong evidence which suggest that when IS is aligned well with a general business, the business performs better financially than its industry competitors.

Before identifying the IT effectiveness for KM, we must know the tools that help managers to manage knowledge and to get all facilities, or at least to exploit them with the intention of KM utilisation. The following are some IT tools that should be recognised by managers:

1.Internet

Internet is a linking system that authorises the sharing of resources by different computers. According Kroenke (1992) and Kroenke and Hatch (1994), the Internet is a collection of LANs interconnected into a single data communications system. Further, it is an international data communications network, linking thousands of regional networks using terminal control program/internet protocol (TCP/IP), while Turban et al. (1999) noted that it is a self-regulated network of computer networks connecting millions of computers all over the world. Users can derive many benefits from the Internet, some examples of this are:

- Send and receive messages and documents around the world, at low or no cost, roughly in real time.
- Review many government-published documents and note government grant opportunities.
- Conduct free telephone calls and videoconferencing.
- Download documents and software.

2. Intranet

Intranet is a corporate network that functions with Internet technologies, such as browser and search engines, using Internet protocols.

Haag et al, (2002) stated that an intranet organisation Internet that is guarded against outside access by special security software called s firewall. Bocij et al. (2003) stated that an intranet uses web services, browsers and e-mal within a organisation to share its information and software applications.

Alter (2002) stated that the human resources expert Jeffrey Pfeffer has argue that construction an intranet might provide the appearance of KM, but in his view, it is really just building an infrastructure that can be used to transfer only explicit, codified information. Further, he defined an intranet as private communication network that uses the type of interface popularised by the web but is accessibility only by authorised people (e.g. workers, contractors, and customers).

3. Extranet

Extranet is one type of Internet infrastructure that allows secure communications between business partners. It enables limited accessibility to the intranets of the participating companies, as well as the necessary interorganisational communications using Internet technology. Organisations prefer this method, as it provides large savings in communication costs (Turban et al., 1999). Bocij et al. (2003) defined extranet as an intranet with controlled access which is extended to suppliers, collaborators or customers.

4. Network

Network is a telecommunications system that permits the sharing of resources such as computing power, software, input/output devices, and data. On the other hand, it is a network that connects hundreds of thousands of internal organisational computer networks worldwide. Radding (1998) states that almost every company these days comprises numerous networks and network connections: local area networks (LANs), wide area networks (WANs), dial-up links, legacy networks (systems network architecture), and others.

Much knowledge is passed through informal networks, across networks and communities of practice. Organisations have got to facilitate the functioning of these networks if they want to manage knowledge. Davenport and Prusak (1998a) believe that all of the technology facilities could be effective to communicate KM to make easier the capturing, transferring and sharing of knowledge across a network, but do not start with the technology. Baines (1998) noted that the data network is now as important as the social network of an organisation.

5. Video-conferencing

Video-conferencing or video display terminal (VDT), Markus (1988) said, is becoming more popular, and it is appropriate when an organisation needs to introduce a large amount of information to its many offices or divisions across the country, and allows organisations to communicate with all of their people simultaneously and in a relatively short time. Therefore Larry (1989) defined VDT as a terminal on which printed and graphic information is displayed on a television-like monitor and data are entered on a typewriter-like keyboard.

6. Telecommuting

This generally refers to all types of electronic, high-speed, long-distance voice and data communication, usually through the use of common carriers (Turban et al. 1999). Larry (1989) defined telecommuting as communication, but it links between home and office. Turban et al. (2002) state that by telecommuting, workers can work at home, at the customer's location, or while travelling, using a computer linked to their place of employment.

The following benefits of telecommuting are stated by Turban et al. (1999, p.311):

1. Benefits to employee

- Less stress (no driving, no office pressure).
- Ability to go to school while working.
- Improved family life (fewer family conflicts).
- Opportunity to make more money (if on an incentive plan).
- Money saved on lunch, clothes, fuel, parking, and car maintenance.
- Commuting time saved.
- Ability to control schedule and time better.
- Employment opportunities for housebound people (single parents, handicapped).

2. *Benefits to Organisation*

- Increased productivity (15 – 50 %) is claimed.
- Reduced real estate (or rent) cost.
- Ability to retain skilled employees who otherwise would leave.
- Ability to tap remote labour pool. Greater staffing flexibility.
- Less paperwork.
- Less absenteeism.
- Fewer labour costs (some people will take lower wages in order to stay at home).
- Better interaction of employees with client and suppliers (work can be done at the customer's sites)

3. *Benefits to Society*

- Less air pollution.
- Less use of fossil fuel.
- Fewer traffic problems and accidents.

- More business for suburbs and rural areas.

However, there are also disadvantages, such as workers have increased feelings of isolation, loss of fringe benefits, lower pay (in some cases), no workplace visibility with the possibility of slower promotions, and lack of socialisation. As for employers, there are difficulties in supervising work, possible data security problems, training costs, and the high cost of equipping and maintaining telecommuters' homes. Despite these disadvantages, the use of telecommuting is on the increase (Turban et al., 1999).

7. E-Mail

E-mail is a computer-based message that can be electronically manipulated, stored, combined with other information, and exchanged with other computers. E-mail systems have been used for many years as an internal medium of communication. It is becoming an important communication tool in many organisations. There are some primary advantages of e-mail:

- Send and receive messages very rapidly.
- Work easily with others on the same task.
- Conduct paperless communication.
- Send messages to numerous users at the same time.
- Send by PC, including pictures, voice, video, audio, film clips, text, maps, and animation.

With e-mail, a person can send letters to anyone connected to the system. When the message is sent, it arrives at an individual's mailbox. The receiver can then read the mail, send a reply, edit the mail, save it, or forward it to another person.

8. Push technology

Push technology is an approach designed to deliver only what the information users want or need. It can be executed on the web, on e-mail, or on specialised client software. It is an important feature as it saves time and is cost-effective. In addition, it helps to increase a worker's productivity. Radding (1998) states that push technology assurance that users have available to them the latest information suitable to their job without requiring that they continually interrupt work to search for it. And he gives an example of an investment trader who may rely on push technology to send him the prices of any stock as soon as it changes. A bank can use push technology to send new currency prices or new CD rates to each branch office.

There are multiple facilities utilised by IT, as mentioned previously. All of these technology facilities could be effective to communicate in KM, sharing, as well transferring and capturing knowledge (Zack 1998).

It then becomes obvious that by using IT facilities, including network, Internet, intranet and groupware, a firm can build a knowledge repository for rich explicit knowledge, and support knowledge to be managed and exploited by organisations so as to yield many and multiple benefits. Therefore, Starr (1999), Duffy (2000), and Kotylar and Saks (2001) believe in sharing work and experiences using technology to archive written work in repositories.

9. Data repository

Parker (1989) considers database as an integrated collection of data. Further, Henry and Lucas (1997) state that a database is a large repository, and they define it as a

comprehensive collection of data organised to avoid repetition of data and allow easy retrieval of information.

10. Data warehouse

This is a huge store, and Turban et al. (1999, 2002) note that it contains terabytes or trillion bytes of data. It is called a depot of historical data, subject-oriented and organised, integrated from various sources that can easily be accessed by end users and manipulated for decision support. These data warehouses are integrated with the Internet, so that they can be accessed from anywhere at any time.

11. Knowledge base

This is part of the expert system and it contains huge amounts of data. Larry (1984), Kroenke and Hatch (1994), Turban et al. (1996, 1999, 2002), Haag et al. (2002), and Alter (2002) argue that the knowledge base contains rules, facts, procedures, inferences, and descriptions of objects. Turban et al. (1999) added a definition of knowledge base organisations which "are organised as networks that capture, store, and utilise knowledge as a major activity with the help of IT".

The most popular IT tools for managing knowledge are relational databases, text and document search engines, groupware, data warehouses, and data mining tools (Davis and Riggs, 1999).

By exploiting these tools, organisations could obtain support for managing their business, and many authors maintain that there is a significant IT effectiveness for KM (Davenport and Prusak, 1998a; Zack, 1998; Lee, 1999; Morten et al., 1999; Schwarzwalder, 1999; Starr, 1999; Duffy, 2000; Morse, 2000; APQC, 2001b; Mentzas et al., 2001; Pyo et al. 2002).

According to Lee (1999), IT enables KM in a number of ways; for instance, IT supplying architecture for networking, collaboration and information exchange, provides a means for intellectual capital exchange. Also, it helps with recognition of data and text patterns, supplies storage for knowledge repositories, and interactivity for communication, dialogue and knowledge creation, providing the medium for communication and information transfer, allowing KM to scale, store and retrieve, people and agents to interact, and giving information in order to enhance learning and improve the ability to comprehend, understand, connect and remember.

Schwarzwalder (1999, p.64) argues that an important point in developing KM systems is the issue of process. To be more effective, a knowledge system needs to operate in a manner that fits the work process flow in an organisation. He maintains that using technology like computers and Web databases is a cheap and easy solution for KM. Morten et al. (1999) support this view further by arguing that using technology has made KM easier and cheaper than ever before.

According to Zack (1998), many organisations have initiated a range of KM projects and programmes to develop new applications of IT to support the digital capture, storage, retrieval and distribution of an organisation's explicitly documented knowledge. For instance, Morten et al. (1999) stated that Ernst & Young exploits an electronic repository for storing interview guides, work schedules, benchmark data and market segmentation analyses from documents for people to use.

As most organisational knowledge resides in the minds of employees, until recently it has been extremely difficult to tap into this knowledge, capture it, and share it among employees. Traditional approaches have not been effective in this regard.

However, using latest technologies is offering interesting solutions. Davenport and Prusak (1998a), Starr (1999), Duffy (2000), Morse (2000), and APQC (2001b) maintain that all of the technology facilities could be effective to communicate KM to make easier the capturing, transferring and sharing of knowledge. Starr (1999) and Duffy (2000) recommended that people should learn more through technology, and make it available and easy to use

The connections that KM software must facilitate are between people, as much as they are between people and information systems. Particularly, the software must support the exchange and transformation from tacit to explicit knowledge. The movement from tacit to explicit knowledge is also a transformation of individual knowledge into organisational knowledge. Mentzas et al. (2001) thought that to be able to really support the sharing of information and knowledge between people and between people and systems, two key components are required: collaboration and discovery facilities

Malhotra (1998) notes that the information and control systems in organisations are intended to achieve the 'programming' for optimisation and efficiency. However, checks and balances need to be built into the organisational processes to ensure that such 'programmes' are continuously updated in alignment with the dynamically changing external environment.

Pyo et al. (2002) mention that knowledge discovery in database (KDD) (with data pulling out) is a useful tool for aim management. IT is imperative to the success of KDD and data pulling out. Since useful KM systems must be timely, the destination

knowledge discovery system can be a perpetual prototype requiring frequent updating, with emphasis on speed in response and updating.

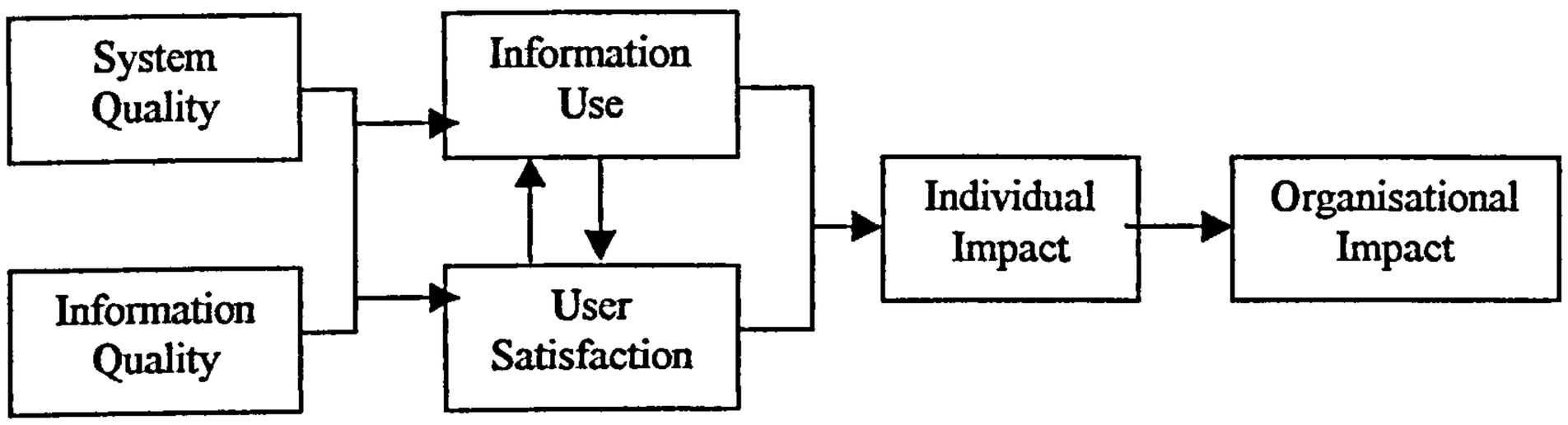
Therefore, organisations that have multiple communication channels they will find knowledge transfer and possibly knowledge creation as well as enhancement easier duty.

3.3.1 Measuring IT effectiveness

The first step in measuring effectiveness is to define the goals of your organisation. Cohen (2002) advised that managers must be careful to set goals that match their business objectives, and be certain to measure results against there objectives. For example, if they set out to generate $1 million in sales, they should be measuring sales and related direct marketing metrics. If their goal was to increase brand awareness, then they should be measuring brand awareness. This is illustrated by an example regarding smart technology, which is DataPop, lately started by CMP Media. DataPop allows readers to request more information from advertisers without having to leave the page they are reading. The reader just clicks, enters his/her e-mail address into a small pop-up window, and returns to the task at hand.

The importance of system quality, information quality and systems success has been recognised by many researchers as a key ingredient in developing a competitive advantage. Organisational effectiveness and user satisfaction are needed. Accordingly, a model of IS Success, shown in Figure 3.4, has been developed by Delone and McLean (1992).

Figure 3.4 IS Success Model



Source: Adapted from Delone and McLean (1992).

- *System Quality*

Measures of system quality typically concentrate on performance characteristics of the system under study. Some research has focused upon resource exploitation and investment utilisation (Charles and Raviv, 1980), hardware exploitation efficiency (Alloway, 1980), dependability, reaction time, ease of terminal use (Swanson, 1974), content of the database, aggregation of details, human factors, and system precision (Emery, 1971). The Hamilton and Chervany (1981a) list of system quality measures is possibly the most well known: data currency, reaction time, turnaround time, dependability, completeness, system elasticity, and ease of use.

- *Information Quality*

Measures of information quality concentrate on the productivity created by a system and the value, worth or relative importance attributed to it by the user. Most of the measures, therefore, are perceptual in nature. Bailey and Pearson (1983) stated nine known characteristics of information quality: accuracy, precision, currency, output timeliness, dependability, wholeness, shortness, format, and relevance, and this began a stream of research in user satisfaction. Other researchers have added criteria

such as understandability (Srinivasan, 1985), report utility (Mahmood and Medewitz, 1985), satisfactoriness, freedom from partiality, contrastability, and quantitativeness (King and Epstein, 1983).

- *Information use*

The real use of a computer system can be affected by the scale to which systems characteristics match user task needs (Goodhue, 1995), but it can also be related to the whether or not the use of the system is voluntary (Lucas, 1978; Welke and Konsynski, 1980). Goodhue (1995) explored Task-Technology Fit (TTF) which suggests that better outcomes will result when there is a match between the task and the technology used. TTF measures would include items to assess the quality, money (Zmud, 1978), relevance (Bailey and Pearson, 1983), locatability of data in order to ease determining what data are available and where (Goodhue and Thompson, 1995), and ease of use of the system (Davis, 1989). Measures of use can be either subjective (Lucas, 1973, 1975, 1978; Maish, 1979; Fuerst and Cheney, 1982; Raymond, 1985; Delone, 1988), or objective (Lucas, 1973, Swanson, 1974, 1978; King and Rodriquez, 1978, 1981). Real usage has been measured by capturing data such as join time, total charges built up, number of clients or transactions processed, and frequency of use. How the system is used, whether for habit tasks or precise use, has also been investigated (Vanlommel and DeBrabander, 1975; Ginzberg, 1978; Iivari, 1985).

- *Individual impact*

Measures of individual impact cover a broad range of subjective and objective factors. Behaviourally, real statistics on usage, such as length of time or frequency of use (Raymond, 1985, 1986; Srinivasan, 1985; Eunhong and Jinjoo (1986; Kim and

Lee, 1986) the number of features or reports selected (King and Rodriquez, 1981; Green and Hughes, 1986), and kind of activity carried out (Fuerst and Cheney, 1982; Zmud et al.,1987), have been taken. Subjectively, the effect of a computer system at the individual level has been examined in performance measures such as productivity (Rivard and Huff, 1984), decision-making effectiveness, rate of learning, and value as perceived by the user. This is typically dominated by issues related to the work system rather than the information system. Decision-making effectiveness, in particular, has been operationalised using measures such as confidence in the decision made, members sharing in decision-making, awareness of improvement in decision-making, and time to reach a decision.

- *Organisational impact*

Many information systems are essential parts of work systems. Some researchers have attempted to examine the value of technology investments in revenue, and in cost savings. Other studies have investigated IS impact on organisational structure and process efficiency

Due to the extensive impact of recent IT on organisations and the complexity of separating out a specific IT contribution, it becomes difficult to evaluate its benefits for the purpose of making an investment decision (Farbey et al., 1994; Willcocks and Lester, 1996). However, Farbey et al. (1994, p. 271) state that:

> *"If no formal evaluation process exists to inform managers, they will make judgements guided only by their own perceptions of what is at stake"*

Glazer (1993, p. 99) describes the importance to an organisation of measuring IT infrastructure effectiveness by stating that:

> *"A primary mechanism by which a firm becomes an information-intensive firm is the implementation of a procedure for measuring the value of its information assets".*

Hamilton and Chervany (1981a, 1981b) suggest service monitoring, user attitudes surveys, post-installation reviews, and cost-benefit analyses as measures of systems' effectiveness. Barki and Hartwick (1994) propose a user-centred model of measuring IS effectiveness; Pitt et al. (1995) use service quality as a measure; and Hitt and Brynjolfsson (1996) focus on the productivity and profitability dimensions as a measure of IS value. Adams et al. (1992) concentrate on usefulness and ease of use factors as indicators for effectiveness.

Managers must know enough about technology to take full advantage of the benefits IT has to offer. Technology exists to affect the fundamental way the organisation is structured, its operations, and its relations with other organisations, e.g. suppliers and customers. This researcher believes that organisations that succeed in the future will use IT in all aspects of their business.

3.3.2 IT vs. KM

The majority of authors maintain that there exist a strong relationship between KM and IT (Sierhuis, 1996; Bassi, 1997; 2000; Malhotra, 1998; Manasco, 1999; Duffy, 2000; Lim et al., 2000; Snyder, 2000; Vaast, 2000; APQC, 2001b; Heisig, 2001; Mertins, 2001) On the other hand however, some authors maintain that IT contributes little assistance toward KM, and that it is possible to manage knowledge without IT (Poynder, 1998; Chait, 1999; Newman, 1999; O'Dell and Grayson, 2000; Morse 2000). For example, Newman (1999) states occasions when knowledge could be managed without utilisation of technology, for instance by addressing practices such as talk rooms, communities of practice, benchmarking and best practice, and

'practice Olympics' (which encourage team meetings and conferences to focus on continuous improvement). Poynder (1998) believes that processes do not necessarily need to involve the use of IT. Chait (1999) maintains that the computer system was just one element in a broad initiative to maximise the potential of our knowledge resources; in fact, technology accounted for only about 20% of our overall solution.

Bassi (1997) assumes that in most firms with a KM system, it is based purely on a technology solution. However, technology may be necessary for KM, but it appears never to be sufficient. That is where an obvious role for education and training professionals exists. Such professionals understand how people learn, share knowledge, and work together. They also understand how an organisation's culture can affect learning initiatives, how hard it is to change an organisation's culture, and how human potential can be tapped through wise KM.

APQC (2001b) noted that IT is one of the most important tools for an organisation to achieve its goals. And they suggested that KM must be integrated with business process and technology tools, and must enable people to act more efficiently to create value. Entire companies compete based on knowledge, and it is that knowledge that enables organisations to serve customers better, develop operations, and speed products to market. Today, organisations are investing millions of dollars in technology tools to leverage information more effectively, but often the deeper knowledge and expertise that exist within the organisation remain untapped.

Undeniable, KM is not technology, but technology indeed is a tool that supports KM. Technology itself cannot create knowledge, rather (as mentioned in Chapter 2) it is managing knowledge, and these techniques are being utilised to perform knowledge

analysis and knowledge planning. Further, Newman (1991) adds that 'knowledge management' is not a ' technology thing' or a 'computer thing'. If one accept the premise that KM is concerned with the entire process of discovery and creation of knowledge, dissemination of knowledge, and the utilisation of knowledge, then one is strongly driven to accept that KM is much more than just a 'technology thing', and that elements of it exist in almost each one of our jobs.

Morse (2000) advised not to start with the technology, and further continued that organisations are not to spend more than one-third of their time thinking about technology for KM. The other two-thirds can be spent on culture, roles and responsibilities, knowledge content, strategy, and economics.

In contrast, there are some researchers who do believe that knowledge could not be managed without technology; KM and IT work well together because their skills are complementary: KM is creative and IT practical. Such as Bassi (1999, p. 423), who stated that part of most KM systems is a set of technologies for capturing and synthesising information from which knowledge can be created and shared. Most KM systems rely heavily on such tools as Lotus, Internet, electronic performance support systems, and specialised software. He says they provide an electronic way so people can share information, best practices, directories of experts, and so forth, systematically - with the ultimate intent to create and disseminate knowledge.

Undoubtedly, IT is very important for every organisation; all businesses try to exploit technology in order to gain competitive advantage, especially with KM, as many authors believe that some result or goal of KM is to provide organisations with

some sustainable competitive advantage (Grey, 1996; Dove, 1998; Morey, 1998; Zack, 1998; Barclay and Murray, 2000; Trussler, 2000).

3.3.3 Evolving IT and KM Roles

The strength of IT in the direction of KM is obvious in the evolution of the responsibilities of the top IT manager. Initially, IT managers accepted the title of data processing (DP) manager. Radding (1998) stated that for many company managers used to managing by instinct alone, the ease of use of the data represented a quantum gain in corporate knowledge. The DP department and DP manager thus evolved into the management information systems (MIS) department or MIS manager. At the MIS group, the organisation became more involved in the knowledge business. At the same time, the team was actively engaged not only in processing data, but also in facilitating access to data and transforming data into business information. The next stage was the emergence of the chief information officer (CIO) and chief knowledge officer (CKO)

3.3.3.1 Chief Information Officer (CIO)

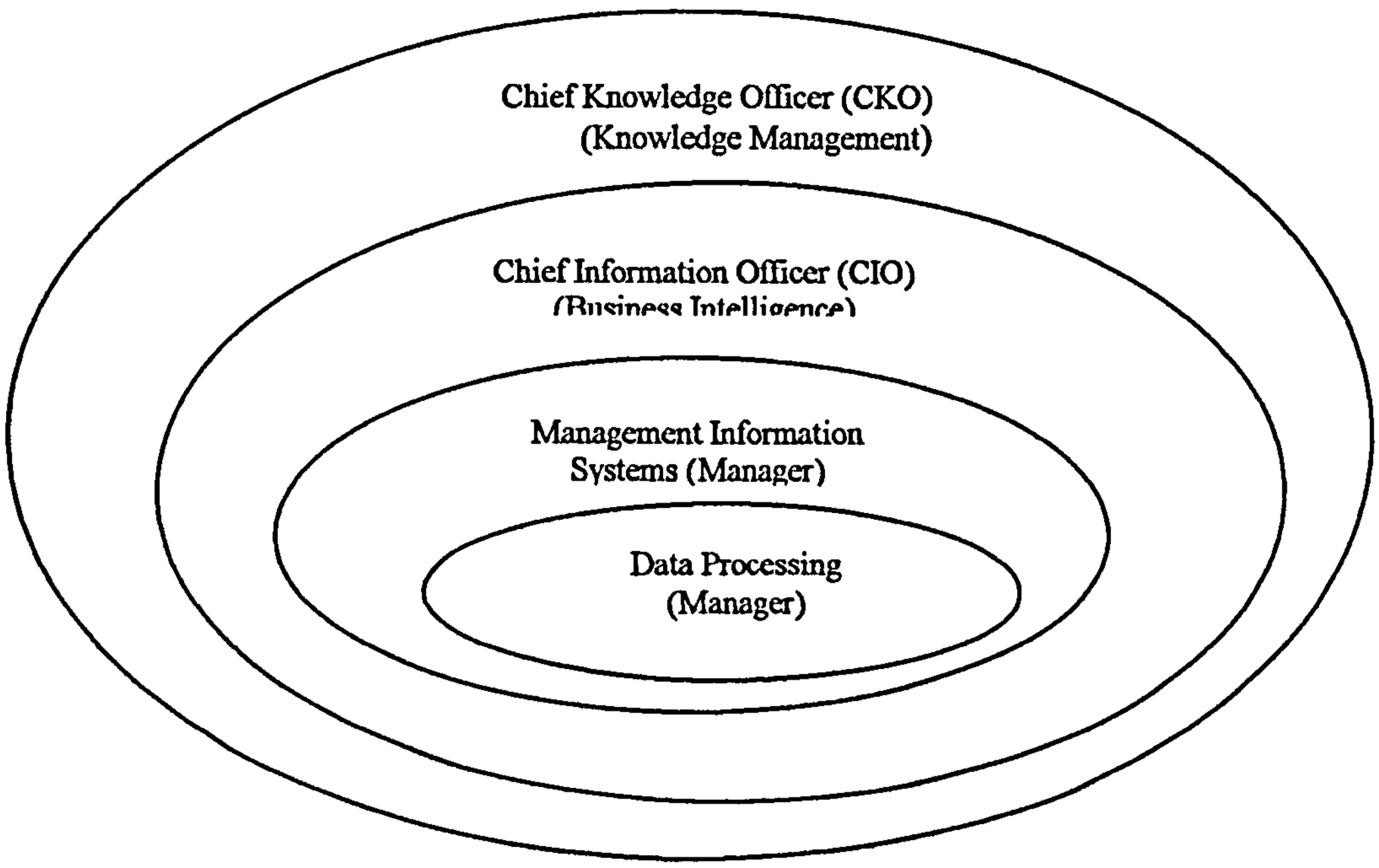
The CIO title reflects both the critical roles played by information and knowledge in the modern organisation's success and IT's critical role as the enabler or facilitator of corporate information. So the title of IT manager in many organisations changed to that of chief information officer (Radding, 1998).

Laud and Theis (1997) proposed a new CIO role, one that promotes his/her responsibility towards resolving both structural and cultural issues, as well as his/her technical-centred role. They argued that a CIO should act as a change agent because of his/her strategic role in the organisation, in being able to access all organisation

information, providing management with strategic insights, linking technology to new work process design to support customer satisfaction, and holding knowledge of technological innovations that are a key to the external market. They further argued that he/she should additionally act as an organisational architect, as he/she is able to translate strategic concepts into hard design and structure forms. As business calls upon IT to drive and define new ways of doing business, the CIO will become a pivotal figure for anticipating and planning the effective implementation of new technologies.

Michael and David (1994) argue that a value-added CIO is loyal to the business and openness, motivated, system-oriented, and competent and experienced in IT and business. As for motivation, psychometric data show that successful CIOs are strongly goal-oriented. Therefore they maintain that CIOs have the difficult job of running a function that uses a lot of resources. Figure 3.5 illustrates the evolution of KM roles.

Figure 3.5 Knowledge Management Roles



Source: Adapted from Radding (1998)

3.3.2.2 Chief Knowledge Officer (CKO)

The role of CKO is to capture and leverage structured knowledge with IT. The latest step in the information evolution has occurred recently, and is apparent in the emergence of a new position - chief knowledge officer (CKO). As mentioned, knowledge is derived from information. Moving from the widely accepted CIO title, the CKO is in some cases the CIO, at least nominally an IT executive, although some organisations generally move managers into the CIO position. In other cases, however, the CKO is another executive, often a general business executive who is a peer of the CIO

There exists on extensive debate among consultants, theorists, and practitioners regarding who makes the most effective CKO. Most agree, however, that the CKO should not be merely the CIO with a new title. The supporting argument is that this knowledge position requires a person with deep appreciation for knowledge and learning, not merely a technical worker, able to make business small talk and use knowledge terms occasionally. Davenport (1996), Liebowitz and Beckman (1998) and Newman (1999) agree that this position is responsible for creating a KM infrastructure, building a knowledge culture, and making it all pay off economically. Additionally, Radding (1998) specified characteristics of the CKO as vision, technology depth, people insights, business measurement skills, knowledge process familiarity, cultural awareness, and communications capabilities. Figure 3.6 shows numerous similarities between the CIO and CKO.

Figure 3.6 CIO and CKO – Common characteristics

Chief information officer	Chief knowledge officer
1. Business acumen. 2. Enterprise scope. 3. Leadership. 4. Cross-functional experience. 5. Information vision. 6. Coalition building. 7. Community development. 8. Technology skill.	1. Business wisdom. 2. Enterprise. 3. Leadership. 4. Cross-functional experience. 5. Knowledge vision. 6. Coalition building. 7. Community development. 8. Learning, education, training, and experience

Source: Adapted from Radding (1998)

The expectation of the CKO is to bring diversified skills and experience to the organisation, such as business wisdom, enterprise, leadership, cross-functional experience, knowledge vision, coalition and consensus building, and community development (information communication). Further, Caddy et al. (2001) expected from CKO play an essential role in terms of managing orphan knowledge.

3.4 IT Vendors

The decision for collaboration or choice of a provider is very important; companies will need to select a vendor. Costs vary depending on the vendor's size and capabilities. Markus (1988) gives an example of training suppliers by means of videoconference when the vendor is selected. Trainers could choose 2 or 3 possible videoconference dates at least 2 1/2 months in advance. Vendors can arrange satellite time and receiving sites in designated cities. Planning will proceed smoothly when a local site coordinator is assigned. The following are some suppliers of diverse information:

3.4.1 Siebel Systems Inc.

This company is drawing on the need for customer relationship management (CRM) improvements, with its primary focus on e-business applications software. The company provides an integrated family of this software that enables multichannel sales, marketing and customer service systems to be deployed over the Web, call centres, field, reseller channels, and retail and dealer networks (Glasgow, 2002).

3.4.2 SAP R/3

This is the leading software for integrated enterprise planning (ERP) (from SAP AG Corporation). It is a highly integrated package containing more than 70 modules. It comprises four main application categories: accounting, manufacturing, sales, and human resources. R/3 is a totally integrated system, allowing companies to automate or eliminate many costly and error-prone manual communication procedures (Turban et al., 1999).

Based on the concept of SAP software, an organisation can keep different departments updated with crucial product information. Once the sales department enters an order, it is directed to a central computer system where others access it. This software is suitable with KM systems. Davenport (1998b) mentioned that big companies like Johnson & Johnson have had knowledge networks and repositories to allow knowledge sharing during implementation, and Service Ware Inc. has offered pre-packaged SAP support knowledge for help desks. He maintains that most organisations will gain advantage from a KM initiative in ERP experts, a variety of users can put what they learn about the system and processes into a knowledge base, and then search it for what knowledge others have added. All ERP vendors will have some sort of KM capability embedded in their systems, and are expected to move

towards a view of their packages as a generalised information and knowledge repository for the organisation

3.4.3 Semio Corp.

A KM software vendor, semio crop makes known the latest version of its content categorisation and indexing engine designed to help customers handle better the thousands of digital documents they are dealing with these days (Mears, 2002). Further, Davis (1999) said that Semio Corp. Rolled out software designed to help companies give their employees access to well-categorised information.

3.5 IT in Organisations

The significance of IT is becoming crucial for most organisations. IT can affect the structure of an organisation, its strategy, its revenues, and its expenses. Henry and Lucas (1998) proposed that there are benefits the organisations expect from IT, such as getting a competitive edge, increasing revenues, reducing cost, improving profits, improving quality, and creating new opportunities.

The IT organisation is the formal group of actions that carry out systems improvement, applications improvement, systems maintenance, data processing, and application support services. Rules are presented for leading the design of an IT organisation that fully exploits its potential to deliver competitive advantage (Laud and Theis, 1997). Moreover, interactions between IT and organisations take place at multiple levels: individual, group and organisation (Contractor and Eisenberg, 1990). In other respects, organisations can be described as 'communities of knowing' (Boland and Tenkasi, 1995) or ' communities of communities' (Brown and Duguid, 1991). Interpersonal relationships and use of IT, communities of knowledge and KM,

mutually dependent, change over time (Brown, 1998). Further, interactions between the use of IT and communities of knowing may change socially enacted organisations and processes of knowledge, and hence affect what is considered as knowledge (Pentland, 1995).

Because of the inevitable interdependencies between IT and its organisational context, much research has focused on gaining a better understanding of the nature of interaction between IT and the organisations (Attwell and Rule, 1984; Markus and Robey, 1988; Delone and McLean, 1992).

Organisations have to determine the role of IT in KM, regardless of who leads it and what his/her title is. From the IT perspective, Gopal and Gagnon (1995) consider KM as an opportunity, and they suggested that the IT group must focus on managing and supporting three distinct but highly interrelated areas: Knowledge: intellectual capital, Information: raw material of knowledge, and Learning: refreshing and updating knowledge.

1. Knowledge: intellectual capital

An organisation can only begin to identify its KM objectives with a clear idea of what the business as a whole is attempting to achieve. Gopal and Gagnon (1995) suggest that companies must respond to three questions:

1. What classes of knowledge are required to support the organisation's overall business strategy? For example, a domestic manufacturer that is considering breaking into international markets needs to identify there will be new knowledge requirements to understand how distribution is accomplished in various regions around the world. Further, a publishing company that recognises its future growth

lies in various new emerging media will need to fill gaps in its technological knowledge. Entering a new market creates these gaps. Even a firm whose strategy is not dramatically changing must fully appreciate how knowledge fuels its existing business to keep up with those companies that are capitalising on their knowledge resources.

2. What is the current state of the company's knowledge? Gopal and Gagnon (1995) suggest that an organisation should examine how it currently assesses knowledge, understand what role knowledge plays in the overall business strategy, locate important knowledge that exists but has not yet been tapped, and identify 'knowledge gaps' - that is, knowledge which is important but cannot be found within the organisation.

3. How can knowledge gaps be filled? Finding ways to transform the organisation's current knowledge base into a new and more powerful one is the central challenge for new knowledge managers.

2. Information: raw material of knowledge

Information needs to be captured, and presented in a form that can be shared, updated and applied in areas of the organisation. Gopal and Gagnon (1995) recommended IS managers to concentrate on four tasks to manage information effectively:

1. Setting goals: Determining what information is actually important.
2. Defining processes: Information management is like other management areas, and can be defined as a set of generic processes.
3. Building infrastructure: Computer and communications technology will represent the main and most expensive part of the infrastructure in most organisations.

Further, information infrastructure includes documents, human networks and other non-IT.

4. Motivating and rewarding people: No effort to improve information sharing will succeed if the persons involved are still encouraged by rewards and compensation to hoard.

3. Organisational Learning: process of refreshing and updating knowledge

Gopal and Gagnon (1995) point out that the process of organisational learning by which companies have built competitive advantage through effective knowledge and information management must continuously refresh and update their intellectual capital. Organisations, like individuals, learn from experience, they try something, note the results, and internalise them, but at the organisational level, this process is far from automatic.

Achieving learning management is the most difficult challenge for IT. Gopal and Gagnon (1995) maintain that learning is the way organisations transmit and increase their knowledge assets. If these assets are not transmitted throughout the enterprise, the organisation does not receive benefit from them. They identified four ways for IT that can facilitate the organisational learning:

1. Constant experimentation. This involves risks. No learning can happen in a situation without risks. IT managers, however, know that the risks of experimentation can be mitigated by the ability to rapidly prototype and test new propositions. IT should share this expertise with knowledge workers and offer them proven models for prototyping and testing their areas.

2. Careful measurement. IT managers have extensive experience of observing, measuring, and benchmarking. They could apply their abilities in this area to KM, and share its measurement processes and methodologies with knowledgeable workers

3. Broad communication. Communication is central to organisational knowledge. Without it, learning stops at the individual level, and any new knowledge fails to become an asset that the entire organisation can use. Because IT managers are experts in the tools that support broad organisational communication, they are uniquely qualified to encourage, if not facilitate, this type of communication

4. Socialisation. Fostering a corporate culture that values and rewards learning and sharing of information must be conducted on both the individual and organisational levels. This type of culture can be achieved in various ways, but one of the most motivating considerations is the cultural impact of groupware, such as Lotus Notes. Groupware may not introduce teamwork overnight to a firm steeped in internal competition, but it encourages collaboration. IT is well positioned to provide tools to help foster sharing, from e-mail to online discussion forums to videoconferencing.

According to Radding (1998), KM is addressed by the IT-based organisation for two reasons. First, knowledge is viewed as a natural extension of data and information. Second, the IT organisation has systems established that process and communicate knowledge, and is probable to be the candidate to implement and maintain any new systems required.

Gopal and Gagnon (1995) state that IS executives will succeed only if they take a broad-minded perspective. That is, if they see enhancing organisational knowledge as the ultimate goal and IT as just one of many tools that can assist their organisations seize this critical competitive advantage. If IT approaches KM simply as an opportunity to experiment with new technology, IT and any KM initiative will fail.

3.5.1 IT-based organisational change

Technology is used today to make major change in organisations, workgroups, and individual jobs. Henry and Lucas (1997) mentioned some IT contributions, for instance it provides new ways to design organisations, creates new relationships between customers and suppliers, creates a knowledge base of organisational intelligence, provides the manager with electronic alternatives to face-to-face communications and supervision, and determines that a world wide web (WWW) and Internet offer new ways to provide information and communications, and to engage in commerce.

Baines (1998) supposed that IT has moved from the realms of being a supporter of business practice to being a core element of business infrastructure and, in some cases, almost the entire business. In a global organisation, control and co-ordination would be impossible without information and communications technology. The technology allows an organisation to decide the proper levels of decentralisation and centralisation on the basis of choice and preferred management approaches, rather than on the ability to handle decision-making information at the point of the decision.

According to Huber (1990), the use of computer-assisted communication technologies leads to the following organisational changes:

- A large number and variety of people participating in decision-making.
- A decrease in the number and variety of people participating in traditional face-to-face communication.
- Fewer organisational levels involved in authorising action.
- More quick and accurate identification of problems and opportunities, so improved decisions are made.
- Organisational intelligence (scanning, monitoring) that is more accurate, comprehensive, timely, and available.
- Shorter time required authorising actions and making decisions.

By using IT facilities like the computer, managers will have time to get out of the office and into the field. The managers can also spend more time planning activities instead of putting out fires. Further, management challenge lies in the ability of IT to support the process of decision-making. Turban et al. (1999) agreed that using IT saves time, and state that IT could change the decision-making process, and even decision-making style, such as information gathering for decision-making, will be done much more quickly. Most leaders currently work up a large number of problems simultaneously, moving from one to another as they wait for more information on their current problem or until some external event interrupts them. IT tends to reduce the time essential to complete any step in the decision-making process. Therefore leaders will work on fewer tasks during each day but complete more of them.

Markus and Robey (1988) proposed three dimensions of causal structure of the relationship between IT and organisational change:

- Causal Agency. This refers to the assumptions made by the analyst about the identity of the causal agent and its influence
- Logical Structure. This refers to the logical relationships between the causes and the outcomes
- Level of Analysis. This refers to the entities about which the theory poses concepts and relationships.

Implementing the technology is not impossible, but it requires a way that is compatible with the way people work. Managers should determine the true value of IT and start working towards reviving IT, rather than carrying it as a dead weight. Most firms compete on their people being their best asset, and the same people are often appreciative to adapt working processes to suit technology. Therefore, managers need to consider the flexible IT and business skills, competencies and working methods that an organisation needs to hold.

3.6 Summary

This chapter has presented a detailed discussion of the major elements associated with the use of IT to support KM implementation. It has reviewed the possible relationships between IT and organisations in the KM context. The discussion has also covered general information systems, IT infrastructure, IT effectiveness for knowledge management (KM), IT vendors, and the IT-based organisation. IT interacts with organisations and can be used to change the structure of the organisation and/or its subunits.

So far, a conclusion can be made on the fact that IT could be a subsystem of IS, as well as on the importance of general IS and IT emphasis on IT tools, especially the

database, with a network that makes the knowledge easy to capture and able to be managed, as well as helping transform the organisation by connecting it to customers, suppliers, and alliance partners. The major role for IT is providing information, and frequently this information is used for decision-making in organisations.

CHAPTER FOUR

Secondary Data Analysis

Chapter 4: Literature Review (III): Secondary Data Analysis

4.1 Introduction

The constantly evolving business dynamics have prompted organisations to perpetually search for factors that will enable sustained and lasting success. Such factors, once identified, will enable the organisations to prioritise and implement KM-related initiatives that are of strategic importance.

Critical factors are a collection of lessons learned and experiences derived from investigation and implementation of KM systems. This is of significance, as the knowledge of such CSFs will enable successful KM implementation, thus preventing rework and hence re-invention. Further, awareness of such factors will also prevent failures.

It can be postulated that the research concerning CSFs related to KM is fragmented. In general, a number of authors (Wiig 1996; Davenport et al. 1998; Davenport and Prusak 1998b; Morey 1998; Trussler 1998; Finneran 1999; Liebowitz 1999b; Heisig 2001; Skyrme 2002a) have identified factors that are perceived to be critical towards management of knowledge. However, it is to be stressed that this study is far from exhaustive. Further, investigations concerning KM-related CSFs have been too general, focusing in the main upon several categories instead of a concurrent or a parallel theme. There thus does not exist a unified audit tool that would enable researchers to explore the importance of KM-based CSFs and their respective implementation.

Thus, it is clear that KM is a relatively maturing phenomenon. In order to fully appreciate the weighting attached to the importance of KM-related CSFs and their respective implementation, one has to profit from organisational experience. In

essence, this involves the examination of what others have done, their feedback, mistakes, results, and overall approach and perceptions towards KM and its respective implementation.

As mentioned on Chapter 1 this chapter provides a comprehensive gap analysis of KM-related CSFs within 91 organisations, as derived from the literature. In essence, these CSFs can be categorised into four distinct categories:

(1) Technology

(2) KM processes

(3) Change management

(4) Top management commitment

It is to be postulated that each of the above-mentioned categories is interdependent. This implies that a failure in one category will have a ripple effect upon the others.

4.2 Background

The 91 case studies contributing to the present analysis have been distilled from the literature, experience reports, and various case studies published on the web.

The survey spanned across four sectors. These sectors are: Manufacturing, IT, Services, and Public sector.

From extensive review of the literature, the factors listed in Figure 4.1 are identified to be the key CSFs for the successful implementation of KM.

Figure 4.1 CSFs used to analyse selected

No	Critical Success Factor
1	Top management commitment
2	Sharing knowledge
3	Transfer knowledge
4	Create knowledge
5	Capture knowledge
6	Training & learning
7	Culture
8	Technology
9	Network
10	Database
11	Internet
12	Intranet
13	Web-site
14	Team
15	Knowledge base
16	Knowledge structure
17	Other

All the case studies were benchmarked against the facts listed in Figure 4.1. This benchmarking process is then used to carry out further analysis (e.g. gap analysis).

The purpose of the present investigation is two-fold:

1. Identification of factors critical for KM, and their relative importance and implementation within the selected organisations.
2. Gap analysis (from KM importance and implementation perspective) for the study organisations.

It is anticipated that the above approach will illustrate the KM-related gaps (at a holistic level) within the selected organisations from the various sectors.

Further, it is to be stressed that the selection of organisations contributing towards the sample were from different sources (some cases have more than one source).

The information reported in some of them may not have been exhaustive, and might have overlooked some aspects of the organisations' efforts towards KM.

4.3 Theoretical Framework

91 case studies from a range of various sectors were analysed. The analysis used a common framework, that of a common set of CSFs (see Figures 4.1 and 4.2, respectively).

The selection of the organisations was based on the relative availability of information concerning the organisations selected.

Further, the CSFs listed in Figure 4.1 can be divided into four categories, as shown in Figure 4.2 below.

Figure 4.2 KM CSFs by category.

Category	KM factor
A	**Technology**: Network, Internet, website, Intranet, channel access, knowledge base, communication.
B	**KM processes**: Creating and capturing, transferring, sharing knowledge, collaboration.
C	**Change management**: Training, learning, culture, team, skills.
D	**Top management commitment**: Knowledge structure, motivation, CKO.

Table 4.2 shows that the KM CSFs are divided into categories, namely A, B, C and D. The rationale behind the grouping of the factors into the designated category is that they reflect strong interdependency.

- Category A factors: Technology: Network, Internet, website, Intranet, channel access, knowledge base, communication.

- Category B factors: KM processes: Creating and capturing, transferring, sharing knowledge, collaboration.
- Category C factors: Change management: Training, learning, culture, team, skills.
- Category D factors: Top management commitment: Knowledge structure, motivation, CKO

Thereafter, the benchmark study of the CSFs for the selected organisations was conducted and the information captured in a generic template (see Figure 4.3).

Figure 4.3 Framework to capture information concerning CSFs as exhibited by various organisations

Critical success factor / Organisation	CSF1	CSF2	....	....	....	....	CSFs
1							
....							
....							
N							

Table 4.3 shows the respective organisations that participated in the survey against their mapping with the identified CSFs. The actual mapping (i.e. the results of the survey for the organisations versus CSFs) is shown in Figure 4.7.

The information captured by using the framework of Figure 4.3 was analysed for the purposes of gap analysis (see Figures 4.4 and 4.5, respectively) by:

1. CSFs for various organisations.
2. CSFs by category for various organisations.

Figure 4.4 CSFs gap analysis for various organisation

No.	Critical Success Factor (Actual)	Count (Actual)	Count (Percentage)	Gap (Percentage)
1				
....				
....				
N				

Figure 4.4 is the framework that illustrates the gap for a given CSF. The number of repetitions (from Figure 4.7) is counted and recorded. This is then captured as a percentage (see column count (percentage) column four). The count (percentage) is then subtracted from 100 in order to arrive at the gap (percentage) last column. The application of the theoretical framework of Figure 4.4 is shown in Figure 4.8.

Figure 4.5 CSFs gap analysis by category for various organisations

No.	KM factors (By category)	Count (Actual)	Count (Percentage)	Gap (Percentage)

Figure 4.5 is the framework that illustrates the gap within the KM factors by category. The number of repetitions for a given category spanning across the 91 organisations surveyed, were counted (actual count). The percentage corresponding to these repetitions was computed (see column labelled count (percentage)). This percentage (for a given category) was then subtracted from 100, in order to arrive at

the percentage gap for a given category (see column labelled gap (percentage)). The actual results from the application of this theoretical framework are shown in table 4.9. Further, the results of the gap analysis were used for benchmarking of the CSFs. In essence, this was done by ranking the CSFs in an ascending gap (%) order, as shown in Figure 4.6.

Figure 4.6 Ranking of CSFs in ascending order

No.	Critical Success Factors (CSFs)	Gap (%)
1		
2		
....		
....		
....		
N		

Figure 4.6 shows the CSFs in increasing percentage gap order. The actual results for this are illustrated in figure 4.10.

4.4 Gap Analysis

The data captured were scrutinised for the purposes of gap analysis. In essence, gap analysis (in the present context) is a technique used to bring out facets of an organisation that exhibit significant areas of improvement. The root cause analysis related to each gap area will not be carried out within the present investigation.

4.4.1 CSFs Mapping

The theoretical framework of Figure 4.3 is applied to the secondary data, thus allowing the mapping of the CSFs for a given organisation. This information is then further scrutinised to conduct gap analysis.

Figure 4.7 mapping of CSFs to various organisations

No	Organisation's name	Top management commitment	Sharing knowledge	Transfer knowledge	Create knowledge	Capture knowledge	Training & learning	Culture	Technology	Network	Database	Internet	Intranet	Web-site	Team	Knowledge base	Knowledge structure
1	HP	*	*	*	*	*	*	*	*	*	*					*	
2	Pricewater- HouseCooper	*	*						*	*			*			*	
3	Ernst &Young	*	*	*	*	*	*	*	*	*						*	
4	Steelcase Designs	*	*		*	*	*	*	*	*		*					
5	Xerox Corporation	*	*	*		*	*	*		*			*	*			
6	Texas Instruments	*	*	*	*	*	*	*		*	*				*	*	*
7	Trilogy Development Group	*	*	*		*			*		*						*
8	Context media L.L.C.	*	*				*		*			*	*			*	
9	Lincoln ReSic	*	*		*	*	*	*		*							
10	Microsoft	*		*	*		*		*	*	*		*	*	*	*	

Figure 4.7 (continued)

No	Organisation's name	Top management commitment	Sharing knowledge	Transfer knowledge	Create knowledge	Capture knowledge	Training & learning	Culture	Technology	Network	Database	Internet	Intranet	Web-site	Team	Knowledge base	Knowledge structure
11	Institute Research learning (IRL)	*	*	*	*		*		*	*					*		
12	Monsanto KM Architecture	*	*	*	*	*	*	*	*	*	*	*		*	*		*
13	Monitor Company	*	*		*		*			*	*						
14	Hughes Space and Communication	*	*	*	*		*		*	*			*				
15	Buckman Laboratories International	*	*	*	*	*		*	*	*			*			*	
16	American Productivity & Quality Center (APQC	*	*	*	*		*	*	*	*	*						
17	Bankers Trust Company BT	*	*				*	*	*		*	*	*	*	*	*	
18	Sun Microsystems		*	*	*		*		*	*	*	*	*				
19	Teltech	*	*		*	*	*		*	*	*						*
20	Arthur D. Little	*	*			*	*	*	*	*				*			*

Figure 4.7 (continued)

No	Organisation's name	Top management commitment	Sharing knowledge	Transfer knowledge	Create knowledge	Capture knowledge	Training & learning	Culture	Technology	Network	Database	Internet	Intranet	Web-site	Team	Knowledge base	Knowledge structure
21	BP	*	*	*	*	*	*	*	*	*					*	*	
22	Frito-Lay Inc (Consultant, Portal)	*	*	*	*	*	*		*		*	*		*	*	*	
23	Knowledge Research Institute, Inc (KRI)	*		*	*	*	*		*	*							
24	Toshiba Corp	*		*				*		*							
25	Lexington Lab	*	*				*	*	*			*					*
26	Knight-Ridder Inc	*							*		*		*	*			
27	Deloitte Consulting LLC	*	*		*		*		*								
28	InFocuse Proxima ASA						*	*									
29	Spherion Corps Sic		*	*		*	*		*							*	
30	Northrop Grumman		*			*		*	*		*	*					

Figure 4.7 (continued)

No	Organisation's name	Top management commitment	Sharing knowledge	Transfer knowledge	Create knowledge	Capture knowledge	Training & learning	Culture	Technology	Network	Database	Internet	Intranet	Web-site	Team	Knowledge base	Knowledge structure
31	American Producrivity & Quality Center (APQC)	*	*	*	*	*	*	*	*	*			*				*
32	Polish Enterprise	*		*	*	*		*	*							*	
33	GSA Information	*			*	*			*		*			*			*
34	Marconi	*	*	*	*		*	*	*		*	*		*	*	*	
35	Mitre Corp	*	*	*		*		*	*	*	*		*	*	*	*	
36	Hunter health intranet	*	*	*	*		*		*			*	*	*	*	*	*
37	TUFTS University	*	*	*	*		*	*	*		*			*	*		*
38	IBM corps	*	*	*	*			*	*	*	*	*	*	*	*	*	
39	Road and Traffic Authority (RTA)	*			*	*	*		*		*			*	*		*
40	MTRC (Transit Railway)	*	*		*		*	*	*	*	*			*	*		*

Figure 4.7 (continued)

No	Organisation's name	Top management commitment	Sharing knowledge	Transfer knowledge	Create knowledge	Capture knowledge	Training & learning	Culture	Technology	Network	Database	Internet	Intranet	Web-site	Team	Knowledge base	Knowledge structure
41	Broderbund software	*	*		*				*		*	*		*		*	
42	Ukranian society			*	*		*	*	*	*	*	*		*	*	*	*
43	KM consulting	*					*		*				*				
44	Telecommunication systems and internet	*	*	*	*		*		*	*	*	*		*	*		
45	Cambridgeshire County Council Social Services		*		*		*		*	*	*						
46	One health plan of Colorado	*					*	*	*			*					
47	The Health system-(Canada)	*	*		*	*	*	*	*						*		
48	Bristol-Myers	*			*			*					*	*	*		
49	Indian university Sic	*	*		*	*	*			*				*			
50	Community hospital Indianapolis	*			*		*	*	*	*	*					*	

Figure 4.7 (continued)

No	Organisation's name	Top management commitment	Sharing knowledge	Transfer knowledge	Create knowledge	Capture knowledge	Training & learning	Culture	Technology	Network	Database	Internet	Intranet	Web-site	Team	Knowledge base	Knowledge structure
51	BP Amoco Chemical	*	*	*	*		*	*	*	*	*			*	*	*	
52	Army-US	*	*	*	*	*	*		*	*		*	*	*		*	*
53	Weyerhaeuser Co Ticker	*			*		*		*	*					*	*	
54	United technologies corp.	*	*	*	*		*								*		*
55	Electric and gas utilities								*		*	*			*		
56	Cisco	*	*	*	*	*	*	*	*	*		*	*	*		*	
57	Dow chemical company	*	*	*	*	*	*		*	*	*				*		
58	Hoffmann laroche company	*				*		*	*		*				*	*	
59	J.P. Morgan Partners			*	*				*	*	*				*		
60	Asia and Europe and middle east	*	*		*		*		*	*	*		*		*	*	*

Figure 4.7 (continued)

No	Organisation's name	Top management commitment	Sharing knowledge	Transfer knowledge	Create knowledge	Capture knowledge	Training & learning	Culture	Technology	Network	Database	Internet	Intranet	Web-site	Team	Knowledge base	Knowledge structure
61	CommWork Corp.	*	*	*					*	*		*					*
62	Brint institute	*	*	*	*		*	*	*		*			*	*	*	
63	Minnesota Mining & Manufacturing (3Ms)	*	*	*	*		*	*	*	*	*				*		*
64	Chevron Corporation	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
65	Lotus development corp.	*		*	*	*	*		*	*	*			*	*		*
66	National semi conductor corp.	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
67	World bank	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
68	Hong Kong IT Corporation	*		*	*		*	*	*	*	*	*			*	*	*
69	Toronto Consultant company		*	*	*		*				*		*		*	*	
70	UK institute learning		*	*	*	*	*	*	*		*			*	*	*	*

Figure 4.7 (continued)

No	Organisation's name	Top management commitment	Sharing knowledge	Transfer knowledge	Create knowledge	Capture knowledge	Training & learning	Culture	Technology	Network	Database	Internet	Intranet	Web-site	Team	Knowledge base	Knowledge structure
71	InfoTech organisation	*	*		*	*	*	*	*				*		*		*
72	Hill & Knowlton	*	*		*	*				*	*	*		*			
73	Syntel Insurance company	*	*	*		*	*	*	*		*				*		
74	Boeing Commercial Airplane Group	*	*		*	*	*								*	*	*
75	Austrian IC Company	*	*		*		*	*	*	*	*				*	*	*
76	Denmark IC Company	*	*		*		*		*	*	*					*	*
77	Asia IC Company	*	*	*	*		*	*	*	*	*	*	*	*		*	*
78	Automobil industry				*		*		*						*		
79	IT and Telecommunications corporation	*	*		*	*	*				*	*	*	*	*		
80	Cyturas contenuity enterprise				*		*		*		*			*		*	

Figure 4.7 (continued)

No	Organisation's name	Top management commitment	Sharing knowledge	Transfer knowledge	Create knowledge	Capture knowledge	Training & learning	Culture	Technology	Network	Database	Internet	Intranet	Web-site	Team	Knowledge base	Knowledge structure
81	Rolls-Royce	*		*					*						*		
82	Ketchum		*						*			*	*		*	*	
83	Process edge	*	*	*	*		*	*	*					*	*	*	
84	Management developing company	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
85	Consulting KM firm	*	*	*	*	*	*	*	*						*		*
86	Compaq	*	*			*	*	*	*			*			*	*	*
87	EBV Elektronik	*	*			*			*			*		*	*	*	
88	MYOB US, Inc.					*			*		*	*		*			
89	Intelligent Service and Broadband Software				*				*	*							*
90	CSC	*	*				*	*	*							*	
91	British telecom	*			*				*		*			*	*		

4.4.2 Gap analysis by CSF

The framework of Figure 4.3 is applied to Figure 4.7 to deduce the actual percentage gap for the actual CSFs which is shown in Figures 4.8 and 4.9.

Figure 4.8 Aggregated KM CSFs analysis (91 organisations)

No.	KM factors	Repetition	Percentage	Gap (%)
1	Top management commitment	84	92	8
2	Sharing knowledge	66	73	27
3	Transfer knowledge	49	54	46
4	Create knowledge	67	74	26
5	Capture knowledge	43	47	53
6	Training & learning	63	69	31
7	Culture	47	52	48
8	Technology	79	87	13
9	Network	49	54	46
10	Database	50	55	45
11	Internet	30	33	67
12	Intranet	28	31	69
13	Web-site	38	42	58
14	Team	49	54	46
15	Knowledge base	44	48	52
16	Knowledge structure	33	36	64
17	Other	------	----	------

Table 4.8 shows the results for the percentage gaps for the individual factors for the organisations surveyed (from the literature review). From these analyses it becomes evident that the factor exhibiting the lowest gap is 'top management commitment' (8 %), whereas the factor exhibiting the largest gap is the Intranet (69 %). These are a substantial number of factors. For the purposes of simplicity, these factors have been categorised under four different headings namely: (1) Technology (2) KM processes (3) Change management (4) Top management commitment.

4.4.3 Gap analysis by category

The framework of Figure 4.5 is applied to the mapping of CSFs to organisations (Figure 4.7), in order to deduce the gap related to KM by categories. This is illustrated in Figure 4.9.

Figure 4.9 Aggregated gaps related to various facets of KM for study organisations

No.	KM factors (By category)	Count (Actual)	Count (Percentage)	Gap (Percentage)
1	Technology	87	95	5
2	KM processes	85	92	8
3	Change management	83	90	10
5	Top management commitment	87	95	5

Table 4.9 shows the results for the gaps for the KM factors (by category). The change management factor exhibit the highest gap (10 %) followed by KM processes (8 %). Thereafter, the top management commitment and technology factors exhibit a gap of 5%.

The key findings and conclusions deduced from Figures 4.8 and 4.9, are presented in chapter 8 (for the purposes of unified coherency).

4.4.4 Benchmarking of CSFs and Best Practice

The theoretical framework of Figure 4.6 is applied to the gap analysis data in order to benchmark and hence yield the CSFs perceived to be most important by the various organisations (according to the analysis based on the secondary data and literature review).

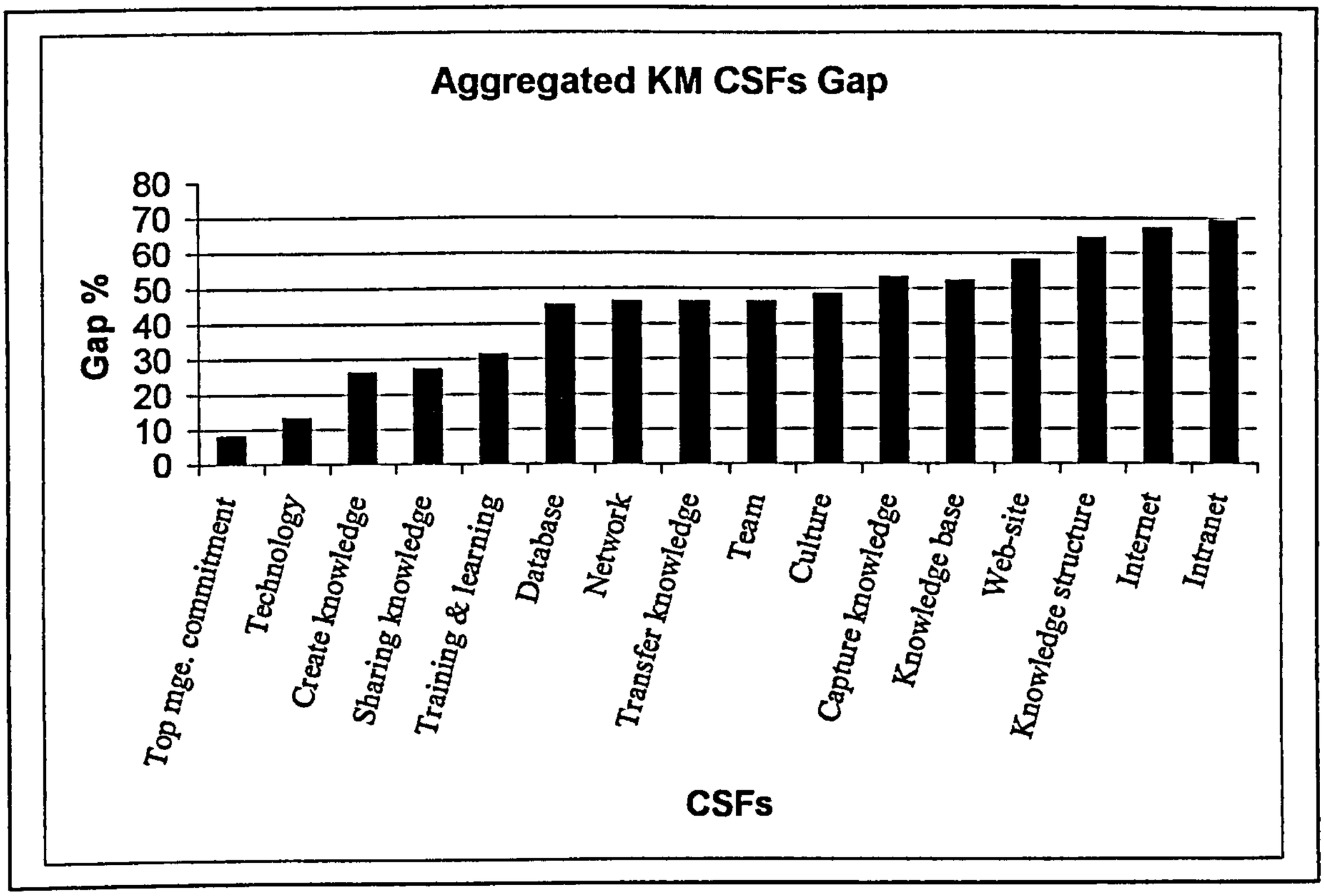
Figure 4.10 shows the CSFs ranked in increasing gap (%) order. From this analysis, it can be postulated that the CSFs exhibiting the least gap (%) is perceived to be most important by the organisations and vice versa.

In this context the factors exhibiting the lowest percentage gap is top management commitment (8 %). Similarly the factor exhibiting the highest gap is Internet (69 %). From this, we interpret that the gap range associated with the identified factors is 55 %.

Figure 4.10 CSFs in ranked gap (%) order

No.	Critical Success Factor	Gap (%)
1	Top management commitment	8
8	Technology	13
4	Create knowledge	26
2	Sharing knowledge	27
6	Training & learning	31
10	Database	45
9	Network	46
3	Transfer knowledge	46
14	Team	46
7	Culture	48
5	Capture knowledge	53
15	Knowledge base	52
13	Web-site	58
16	Knowledge structure	64
11	Internet	67
12	Intranet	69

Figure (4.11) is a graphical representation of figure (4.10) and illustrates the percentage gap for the selected identified CSFs.



4.5 Limitations of Study

This study is not without limitations, as is any study based on secondary source data.

The limitations include: here

1. Misinterpretation, whether by the author of this study or by the case studies' authors.
2. Case studies provided by various sector vendors may be unreliable or exaggerated.

However, the purpose of this study is to examine the importance and implementation of critical factors of KM as viewed by authors and practitioners, whether directly or indirectly mentioned.

4.6 Summary

To realise benefits of KM and to avoid 're-inventing' the wheel, organisations have to learn the critical issues that are important for the implementation of KM.

A comprehensive literature review was carried out (in conjunction with the gap analysis), and the number of times a particular CSF for a given organisation was mapped and aggregated. 21 CSFs were thus identified, based upon 91case studies. By adhering to this approach, the general gap areas for organisations (sectors) were highlighted (i.e. the factors that stand out most in criticality). Although a root cause analysis on each of the critical factors has not been conducted, several important and significant conclusions have however been drawn from the analysis of the present chapter. For the purposes of coherency, these conclusions are presented in Chapter 8.

CHAPTER FIVE

Research Design and methodology

CHAPTER 5: RESEARCH DESIGN AND METHODOLOGY

5.1 Introduction

This chapter discusses issues related to the research design and methodology selected, and the data collection and analysis methods used to conduct the research study. These issues are addressed in the identified in Chapters One, Two and Three.

Nachmias and Nachmias (1996) describe the role of research as an attempt to increase the adding up of what is known, by discovering new facts and relationships through a systematic scientific inquiry. The research request to be able to argue realistically that something new of value has been added to the body of knowledge.

The aim of research is to find answer or solutions to problems through an organised, critical, systemic, scientific, databased inquiry or investigation (Sekaran, 1984).

The role of research methodology, is to direct the research process through a system of procedures

One of the major aims of this study is, through the use of a best practice, to propose a generic model for effective KM implementation and supported by IT.

The chapter first explains and discusses some of the research designs and methodologies available to researchers. The selection of approach will be justified in view of its appropriateness and usefulness to the research project in order to achieve the study objectives. It also discusses how this research strategy was translated into a detailed research design which directs the process of collecting, analysing, and interpreting data, as well as statistical techniques used for the analysis.

5.2 Research Strategy

Research involves a selective combination of a massive range of skills and activities.

Trochim (2001) stated,

> *" To be a good social researcher, you have to be able to work well with a wide variety of people, understand the specific methods used to conduct research, understand the subject that you are studying, be able to convince someone to give you the funds to study it, stay on track and on schedule, speak and write persuasively, and on and on.*

Babbie (1989), Hughes (1990), Nachmias and Nachmias (1996), Remenyi et al. (1998) and Trochim (2001) suppose that scientific research consists of two key elements, theory and empirical research. They propose that a systematic link between these two elements can improve the role of social science through deduction and induction. From Trochim's (2001) point of view, the two terms theoretical and empirical are presented together because both of them are often dissimilar from each other. Social research is theoretical, it is concerned with developing, exploring or testing the theories or ideas that social researchers have about how the world manages itself. Also, it is empirical, it is based on observations and measurements of reality, on what we observe of the world around us. He added three elements: *nomothetic, probabilistic, and causal,* and stated,

> *"Empirical, meaning that it is based on observations and measurements of reality on what we perceive of the world around us"*

Nachmias and Nachmias (1996) and Trochim (2001) argue that there are two types of research strategy: theory-then-research and research-then-theory. Theory-then-research strategy starts with a hypothesis-testing approach to research, and then collects data that will lead to accepting or rejecting the hypothesis. Trochim (2001) called deductive top-down and inductive bottom-up thinking. (See Figure 5. 1)

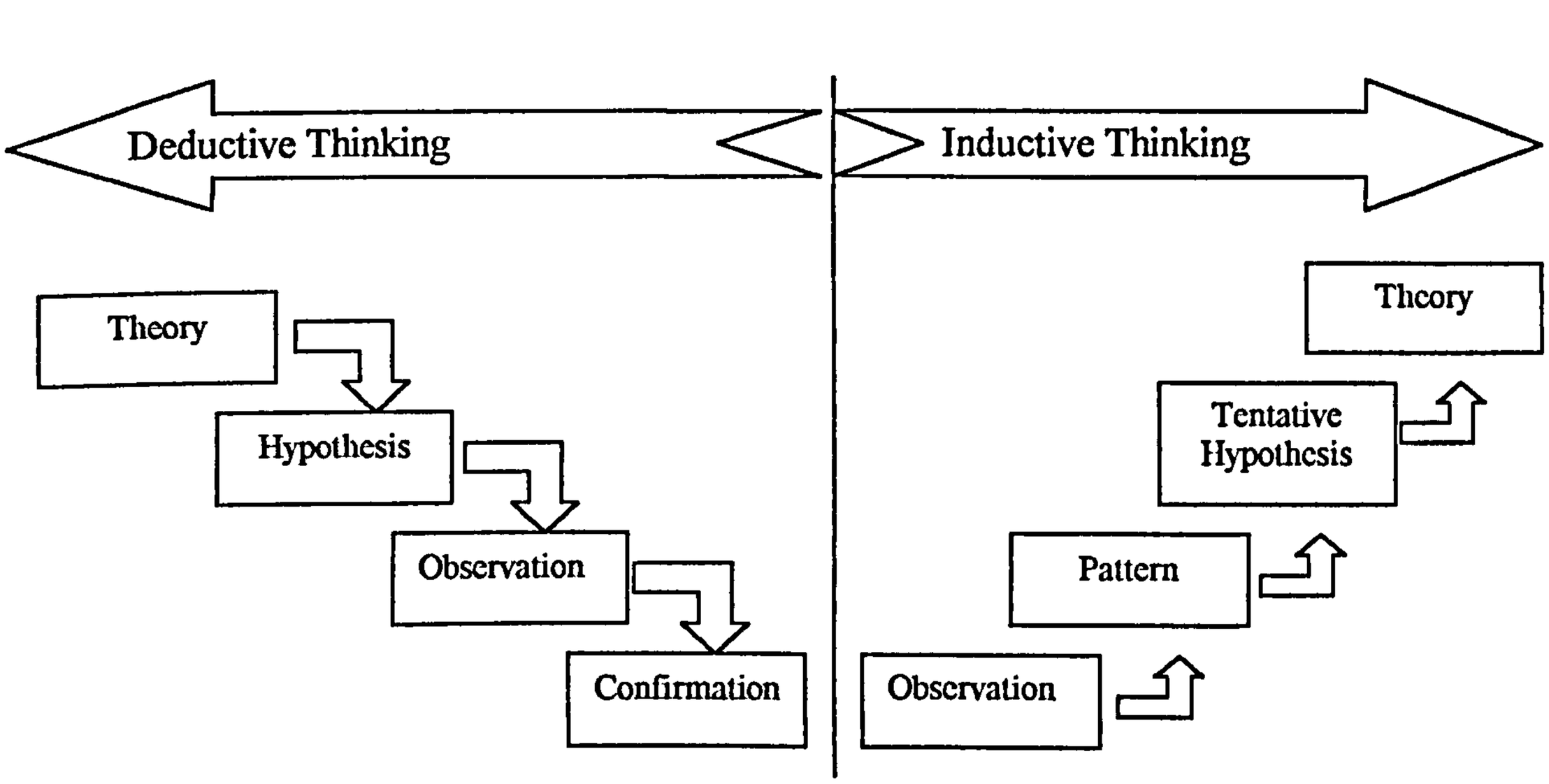
According to Reynolds (1971), research strategy involves developing a model for testing, building up a number of suggestions that describe relationships between its constituents, designing research instruments to examine the model, testing the

suggestions against the data collected, and refining the model and its associated theories.

Advocates of research-then-theory, on the other hand, suppose that empirical research goes far beyond the passive role of verifying and testing theory, but should seek to formulate new theories (Merton, 1968; Benbasat et al., 1987; Strauss and Corbin, 1990). Research that takes up this strategy begins to determine the phenomenon's attributes, and then seeks data to build theories around them (Reynolds, 1971). Trochim (2001) noted,

> *" Deductive reasoning works from the more general to more specific, while **Inductive** reasoning works the other way, moving from specific observations to broader generalizations and theories"*

Figure 5. 1 Deductive and Inductive Thinking



Source: Adapted from Trochim (2001)

5.3 Research Methods

Research methods supply means to collect data. Data can be collected from numerous sources using different methodologies. Data collected can be classified as qualitative or

quantitative; they are qualitative if they come in word form and explain conditions, while they are considered as quantitative if they are in the form of numbers (Miles and Huberman (1994), Blaxter and Hughes (1996), and Remenyi et al. (1998).

Downey and Ireland (1979) stated that the adequate selection of these methods and the understanding of their application to the research context are critical to the success of the research in presenting the phenomenon being studied in a scientific frame. However, choosing between them for a particular research study has always been problematic, because a decision on the appropriateness of a particular method cannot be made in isolation of the context in which the research problem exists.

The following sections present insights into the nature of these methods, their different approaches, and a detailed discussion of the two approaches (quantitative and qualitative methodologies) in the context of this research study.

5.3.1 Quantitative and Qualitative Methods

Some writers, Van Maanen, (1979); Nettelton and Taylor (1990); Lee, (1992) argue that qualitative and quantitative research differ in so many fundamental ways that integrating methodology from the two types is difficult, if not impossible.

Quantitative and qualitative methods reflect more than just differences between research strategies and data collection procedures. These approaches represent fundamentally different epistemological frameworks for conceptualising the nature of knowing social reality and procedures for comprehending these phenomena (Filstead, 1979).

Guba (1985) has argued vehemently against the suggestion that the two-research tradition might be reconciled. In this view, attempts to combine the two approaches fail

to recognise the distinction between a paradigm and a method. He thinks that the idea that quantitative and qualitative research can be dovetailed rests on a view that they present only different methods of investigation; instead, "we are dealing with an either or proposition in which one must pledge allegiance to one paradigm or the other" (Guba, 1985: 80).

Qualitative research is distinguished from quantitative research in that quantitative research is concerned with frequency while qualitative research is concerned with abstract characteristics of events. Qualitative researchers maintain that many natural properties cannot be expressed in quantitative terms; indeed, they will lose their reality if expressed simply in terms of frequency.

As qualitative researchers direct their attention to the meanings given to events by participants, they come to understand more than what a list of descriptions or a table of statistics could support. When positivistic researchers focus inquiry exclusively on a quantitative dimension, research in the social sciences is narrowed to those aspects which lend themselves to numerical expression. For example, instead of focusing on a student's attitude towards learning or his or her creativity, much educational research will instead direct its energy to achievement - an operationally defined achievement based on standardised tests (Willers, 1987).

Trochim (2000) stated

> *"We call data 'quantitative' if it is in numerical form and 'qualitative' if it is not. Notice that qualitative data could be much more than just words or text. Photographs, videos, sound recordings and so on, can be considered qualitative data. All quantitative data based upon qualitative judgments; and all qualitative data can be described and manipulated numerically".*

5.3.1.1 Quantitative Methods

A quantitative design provides a quantitative or numeric description of the population through the data collection process of asking questions of people (Fowler, 1988). The research manipulates one or more independent variables and determines whether these manipulations cause an outcome (McMillan and Schumacher, 1989). Quantitative research is concerned with wider populations, so that the generalisability of findings can be enhanced.

Nettleton and Taylor (1990) emphasise the goal of quantitative research as providing accurate measurement for social actions by explaining the causal relationships related to specific events and measuring events by objective criteria.

5.3.1.2 Qualitative Methods

According to Bryman (1995), a qualitative design is a process of inquiry for understanding a social or human problem, based on building in words a complex, holistic picture, presenting detailed views of subjects, and conducted in a natural setting.

Qualitative research is not disinterested in causes, in that it is frequently concerned to establish how flows of events connect and mesh with each other in the social contexts it investigates, or how subjects perceive the connections between the facts of their environment. Qualitative research gives less attention to statistical sampling, being rather more concerned with the issue of whether the sample conforms to the investigator's emerging theoretical framework (Bryman, 1995: 110).

5.3.2 Secondary Data

There are data previously collected by someone else, possibly for some other purpose (e.g., data in books, journals, newspapers, magazines, Internet, etc.). Remenyi et al.

(1998) and McDaniel and Gates (2002) said that secondary data constitute one of the elements in data collection. Information that has already been published or is available indirectly can provide a fruitful source of secondary data which can be obtained at a fraction of the cost, time, and inconvenience associated with primary data.

Secondary data analysis uses the analysis of data that the analyst was not responsible for collecting, or data that were collected for a different problem from the one currently under analysis (Graves, 2003). This part of study incorporates them for those purposes, as well as to serve as a comparative perspective for best practice related to implementation methodology.

McDaniel and Gates (2002) and Graves (2003) list advantages of using secondary data. These former listed them as:

- Providing necessary background information and building credibility for the research report.
- Helping to clarify or redefine the problem during the exploratory research process.
- Providing a solution to the problem
- Providing primary data research method alternatives.

For Graves, (2003), the determined advantages are:

- Secondary information is an inexpensive data source.
- Useful for generating hypotheses for further research.
- Useful in comparing findings from different studies and examining trends.
- Useful strategy for learning the research process.
- Given that students are expected to understand, explain, and defend the data set in terms of purpose, sample selection, methods, and instruments.

5.3.3 Survey Questionnaire

The questionnaire is one of the primary tools for collecting data. Therefore, it would be advantageous to talk about aspects of the questionnaire in general and the advantages of using such a method in data collection.

The questionnaire can be defined as

> "*A self-report instrument used for gathering information about variables of interest to an investigator. It consists of a number of questions or items on paper that the respondent reads and answers*" (Wolf, 1990: 374).

Some authors define the questionnaire in terms of its usage. Galfo (1983) suggests that:

> "*Questionnaires are used to obtain factual data, opinions and attitudes in a structural framework from respondents not contacted on a face-to-face basis*" (Galfo, 1983: 83).

As for the method of distributing the questionnaire, Good (1963) says that

> "*The questionnaire is generally regarded as a form distributed though the mail filled out by the respondent under the supervision of the investigator*" (Good, 1963: 270).

Kerlinger (1986) stated that there are two main types of questionnaire. The first is 'exploratory', and its objective is to become more familiar with a topic. The second type, and arguably the more important, is 'explanatory' and its objective is to find causal relationships among variables.

There are many advantages to using a questionnaire, ranging from low cost, convenience, and providing substantial information in a relatively short time. As for cost:

> "*Written questionnaires are the least expensive means of data gathering, and cost is not a trivial consideration*" (Judd et al. 1991: 216).

Face-to-face interviews may put some sort of pressure on the respondent, who feels expected to come up with an immediate and often socially acceptable answer. Using a questionnaire lessens this type of pressure by giving the respondent some time to deliberate before answering a question. Moreover, the questionnaire gives respondents the feeling of anonymity they need, especially when answering sensitive questions, and therefore they might be encouraged to provide accurate answers even to personal questions. Finally, questionnaires can save time, especially when dealing with a large sample. It is highly impractical to use another method of data collection, like the interview, when dealing with a sample of 500 for example, whereas the questionnaire is more practical in cases like this, and saves an immense amount of time. It also offers relative ease in analysing large quantities of data (Judd, 1991).

5.3.4 Case Study Method

Case study is a typical research method extensively used for qualitative data collection in social research. Trochim (2000) defined case study as:

> *"Intensive study of a specific individual or specific context. For instance, Freud developed case studies of several individuals as the basis for the theory of psychoanalysis and Piaget did case studies of children to study developmental phases. There is no single way to conduct a case study, and a combination of methods (e.g., unstructured interviewing, direct observation) can be used".*

Therefore, Merriam, (1988) Cohen and Manion, (1994), and Remenyi et al. (1998) believe that the data for case study are often obtained from various sources: documents, interviews, direct observations, participant-observation situation, physical artefacts, and/or achieved records. However, structured interviews are the major part of the case study research protocol (Kasanen and Suomi, 1987; Bell, 1993; Yin, 1993)

Wong (1992) said that the researcher's role is to find out the research problem context through the eyes of the people being investigated. Case study is research method for the

social scientist as experiment is a research strategy for the natural scientist (Kasanen and Suomi, 1987; Smith, 1990). Therefore, Remenyi et al. (1998) thought that case study is a favoured research method when 'who', 'why' and 'how' questions are being examined, when the researcher has little control over events, and when the focus is on a modern phenomenon within some real-life context.

Basically, the case study lets the researcher focus on a precise example in an attempt to recognise detailed interactive processes that can be essential to understanding. Consequently, it is important to identify that the case study has the limitation of being inappropriate for research that seeks statistical generalisation or assessment (Yin, 1989; Cohen and Manion, 1994).

5.3.5 The Combined Use of Qualitative and Quantitative Methods of Research (Triangulation)

A researcher cannot simply trust one type of data collection, because the information gathered by one method alone would be more susceptible to error than that gathered by multiple methods of data collection. Therefore, the researcher should apply various techniques, and include quantitative as well as qualitative methods, in collecting data. This approach gives the researcher greater flexibility in choosing the most convenient tools for each group of respondents.

Combining qualitative and quantitative methods means combining the ways in which the two methods are associated with the research in a single study, mixing methods, and linking paradigms to methods. It also means combining research design in all phases of a study, or other ways in which a researcher may use multiple methods of data collection and analysis.

Denzin (1970) treats triangulation as an approach in which multiple observers, theoretical perspectives, sources of data, and methodologies are combined. By and large, researchers have viewed the main message of the idea of triangulation as entailing a need to employ more than one method of investigation, and hence more than one type of data. Within this context, quantitative and qualitative research may be perceived as different ways of examining the same research problem. By combining the two, the researcher's claims for the validity of their conclusions are enhanced if they can be shown to provide mutual confirmation (Denzin, 1970: 310). There are a number of ways in which qualitative research acts as a precursor to the formulation of problems and the development of instruments for quantitative research.

The concept of triangulation was based on the assumption that any bias inherent in particular data sources, investigator and method would be neutralised when used in conjunction with other data sources, investigators, and methods (Jick, 1979).

Qualitative research may facilitate the construction of scales and indices for quantitative research, and the presence of qualitative data may greatly assist the analysis of quantitative data. The combinations of quantitative and qualitative research techniques provide broadly consistent data.

Morse (1991) argues that using qualitative and quantitative methods to address the same research problem leads to issues of weighing each method and their sequence in a study. From these ideas, she then advances two forms of methodological triangulation: simultaneous, using both methods at the same time, and sequential, using the results of one method for planning the next method. Further, a notation of capital and small letters that signify the relative weight given to a method as well as sequence can describe these

two forms. The different approaches to triangulation are discussed in light of their purpose, limitations, and approaches.

5.4 Research Approach

Creating a research approach is a significant task in any research study. However, there are many factors to be considered when selecting a suitable research methodology. Alshammri (1997) believes that choosing the right research methodology depends on some criteria such as study objective, type of needed information, nature of respondents, manipulation of independent variables, degree of control that the researcher has over the case under study, and effort, time and money.

As mentioned in Chapter Two, KM is a quite new phenomenon in the field of management (Chan, 1999; Snyder and Wilson, 2000). And has grew from organizational learning theories (Gable et al., 1998; Chan, 1999; Morse, 2000)

Implementation methodologies are still developing with experience, and there is a lack of knowledge on the key components influencing the process of KM implementation, and the way these components should be addressed and managed in an organisational context. Somers et al. (2000) stated that organisations need to understand how to identify the critical factors that affect the implementation process, and address them effectively to ensure that the promised benefits can be realised and failures can be avoided. Therefore, the key purpose of this research study being to propose a generic holistic model for the effective integrative implementation of KM in an organisation, is justifiable.

Considering the building of a model for effective KM implementation as a research topic requires a study of organisations that have experienced the implementation of KM. This type of research requires the collection of complex confirmation regarding the 'what' (structure) and the 'how' (process). The structure aspects of research require the use of quantitative methods, while process aspects are best investigated using qualitative methods. This calls for a combination of both methods (triangulation) to address different levels of the study.

A methodological triangulation approach is adopted in this study through a complementary use of secondary data, a mail questionnaire survey, and case studies, to collect quantitative and qualitative data.

As discussed before, research on KM implementation is not yet well established, and implementation methodologies are still lacking and are developing with experience. Some authors and practitioners presented many different aspects as critical factors based on their experiences (e.g. Wiig, 1996; Davenport et al., 1998; Trussler, 1998; Liebowitz, 1999b; Skyrme and Amidon, 2000; Heisig, 2001). For example, Finneran (1999) and Bassi (2000) cover the KM process aspects, whereas Trussler (1998) addresses top management commitment and technology. Therefore, an exploratory survey is required to achieve a kind of assessment and generalisability (Tornatzky and Klein, 1982). And Benbasat (1984) supports this view further by arguing that surveys are useful in bringing out participants' beliefs, opinions or attitudes about some issues of interest to the study.

This study aims to bring out the experience of organisations regarding elements and key factors in holistic KM implementation. Given the nature of the topic. Eisenhardt (1989) and Yin (1989) argued that this type of inquiry favours the use of an exploratory

structured questionnaire survey. However, the questionnaire survey technique can only measure the 'what' elements, and Mason (1984) said that questionnaire survey does not help answer the questions of 'how' and 'why', which relate to the process aspects of implementing the main elements of KM. For this reason, the case study based on the qualitative method is chosen. Also quantitative methods deal with technological and organisational features statistically rather than dynamically (Kaplan and Duchon, 1988). Furthermore, the process aspects of KM implementation do vary amongst organisations, as they are often addressed differently, despite that quantitative findings may reveal a general agreement between organisations on the assessment of the key elements of implementation.

Benbasat et al. (1987) and Kaplan and Duchon (1988) advocate the use of qualitative techniques for obtaining interpretations in the information systems (IS) area to gain insights into the new organisational developments associated with the rapid pace of change in IS.

Benbasat et al. (1987) and Silverman (1993) have trust in the appropriateness of the case study approach for cases which are in their early stages, and where the context and respondents are of particular importance to the study. Bonoma (1985) and Yin (1989) stated that the complexity of the context being investigated and the diversity of the issues related to KM implementation make the case study approach of full usefulness. Yin (1989) said case studies are particularly pertinent when the research seeks information about 'how', 'when', or 'why' rather than 'what', 'when', 'where', 'how much', or 'how long', and when the research does not have control over behavioural events. As mentioned before, the process elements concerning KM implementation are primarily related to the 'how' and 'why' issues of KM. Moreover, the researcher has the

sole task of observing in the context of this study, which means that no control over behavioural events in the organisations being studied can be taken.

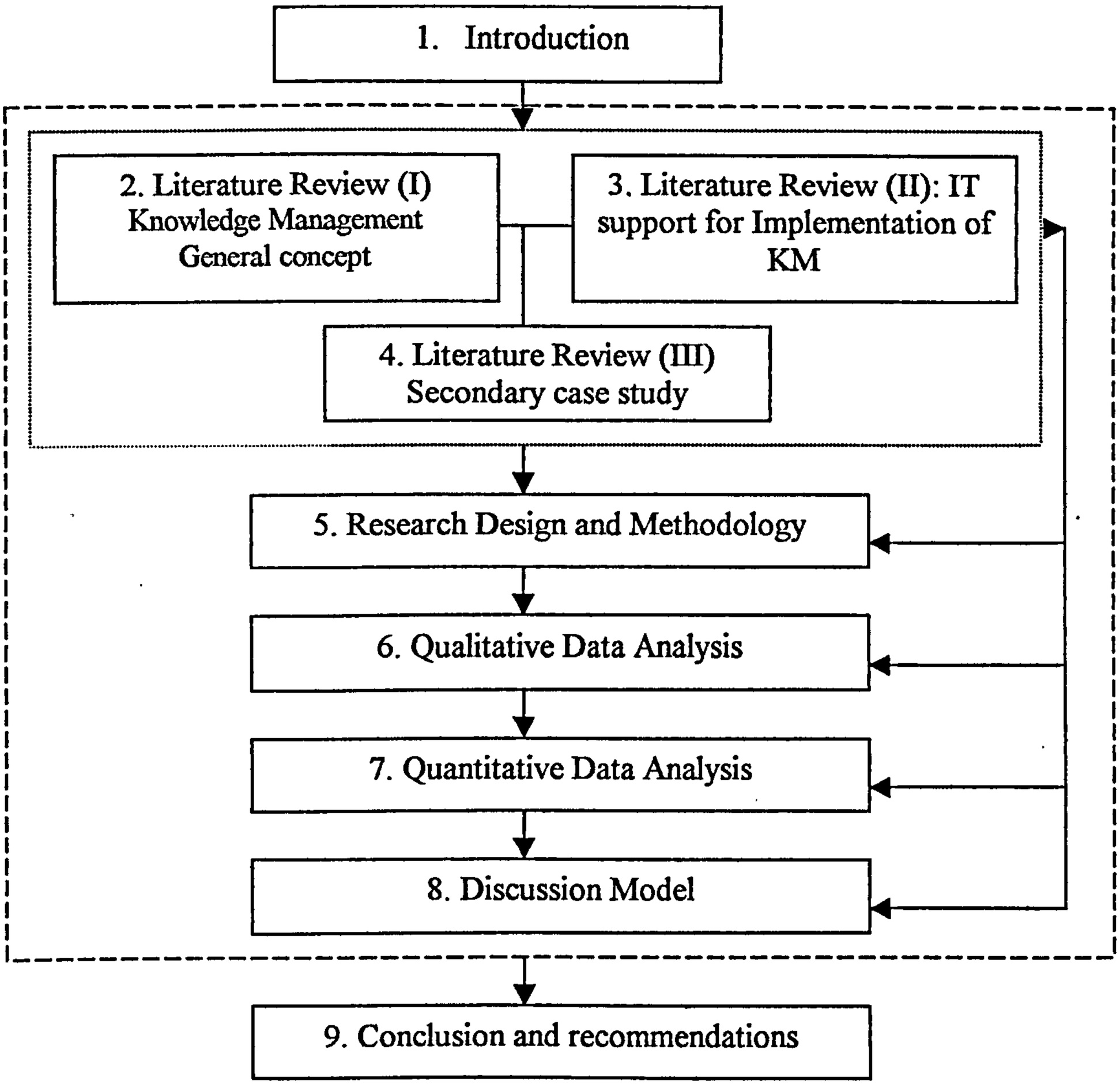
Briefly, combining quantitative and qualitative methods in this research study has a clear complementary role. The main aim of this research is to propose a generic model for effective KM implementation based on a holistic integrative perspective. Therefore, this study attempts to unify the available writings and research work, which mostly represent different schools of thought on KM implementation. Based on that, understanding the phenomena in depth, and this understanding should result from attempting to find tentative answers to questions such as 'what', 'how', and 'why'. Overall, the combination will provide the strength and richness of findings.

5.5 Research Design

This study represents exploratory research that aims to enhance existing theories and the understanding and practices of KM system implementation concepts from a holistic perspective. Figure 5.1 illustrates the research design phases adopted in this research. These phases are as follows: literature review, recognising research problems, conducting qualitative research through case studies, conducting quantitative research through questionnaire survey, proposed a generic model for KM implementation, and producing conclusions and recommendations.

page 5-16
5-17
is located
between 3-36
and 3-37

Figure 5.1 Research Design



5.5.1 Literature Review

This study starts with a comprehensive review of relevant literature on the KM concept and implementation. This includes possible references available such as textbooks, academic papers, professional magazines and reports, Internet articles, and newspapers.

The first part of the literature review includes KM definitions and concepts, history, strategy perspectives, types, benefits, best practices, and the future. These areas are all covered in Chapter 2. The second part of the review covers in detail the issues involved in using IT tools as enablers to support KM implementation. These include IT

infrastructure, information systems (IS) and information technology (IT), IT effectiveness for knowledge management (KM), IT vendors, and IT in organisations, including IT-based organisation change. These issues are presented in Chapter 3.

The scrutiny of the relevant literature on KM indicated a suitable problem to research, as well as giving the researcher some idea of the research methods and approaches that have been used in this field. However, the literature review will not completed, as the researcher has to remain aware of the latest literature right up to the ending stage of this study.

5.5.2 Secondary Data

This study has relied on many sources of secondary data in order to discover the most critical factors of KM implementation, as well as to gain a richer picture of the level of importance of the elements that constitute the holistic approach to KM implementation and factors that contribute to success. It introduces a wide spectrum of case studies studying the various approaches and methodologies to assess the applicability of KM within different organisational sectors and types, and the most critical factors from the viewpoint of both authors and practitioners. The degree of criticality of each factor has been analysed by using a content analysis approach.

5.5.3 Survey Questionnaire (Mail Survey)

The survey is an effort to assess the level of importance of the elements that constitute the holistic approach to KM implementation. It has also aimed at identifying the level of maturity of KM concepts and practices. Moreover, it has sought to provide assessment of the level of familiarity, experience and comprehension of the essential elements of KM within the sample organisations. A major part of the study has been devoted to

gaining assessment of the level of criticality of the KM success distilled from the literature.

Mail survey plays a critical role in the data collection and is a popular data collection technique in research studies. It was concluded that the most suitable instrument would be mail survey, as Bourque and Fielder (1995) stated, "one of the most frequently used methods for collecting data in research studies."

The questionnaire contained eight separate sections, each addressing one or more dimensions of interest. Section 1 addresses the overall organisational demographics. Section 2 includes the personnel data with involving of KM. Section 3 focuses on IT that the organisation uses. Section 4 addresses the KM issues. Section 5 identifies the key CSF contained in two scales for the level of importance based on the respondent's experience and implementation effectiveness that indicates the level of actual implementation of KM in the organisation. Section 6 regards the achievement of benefits resulting from KM implementation. Section 7 indicates the obstacles to implementation of KM. Section 8 about the respondent's suggestions and comments on KM. Each section has a separate clear title, making it easy for the respondent to follow.

Trochim (2000) determined some advantages to mail surveys such as relatively inexpensive to administer, sending exactly the same instrument to a wide number of people, allowing the respondents to fill it in at their own convenience. But there are some disadvantages as well, such as response rates from mail surveys are often very low, and they are not the best vehicles for asking for detailed written responses (Bourgue and Fielder, 1995, Trochim, 2000).

5.5.3.1 Survey Design

All questions were carefully worded in order to encourage highest response, as some modifications of them were made to ensure simplicity of sentence structure. Each group of questions was preceded by an instructional statement explaining what was required, and the meaning of each scale point used to give answers to questions. The questions themselves were designed in closed-ended format, where answers were particularly limited to a number of responses.

Based on the result of the extensive the review, a standardised questionnaire was developed to collect data from Kuwait and UK public sector organisations in order to bring out their experience concerning elements and key factors in holistic KM implementation and their effectiveness.

Bourgue and Fielder (1995), and Remenyi et al. (1998) argue that there are four basic scales for questionnaire measurement: nominal, ordinal, interval, and ratio measurement. In this research, ordinal scales, which means providing classes of variables, in such a way as to denote qualitative differences among the various groups, and to rank-order the classes in some significant way, have been selected for the questionnaire survey. This is because the researcher feels that this made the questions easy for respondents to answer, and they were enabled to choose between a range of values to give their replies. Also, the questionnaire has two types of questions. First, closed-ended that required respondents to choose from a list of answer. Second, scaled-response questions (five-point Likert scale), that is closed-ended questions in which the response selected is measured by a rating scale.

5.5.3.2 Pre-Test and Revise

It was important to validate the instrument to make certain that it measured what was intended, and gave the respondents clear and understandable items that would evoke clear and understandable answers. This would affirm that the questionnaire was a reliable vehicle to solicit options on the issues under study.

The questionnaire was pre-tested by two academic researchers experienced in questionnaire design, as well as by two KM experts known to the project manager. They were asked to provide feedback on the overall format as well as the clarity and consistency of questions. Their inputs were then considered in improving the design and clarity of some questions. The instrument was also seen as lengthy, and as a result, several questions that were found not to be directly addressing the issues under study were dropped.

5.5.3.3 Sample Selection

When the population is large, there will be limited resources in terms of money, time or effort that can be used to complete enumeration of the population (Barnett, 1991). Sampling is therefore the process of obtaining information from a subset of a large group, whereas a sample is a subset of all the numbers of a population of interest (McDaniel and Gates 2002).

A search was made for a mailing list for KM/IT departments of the Kuwait and UK public sector organisations. The total number of organisations was 77, 52 Kuwaiti government organisations and 25 main UK government organisations. These organisations were chosen from two main sources. First, regarding Kuwait, from the Statistical Consultant Unit, Kuwait University. Second, regarding the UK, from Cabinet Office (2000). Because the small total of organisations, the researcher selected all of

them. Questionnaires were mailed to the head of the organisation (e.g. Manager, General Manger, Under-secretary, Chairman) in order to enhance the chance of getting back a quick and effective response.

5.5.3.4 Data Collection and Analysis

Each of the 77 questionnaires (52 to Kuwait, 25 to UK organisations) was sent with a cover letter, and an addressed return envelope. Questionnaires distributed within the UK had addressed postage-paid return envelopes. Those distributed within Kuwait were by face-to-face, delivery.

First questionnaires sent mentioned just the head of the organisation with no individual name. After four weeks, responses were seen to be low. Therefore, after a follow-up reminder telephone call, they were sent again with mention of the personal name for each organisation. Furthermore, in order to increase response rate, the researcher telephoned the organisations that had not responded, and sent questionnaires again by e-mail to the organisations which preferred this. In total, 14 questionnaires (2 to Kuwait and 12 to UK) were sent electronically.

Table 5.2 presents a summary of the responses, distribution and response rate. Three recipients declined participation due to lack of understanding of the KM concept, organisation policy, or lack of time. Finally, a total of 68 usable responses (45 from Kuwait and 23 from UK) were returned, resulting in a final response rate of 88 per cent.

Table 5.2 Survey responses summary

Total number of questionnaires distributed	77
Usable questionnaires returned	68
Declined participation	3
No return	6
Response rate	88%

There are many numeric data analysis techniques that can be embraced (e.g. descriptive measures, correlation, regression, factor analysis, validity and reliability analysis, and chi-square). The following are some available techniques:

1. Bivariate Correlations. This procedure computes Pearson's correlation coefficient, Spearman's rho, and Kendall's tau-b, with their significance levels. Correlations measure how variables or rank orders are related. Before calculating a correlation coefficient, data are screened for outliers (which can cause misleading results) and evidence of a linear relationship. Pearson's correlation coefficient is a measure of linear association. Two variables can be perfectly related, but if the relationship is not linear, Pearson's correlation coefficient is not an appropriate statistic for measuring their association.
2. Linear Regression. This estimates the coefficients of the linear equation, involving one or more independent variables, that best predict the value of the dependent variable. For example, a researcher can try to predict a salesperson's total yearly sales (the dependent variable) from independent variables such as age, education, and years of experience.
3. Chi-Square Test. This procedure tabulates a variable into categories and computes a chi-square statistic. This goodness-of-fit test compares the observed and expected frequencies in each category to test either that all categories contain the same proportion of values or that each category contains a user-specified proportion of values.
4. Mann-Whitney U Test

   This is a nonparametric equivalent to the t test, and tests whether two independent samples are from the same population. It is more powerful than the median test

since it uses the ranks of the cases. It requires an ordinal level of measurement. U is the number of times a value in the first group precedes a value in the second group, when values are sorted in ascending order.

5. Wald-Wolfowitz Runs Test

This is a nonparametric test of the hypothesis that two samples come from the same population. Requires at least an ordinal scale of measurement. The values of the observations from both samples are combined and ranked from smallest to largest. Runs are sequences of values from the same group. If the samples are from the same population, the two groups should be randomly scattered throughout the ranking.

6. Moses Extreme Reactions

This is a nonparametric test designed to test hypotheses in which it is expected that the experimental variable will affect some subjects in one direction and other subjects in the opposite direction. It tests for extreme responses compared to the control group, and requires an ordinal scale of measurement. This test focuses on the span of the control group, and is a measure of how much extreme values in the experimental group influence the span when combined with the control group.

7. Kolmogorov-Smirnov Z

This is a nonparametric test of whether two samples (groups) come from the same distribution. It is sensitive to any type of difference in the two distributions: shape. location, etc.. The test is based on the largest difference between the two cumulative distributions while the one-sample is computed from the largest difference (in absolute value) between the observed and theoretical cumulative distribution functions. This goodness-of-fit test tests whether the observations could reasonably have come from the specified distribution.

The Mann-Whitney U test is the most popular of the two-independent-samples tests. It is equivalent to the Wilcoxon rank sum test and the Kruskal-Wallis test for two groups. Mann-Whitney tests that two sampled populations are equivalent in location.

The Kolmogorov-Smirnov Z test and the Wald-Wolfowitz runs test are more general tests that detect differences in both the locations and the shapes of the distributions.

However, for the sake of simplicity, the researcher has adhered to some of the simple analysis techniques. He therefore selected some that he considered suitable for this study: descriptive measures, T-test, factor analysis, and reliability analysis.

Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS, version 11). Also Microsoft Excel 2000 was used in descriptive data analysis. SPSS provided the main types of statistical analysis techniques:

1. Frequency tables to present numbers and percentages of categorical questions.
2. Descriptive measures such as mean, median, mode, and standard deviation
3. Factor analysis for KM CSFs:
    - Reduce dimensionality of variable.
    - Find related variables within factors.

The following are the techniques used in this research:

1. **Descriptive measures** (the first three measurements are called central tendency measurements, and the fourth dispersion measurements):
    - Mean: A measure of central tendency which is the arithmetic average, the sum divided by the number of cases.
    - Median: The value above and below which half the cases fall, the 50th percentile. If there is an even number of cases, the median is the average of

the two middle cases when they are sorted in ascending or descending order. The median is a measure of central tendency not sensitive to outlying values, unlike the mean, which can be affected by a few extremely high or low values.

- Mode: The most frequently occurring value. If several values share the greatest frequency of occurrence, each of them is a mode.
- Standard Deviation: A measure of dispersion around the mean. In a normal distribution, 68% of cases fall within one SD of the mean and 95% of cases fall within 2 SD. For example, if the mean age is 45, with a standard deviation of 10, 95% of the cases would be between 25 and 65 in a normal distribution

2. One-Sample T-Test

The T-Test is used to get the degree of the significance of the gap between the important factors and their respective implementation (the significance for all these factors is .000).

3. Validity

The purpose of establishing validity is to assess the quality of correspondence between a theoretically based construct and its operational measures (Babbie, 1995). One of the most powerful methods to test build validity is factor analysis (Kerlinger, 1986). If all items in the variables are factor analysed and loaded in accordance with a priori theoretical expectations, then significant aspects of construct validity have been assessed (Nunnally and Bernstein, 1994).

Factor analysis attempts to identify underlying variables, or factors, that explain the pattern of correlations within a set of observed variables. Factor analysis is often used in

data reduction to identify a small number of factors that explain most of the variance observed in a much larger number of manifest variables.

The researcher used factor analysis to identify questions that are related to each other in causing or affecting the score of CSFs (importance, implementation effectiveness and gap), KM benefits, and the obstacles in KM implementation.

In each of the factor analyses, the following rules were used:

1. A principal components exploratory factor analysis with a VARIMAX rotation.
2. Stopping rule for factoring is taken as eigenvalue ≥1.0 (default stopping rule in SPSS).
3. Extraction method: principal component method.
4. To maximise the separation between questions, the varimax rotation method is adopted for the obtained factors.

Additionally, an analysis was performed on items within overlapping dimensions of the construct to test for initial convergent and discriminant validity (Kirk and Miller, 1986). After testing each of the items within each of the determined factors, Cronbach alphas were calculated to determine the reliability of each of the scales.

2. Reliability

Reliability Analysis Procedure for evaluating multiple-item additive scales. The procedure provides a large number of reliability coefficients for multiple-item scales. Its subcommands encompass many different approaches to reliability definition and estimation. In general, the concept of reliability refers to how accurate, on the average, the estimate of the true score is in a population of objects to be measured.

Reliability analysis also allows anyone to study the properties of measurement scales and the items that make them up. The Reliability Analysis procedure calculates a number of commonly used measures of scale reliability and also provides information

about the relationships between individual items in the scale. Intraclass correlation coefficients can be used to compute interrater reliability estimates. For example, does the questionnaire measure CSFs in a useful way? Using reliability analysis can determine the extent to which the items in the questionnaire are related to each other, anyone can get an overall index of the repeatability or internal consistency of the scale as a whole, and he/she can identify problem items that should be excluded from the scale. The following models of reliability are available:

1. Alpha (Cronbach). This is a model of internal consistency, based on the average inter-item correlation.
2. Split-half. This model splits the scale into two parts and examines the correlation between the parts.
3. Guttman. This model computes Guttman's lower bounds for true reliability.
4. Parallel. This model assumes that all items have equal variances and equal error variances across replications.

The reliability of a measure refers to its stability over a variety of conditions (Nunnally and Bernstein, 1994). It concerns the dependability, consistency, accuracy, predictability, and stability of a measuring instrument(Kerlinger, 1986). Trochim (2001) defined reliability as:

> "In research, the term reliability means 'repeatability' or 'consistency'. A measure is considered reliable if it would give us the same result over and over again (assuming that what we are measuring isn't changing!)".

Poor reliability can be a result of various sources such as contestable instrument items, researcher bias, respondent bias, and unreliable subjects. The Cronbach alpha is widely used for estimating the internal consistency and reliability of a measure. Typically, alpha can range from 0 to 1. Although there is no definite value for evaluating the

reliability of measure, the rule of thumb is that an alpha coefficint above 0.7 signifies high reliability (Nunnally and Bernstein, 1994; Pedhazur and Pedhazur Schmelkin, 1991).

The size of this coefficient depends on the average correlation among items and the number of items. If the value is low, dropping items that do not contribute significantly to the average correlation can increase the value of alpha and, in essence, the reliability of measure (Carmines and Zeller, 1997).

All items and their related Cronbach alphas are reported in Chapter 7, and the final survey instrument is presented in Appendix A.

5.5.4 Case studies

The case study allows the organisational culture to be examined in its natural setting, which enhances the generation of theories in practice. Moreover, the case study is appropriate to understand the constructs and their interaction better (Benbasat et al, 1987).

The use of case studies as part of this research aims to investigate how KM is being implemented in organisations. The organisation to be researched was a KM or IT department that has high technology. Furthermore, the IT department in this high technology organisation is the place where most new knowledge is created and knowledge sharing in critical. In this department, it is expected that the elements of KM implementation and its obstacles are especially apparent. It should also be pointed out that high-technology organisations have a lot to gain by better understanding and managing of their KM processes.

5.5.4.1 Sample Selection

This study is exploratory in nature, and the sampling of the case is not representative of a particular population. This part of research was seen as a complementary study, to further assess and test the applicability of critical factors of KM implementation and to investigate any potential benefits. The organisation to be researched was selected by its willingness to participate and its fit with the research objective (e.g. KM or IT department). Follow-up phone calls were made to arrange for initial interviews.

In so doing, a total of 16 public sector organisations were sampled, consisting of 13 Kuwaiti and 4 UK public sector organisations, respectively. The interviewees were the head of the department (e.g. Manager, General Manager, Under-secretary, Chairman).

With many organisations in UK and Kuwait advantage was taken of the superior network of the researcher's supervisor as the head of the ECTQM.

The16 organisations contacted were:

- Kuwaiti organisations (13)

    1. IT consultancy organisation.
    2. Strategy planning organisation.
    3. IS consultancy organisation.
    4. Social Affairs organisation.
    5. Consultation organisation.
    6. Petroleum Corporation.
    7. Civil Service organisation.
    8. Union Societies
    9. Social organisation.
    10. Finance organisation.

11. International airline.

12. Science Research organisation.

13. Public Civil Information organisation.

- UK organisations (3)

1. Public Sector Benchmarking Service.

2. Department of Trade and Industry.

3. Department for Culture.

The variety of issues represented by sixteen case studies have the advantage of enriching the data collected (Swanson and Beath, 1989; Yin, 1989). This wealth of data facilitates comparative analysis between the cases, and therefore leads to theory improvement.

5.5.4.2 Data collection and Analysis

The technique chosen for data collection was face-to-face interviews. The interviews conducted were structured and semi-structured interviews. A number of questions were to provide a structured interview, and to ensure coverage of all related issues of KM implementation. Furthermore, the questions themselves were grouped to address the KM implementation, namely top management commitment, KM processes, IT infrastructure, and change management programme.

The interviews were conducted with the researcher recording only the UK interviews. Time of interviews varied, depending on the availability of the interviewees. The maximum time for interviews was two hours and thirty minutes, and the minimum was thirty-five minutes. Also, the number of interviewees varied from one organisation to another, ranging from one to two persons. More than one appointment was needed to

complete interviewing all interviewees. Follow-up calls were also made to cover some aspects that were not fully covered in the interview.

After data were collected, analysis began with the transcription of the UK interviews and all data taken from the interviews; observations and document study were consolidated and linked together to create a picture of the entire process of change undertaken by the organisation.

5.6 Limitations of data collection

During the course of this research, the researcher faced numerous challenges, most notably when dealing with the KPSOs. Most of the KPSO top management appeared far too busy to make themselves available for the interview. The concept of KM is still relatively novel to the large majority of the top management in KPSOs, and many of them therefore preferred to fill in questionnaires rather than participate in the interview. In addition, the questionnaire was translated into Arabic for the Kuwaiti organisations for several reasons. First, although English is spoken as a second language in business by Kuwaiti people, not all employees are fluent. Second, using the native language is more convenient to the respondent to understand and complete the questionnaire. Third, the translation was made by the researcher. The two versions of the questionnaire (Arabic, English) were put in one file, and respondents were thus given the choice of using either language.

The organisations asked not to have their names exposed. They were assured of their anonymity in order to gain their confidence and participation, and the respondents would be more likely to give unbiased responses. Time and money constraints, as well as the effort involved were as in many researches on inevitable limitation. The following is a summary of the hindrances limiting progress:

- Most of the managers and top management were already busy for arranging meetings and they have a lot of tasks.
- When the researcher distributed the questionnaire, sometimes it took a long time before it was handed back to him.
- Some of the respondents did not understand the KM term.
- The researcher would distribute the questionnaire by himself and meet the people who will answer it, in order to explain KM concept.
- The researcher would spend the bulk of his time travelling to companies across the UK and Kuwait conducting interviews.

5.7 Summary

This chapter has provided a detailed discussion of the research design and methodology issues that a researcher needs to deal with. The chapter has also presented the suppositions that underlie the methodology. The selection of methodology was justified, and subsequent procedures have been highlighted to provide an integrated discussion and a conclusive statement, which will guide the next phase of the research process.

The triangulation approach has been adopted for combining the quantitative and qualitative methodologies used to collect and analyse data. This approach allowed richness of data and comprehensive treatment of implementation elements which constitute the holistic approach to the KM concept.

This chapter has set the foundation for data collection. The next chapters discuss data collected from the case study and the survey.

CHAPTER SIX

Qualitative Primary Data Analysis

CHAPTER 6: QUALITATIVE DATA ANALYSIS

6.1 Introduction

Knowledge and its subsequent management is a fundamental asset for most organisations.

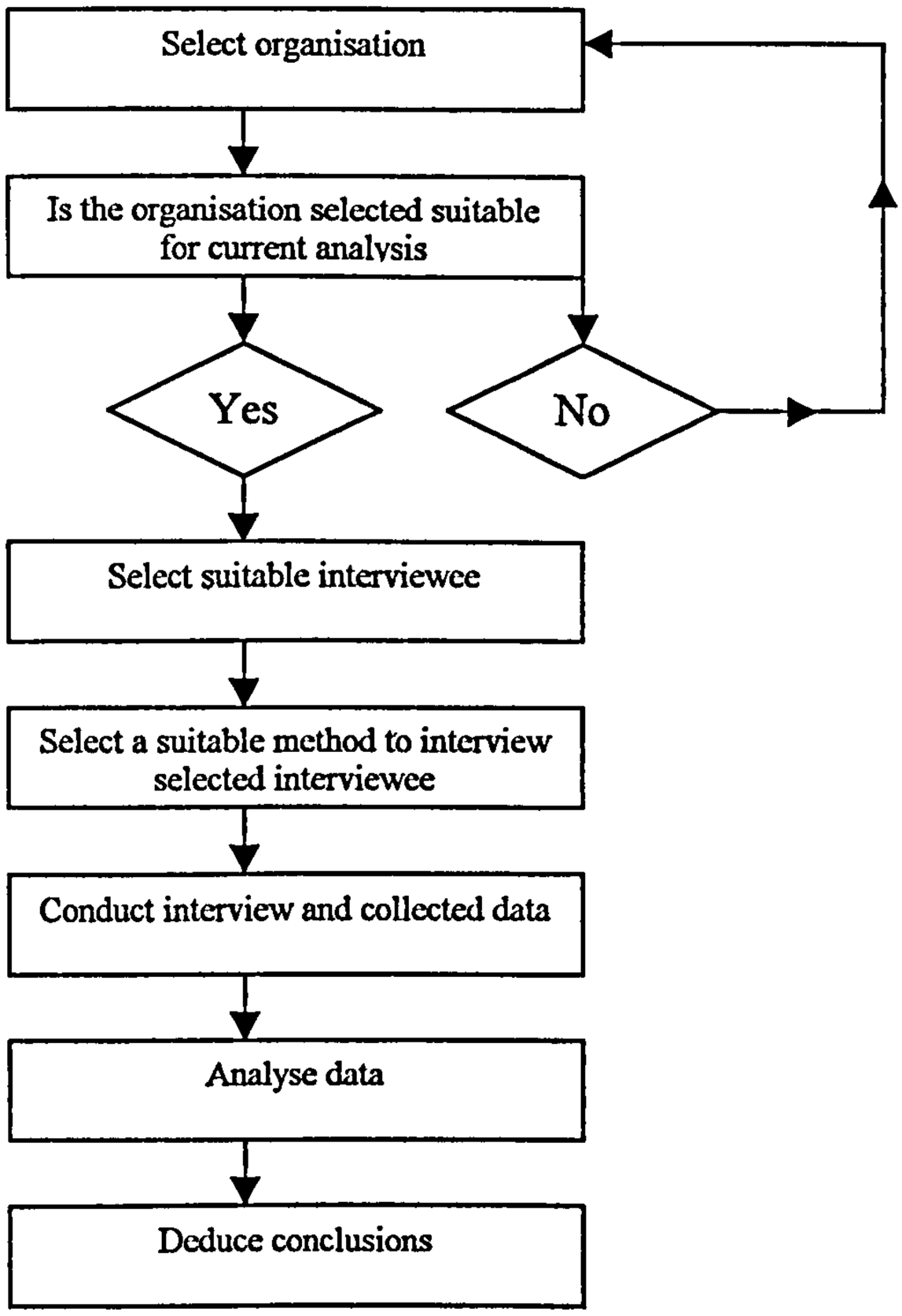
This chapter examines KM and its implementation in large organisations belonging to the public sector. In so doing, a total of 16 public sector organisations were sampled, comprising 13 Kuwaiti and 3 UK. (The researcher has deliberately altered the name of certain organisation mentioned within this chapter due to confidentiality reasons).

The sample was selected with a view to examining the KM CSFs adopted by each of the constituent organisation and to deduce any similarity in the KM implementation and the corresponding success factors.

6.2 Data collection and Analysis

In constructing the sample and collecting the data, the process following is shown in Figure 6.1.

Figure (6.1) Sample selecting and data collection/analysis process flow



The organisations contributing to the Kuwaitis sample consisted of:

- IT consultancy organisation.
- Strategy planning organisation.
- IS consultancy organisation.
- Social Affairs organisation.
- Consultation organisation.
- Petroleum Corporation.
- Civil Service organisation.
- Union Societies
- Social organisation.

- Finance organisation.
- International airline.
- Science Research organisation.
- Public Civil Information

Organisations contributing to the British sample consisted of:

- Public Sector Benchmarking Service.
- Department of Trade and Industry.
- Department for Culture.

Due to the differing structure inherent to each of the organisations, various personnel were interviewed for research data collection. Table 6.1 shows the number of people interviewed and their corresponding position within the organisation.

Table 6.1 interviewee's position

Position in organisation	Total No. of Interviewees	Total No. of Organisations
Chairman	1	1
Heads of IT Department	8	8
Under-secretary	2	2
Consultant	1	1
General Manager	2	2
Head of KM	2	2
Total	16	16

Each of the respective organisations was scrutinised against a set of given KM CSFs shown in figure 6.1.

Figure 6.1 KM CSFs

Top management commitment	Organisation should be supported by leaders as well as knowledge structure
KM processes	Include capturing and creating, transferring, and sharing knowledge. 90% of success of KM is involved with gaining buy-in of knowledge users and encouraging knowledge sharing (Finneran, 1999)
IT infrastructure	Include technology (network, E- repositories, Internet, intranet, e-mail, web site, and IS infrastructure).
Change management programme	Training and learning, knowledge-friendly culture, motivational practices, in order to create qualified people.

Part I: Kuwait public sector organisations

6.3 Case Study 1: Union Societies

6.3.1 Introduction

In Kuwait, the consumer co-operatives play an important social and economic role that cannot be isolated from the general economic activity of the State. The Union of Consumer Co-operative Societies was established in 1971. Its objectives are to lead the consumer co-operative movement in Kuwait, protecting and defending in a democratic way the moral and material interests of its members; spread co-operative awareness and develop membership in the co-operative sector; organise consumer co-operatives and coordinate their activities in full harmony; contribute to upgrade the output and effectiveness of consumer co-operatives; undertake joint services such as local purchasing and import; curtail the artificial increase in prices of consumer goods and maintain them at a reasonable level, as much as possible uniform in all co-ops; and set up production units, warehouses, distribution and information channels.

6.3.2 Interviewee and KM at organisation

The interview was conducted with the chairman of the organisation who has held his present position since 1985.

The interviewee was probed as regards his organisation's policy, processes and structure concerning KM.

Whilst acknowledging the importance and significance of managing knowledge, the interviewee felt that the present climate and state of the organisation is not right nor ripe for applying KM. This stems from the fact that the KM enabling processes, namely the information systems and other related database technology have not fully matured within the organisation. There exist gaps within the knowledge of the employees concerning these technologies and processes. The interviewee feels that until this is eradicated, the organisation will not be able to derive full benefit from its knowledge related. The interviewee stated,

> *"KM must be distributed to all public and private sectors, and organisations that are applying KM should create an explanation booklet (best practice) which contains how it is using KM with some examples".*

The interviewee maintains that if KM is exploited in the correct way, organisations will derive greater benefits and will be able to exploit KM to its maximum potentiol.

6.3.3 Analysis

6.3.3.1 Top management

Top management at this organisation recognise the importance of having a new concept such as KM. Support will be helpful, such as making KM structure clear and easy to understand for implementation, sending the message that KM, knowledge sharing and organisational learning are critical to the organisation's success,

providing funding and other resources or KM infrastructure, and illuminating what type of knowledge based assets are most important to the organisation.

6.3.3.2 KM process

The interviewee said that managing knowledge by using KM processes like creating, transferring, and sharing knowledge, supporting with training, learning and technology, will help leverage organisational capabilities, for example saving time and reducing cost, getting useful information with no duplication, exchanging experience between the employees, and workers doing their job efficiently

The interviewee stated,

> " *The organisation technology has been developing the knowledge documents which will be applied and distributed when the organisation senses the time is ready for that".*

The documents obtainable give confidence for the workers to exchange and share the information and experiences with others.

Finally, the knowledge processes have not been built yet, the organisation predominantly engages in application of IT. The researcher concluded that there is no mechanism for transferring or sharing knowledge, the organisation's consultant keeps his knowledge to himself, and he is not willing to transfer or share the experience with other workers to guard his position.

6.3.3.3 IT infrastructure

The IT department is responsible for maintenance of hardware and software, and there is a database which helps the union to withdraw information needed. Most heads of department are educated and willing to learn more, but they do not collaborate fully with each other as the enabling process is missing.

Technology in this organisation is almost recent, it needs more support by appointing some people with expertise to develop it, because the top management is open minded and accepts the suggestions from the organisation which is able to apply KM/IT infrastructure if it gets assistance from new expertise and consultants.

According to the interviewee, the organisation's data are stored, all workers take advantage of access to these data, but it is still basic data recording only the employees' information such as name, age, salary…and so on. The organisation does not store knowledge documents like presentations, procedures, inferences, descriptions of objects, charts, graphs, plans, audio files, and/or video files which are made accessible. By customising the existing IT infrastructure, the documents could be accommodated (e.g. knowledge repository).

6.3.3.4 Change management programme

The interviewee stated that the organisation which wishes to capture the knowledge of its workers has to grow a culture that encourages teamwork and knowledge sharing.

He also stated,

> *" We will face the culture change. It is a very important factor to succeed and it is also very difficult... the person who is responsible for developing the organisation by applying IT avoids contact with workers and has a difficult personality".*

The organisation develop various courses for its departments, but sometimes these courses are not appropriate to the trainee's level and abilities, or sometimes the subject is not related to the job description that the trainee will be appointed for. This seems that the organisation responsible for providing the training does not have experience or it is not qualified for this purpose.

6.4 Case Study 2: IT consultancy organisation.

6.4.1 Introduction

This organisation provides cutting edge IT consultancy to numerous organisations

Within the state of Kuwait. The organisations service portfolio constitutes of:

- Strategic IT consultancy
- Software and hardware support
- Networking
- Outsourcing
- Systems support
- Systems integration

The organisation caters for a large number of systems and has onsite experts that can provide consultancy and answer any queries concerning any aspects of the systems round the clock.

6.4.2 Interviewee and KM at organisation

The interview was conducted with the head of department and general manager.The organisation has a huge database, and it develops databases for all others departments of the ministry (Kuwaiti nationalities and passports, traffic department, immigration...etc.).These departments include financial control, administration, maintenance, providing information, order processing, inventory management, etc. Hardware resides in a centralised mainframe with distributed computing. A central IS/IT department controlls all IT services. According to the interviewee, all departments and management were involved in planning which was initiated by the IT manager. The IT manager bore final responsibility for planning while consultants were involved.

The interviewee suggested,

> "*...Having more than one model to cover public and private sectors as these sectors function differently in term of organisational structures and decision-making processes*".

Towards the latter part of the interview, the researcher discovered that there existed fundamental gaps in the management's understanding of basic concepts concerning KM, e.g. when one of the interviewees was asked about the difference between data, information, and knowledge, he declared that "*there is no difference in these terms, all of them have one meaning but a dissimilar name*"!

6.4.3 Analysis

6.4.3.1 Top management

The researcher found that the top management for the organisation in its commitment for the IS and its support encourages a positive attitude on the part of users towards use of the IS. The top management focuses on the hard side and pays slight attention to the soft side (e.g. KM-related processes).

One of the interviewees stated that certain workers are hard to deal with, he keeps trying to develop the workers in order to transfer and share his knowledge with them, but they are not willing to do that, and they are thinking how to waste their time, and the top management did not try to do anything to solve the problem, but rather ignored them.

These workers are not willing to be active in the work of the organisation, because the top management does not give them more attention and extra support such as extensive training, and motivate them morally and physically.

6.4.3.2 KM process

It seems that the policy of the organisation is weak. The organisation management does not have authority or even motivation for workers to force them to be active and

share knowledge with each other; the manager also does not have an incentive to apply KM, and furthermore, he pays no attention to KM benefits.

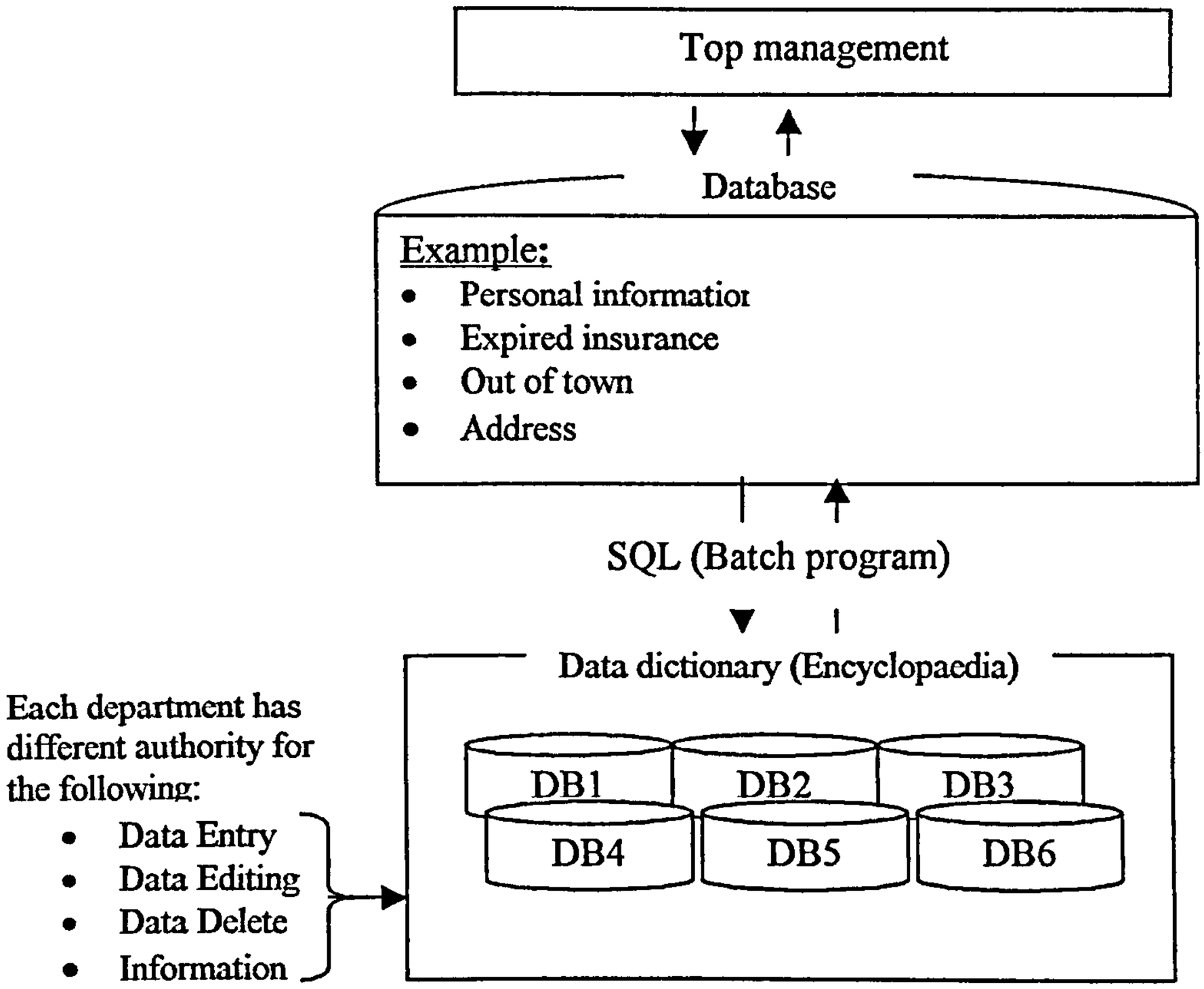
Although one of the interviewees said that the organisation does not have the system to manage KM processes, it has skill transfer regarding troubleshooting of computer-related problems. Also, sharing information is one of the elements of successful KM practice. The interviewee argues that if it is happening, it is only between managers, assistant manager and consultant, the rest of the employees are not involved.

Because the manager does not pay attention to KM implementation, he considers it a secondary success factor of the organisation. The researcher thought it is difficult to gain any new idea or concept if the workers who will use it do not believe in it. The manager does not try to understand the concept of KM, he focuses only on IT, and he gets confused between the basic terms such as data, information, and knowledge.

6.4.3.3 IT infrastructure

The organisation has plenty of resources and technology infrastructure available. The researcher found that the manager does not carry the organisation management forward, but focuses on the new technology, takes into consideration only the advantage of the latest technology, and keeps the top management uninvolved in the organisation management. The interviewee's view is that the organisation derives some benefits from information gathered/collected, but it does not know if it is part of a KM-related process. Figure 6.2 illustrates the organisation's information and a particular database.

Figure 6.2 Information and database (case study 2)



The information system has consumed a lot of money for buying latest hardware and software, nevertheless most others departments are not satisfied and get low quality services.

6.4.3.4 Change management programme

The training department creates various training courses for all others departments. Sometimes the course is not appropriate to the trainee's level and abilities, and often the subject is not related specifically to the job description that the trainee will be appointed for. The interviewee summarised the problems being faced by the organisation as follows:

- The end user is not committed.
- The end user does not understand the facilities of the system.

- There is no clear policy, procedures and systems.
- There is no arrangement among different departments.
- Different culture and education between the IS department and the other departments.

6.5 Case Study 3: Strategy planning organisation

6.5.1 Introduction

This organisation has been established since 1976. It is involved in a whole array of activities on behalf of the ministry of planning. Activities embarked upon by this organisation range from planning and outlining the methodology for the Kuwaiti government. Further, this organisation is involved in organising the various census for Kuwait. In addition, this organisation is involved in forecasting of the various elements for Kuwait.

6.5.2 Interviewee and KM at organisation

The interview was conducted with the head of department and the under-secretary. The interviewees stated that the organisation is using KM partially, referred to it by a different name. They agreed that managing knowledge is very important for both public and private organisations. They believe that KM processes such as creating and capturing, transferring, and sharing as well as storing knowledge and information, are very important in order to make the information available when the employees need it, and this also results in the organisation having competitive advantages. They emphasised that changing culture is very hard in the organisation because there is a diverse workers' culture from different nationalities. KM can be applied in the current situation because of support from the top management and the available technology infrastructure that is one of the elements helping in managing knowledge.

The manager stated that the organisation is developing very slowly because it is one of the public sectors that have a centralised system. The organisation needs to promote innovation culture. He continued that the organisation has duplicated information and its workers faced difficulty in sharing knowledge. He gave an example: banks get information from outside their database to expand their employees' experiences and knowledge.

6.5.3 Analysis

6.5.3.1 Top management commitment

This organisation has support from top management, and the interviewees said that top management is helpful and understands the workers of the organisation. And they also declared that top management promises to give priority to knowledge for workers to give them direction and help them to allocate their resources.

The interviewee stated that the organisation requires additional support from the leaders, especially on KM, as organisation and categorisation of knowledge will be a core competence for every firm, as well as KM being critical for organisation success in future.

6.5.3.2 KM process

The interviewee agreed that KM processes are capturing, storing, transferring, and sharing, but the organisation does not have the system at its disposal to manage KM processes, it has skill transfer regarding troubleshooting of computer problems.

Further, he added that there does not exist a clear procedure (or process) for creating, transferring, and sharing knowledge. He believes that the organisation has full resources, such as expertise, consultant, latest technology with plenty of database,

but it did not have a system or clear rules to follow. As well, success or failure of organisation depends on how well it uses these processes.

6.5.3.3 IT infrastructure

This organisation focuses on the information side like hardware (computers) and software (computer programmes); it adopts the latest technology and has modern IT infrastructure.

In addition, it has resources, technology infrastructure is obtainable, and Internet, intranet, network and e-mail are used. The interviewee strongly believes in KM implementation and its advantages, the problem is that the organisation lacks experience in the KM arena.

The interviewee stated,

> *" If the organisation wants to be on a high level of competitiveness, it must convert its information to knowledge, then manage this knowledge, and exploit its employees' knowledge".*

Data, when transformed to information, can prove to be a valuable asset. This information (or knowledge) must then be managed by continuously exploiting the organisational KM system, in order to sustain organisational competitive advantage.

6.5.3.4 Change management programme

The training department creates training courses for all others divisions. Sometimes, the course is not appropriate to the trainee's level and capabilities, and often the topic is not related accurately to the job description.

The organisation keeps the line of communication open for all workers, but its strategy of training is basic, there is no long-term strategic planning, and it trains its workers on how to use the computer for data entry. Because of workers' culture from

different nationalities, changing culture is very hard in this organisation. Also, the organisation does not strongly support reward and recognition for actual performance improvement; in addition, it does not support innovation and learning.

6.6 Case Study 4: Social Affairs organisation

6.6.1 Introduction

The organisation was found in 1981 and comes under the umberalla of ministry of planning. The organisation is involved in a number of activities, these range from setting up of the technical systems for the various departments, retrieving data and documents to operating and maintenance of the systems.

6.6.2 Interviewee and KM at organisation

The interview was conducted with the head of department and under-secretary. The interviewee has a wide idea of KM, and he said that at this moment the organisation does not have any KM, but it is hoping to apply KM during the next few months, and the organisation does reengineering for the IT department to apply KM for its entire ministry organisation.

The manager strongly recommends using KM processes such as creating and capturing knowledge, as well as transferring and sharing information and knowledge. Also, the sources of technology infrastructure are obtainable. He stated,

> *"By using KM, everyone knows exactly what he/she should know and what he/she should avoid".*

Because of the top management continuous support, the manager believes, the organisation can be developed and the recent tools and technology that return benefits can be applied.

6.6.2 Analysis

6.6.2.1 Top management commitment

According to the interviewee, the top management is very helpful and understands the importance of KM. As mentioned earlier, top management believes that KM will become a more important issue in the future, a KM programme fits its organisation.

The organisation will apply KM during the next few months; it has been planning on how to support the KM implementation within the organisation, such as to create a new position for a senior corporate executive which will be known as the chief knowledge officer (CKO), whose role will be to provide leadership and strategy, furnish tools and technology, create and use taxonomy of knowledge and knowledge-sharing culture, promote best practice and processes, measure outcomes, secure resources, champion education incentives and rewards, and champion communities of practice.

The manager stated,

> *"KM is new science, it will be the major core for social, political, economics, and techniques as well as for all fields. KM is related to humans and their environment. It is really successful management that obtains developing and growing."*

6.6.2.2 KM process

The organisation is planning to apply KM in the next few months, and the interviewee affirmed, " *KM processes are part of the organisation strategy*". The organisation will focus on these processes as well as culture, because the organisation strongly believes in the exchange of experience between the employees.

KM processes can build up the organisation, and the recent tools and technology are enabling elimination of duplicated job and information. Also, the organisation will

have competitive advantage and obtain many benefits, such as employee and customer satisfaction, saving time, and reducing cost. But the workers still want more resources to capture and enable learning and sharing of information.

6.6.2.3 IT infrastructure

As mentioned before, this organisation hopes to apply KM, and thus in turn exploit its knowledge-based assts. At present, the organisation employs some people who have IS experience and is training its employees to be qualified for KM implementation; this comprises a CKO who will be responsible for the knowledge infrastructure. As information infrastructure already exists (e.g. Internet, network, data warehouse, web site, and videoconferencing) the organisation prepares itself toward the application of KM systems.

The interviewee stated that,

> *" The workers' knowledge is the organisation assets, and from saying this, the organisation has to be conscious to deal with its assets, and must identify how to exploit its knowledge."*

The researcher observes that the organisation database location and administration are in the Ministry of Planning, the organisation cannot operate its information without support from this ministry. It appears that the system is complicated and very weak, as well as not clear for other employees.

6.6.2.4 Change management programme

The training department creates course subjects for all other departments. Sometimes, the course does not fit with the trainee's level and abilities, and at times the subject is not related exactly to the job description that the trainee will be hired for. The interviewee views that some employees guard their knowledge to protect their position, and on the other hand some are unwilling to learn

Therefore, the manager believes that culture change is one of the most important issues in the use the KM system, and it takes a long time, at least two years, until the situation of employees' culture is secure. In addition, the organisation motivates the workers to attend conferences, and leaders are encouraged to communicate with their employees periodically.

6.7 Case Study 5: Construction organisation.

6.7.1 Introduction

This organisation has been established since 1945. In the past the main activities undertaken by this organisation has been primarily involved in the construction in Kuwait (on behalf of the Kuwaiti government). However, in more recent times the organisation is involved in a range of activities on behalf of the Ministry of public works it has broaden the portfolio of service by providing the maintenance of roads and sewage etc. in addition to the construction activities.

6.7.2 Interviewee and KM at organisation

The interview was conducted with the head of department. The interviewee recognises the significance of KM and the advantage of resorting to the KM concept, but unfortunately the ministry has not yet put the KM through its planning phase. The organisation in the current situation is focused on the IT side, such as hardware and software, as well as developing the system for purchasing new software.

The interviewee is aware of KM as a vital issue to management, and the KM programme can contribute to the organisation's product or services, and supporting technology infrastructure is one of the elements for successful KM implementation.

He stated,

> *"Knowledge management is an important implementation for organisations that plan to improve their overall performance.*

> *However, the utilisation of such a concept is not only an IT issue, it is a decision-maker and a management issue as well which needs to sponsor and adopt KM. The concept of KM needs to be promoted further on the decision-making level and high-level management before an organisation can seek the benefits of implementing KM.*"

By exploiting KM, the organisation will be at an increased level of competitive advantage, as well as gaining the benefits which might be obtained, such as employee and customer satisfaction, saving time, and reducing cost. Because the organisation gets support from top management only on the IT side, in the manager's view it is difficult to apply KM in current circumstances.

6.7.3 Analysis

6.7.3.1 Top management commitment

As mentioned, the top management supports the IT projects. Because they do not have sufficient ideas regarding KM, the interviewee believes that top management will help and support the organisation when they fully understand and recognise the benefits of KM. Also, the organisation is continuously seeking human values of employees, but it needs more support and commitment from leaders in top management.

6.7.3.2 KM process

The organisation does not have the system to manage KM processes, and the ministry does not have a strategy to apply KM, but it has skill transfer regarding troubleshooting of computer problems. Although KM processes is one of the elements of successful KM practice, the interviewee confesses that if it is happening, it is only taking place at the top management level, the rest of the employees are not involved. The reason why the ministry does not plan to implement KM, the

interviewee stated, is because it does not have an adequate idea regarding KM processes or benefits.

According to the interviewee, the top management does not have a clear procedure on how to create, transfer, and share information or knowledge. The organisation has plenty of resources, but it has not built a system or clear rules to follow.

6.7.3.3 IT infrastructure

The organisation has an excellent information system and the latest technology. It has a huge database, but it does not exploit these data, and it does not process its information to get knowledge that is more useful and actionable. The technology infrastructure tools exist: Internet, intranet, network, web site, world wide web, and electronic repository are slightly implemented; it needs effective implementation of these tools and reaching the requirements of knowledge practice. The organisation strongly understands the extent of significance of the KM concept, and it is willing to adopt this concept, but it needs KM infrastructure. Because the technology is accessible, KM would be slightly easy to implement.

6.7.3.4 Change management programme

The interviewee stated that there are some training courses with changing culture but they are not effective, because some of them do not fit with the trainee's level or with the organisation's objectives, as well as a gap between other departments. Most of the organisation's training appears to be centred around enabling its workers to enter data into a computer database.

He added,

> *"Because KM implementation depends on sharing and transferring, using KM needs a change in workers' culture to be easy to deal with in a spirit of trust."*

The organisation gives low priority to knowledge gathering, and does not have an adequate budget to be able to develop all levels of employees to continuous learning and creating a culture that supports innovation, and knowledge sharing in order to change the culture among its employees.

6.8 Case Study 6: Petroleum Corporation (PTC)

6.8.1 Introduction

The organisation is universally recognised as one of today's top ten oil energy conglomerates, and a leader in providing safe, clean energy to the global markets.

PTC was first established in 1980 in order to bring together all state-owned elements of the Kuwait oil sector under one corporate umbrella. Today, KPC oversees a fully integrated industry with operations on six continents. it brings hydrocarbon energy from our own domestic reservoirs and our upstream interests abroad direct to the consumer through a series of specialised subsidiary operating organisations.

The Chairman of PTC's Board of Directors is the Minister of Oil. The Board in turn reports to the Supreme Petroleum Council.

The Board Members include Managing Directors for Exploration and Production; Refining and Local Marketing; Transportation; Petrochemical Industries; Finance, Administration and International Relations; and International Marketing, as well as the Under-secretary of the Ministry of Oil, a representative of the Ministry of Oil, and several other non-executive directors.

6.8.2 Interviewee and KM at organisation

The interview was conducted with the head of department and the general manager. The organisation has up-to-date management and it has sufficient budget to support its projects, it also feels that KM is very important and critical for any organisation,

but stated with regret that the ministry does not have a strategy to apply KM. The interviewee stated that there is a lot of support from top management, but unfortunately they do not plan to apply KM, because they do not have sufficient idea regarding its processes or benefits. Part of knowledge transfer is applied and that is known as skill transfer, but it is only concerning the troubleshooting of computer-related problems.

One of the interviewees stated that KM is very important and it is really vital for organisational success in the future. He believe that the categorising and administration of knowledge is a core competence for every organisation. He gave as an example: if we have diverse books in one room and we do not categorise and classify them, it is very difficult to get to the book that we need, it takes a lot of time to retrieve the book desired. In this situation, KM is used to get the proper information at the proper time. Finneran (1999) also states that KM envisions getting the Right Information within the Right Context to the Right Person at the Right Time for the Right Business Purpose.

6.8.3 Analysis

6.8.3.1 Top management commitment

The top management is very friendly but does not fully support the organisation. The problem is that they do not fully appreciate the benefits of the KM concept, such as the top management does not incorporate KM strategy at an organisational level. The IT department has very educated and open-minded workers, but if this department offered KM to the top management and gave them more detail and the benefits that they can derive from managing knowledge, the KM initiative could then really excel.

6.8.3.2 KM process

The manager further stated that managing knowledge is vital in giving the organisation competitive advantage. Furthermore, he believes that KM processes are

capturing, storing, transferring, and sharing knowledge, and a KM programme can improve the organisation's overall performance and sustainable competitiveness.

The interviewee continued that the relationship among employees and their boss is very close, as well as friendly; the better relationship makes the workers help each other by transferring knowledge and sharing information, but this is not as a result of a planned process.

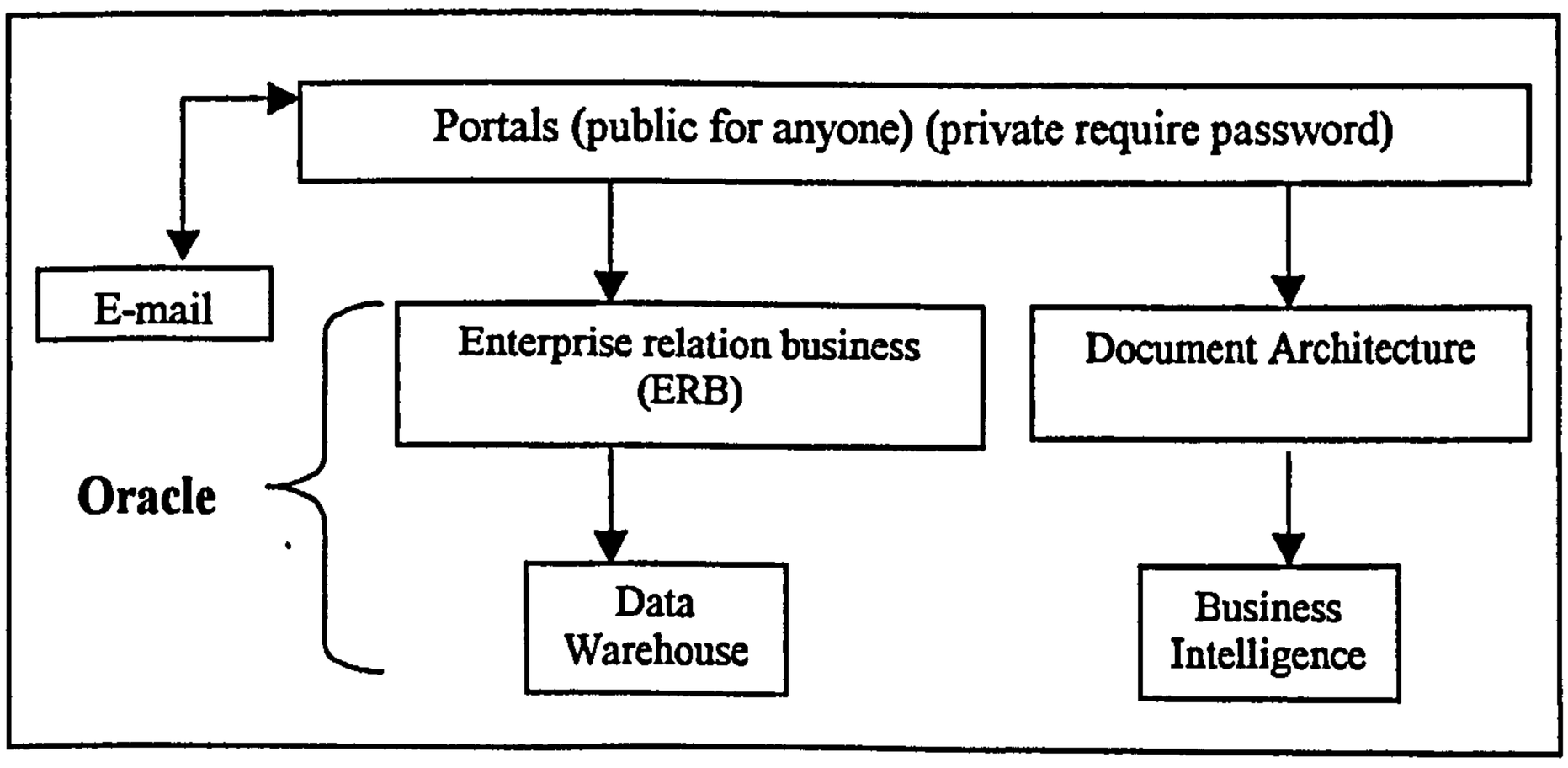
6.8.3.3 IT infrastructure

The organisation has an excellent information system and the latest technology. The technology infrastructure that exists consists of Internet, intranet, network, web site, world wide web, and e-mail; they need to reach the requirements of knowledge practice. This organisation strongly understands the significance of the KM concept, and is willing to adopt it. The interviewee stated that,

> *" Before applying KM, the organisation has to prepare KM requirements that are called knowledge infrastructure".*

The interviewee stated that the organisation is going to use portal market instead of intranet and extranet, also the organisation has a knowledge base that is called data warehouse, as well as Meta data (See Figure 6.3).

Figure 6.3. Organisation Portal (case study 7)



6.8.3.3 Change management programme

The training department creates course subjects for all others departments. The course is appropriate to the trainee's level and abilities, and the subject is related exactly to the job description of the trainee's work. Most of the employees are educated and have awareness of the modern concepts and management.

The interviewee stated that applying KM requires unavoidable elements which make for a successful KM implementation, such as culture of workers with trust put in each other, because the workers are motivated, feel happy to work hard, and learn more and more.

6.9 Case Study 7: Civil Service organisation

6.9.1 Introduction

This organisation is an independent organisation and is involved in a range of activities. These activities range from contributing in updating of the information for the civil services and helping to spread and make this information transparent.

6.9.2 Interviewee and KM at Organisation

The interview was conducted with the head of department. The organisation's job is controlled, but it has no KM. The manager stated that the organisation has plenty of resources and a huge employee database, but only information like name, age, nationality, and so on. But regrettably, the organisation did not exploit capturing the vital information. The manager gave an example. If someone has a question regarding the organisation policy, he/she must go to the manager personally to get the answer; when he/she asks the manager directly, the manager will definitely waste his time, and get more stress, as well as misusing management's role.

The manager desires to apply KM in order to solve the most difficult problems and avoid job duplication. He added that this organisation is one of the Kuwaiti public sectors that control the employees and no one can get a government job without its approval. Applying managing knowledge by taking advantage of creating capturing, storing, transferring, and sharing knowledge makes work easier to understand, and the new workers get the advantage that it is faster learning than for old workers, as well as satisfying customers and the employees.

6.9.3 Analysis

6.9.3.1 Top management programme

In this organisation, top management provides little support, but the organisation does not have a KM system, but has an IT project, and it does not exploit the stored data. The job is unorganised. In the view of the researcher, this organisation really needs KM because the manager is not satisfied with the current situation, and he declared,

> *"By exploiting KM the organisation will leverage itself to the highest level".*

The organisation will take into account to hire more consultants, particularly in the knowledge domain.

The interviewee stated that the leaders in top management should understand their needs, objectives, and future vision; also, they must offer more support, such as motivating workers and building a solid policy concerning KM.

6.9.3.2.KM process

The organisation does not have the system to manage KM processes, but it has skill transfer regarding troubleshooting of computer-related problems. The organisation acknowledges that KM processes of creating, storing, transferring, and sharing

knowledge, and success or failure of companies depend on how they use these processes. The interviewee stated,

> " *KM programme fits our organisation and can contribute to our organisation's services*"

According to the interviewee, there is no clear procedure for how to create, transfer, and share information or knowledge. He believes that the organisation has full resources, such as expertise, consultant, latest technology with plenty of database, but it has not built a system or clear rules to follow.

6.9.3.3 IT infrastructure

The organisation has an excellent information system and the possesses latest technology. The technology infrastructure exists (Internet, data warehouse, web site, and work flow); it needs to reach the requirements of knowledge practice. The organisation is willing to adopt this KM concept, but it needs more information as well as experience in the KM field. The interviewee stated,

> " *Knowledge infrastructure is one of the critical success factors for information systems and KM implementation*"

The organisation always attempts to be at the cutting edge in its field, and always strives to provide maximum satisfaction to its customers and workers. Figure 6.4A shows the old and Figure 6.4B shows the new database system in the Civil Service Commission.

Figure 6.4A Old database of Civil Service Commission

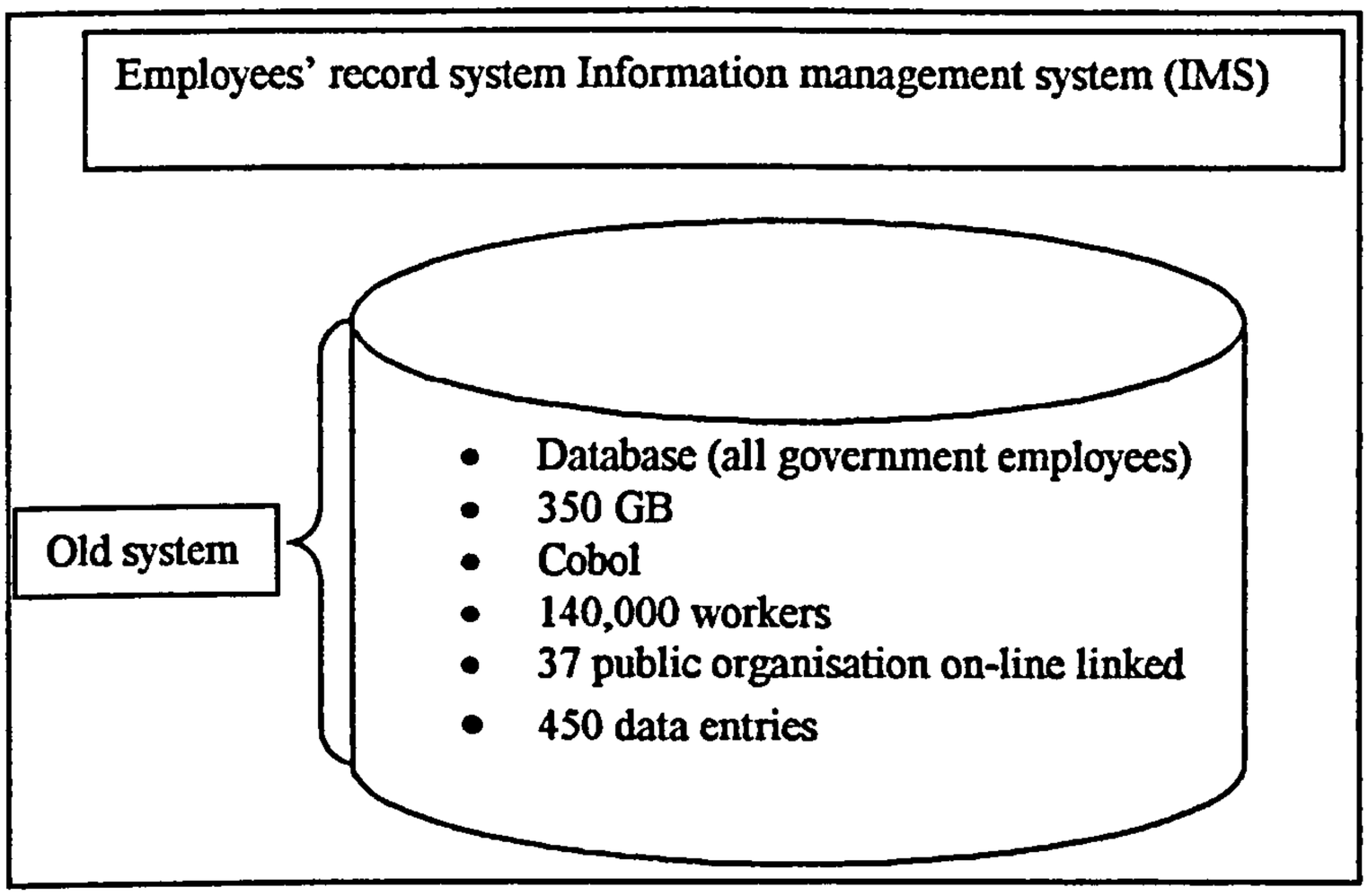
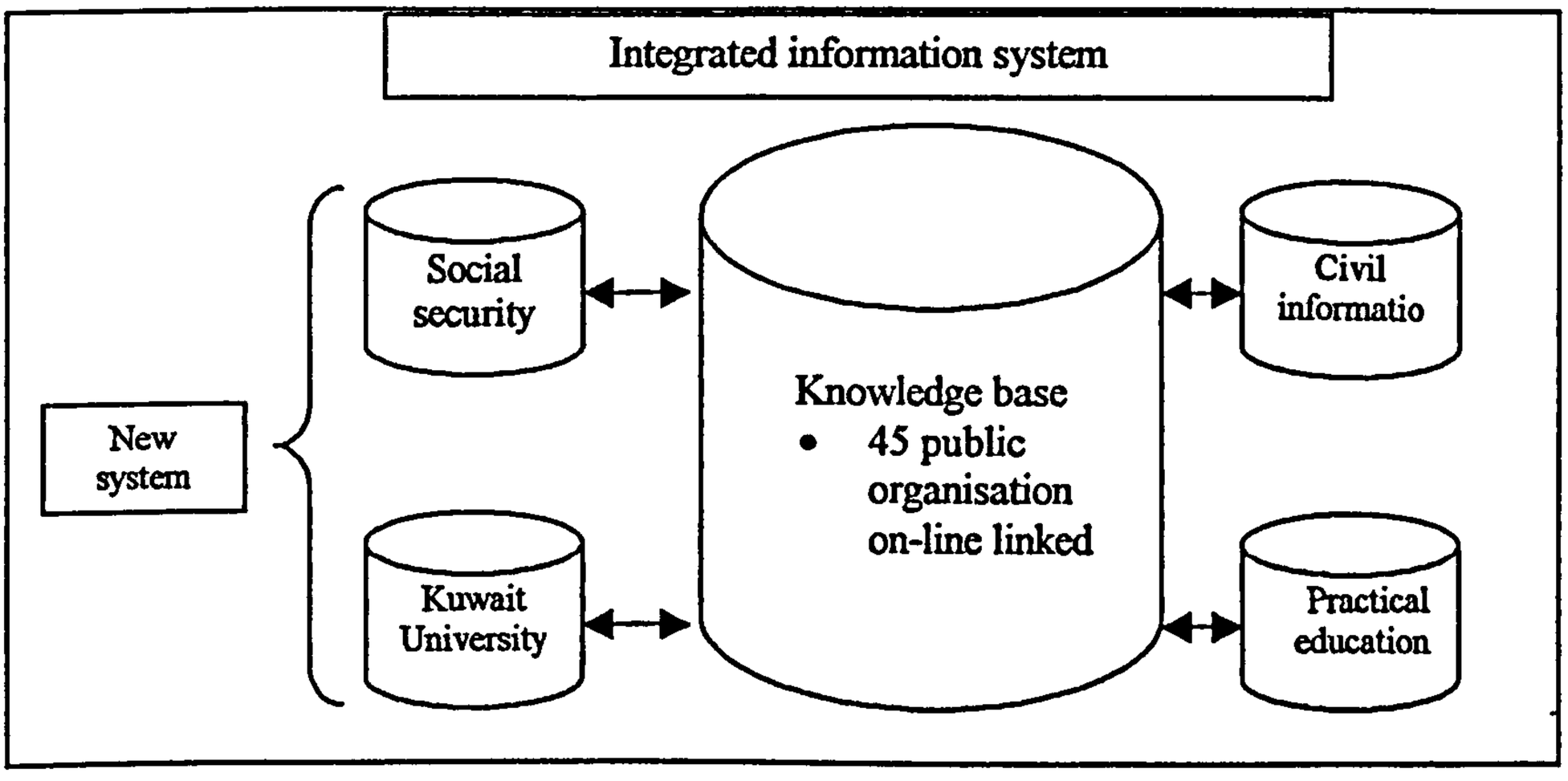


Figure 6.4B New database of Civil Service Commission



6.9.3.4. Change management programme

The training courses are weak in subjects and structure; in addition, the instructors do not have adequate information and experience of the subject, or sometimes the subject is not related exactly to the job description of the trainee's post.

The interviewee believes that by right training, proper technology, and periodic meetings, the organisation is able to transfer and share its information and knowledge. Also, the workers need more motivation to learn or share information and knowledge, and the organisation must create a culture that supports innovation and learning.

The interviewee stated,

> *"KM is ignored by public sectors because there is no strategic, clear vision as well as evaluation productivity. KM is a main and important element for a successful organisation, but the Arabic KM implementations do not exist in the Kuwaiti public sectors. "*

6.10 Case Study 8: IS consultancy organisation

6.10.1 Introduction

The organisation controls the interests of the State, draws up general government policy, and follows up its implementation. Whoever occupies a ministerial position must fulfil conditions specified in Article 82 of the Constitution, which are the same conditions for membership of the National Assembly: minimum age (30 years), nationality (Kuwaiti), and fluency in reading and writing Arabic. As soon as it is formed, every cabinet has to present its programme to the National Assembly, and the latter may comment as it sees fit.

Decisions of the organisation can be adopted when a majority of members are present, and with the agreement of a majority of those present. The head of the organisation's vote can tip the balance if the votes are tied.

The organisation may not hold another position during his term of office, or even indirectly practise a liberal profession or industrial, commercial or financial work, or buy, rent out or lease state property, or rent or sell any of his property to the State or receive remuneration for it.

6.10.2 Interviewee and KM at organisation

The interview was conducted with the head of department. It is a very significant organisation, it is really a critical organisation, and its resources are massive. The interviewee declared,

> " *We acknowledge the importance of KM, however we do not manage knowledge at this moment, it is a new concept and until now our strategy does not plan to apply it, we hope to use it in future."*

He continued, that cannot be imagined that a successful business can be run without KM, and using high technology without KM is not sufficient to result in competitive advantage.

The increasing competition has put pressure on most organisations to use proper KM systems and in order to strive for increased efficiencies.

The manager recognised that KM will be an important issue in the future, and it really fits the organisation and it can contribute to organisation's services' competitiveness, he stated,

> *"Employees always complain, everyone does the job in a different way."*

And he assumes that the cause for the complicated job is that the rules are not clear, and maybe there are no qualified workers or there is insufficient experience in certain areas. By managing knowledge properly, the organisation can derive advantages, such as competitive advantage, reduced cost and save a time. He added that they could not ignore using the technology infrastructure side for KM implementation, and trying to make the employees understand the KM concept and become involved with willingness to share and transfer their experience.

6.10.3 Analysis

6.10.3.1 Top management commitment

This is one of the most vital and important organisation. Although this organisation is important, the top management does not support it, the manner in which it is supposed to be supported, as it is supposed. He outlined that the top management put employees under pressure by making recommendations without the supporting infrastructure.

He suggested that without top management advising, the job would be smooth and excellent. He wants the top management to leave the organisation alone, with no advising, in order to manage itself efficiently.

In the interviewee's opinion, the organisation will be excellent when the top management stop advising The researcher found out that the top management want to help and support, but they do not identify the right way for that. The lack of open communication between top management and rest of the organisation is hampering KM-related progress.

6.10.3.2 KM process

As mentioned before, the organisation does not have the system to manage KM processes, but it has experience transfer regarding troubleshooting of computer related problems. The interviewee believes that KM processes are one of the factors critical towards the success of a organisation, such as creating, transferring, and sharing knowledge that helps to increase the level of service to the client as well as the organisation's efficiency and effectiveness, the success or failure of organisations depend on how well they exploit these processes, but none has a clear procedure for how to create, transfer, and share information or knowledge. He believes that the

organisation has full resources, such as expertise, consultant, latest technology with plenty of database, but it did not build a system or clear rules to follow.

6.10.3.3 IT infrastructure

The organisation has ample resources and focuses on information systems and IT (e.g. Internet, network, data warehouse, decision support system, World Wide Web, e-repository, and e-mail). However, the organisation does not exploit these systems in the appropriate manner. The data stored are for inquiries about name, addresses, status, nationality.... and so on, it is just an archive; there is no information processed or converted to knowledge.

In the view of the interviewee,

> *"Without the appropriate knowledge infrastructure,* the *organisation could not be successful in applying KM. Knowledge infrastructure, including hard (e.g. information technology tools) and soft (e.g. skilled individuals) is the crucial element for a successful organisation".*

6.10.3.4 Change management commitment

The training department creates course for all others departments in order to educate their employees, but sometimes the courses are just routine courses not fitting with all the trainees' level and abilities.

The interviewee stated that change of culture within the organisation is very important and at the same time it is very difficult, because some workers see their experience as power, and the culture is such that no one feels it is right to share knowledge, also some of them protect their position by guarding their knowledge and others are unwilling to learn. In addition, the organisation gives low priority and resource for knowledge gathering.

6.11 Case Study 9: Social organisation

6.11.1 Introduction

This organisation (Social Security) has an independent budget and has a body corporate. It is subjected to the supervision by the Ministry of Finance.

This institution is managed by a Director General who has one Deputy. The Director General represents the Institution in its relations with others and in the courts of law. He is responsible for executing the policy drawn up by the Board of Directors and the specification of the Institution's departments and their respective functions.

The Social Security System is mainly financed by contributions paid by the three security parties (i.e. the insured person), the employers, and the State Public Treasury. It was established in order to implement the system it promulgated, which covers the following:

- Old-age, disability, sickness and death insurance of civilians employed in the public sector as well as in the private and oil sectors.
- Old-age, disability, sickness and death insurance of the self-employed, or whoever else may fall into their category.
- Work injury insurance.

6.11.2 Interviewee and KM at organisation

The interview was conducted with the head of department. This organisation has a sophisticated IT infrastructure and similarly accompanying software. The manager acknowledged that the goal of the management is to increase clients' satisfaction by exploiting IT. Therefore, he feels that KM is particularly appropriate to the organisation's strategic goals and the organisation thus focuses on acquiring IT equipment and consultants. The organisation has some KM processes in place, such as creating and capturing, storing, transferring and sharing essential information and

knowledge are the main reason for the organisation's success. By utilising these processes, the organisation must increase the level of services to clients and be able to provide more accurate and shorter lead-time, as well as improve on-time delivery margins.

KM implementation being based on creating, transferring and sharing, it requires perpetual support from top management and change in workers attitude and behaviour by encouraging them to become more involved in and willing to share knowledge to build trust.

The interviewee continued,

> " *We have to go for a new modern system, a new vital conception to be in on the global business, We can not keep on dealing with development of business, because we would do not have capabilities for KM system at present. We will not be able to grow nor support the growth within the organisation without innovation and creation of new ideas.*"

6.11.3 Analysis

6.11.3.1 Top management commitment

This organisation has a good reputation and remarkable integrity. The interviewee reflected that

> *"The organisation has an outstanding management and provides high-quality services to its clients, this is largely due to top management full support and commitment.*"

This is a shining example of a successful organisation which attempts to stay in vogue with the current technology by continuously embracing new ideas. The top management and the culture of the organisation are committed to supporting innovation. The interviewee acknowledged that the organisation does use KM concepts, but refers to them by a different name. In addition, the interviewee feels that the KM concepts and applications are imperative in sustaining competitive

advantage over its competitors. He feels that the existing KM-related strategy is required to be modified. The interviewee stated that the following:

> *" I am sure when I discuss it with the top management, it will be pleased to support this concept."*

6.11.3.2 KM process

The interviewee believes that success depends upon a clear roadmap for KM processes, and sharing information or transferring knowledge from experienced people to less experienced needs to rely on the organisation awareness that an organisation should make its employees share and use knowledge automatically, he declared. Regarding transferable skills, workers face problems when doing their jobs, and these problems are stored in a database in order to retrieve them when they are needed.

During the interview, the researcher discovered that the organisation exercises the concept of KM under a different name. The interviewee supported the researcher's point of view when he stated that the workers are sometimes transferring or sharing their experience and information among each other, but it occurs by chance, because there is no rule or policy to follow.

Therefore, the interviewee believes that knowledge could not be managed without a formal KM process, and that success or failure of organisation depends on how well they make use of these processes.

6.11.3.3 IT infrastructure

As previously stated, the IT infrastructure at this organisation is at an advanced level and it employs a qualified workforce. This implies that the application of KM has the

potential to become a successful organisation-wide initiative. The interviewee commented,

> " *The organisation has the benefit of IT that makes KM implementation easy to be successful. Information infrastructure and knowledge infrastructure are guarantees for success in KM implementation as they complement each other.*"

The organisation uses IT tools such as network, data warehouse, and e-mail. It is, however, currently focused on the IT side and it takes account of improving the technology infrastructure.

6.11.3.4 Change management programme

The training department within this organisation has a five-year strategic planning cycle, and each department must provide the training department with its vision and in what domain its needs are. The interviewee stated that the organisation employees were trained by means of courses, seminars, conversation face-to-face, or over the Internet and through team group learning. He further stated,

> " *The training department must by aware of the organisation's training needs.*"

The organisation always attempts to provide the workers with adequate information and supports team-based approaches to problem solving. But some workers feel that no one has the right to share their knowledge, and they try to guard their knowledge and experience to protect their position. In addition, some workers are unmotivated and not prepared to learn.

6.12 Case Study 10: Finance organisation

6.12.1 Introduction

The organisation is responsible for introducing financial procedures and controls.

This organisation supplies the following applications software for the governmental authorities:

- Financial and controlling
- Materials management

The organisation computer centre department has also developed application systems for others departments own use, such as Taxation, Hospitality System, State domain, State domain utilisation, Expropriation, Training, Governmental guest housing, and Governmental building maintenance system.

Many other systems have been developed for the organisation inter–departmental use. The organisation was a pioneer in realising the importance of millennium problems since 1997.

The organisation gave the process of solving the millennium problem their top priority. Technical groups were formed to study and analyse the impacts of the millennium problems on local and public application systems, and implications of millennium problems on hardware, communication and network equipment, as well as operating system software.

6.12.2 Interviewee and KM at organisation

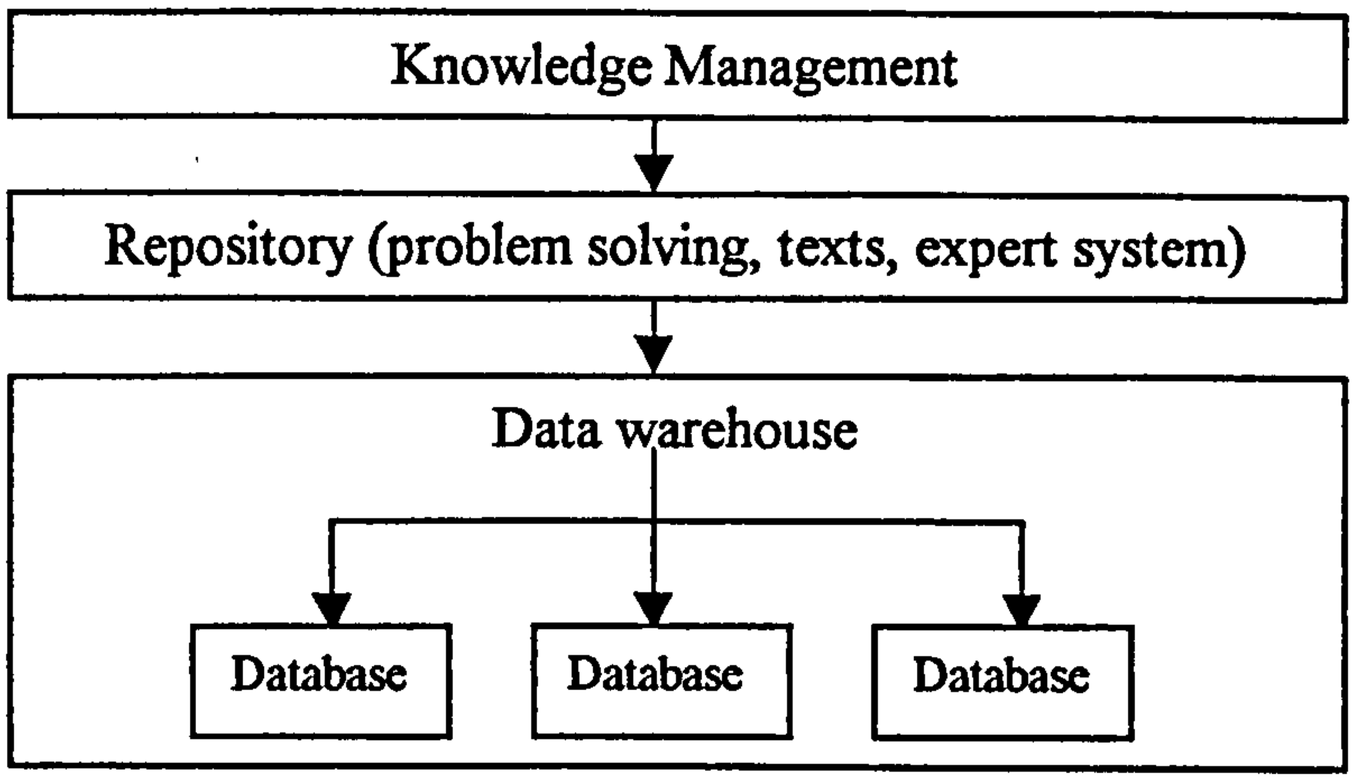
The interview was conducted with the head of department. The concept of KM is not known to this organisation. The organisation is based on management information system (MIS) which serves some departments, and is used by more than 1000 users. The MIS was designed to manage the material information, and consists of managing

database and data warehouse. When the interviewee read the researcher's questionnaire and reached the concept of KM, he stated:

" Now we can classify KM in our organisation."

And he illustrated KM by means of Figure 6.5

Figure 6.5 KM Chart



6.12.3 Analysis

6.12.3.1 Top management commitment

As usual, the top management and IS department were involved in planning for new technology, although the responsibility was squarely distributed on the IS/IT director, as it is driven out to implementation. The organisation gets support from top management, but sometime the top management does not recognise some of fundamental issues being faced by the organisation.

The interviewee stated,

> *"The departments that derive the greatest benefit from IT department have to know what they need and must therefore have clear objectives. In addition, the other departments must also identify the specific information that needs to be processed or turned into knowledge."*

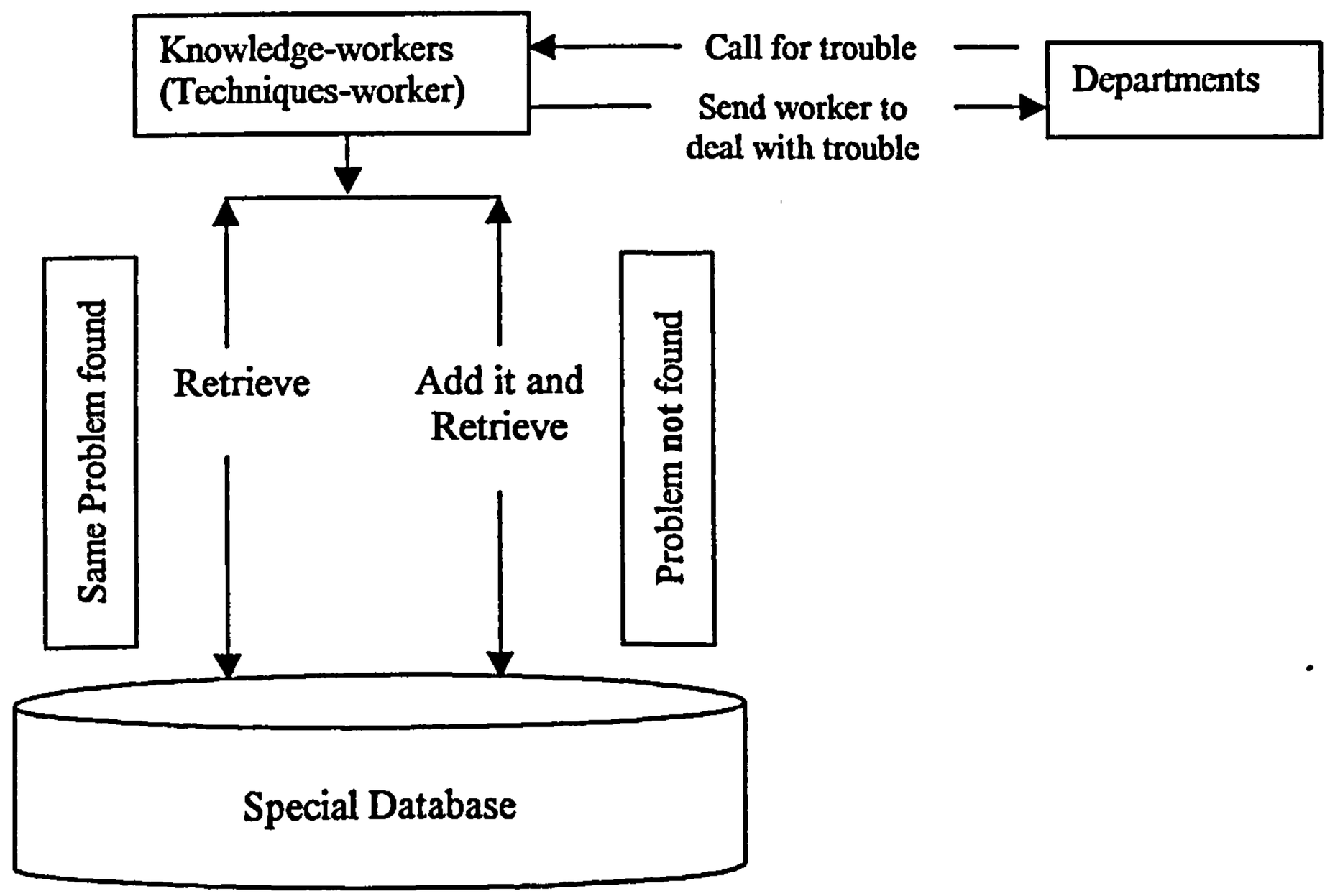
6.12.3.2 KM process

As mentioned earlier, the KM concept is not familiar to this organisation, the organisation focuses on information systems, but it often has KM processes, such as transferring and sharing information between the knowledge-workers, but this knowledge is mainly concerned with solving computer-related problems

The interviewee stated,

> *"Solutions to the problems encountered by our workers are stored in a special database, which can then be accessed by the rest of the employees when needed. When a user logs a call, the database is probed to examine if a solution to the problem already exists "* (See Figure 6.6)

Figure 6.6 Processes of troubleshooting



The interviewee agrees that the KM processes are the most important and he considers them as one of the KM CSFs. He stated,

> *" When the Kuwaiti public sectors take advantage of capturing, transferring, and sharing information and knowledge among organisations and workers, I am certain that the employee productivity, efficient and effectiveness will".*

6.12.3.3 IT infrastructure

This organisation concentrates on information systems, it has Internet, network, web site, and database. The interviewee mentioned these tools help the employees to contact each other, and the organisation continues providing its workers with the latest technology and up-to-date information, as well as improving its IT infrastructure.

6.12.3.4 Change management programme

The organisation supports the training and learning of its employees because it believes that educated workers yield high productivity, so it encourages the employees to participate in new courses related to their job, inside or outside the organisation.

The organisation is involving employees in decision-making and encourages and motivates its employees concerning their job. Also, it is keeping the lines of communication open to encourage employees to communicate openly and raise any issues that they may have.

6.13 Case Study 11: International airline

6.13.1 Introduction

It was founded in 1953 with a route from Kuwait City to Basra (in modern Iraq) using DC-3. By 1962, the Vickers Viscount had replaced the DC-3, and the next plane was the de Havilland Comet 4C, and in 1966 the HS Trident, with the Boeing 707 coming in 1968. The first widebody, the B747, arrived in 1978, and the B767

replaced the B707s. During the Iraqi occupation, flights were discontinued and some aircraft destroyed, but some restricted flight continued from Cairo. After the war, a fleet replacement began with the A300-600, A310-300, A320-200, B747-400, A340-300,B777-200 and B777-300.

6.13.2 Interviewee and KM at organisation

The interview was conducted with the head of department. According to the interviewee, this organisation does not use the term KM, and he stated,

> *"We acknowledge the importance of KM. However, at present we do not have a strategy to manage knowledge and as such use IS. However, we do hope to utilise KM, by in incorporating it into our future organisational strategy."*

He mentioned intellectual capital, and stated that this is very significant and will be the key way for businesses to measure their value. Also, he believes that KM is suitable to his organisation and its future strategy, because its activities depend upon competitive advantage. But the major problem it is faced with is that the organisation is controlled by the government system.

6.13.3 Analysis

6.13.3.1 Top management commitment

Top management is fairly supportive, but it does not provide support to the full degree. The interviewee stated that the reason for this is that the organisation has numerous branches inside and outside of Kuwait, which include financial control, administration, maintenance, providing information, order processing, inventory management, etc..

If top management wishes the organisation to become a successful, it must build a strong system and policy for all branches to pursue; in addition, it must provide strong and continuous support.

According to the interviewee, the top management get a lot of complaints from customers regarding low quality services and poor customer handling, but top management pays no attention to these complaints and they do not try to solve the problems. Even though the employees are not satisfied, and they always complain concerning the organisation's treatment of them or customers. The interviewee suggested that the organisation must build a database to keep track of customers' problems.

6.13.3.2 KM process

The interviewee agreed that KM processes such as capturing and creating, storing, transferring, and sharing information and knowledge between people should be adhered to. However, the organisation does not have a system in place to manage KM processes; there is no collaborative relationship between departments. And he stressed,

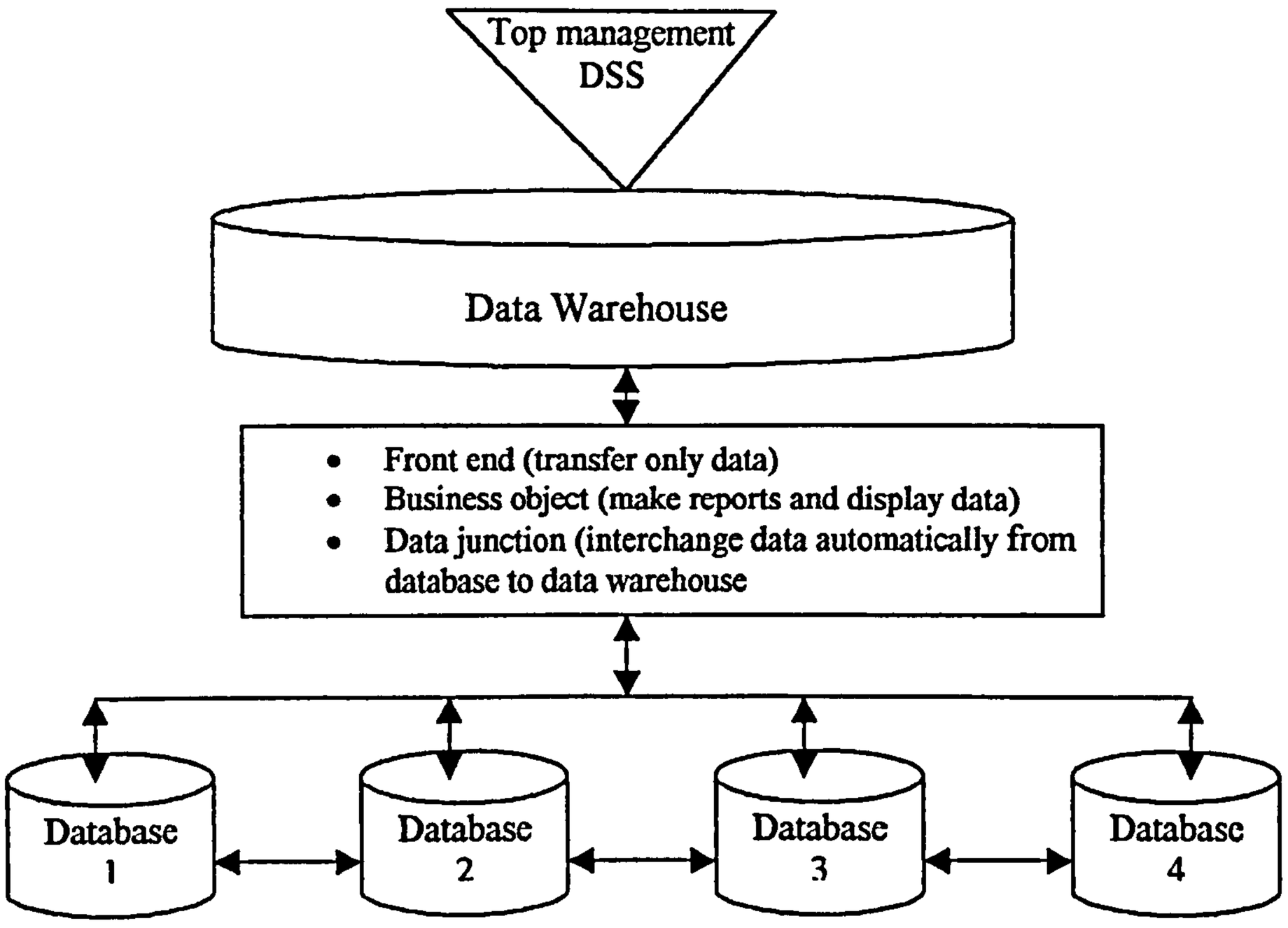
> *" We have an IT problems-related database, where information regarding troubleshooting of IT problems is stored."*

6.13.3.3 IT infrastructure

The interviewee stated that the organisation has a huge database and system, but it needs to be more ordered and systematic, and create a knowledge base in which to store the customers' complaints and problems, in order to avoid them in future. In addition, the organisation is planning on installing a new system referred to as customer relations management (CRM); this system contains valued customers' records in order to help and give them the best service in order to increase their level of satisfaction. He further stated,

> *"The employees are based on a limited experience of decision making using data warehousing and decision support tools. Not due to the lack of it, but rather due to resistance to change to using new methods of knowledge gathering."* (See Figure 6.7).

Figure 6.7 Decision support system (case study 11)



6.13.3.4 Change management programme

As mentioned previously, most employees are not happy with their job and the interviewee attributed this to inadequate facilities and poor motivation.

The employees get training courses, but some of these courses do not benefit their abilities, or sometimes the subject is not related exactly to the job description the trainee is hired for. The interviewee observes that some employees guard their knowledge to protect their position and they see knowledge as power and as far the knowledge that they obtain from their experience, it appears to be conferred at an individual level.

6.14 Case Study 12: Science Research organisation (SRO)

6.14.1 Introduction

SRO was established in 1967 by the Arabian Oil Company Limited (Japan) in fulfilment of its obligations under the oil concession agreement with the Government of the State of Kuwait. The Institute was established to carry out applied scientific research in three fields: petroleum, desert agriculture and marine biology. SRO was organised by an Amiri Decree issued in 1973, under which it became directly responsible, through its Board of Trustees, to the Council of Ministers. The main objectives of the institute, as specified in the Amiri Decree, were to carry out applied scientific research, especially related to industry, energy, agriculture, and the national economy, to contribute to the economic and social development of the state and to advise the Government on the country's scientific research policy. An Amiri Decree in 1981 formally established KISR as an independent public institution. The law specified that the Institute would be governed by the Board of Trustees chaired by a minister chosen by the Council of Ministers. The revised objectives of the Institute remain to carry out applied scientific research that helps the advancement of national industry and to undertake studies relating to the preservation of the environment, resources of natural wealth and their discovery, sources of water and energy, methods of agricultural exploitation and promotion of water wealth. The law entrusted the Institute with undertaking research and scientific and technological consultations for both governmental and private institutions in Kuwait, The Gulf region and the Arab World.

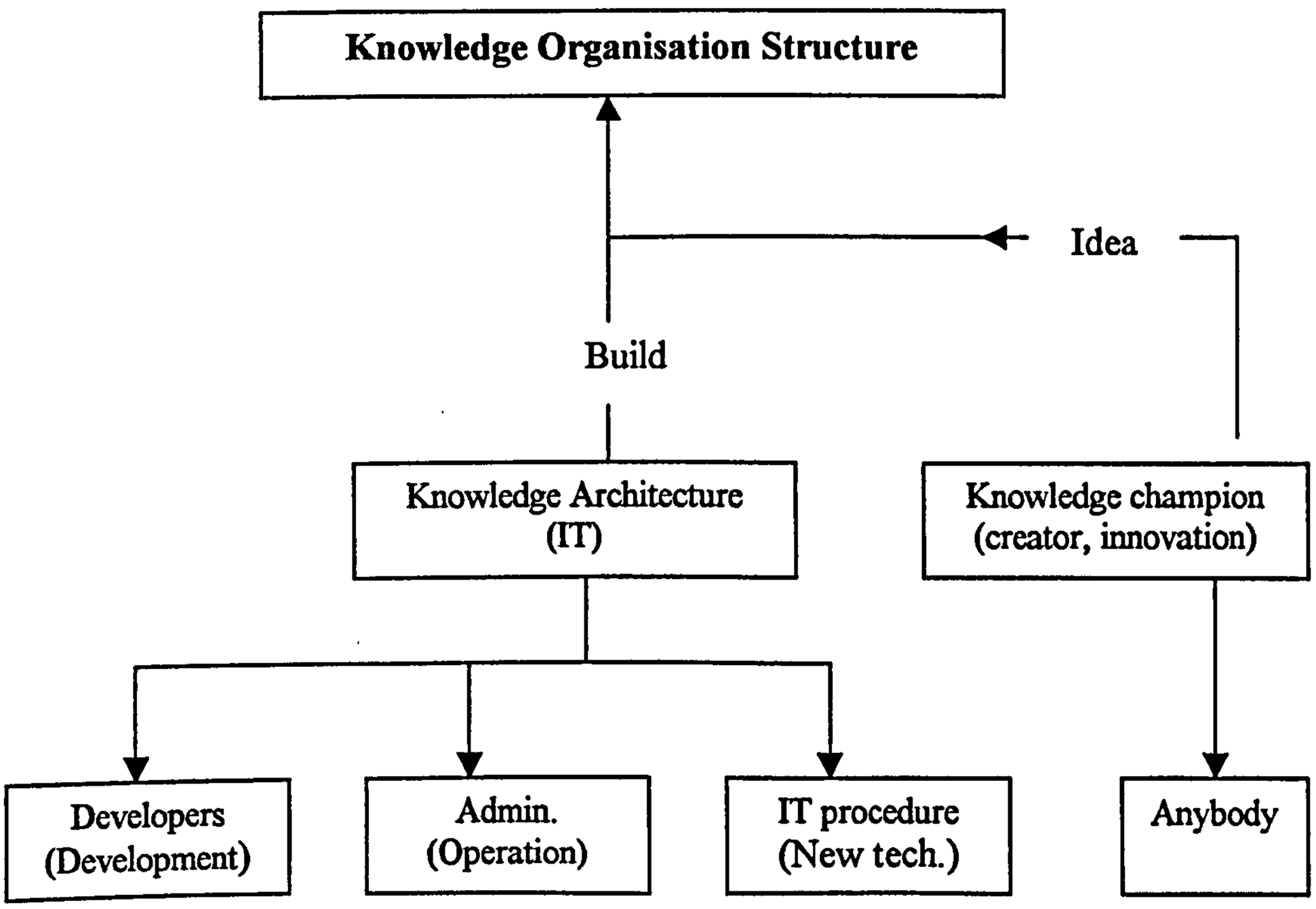
6.14.2 Interviewee and KM at organisation

The interview was conducted with the head of department. The organisation has up-to-date management, and it has enough budget to support its projects, and it also

feels that KM is very important and critical for the organisation. The interviewee stated that the organisation has just started to apply KM, and the top management feels that KM is very important, and is really vital for organisation success in the future. He does believe that KM enables ways to create, identify, capture, and distribute organisational knowledge to the people who need it to help them to do their job efficiently. The organisation tries to exploit its knowledge in order to get the benefits in order to minimise duplication of work and other processes.

The interviewee illustrated the knowledge organisation structure, which is shown in Figure 6.8.

Figure 6.8 Knowledge Organisation Structure (case study 12)



6.14.3 Analysis

6.14.3.1 Top management commitment

The interviewee strongly agreed that top management support and commitment play a critical role in successful KM implementation. In essence, top management must know the right way to support the organisation and how to be positively involved.

Sometimes however, top management involvement makes trouble for the organisation and makes the processes inefficient and slow.

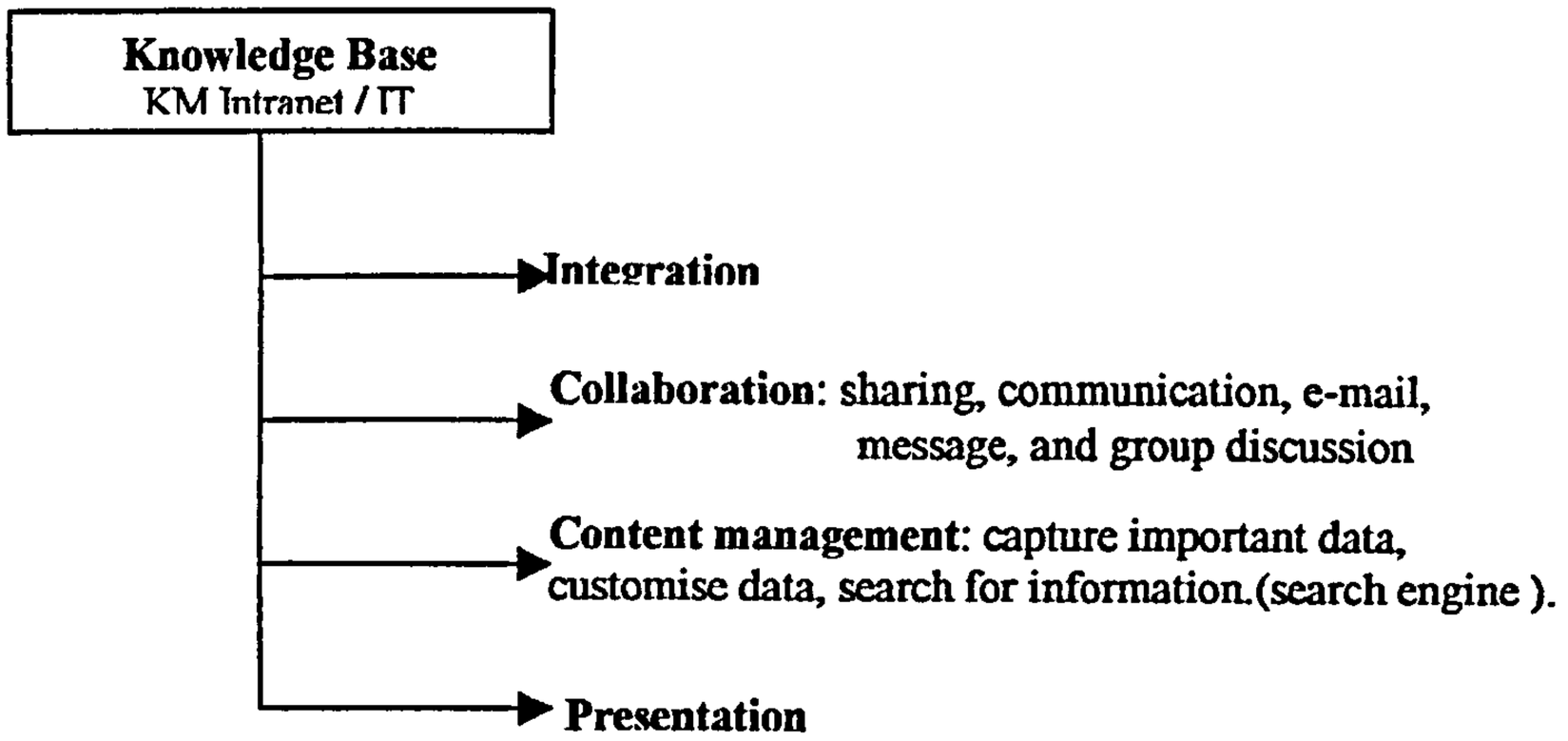
He continued that the IT department has very cultured and open-minded workers, and the top management is very friendly and understanding, but added that the management could be more supportive.

6.14.3.2 KM process

The interviewee defined KM as the method to create, identify, capture, and distribute organisational knowledge to the employees who need it. And he believes that KM processes are capturing, storing, transferring, and sharing knowledge, and the KM programme can improve the organisation's overall performance and sustainable competitiveness. It is vital for organisation success in the future

He continued that there is no system to manage KM processes directly, but the workers are used to helping each other, and when anyone needs help or has a question, it takes place on a coincidental basis in the absence of any systematic processes. This is further hampered by the fact that top management tends to prioritise IT infrastructure related elements of KM. Figure 6.9 gives the interviewee's view of the knowledge base.

Figure 6.9 Knowledge Base



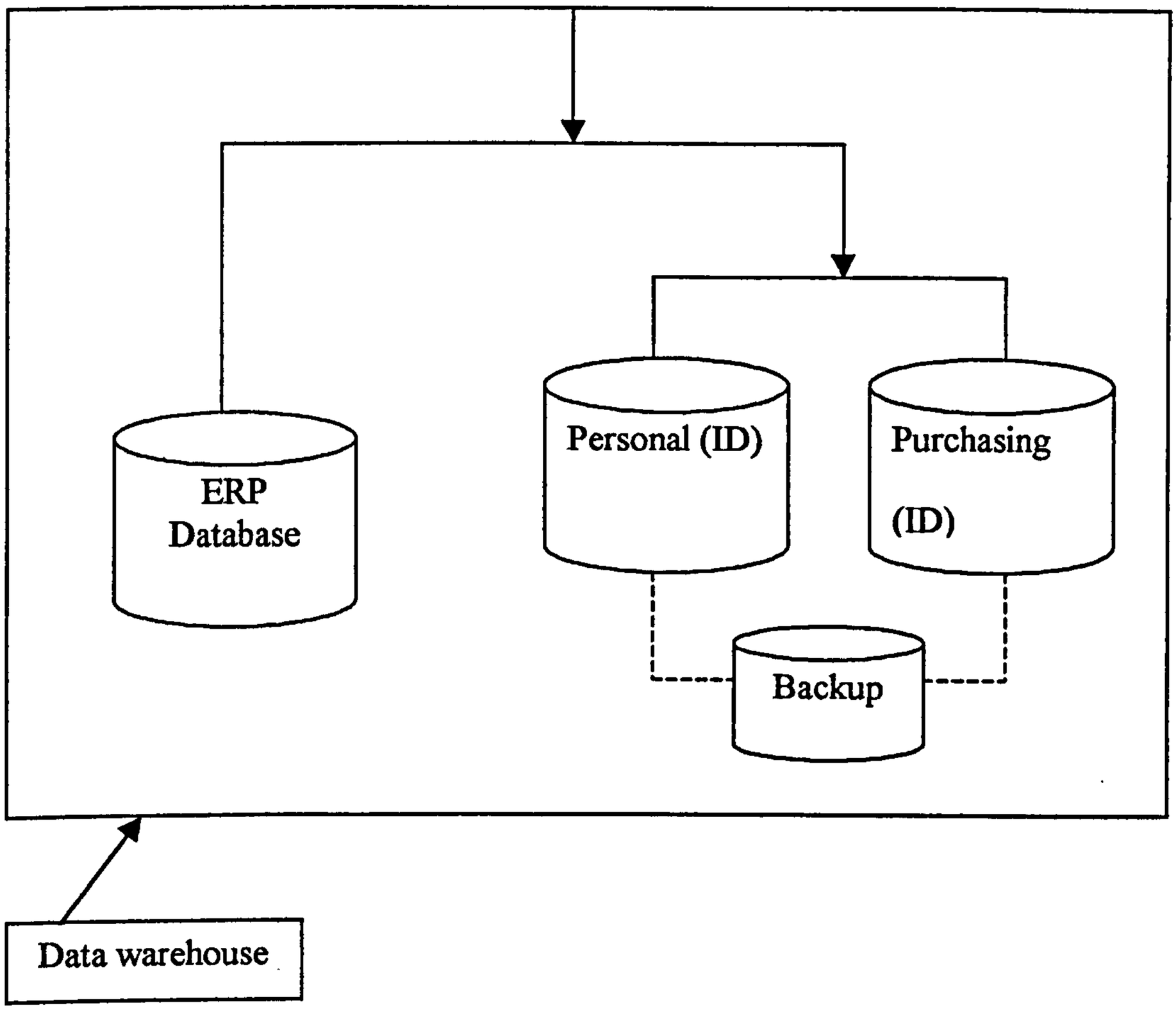
The interviewee stated,

> *"KM should be on co-operative level and cover the following: system integration, collaboration, content management, and presentation. It is a top- down approach".*

6.14.3.3 IT infrastructure

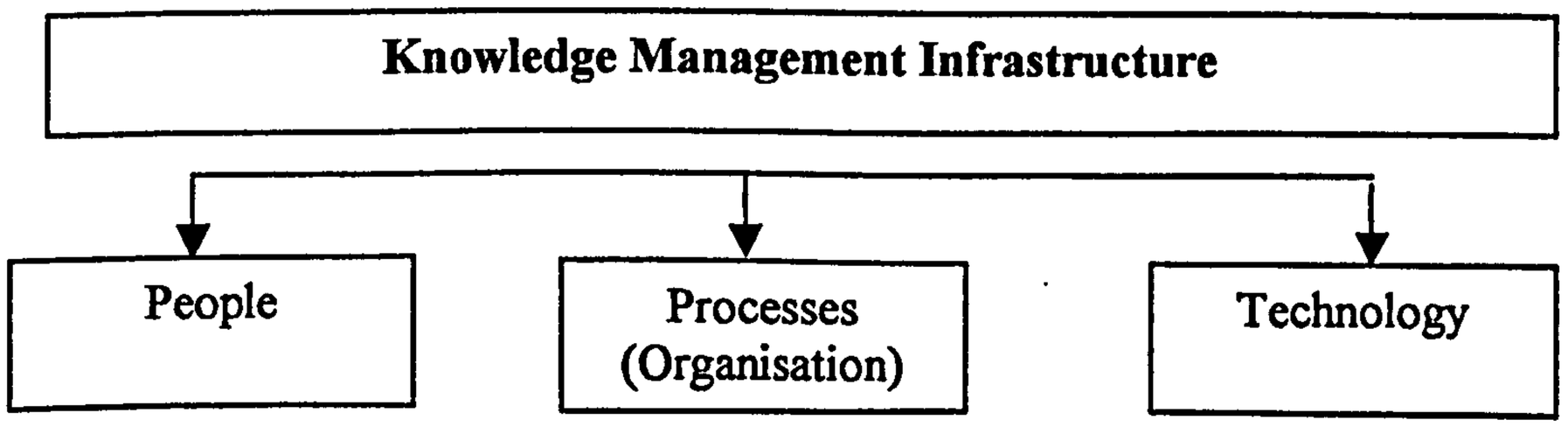
The organisation has an excellent information system and the latest technology. Various technology tools, such as Internet, intranet, network, data warehouse, web site, E-repository, and e-mail are available. It has a chief information officer (CIO). But the organisation does not exploit these tools to their full potential. Therefore, the organisation intends to use the portal system instead of intranet and extranet. Figure 6.10 shows the database system and Figure 6.11 show KM infrastructure.

Figure 6.10 Database system (case study 12)



1. Warehouse: can get information from different databases.
2. Repository: database that has highest information for organisation.
3. Knowledge-base: database that has information that turned on knowledge.
4. Meta-data: means that many data or information got from different data stores.

Figure 6.11 Knowledge Infrastructure (case study 12)



6.14.3.4 Change management programme

The training department creates course subjects for all other departments. The course is appropriate to the trainee's level and abilities, and the subject is related exactly to the job description of the trainee for. Most of the workforce are cultured and aware of current practices and management.

The interviewee stated that the organisation encourages learning on the job and through training courses. The interviewee stated,

> *"Indeed some employees envisage their knowledge as a precious commodity and this are reluctant to share it. However the top management motivates these employees to share the knowledge instead of punishing them."*

6.15 Case Study 13: Public Civil Information organisation

6.15.1 Introduction

The Public Civil Information organisation is an organisation established in 1982 to provide a civil information system and register the population of Kuwait (Kuwaitis and non-Kuwaitis). This is a continuous process and includes the registration of events, such as births, marriages, divorces and deaths. It is also responsible for the issuing of civil identification numbers and cards to all citizens and expatriates resident in Kuwait.

The organisation is headed by the Minister of Planning as the chairman of the board of directors. A general director is responsible for the management of the administrative, financial and technical affairs, and is the authority's representative.

6.15.2 Interviewee and KM at organisation

The interviewee was conducted with an expert consultant. The organisation does not manage knowledge directly and the interviewee stated,

> *" The organisation is not familiar with the term KM. In my personal view, KM is vital for organisational success in the future and it will be more important in the future for businesses,".*

The organisation focuses on IT, and it does not ignore the human values of employees, but it should concentrate more on this aspect. Also, the organisation is willing to implement any new method that can guide it to improve its services and make the customers satisfied. The organisation is more focused on the hard (e.g. IT) system then than softer issues.

6.15.3 Analysis

6.15.3.1 Top management commitment

The organisation gets support from the top management in various areas (especially in IS projects). The top management continuously attempts to provide support keep develop systems that will enable the employees to do a better job. Any new idea is supported from the top management, and the workers rely upon their top management for creation and innovation of new ideas.

6.15.3.2 KM process

The interviewee stated that managing knowledge by using KM processes for creating, transferring, and sharing knowledge, supported with technology tools, drives the organisation to obtain many benefits, for example saving time and reducing cost, getting useful information, no duplication of information, and exchanging experience between the employees, in order to help them do their job more efficiently.

The interviewee stated that transferring knowledge can take place through training under proficient supervision, courses, workshops, teamwork and seminars. Also,

sharing knowledge could be through team group meetings and exploiting technology tools such as Internet, intranet, e-mail, and keeping channels open 24 hours. At present, the organisation is applying skill transfer regarding troubleshooting of computer-related problems. This initiative is known as helpdesk.

6.15.3.3 IT infrastructure

As mentioned earlier, the purpose of this organisation is to provide civil information for the Kuwaiti government and to issue all individuals with a civil identification card (ID). It must have quality information and build an accurate database system.

The organisation has the civil information system that consists of a computerised data bank containing information and details about all citizens and expatriates. As events occur, these data are continuously used to update the database to reflect these changes. Information is also held about buildings and complexes, as well as ministries, companies, corporations, authorities and establishments.

The interviewee stated that organisation installed a new service for customers' convenience. They may call to enquire about the progress of their civil ID card, as well as to established answers to their queries concerning registration procedures, for those who cannot use or do not have access to the automated telephone inquiry service (See Figure 6.12).

The organisation is able to identify the people working in the public or private sector by utilising the database system illustrated in figure 6.12.

Figure 6.12 illustrates a database system that utilises three tables. These tables are:

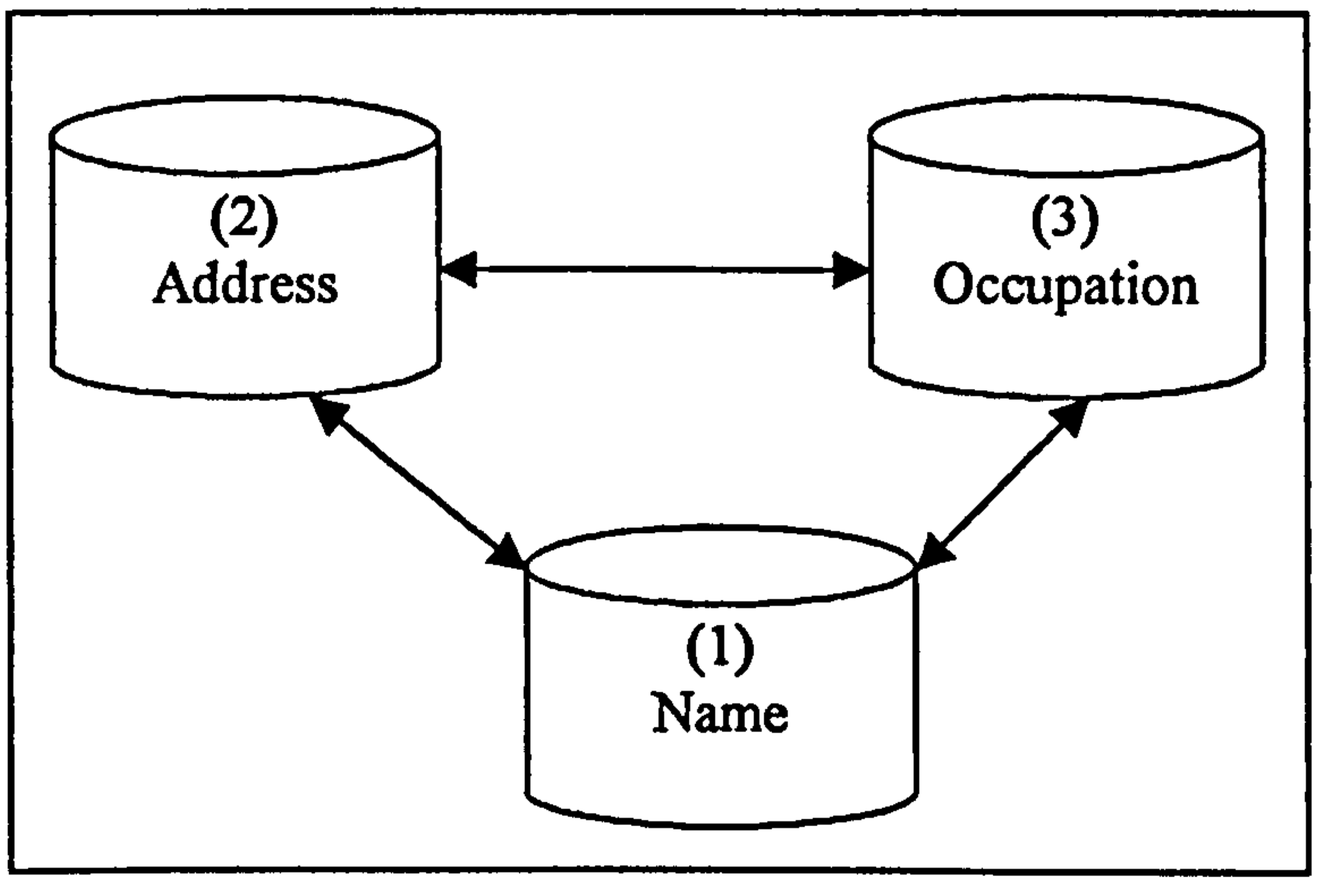
(1) Name

(2) Address

(3) Occupation

Further, each table is linked to the other by the primary key. These are the tables that drive the database oriented relationship, thus enabling the information to be structured in an orderly manner. This information is then retrieved by the organisation towards identifying people who work in the public or the private sector.

Figure 6.12 Organisation database (case study 13)



6.15.3.4 Change management programme

The interviewee stated that people's culture is dissimilar, each one has a different culture, some are helpful and others are unhelpful. To change the culture is very difficult but it is possible by motivation to distinguish between the competent workers and others.

The interviewee stated the organisation is more concerned with employees' training and there is a special budget to support the training department.

He stated that KM is one of the most important factors for developing managerial and technical competences by exploiting knowledge. The organisation must develop a strategy and accompanying tools to support KM.

The following is the overviews of the CSFs of the Kuwaiti PSOs:

Table 6.2 CSFs of the Kuwaiti organisations

No	Factors / Organisations	Top – Management Supported	KM processes implemented	IT infrastructure	Change management programme
1	Union of Consumer Co-operative Societies	*		*	*
2	IT consultancy organisation	*		*	*
3	Strategy planning organisation	*		*	*
4	Social Affairs organisation	*		*	*
5	Construction organisation	*		*	*
6	Petroleum Corporation	*	*	*	*
7	Civil Service organisation			*	
8	IS consultancy organisation			*	*
9	Social organisation	*	*	*	*
10	Finance organisation	*	*	*	*
11	International airline			*	*
12	Science Research organisation			*	*
13	Public Civil Information organisation	*		*	*

Table 6.2 shows the mapping of the CSFs (by Category) for the organisations surveyed from the Kuwaiti PS. In this regard, 13 organisations from the KPS were mapped against 4 categories of CSFs. The results of the mapping are illustrated in Table 6.2. The discussion based around the findings of the analysis is presented below.

Top management support

Top management support is mainly concerned with supporting hard or IT infrastructure, and that might explain why KM is not applied. But ten of the organisations surveyed are willing to apply and support KM implementation when they have sufficient processes to support a KM infrastructure.

At present, eleven organisations are supported by top management financially (six have a meeting weekly, four have a meeting monthly, and one has a meeting every fifteen days).

Below is a summary of the top managements activities and perceptions concerning KM:

- Top management is busy with itself, and it wants the work to be continued without complaints.
- Top management does not have a strong enough character to face the problems there might be, and it also does not have the quality for best decision-making.
- Top management does not judge or support the employees based on the merit, but instead on their status and whom they are related to.
- Top management see everything as secret.
- Sometimes people feel the only way to deal with top management is to make them happy instead of doing the job, and any misunderstanding of communication creates personal problems and makes dealing with top management difficult.
- There is not a solid system in place, because with any change in top management, the system or policy is changed as well, as when the new executive manager comes to the new position he/she brings in a new strategy and policy and throws out the current policies, even if it is an excellent structure.

- Miscommunications between the top management and the various departments.

KM processes

Almost all organisations do not have KM processes. Three of them used transferring and sharing information between the employees, but not under KM processes or systems, but this happens accidentally. Because the relationship between employees and their boss is one of a friendly nature, the better relationship enables them to help each other. Also, eleven of them have skill transfer which is part of KM processes, as well as having a database for troubleshooting related to computer-oriented problems.

IT infrastructure

All of the organisations have an IT infrastructure, and they are able to have the latest technology that they need. At this moment, ten of these organisations have a huge database and latest technology, as well as expert workers and consultants. But these organisations do not exploit their information in an effective manner. Also, two of them are hoping to apply a portal system instead of intranet and extranet.

Organisations have full resources, for example expertise, consultant, latest technology with plenty of database, but did not build a system or clear rules to follow; in addition, employees do not have a clear vision and there is no transaction information.

Change management programme

Organisations attempt to develop their employees to give them opportunities to improve their skills by providing training courses and on the right subject for their job description. In these organisations, five of them have an excellent system for their employees and the subjects fit well with the employees' job, and they continue to improve their employees' skills and their productivity. In contrast, eight of them do not pay any attention to their employees, the subjects of their training do not fit

with the employees' job, and they do not have the right training strategy. For that reason, none has a clear policy for how to do his or her job, everyone is doing the same job in different ways, and employees are always complaining.

Part II: UK public sector organisations

6.1 Case Study 1: Public Sector Benchmarking Service

6.1.1 Introduction

The interview was conducted at the public sector benchmarking services (PSBS). Headquarter in London (UK) The interviewee outlined that the services the employees are responsible for is actually a partnership between the company itself and the Cabinet Office in UK and further added that it does not just serve this department, Customs & Excise, it is for the whole of the public sector. So the work that the organisation carries out is concerning transferring knowledge on good practice. The organisation (PSBS) is not the KM centre for Customs & Excise. Rather, it is a KM group within Customs & Excise, and at the moment it is mainly concerned with cultural change within the department, so that they can accept knowledge management as a means of delivering improved services and effectiveness over time.

The interviewee began by explaining how the organisation was set up, about 3 or 4 years ago, in early 1999, at the time when the public sector was undergoing many changes. Around that time, a White Paper called *Modernising Public Services* was published. The paper was essentially a reform agenda from the centre, and it was all about central government departments reviewing every service and activity that they were involved in over a 5-year period, to make sure that they had, or they were offering, good value for money, and this was a mandatory requirement within the White Paper. The central government areas represent 20 major departments in the

UK, and along with other associated agencies, there are around a total of 75 organisations it was anticipated that these agencies would periodically examine the services and activities, to ensure they were offering value for money. One way of doing this was to compare themselves with the best that they could find, both in the public sector and externally (benchmarking). At the government level, however, authorities were expected to examine every service and activity and assess them according to the best value criterion. Benchmarking and better quality were central to this theme.

A central are a focal point to achieve some of the initiatives within the public sector was deemed necessary. This was due to the fact that the rate of diffusion of knowledge was slow and organisations within the public sector were doing a lot of rework. It was expected that a central point of contact would, in essence, act as a short circuit and thus enable the transfer of knowledge to speed up. The organisations involved in the exchange process would then be able to implement the lessons learnt more quickly. The interviewee stated:

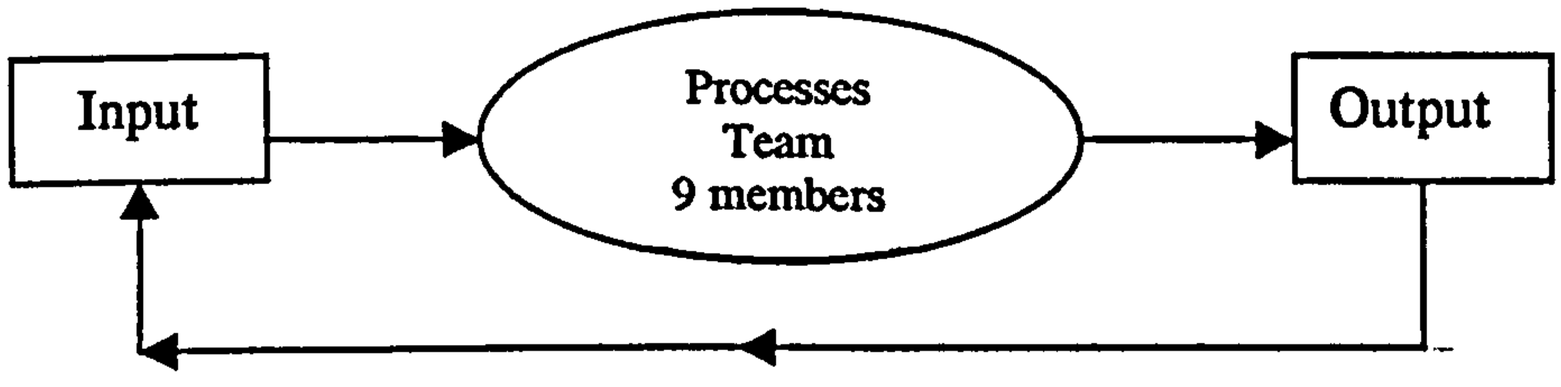
> *"In local government, there are probably in England you're talking about 400 or 500 organisations, local authority organisations, so you can see that when we include local government, you're talking about close on 1000 organisations, in Scotland, wherever - all looking at every service and activity over 5 years. And what we wanted to be was a focal point, so that we could help people shorten the learning cycles - learn from each other, and in that way improve services and activities. So in that way, we are a knowledge transfer system. And if you think of knowledge management, this being a component of knowledge management, we are managing knowledge on benchmarking and good practice for a sector - that's how we operate".*

6.1.2 interviewee and KM at organisation

The interview was conducted with the head of department and assistant director. The aims of the organisation are to support those involved with improving performance and reforming public service, encourage the exchange of information and knowledge in the public sector, and increase the availability of information on good practice and benchmarking. The interviewee stated that if the organisation manage their knowledge correctly, they could potentially give the customer a better service. In essence, the efficient and effective customers services delivery can be attributed to improved KM process.

The interviewee stated the organisation model is very simple. It starts with input then processes by the organisation's team, followed by the production that is classified as the output (see Figure 6.13)

Figure 6.13 organisation model



6.1.3 Analysis

6.1.3.1 Top management commitment

Top management support to instigate and implement any key KM initiatives was considered absolutely crucial. The best way to gain top management support within this arena is by outlining key benefits along with quick wins. He stated:

> *"If you can demonstrate to top management very quickly, which like today we can demonstrate to you, we can manage knowledge in this area, and we can transfer it, if top management can see that, then they're more likely to be committed and somebody talking about -*

> *we're going to do this and this is how we're going to do it, etc. - if you've got the process in place, and they can see the end result very quickly, then you get more and more support, so they say."*

The top management support and fund various KM related initiatives within the public sector. There is a steering group constituted of representatives from different parts of the public sector. This group assesses and evaluates key achievements and then reports to the top management with recommendations and suggestions on a periodic basis.

Further, the top management appointed a help desk research team to support their employees, this team contains 9 employees, they are not a knowledge management unit, rather they are a service that has ended up being a knowledge management or managing knowledge, but they have massive experience. Throughout the course of their work they are continuously building up an expertise. This expertise is developed in different ways, i.e. by helping the police, by helping with customer focus and customer satisfaction initiatives.

6.1.3.2 KM processes

The interviewee outlined that it is imperative that the relevant and supporting processes are in place to manage knowledge effectively and efficiently.

Regarding capturing and transferring knowledge the interviewee stated:

> *"If you put restrictions on where you can get knowledge from, you'll never get true knowledge."*

Organisations must be absolutely fluid and flexible in looking for sources of knowledge, and never exclude anywhere or anything that might be in the field that the organisation is trying to expand into. To this end, it is considered a good practice, then organisations (from public sector) could look and scour the world for good practices in areas that would help the public sector. The KM processes then enable

the transfer of knowledge in numerous ways. The organisation uses the intranet, rather than the Internet, in order to transfer knowledge internally.

There are a number of further processes in place that enable the successful management of knowledge concerning external members and their queries.

The interviewee outlined that the manner in which the organisation deals with external member queries is that if a member comes along with a question, one of the staff will then allocate the question to one of the organisation help desk research team, and they are then accountable for providing an answer. Sometimes the question is too complex or it is too obscure, but this seldom happens. In general, the organisation tends to answer 99% of the questions and the interviewee supposes that the success rate is about 95-98%. The organisation gets this information through the feedback from the customer.

6.1.3.3 IT infrastructure

The diffusion of knowledge is directly proportional to the transfer and capture of knowledge. This then implies that speed (of knowledge transfer) is of the essence. The factor that contributes to or complement the speedier transfer of knowledge is IT. Further, IT plays a critical role in the effective and efficient management of knowledge. The interviewee stated:

> *"Meetings, yes. I mean, this is what we were saying before, that the organisation has a system where if somebody has no IT, they can ring us up, they can come and see us"*

The interviewee believes that in the early stages of KM everyone must have hard copy material to supplement IT systems. He further added:

> *"All IT does is speed up the process and make it manageable. It would not be manageable without IT".*

The organisation under scrutiny has an intranet as well as an external portal. The interviewee stated:

> *" We call ourselves a portal for information PSBS, it's not really tied up with Internet and Intranet".*

6.1.3.4 Change management programme

This organisation does not run external courses but it has its own trainers and runs seminars on specific subjects that the customer wants or is interested in. Further, the organisation has developed its own internal training programme that meets the needs of its employees.

The interviewee believes that change has to be managed with tact and diplomacy. He stated:

> *"It's very difficult to change culture without a stick as well as a carrot. People will not change, unless there is a reason, but if you want to change culture in a knowledge transfer environment, a knowledge management environment, the customer has to see the benefit".*

Unless clear benefits are explicitly outlined, it is extremely difficult to influence individuals and organisations to embrace change. This is due to the fact that individuals have differing personalities and characteristics. Further, this hypothesis is not restricted to individuals or organisations, and it can be extended to different cultures as well as different organisations.

Motivation is one of the elements to change culture, as the interviewee stated:

> *"If people can actually see that they've helped, it's a tremendous motivation, so your feedback systems are essential. And the people realise that they're doing something that is helping the community, is helping the citizen, and then there is a feeling of worth that comes into their working environment. They feel as if they are worth something".*

This organisation is a focal point for help, advice and knowledge on good practice and benchmarking spanning all parts of public service. Further information is

available from organisation website: (www.benchmarking.gov.uk), and anyone can get information in English, Welsh, French and German on:

- PSBS services and facilities
- The site's contents
- Benchmarking in practice
- Other public sector improvement initiatives
- Frequently asked questions
- The local government 'sign posting service'
- The good practice database
- Risk management
- Links to other useful websites
- What's new on the site.

The interviewee outlined that the bulk of the organisation's research concerning KM comes from a huge database, that is otherwise known as the knowledge bank. This database provides an introduction to KM and additional resources of information on topics likely to be of interest to those involved with this subject in the public sector. This is an example of a successful organisation within the public sector that is involved in many different services, from which end users and citizens derive many . useful and valuable benefits.

6.2 Case Study 2: Department of Trade and Industry

6.2.1 Introduction

The UK construction industry provides a tenth of the UK's gross domestic product (GDP), and employs 1.4 million people. UK designers, civil engineers, contractors and component and product manufacturers have a worldwide reputation for working

overseas. The UK construction industry is one of the strongest in the world, with output ranked in the global top ten. With the increase in private finance to public sector projects, British consultants and contractors are well positioned to offer skills and experience in private finance initiative projects and can also provide high tech solutions to environmental, transport and building projects. Also, it is the section of the Department of Trade and Industry (DTI) that acts as an advise for government on strategic construction issues, with colleagues in Whitehall, to make a stronger case for construction in the UK government, in Europe and internationally.

The DTI is the main government partner with the construction industry. The department's objective is to secure an efficient market in the construction industry, with innovative and successful UK firms that meet the needs of clients and society at home and abroad. Further, the construction sector unit (CSU) of the DTI is a business relation unit and therefore takes the lead in central government on relations with the construction sector. The organisation mission is to improve the UK construction industry by:

- Building confident and open relations with key companies and organisations
- Developing high quality analysis and understanding of various sectors.
- Challenging and helping local companies to improve their performance.
- Championing various companies legitimate interests in government and elsewhere.

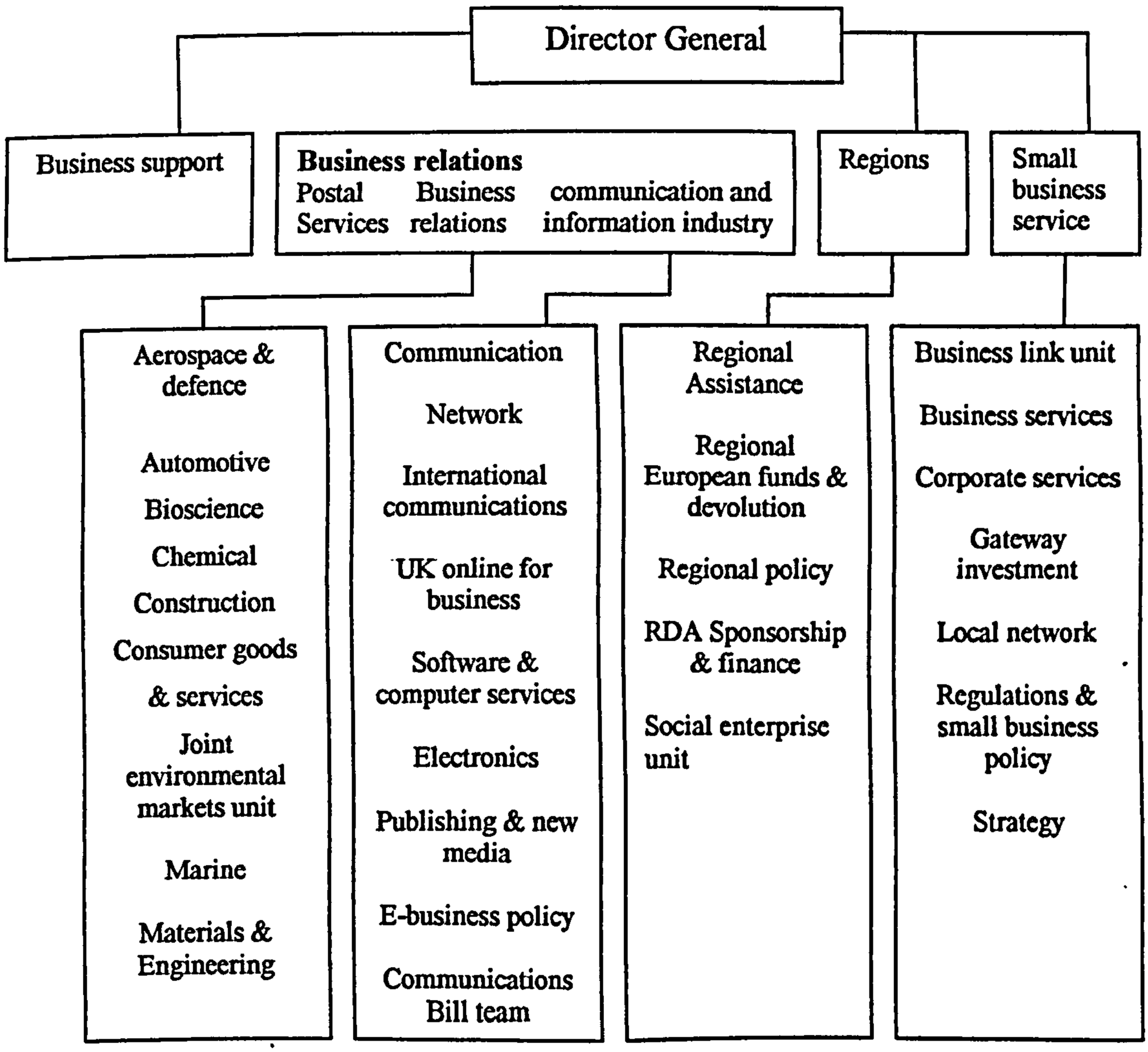
The organisation has a business group, the aim which is to make the business group work together to drive up productivity and competitiveness and thus achieve prosperity for all. It does this by:

- Developing purposeful relationships with their most important business stakeholders.

- Delivering changes in business support to make it more effective and valued.
- Working with regional organisations to improve the economic performance of the English regions.
- Developing closer working relationships between national, regional and local teams in various market sectors and ensuring a seamless service to all types of business.

The business group has four main parts: business relations, business support, regions, and small business service. (see Figure 6. 14)

Figure 6. 14 Organisational chart of



The organisation effectiveness depends upon a good understanding of its industry and developing trust between the unit and the companies and trade associations that make up the industry, so it seeks to develop this by:

- Building good working relationships with companies, trade associations and other industry bodies through regular meeting, workshops and exchanges of correspondence.
- Undertaking analysis of the competitiveness of the industry.
- Encouraging trade associations to be effective and give genuine leadership to their sub-sectors, hence
- Providing its staff with experience in the industry though secondment and visits to companies. As well as providing the opportunity to gain experience in unit activities.
- Supporting research relevant to the industry and to the objective of sustainable construction.
- Undertaking activities jointly with industry, and through the construction best practice programme.
- Encouraging the industry to participate in government-sponsored industry events and initiatives.
- Encouraging benchmarking, best practice and demonstration projects, so it all knows how the industry is performing.

6.2.2 Interviewee and KM at organisation

The interview was conducted with the head of department. The entire DTI HQ computing infrastructure resides on a single integrated network. The organisation recently implemented KM-related systems, and as such many of the organisation

staff are not fully versed with the KM-related technologies. With reference to this point, the interviewee stated:

> *"I am not familiar with the KM jargon. As I stated before, we've only just started out on the KM initiative. In our case each unit is responsible for its own knowledge management, because we've just started out, so a lot of the jargon in your questionnaire I wasn't quite sure about"*

However, after some discussion, the interviewee agreed to define KM (as perceived by his organisation) as:

> *'Finding ways to create, identify, capture, and distribute organisational knowledge to the people who need it'.*

Further, the interviewee added the identification of tacit knowledge and capturing it in a shared form to be important for the organisation. In addition, the organisation has a programme that is named construction best practice. This programme raises awareness of benefits of best practice and provides guidance and advice to UK construction organisations so that they have the knowledge and skills required to implement change.

6.2.3 Analysis

6.2.3.1 Top management commitment

The interviewee was asked if he thinks his organisation gets support from the top management. He replied:

> *"Yes, I don't have an issue with that. Knowledge management, improved knowledge management, is a key priority at the DTI and has top management backing".*

Further, the interviewee added that the top management has demonstrated its support by providing accurate information and forecast, software and hardware, and moral support for the KM-related initiatives. Implementation of knowledge sharing tools such as the intranet are a direct result of top management

commitment. Further, the top management is always committed towards making the information as current as is feasible.

6.2.3.2 KM Processes

The interviewee stated that his organisation perceives the KM-related processes to be:

"Capturing, transferring and sharing knowledge and information".

The organisation executes various means and enabling technologies to achieve these, e.g. e-mail, intranet, Internet. The interviewee further stated that the workers prefer to use a number of technical tools to share knowledge, rather than face-to-face meetings. They find this process to be much speedier than the traditional processes of knowledge sharing.

Further, the interviewee stated that the multiple channel knowledge sharing strategy is an important one towards organisational successful management and facilitation of knowledge.

6.2.3.3 IT infrastructure

As mentioned previously, the organisation has electronic files otherwise known as matrix (a concept based on software from Australia). The interviewee was asked about the difference between electronic filing and knowledge base. He replied:

> *" Well yes, I mean, electronic filing, everything goes on it. Whereas knowledge management is about storing pieces of information and, in my view the profile from the Intranet, things like the government employees of the UK and that would be the Intranet. All sorts of bog standard correspondence and so on."*

It then emerges that the electronic file contains a numerous and rich variety of data, e.g. Excel documents, PowerPoint documents and so on, and it can also obviously

keep papers. The interviewee further added that the organisation uses an Intranet, which is available to DTI headquarters, and it also has access to the Internet.

The IT construction seeks to address specific sectors of the construction industry in a 3-year campaign. It has its own website which is being developed into the pre-eminent site for IT in UK construction.

6.2.3.4 Change management programme

The interviewee maintains that changing culture is not difficult and he feels that most people are amenable to change and there are a few people who would object to it. There are many factors that help to change the workers' culture, such as motivation, empowerment, clear goal setting, vision, etc.

Further, training and personal development is encouraged at DTI. The employees and the team leaders together design an effectiveness plan. Professional training courses are then organised based on this plan. By adhering to this approach, the employees' knowledge is continuously updated. This is an example of a process adopted by the organisation to create, capture and transfer knowledge.

6.3 Case Study 3: Department for culture

6.3.1 Introduction

The central government has instigated an initiative whereby it expects all the public authorities to be able to store all the public records electronically by year 2004. Further, the government intends to introduce the Freedom of Information Act by year 2005. The latter implies that much of the information that the government departments hold will be available for the general public to see.

6.3.2 interviewee and KM at organisation

The interview was conducted with the head of information management at the central governments department of culture, media and sport.

Prior to joining this department, the interviewee delivered many and various 'knowledge & information' management projects with the health services (another prominent central government department).

The interviewee was employed specifically to analyse and implement processes that would enable the successful delivery of these two projects.

The interviewee's official title is 'Data protection officer'. However, this in itself is a hybrid of two roles: namely the data protection officer role and also the departmental records officer. The latter role is primarily concerned with the governance of the governments Public Record Act of 1958, which in essence refers to how the government actually controls the information on paper. The existing process of capturing this information on paper is relatively tedious and time-consuming, thus making the entire information life cycle difficult to manage and control.

The interviewee anticipate that through creativity and innovation, the processes associated with the information life cycle will be re-engineered, so as to simplify the capture, management and retrieval of knowledge. To this end, the interviewee stated:

> *"We have such huge and vast quantities of information (around a quarter of a million files), that at times people simply don't know where to look. The information life cycle is too long and too tedious. This implies that our information management processes are not efficient nor effective".*

6.3.3 Analysis

6.3.3.1 Top management commitment

It appears that there is a lack of awareness within this organisation concerning KM. The interviewee stated:

> *"I think if you speak to top management, they would say they understand about international targets to meet and that they understand freedom of information. But their understanding is not as good as it should be. I think there is a recognition in government that senior managers, senior civil servants, need to be much more aware of what these issues are".*

The top management, in principle, agree that KM is a good idea. However, in practice, there is a serious shortage of financial and other resources to support the KM-related initiatives. Further, the top management is committed to change, but this change can occur by training the employees. To this end, it is to be noted that training budget is restricted and is usually the first one to be significantly slashed whenever the government introduces any cost cutting initiatives. It appears that the top management is committed to doing the talk, but is hesitant to do the walk! The interviewee summed this by echoing the following centiment:

> *"The top management need to put their money where their mouth is!".*

6.3.3.2 KM processes

This organisation does not have a formal KM programme in place. However, the increasing and growing demands of information management (coupled with inefficient processes) is driving the organisation to implement mechanisms and processes that will help to eradicate such inefficiencies. The interviewee stated:

> *"The sheer volume of information that we have, and the manner in which it evolves, simply means that at times people just do not know where to look. And I think this is one of the reason why electronic record management is coming along".*

Many of the KM-related communication processes are either missing or are too complicated. With particular reference to the document version control, the interviewee stated:

> *"What we want to do is give people an environment in which they can actually create documents and work with them collaboratively, have good version control, so they always know which version was at which point and what comments were made, and then, we can say we 're happy with that process".*

Further, it is felt that the KM-related process could be simplified.

The constant evolution and mobilisation of knowledge calls for greater collaboration across the various government agencies. The interviewee stated:

> *"It would be nice if you as a citizen could go to the government and say – I've changed address and tell government once, and all the various agencies that need to know about your address change would get that information automatically".*

The interviewee acknowledged that many of the KM-related processes are missing from his organisation and attributed such fortunes to the following:

1. *"People don't know what best practice is".*
2. *"People don't know the cost of not knowing".*

6.3.3.3 IT infrastructure

This organisation utilises the IT tools such as databases, Internet, intranet and XML to store information, but not necessarily to manage knowledge. The huge volume of records have made IT a necessity for the organisation, and hence the emergence of electronic records management. The interviewee stated:

> *"We have Internet, intranet and we have databases. However, what we probably don't have is an information sharing culture.....most people will simply not know where to look".*

Further, the organisation's employees come from a very low technology base. Although people have the basic IT skill, these skills are far from an adequate level to enable profound KM.

6.3.3.4 Change management programme

This organisation is not very receptive to change nor to the management of change. The interviewee stated:

> *"In this organisation, first of all, people don't like change, they don't like technological change and they don't always put the effort into learning the systems which will actually enable them to get the best out of the system".*

The culture within the organisation appears to be one of the blocking factors towards change and its management. Upon giving possible explanations as to why people resist change, the interviewee stated:

> *"I think there are a number of reasons why people don't change. We all like things that we feel comfortable with and some of us have been working in this organisation for a long time – I have been working in government for 25 years, but I am open to new ideas, I want to actually change, I can see the benefits of change. You need to actually show people the benefits, to them personally, as to why they should work differently. It's capturing the heart. You might say, well logically I know that this is different, but I don't want to change. I am too old to change, or I don't see the need for change, or ....".*

The interviewee confessed that his organisation, along with many other organisations within the public sector, are not particularly good at managing change, and stated:

> *"...It comes back to the change management. We are not good at handling change in the civil service".*

Whilst there are many and multiple reasons for the above mentioned poor change management, one that the interviewee attributed to be the root cause is:

> *"We don't fully think through what it is that the government is trying to achieve. Until we do that, we're not going to change".*

The following table shown the CSFs of the UK organisations

Table 6.3 CSFs of the UK organisations

No	Factors / Organisations	Top – Management Supported	KM processes implemented	IT infrastructure	Change management programme
1	Public Sector Benchmarking Service	*	*	*	*
2	Department of Trade and Industry, Construction Sector Unit	*	*	*	*
3	Department for culture, media and sport			*	*

Table 6.3 shows the mapping of the CSFs (by Category) for the organisations surveyed from the UKPS. In this regard, 4 organisations from the UK PS were mapped against 4 categories of CSF. The results of the mapping are illustrated in Table 6.3. The discussion based around the findings of the analyses is presented below.

Top Management Commitment

The results of the survey show that the first two organisations surveyed have top management support concerning KM, whereas the third organisation does not have this support. Even when an organisation does have top management commitment the degree or level can differ significantly. In this regard, the interview showed that one organisation (Public benchmarking service) has strong support from the top management concerning KM. The reasons for this are many and multiple; in the main, however, a number of interviewees suggested that top management commitment is directly related to the culture within the organisation and availability of resources.

KM Processes

Two of the organisations surveyed have some form of KM-related processes in place, whereas the third organisation does not have KM processes in place. One of the interviewees suggested that:

> *"The lack of KM processes is due to top management poor commitment, lack of resources, and the lack of appropriate KM systems"*

It then becomes clear that these two categories (i.e. top management commitment and KM processes) are highly interdependent, and a gap in one category will produce a gap in the other category.

IT Infrastructure

All of the participant organisations of the UK survey have an IT infrastructure in place for KM. UK PSOs use KM technology with databases for the archiving of knowledge. Further example of UK PSOs include data mining to extract knowledge.

One interviewee mentioned:

> *"The available KM technology is not utilised to its full potential as the supporting processes are not in place"*

This suggests that if the UK PSOs wish to use technology effectively to manage knowledge, they must revise and implement the related KM systems and processes.

Change Management Programme

All of the UK PSOs surveyed have a change management programme in place. One interviewee stated:

> *"Although, we have a change management programme in place within our organisation, we do not however have a system in place to measure the effectiveness of the change programme"*

It then becomes imperative that organisations must assess the effectiveness of the change in order to progress and fully align the various initiatives taking place within the organisation. To this end, proper measurement methodologies and systems are required to be implemented.

The following Table 6.4 illustrated both Kuwaiti and UK organisations

Table 6.4 summaries of Kuwaiti (no 1-13) and UK organisations (14-16)

No	Factors / Organisations	Top – Management Supported	KM processes implemented	IT infrastructure	Change management programme
1	Union of Consumer Co-operative Societies	*		*	*
2	IT consultancy organisation	*		*	*
3	Strategy planning organisation	*		*	*
4	Social Affairs organisation	*		*	*
5	Construction organisation	*		*	*
6	Petroleum Corporation	*	*	*	*
7	Civil Service organisation			*	
8	IS consultancy organisation			*	*
9	Social organisation	*	*	*	*
10	Finance organisation	*	*	*	*
11	International airline			*	*
12	Science Research organisation			*	*
13	Public Civil Information organisation	*		*	*
14	Public Sector Benchmarking Service	*	*	*	*
15	Department of Trade and Industry, Construction Sector Unit	*	*	*	*
16	Department for culture, media and sport			*	*

Table 6.4 shows the results for the Kuwaiti and UK PSOs. Of the Kuwaiti PSOs have some form of KM processes in place, whereas two of the UK PSO have them in place. However, the former is by chance, whereas the latter is due to adherence to proper planning and procedures.

All of the organisations featured within the survey demonstrated that they have the IT infrastructure for KM. However, it is evident (from speaking to the interviewees) that in large number of cases, this IT infrastructure is not utilised effectively. Similarly, all of the organisations participating in the survey showed that that there is a change management programme in place for all of the organisations. However, very often the change management programme is carried out 'just for the sake of change'.

Although UK PSOs appear to be better at managing change than their Kuwaiti counterparts, even with the UK PSOs there exist areas of gaps related to the management of change and a more focused and a concentrated effort is thus required. The same discussion also applies for the case of KM processes.

6.16 Summary

This chapter has provided a detailed description of the qualitative primary data collected. None of the Kuwaiti organisations surveyed have a clear procedure for how to create, transfer, and share information or knowledge. The survey involved thirteen Kuwaiti and three UK public sector organisations. Further, the KM implementation as experienced by these organisations has been analysed.

In concluding, it can be said that all of the thirteen organisations do not have a direct strategy for KM implementation. Kuwait organisations have skill transfer which is part of KM processes, as well as having a database for troubleshooting on computer-

related problems. IT infrastructure exists, such as database and network that make the knowledge easy to capture. But this captured knowledge could be managed much more effectively.

With reference to the UK organisations two of them surveyed have KM processes in place. One UK organisation stated that the management related to change is not difficult, whereas the other two found this aspect a major challenge. On the whole, the UK PSOs appear to be ahead of Kuwait PSOs in the field of KM.

CHAPTER SEVEN

Quantitative Primary Data Analysis

CHAPTER 7: QUALITATIVE DATA ANALYSIS

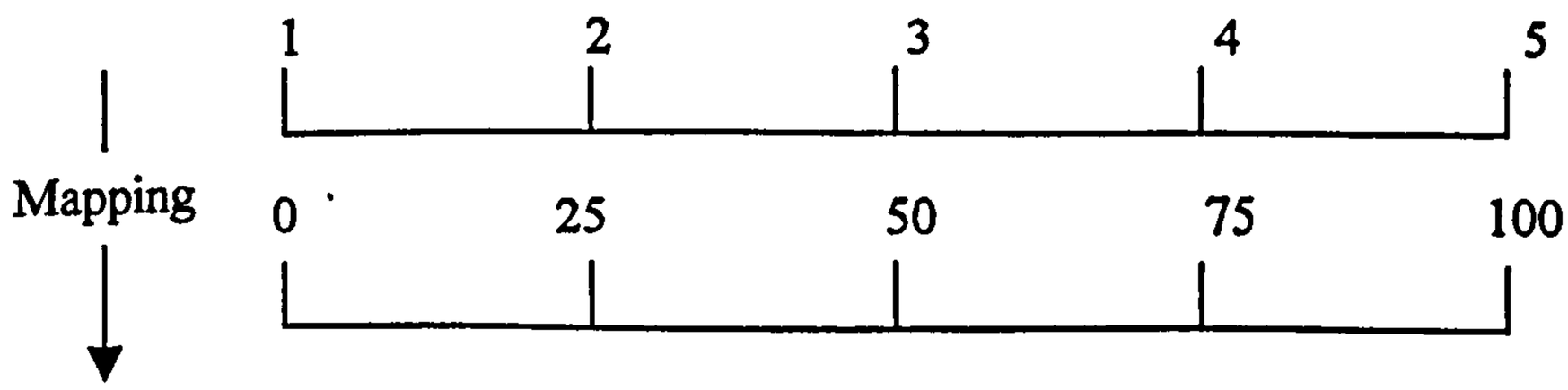
7.1 Introduction

This chapter focuses on the description and analysis of the quantitative data collected from 45 Kuwaiti and 23 UK public sector organisations using 35 CSFs identified from the literature review in chapter 2. the purpose of this analysis is to investigate the extent to which organisations in Kuwait are aware of KM implementation. Further, it considers each critical factor of KM system implementation, KM issues, KM benefits, and obstacles towards implementation of KM. It also seeks to observe the similarities and differences between their experiences of KM implementation based on the questionnaires that were distributed. The data collated is analysed utilising SPSS package along with standard statistical analysis techniques, e.g.:

1. Frequency tables to present numbers and percentages of categorical questions.
2. Descriptive measures such as mean, median, mode, and standard deviation
3. Factor analysis for KM CSFs to:
    - Reduce dimensionality of variables.
    - Find related variables within factors.
4. Variable mean line chart for importance, implementation effectiveness, and gap variables. Charts sorted according to gap are also presented

- Measure of strength (MS) = (mean-1)* 25, if scale of measurement is from 1 to 5 (see Figure 7.1).

Figure 7.1 Measure of strength (MS)



- The formula maps a scale from (1 – 5) to a scale from (0 – 100) (percentage of strength) For example: Mean = 4.51MS = (4.51-1) * 25 = 87.75 %

Further, the reliability of the two research questionnaires is found to be as shown in Table 7.1.

(see below).

Table 7.1 Kuwait and UK questionnaire reliability

Items	Kuwait	Result	UK	Result
1. KM issues contain 19 items	Alpha = .7745	Acceptable	Alpha = .7869	Acceptable
2. Importance of CSFs 35 items	Alpha = .9412	Acceptable	Alpha = .8224	Acceptable
3. Implementation effectiveness of CSFs 35 items	Alpha = .9753	Acceptable	Alpha = .9450	Acceptable
4. KM benefits 29 items	Alpha = .9850	Acceptable	Alpha = .9652	Acceptable
5. Obstacles to implementing KM12 items	Alpha = .7950	Acceptable	Alpha = .7938	Acceptable

Based on Table 7.1 the value of alpha are all within the acceptable range. For the Kuwaiti organisations, the value of alpha is found to be in the range (0.7745 to 0.9850). Table 7.1 indicates questions number 2, 3 and 4 to be highly reliable, attaining a value of 0.9412, 0.9753 and 0.9850 respectively. For the UK organisations, the value of alpha is found to be in the range 0.5131 to 0.9450. The results of table 7.1 indicate that the questionnaires exhibit strong reliability.

7.2 KM issues

Respondents were given 19 statements that describe various issues of KM, and rated them on a scale of 1 = Strongly disagree, 2 = Disagree, 3 = Neutral 4 = Agree, 5 = Strongly agree. This section approaches the concept of KM, and it could be identified if the Kuwaiti organisations are aware of the concept of KM as well as if they accept it or not. The following Table 7.1 presents the descriptive statistics for the KM issues.

Table 7.2 KM issues: Descriptive measures and Measure of Strength (MS)

		Kuwait				UK			Overall	
No	Item	Mean	Rank	Standard deviation	MS %	Mean	Rank	MS %	Mean	Rank
1	KM means finding ways to create, identify, capture, and distribute organisational knowledge to the people who need it	4.53	1	.50	88	4.65	1	91	4.58	1
4	KM is vital for organisation success in the future	4.49	2	.55	87	4.48	3	87	4.49	2
5	KM will gradually become a more important issue in the future	4.48	3	.59	87	4.39	4	85	4.45	3
9	KM programme can improve our organisations overall performance and sustainable competitiveness.	4.32	4	.67	83	4.52	2	88	4.39	4
13	KM processes are capturing and creating, storing, transferring, and sharing knowledge.	4.29	5	.59	82	3.74	10	69	4.10	7
3	Categorisation and organisation of knowledge will be a core competence for every firm	4.24	6	.71	81	3.70	11	68	4.06	9
8	The KM programme can contribute to our organisation's product or service competitiveness.	4.20	7	.67	80	4.17	5	79	4.19	5
7	I believe the KM programme fits our organisation	4.14	8	.82	79	3.90	7	73	4.19	6
2	Since organisational knowledge assets have become more important, my organisation will see greater emphasis on KM in the future.	4.11	9	.61	88	4.00	6	75	4.07	8
10	The organisation's structure should be built on confidence	4.02	10	.94	76	3.87	8	72	3.97	10
15	Success or failure of companies depends on how well they use these processes	4.00	11	.94	75	3.52	13	63	3.85	12
12	A KM specialist, such as Chief Knowledge Officer (CKO) or an external consultant, is needed for effective management of knowledge.	3.98	12	.84	74	3.78	9	70	3.91	11
6	Intellectual capital will be the primary way in which businesses measure their value	3.91	13	.82	73	3.17	15	54	3.66	13
16	KM strategy is composed of Codification strategy regarding information, and Personalisation strategy regarding people	3.89	14	.71	72	3.22	14	56	3.66	14
11	Employees' productivity is measured effectively.	3.67	15	1.00	67	3.04	16	27	3.46	15
14	Knowledge itself cannot be managed, only its processes.	3.40	16	1.03	60	3.53	12	63	3.44	16
17	Our organisation uses Codification strategy	3.27	17	1.03	57	2.84	18	46	3.14	17
18	Our organisation uses Personalisation strategy	3.04	18	1.00	51	2.53	19	38	2.89	19
19	Our organisation uses both strategies, Codification and Personalisation	2.98	19	.99	50	2.94	17	49	2.97	18

Table 7.2 shows that most items scored highly favourably, and hence indicate a strong measure of strength. For the Kuwaiti organisations, selected questions and their respective measure of strength is indicated below.

- Q1 (KM means finding ways to create, identify, capture, and distribute organisational knowledge to the people who need it) 88 %.
- Q4 (KM is vital for organisation success in the future) 87.25 %. Q5 (KM will gradually become a more important issue in the future) 87%.
- Q9 (KM programme can improve our organisation's overall performance and sustainable competitiveness) 83%.
- Q13 (KM processes are capturing and creating, storing, transferring, and sharing knowledge) 82.25 %
- Q3 (Knowledge will be a core competence for every firm) 81%.
- Q8 (The KM programme can contribute to our organisation's product or service competitiveness) 80 %.

The mean score of the 19 items for the Kuwaiti organisations range from 4.53 to 2.98 (these scores are all on the positive side of the 5 – point scale used). Further, the Kuwaiti organisations sample indicates that the MS for items 1, 4, 5, 9, 13, 3 and 8 scored highly favourably. Similarly, the standard deviations derived from table 7.2 indicate that the degree of dispersion or agreement for the Kuwaiti sample is good and strong. For example, there was more agreement on item 1 (with .5 st.dev.) and most disagreement on items 14 and 17 (with 1.03 st.dev.). Results in Table 7.2 clearly show the Kuwaiti organisations are aware of KM issues and the KM concept is accepted by them, even though the term KM is not very well known and / or not very much used.

On the other hand, the UK organisations exhibit a score that ranges from 4.56 to 2.53.

Similarly, this is also on the positive side of the 5 point scale used. items 1, 9, 4, 5, 8 and 2 exhibit strong MS.

7.3 KM critical success factors (CSFs)

This is a fundamental part of the survey. It is expected that the analysis derived from this part will shed light on as to:

> *"Why is management in the Kuwaiti public sector is unable to make total use of KM aspects in the way organisations conduct their day-to-day business, despite the existing IT resources available to them?."*

The respondents were asked to assess criticality of 35 key success factors extracted from the KM literature and previous research, and contained in two different scales, the first is concerned with the importance of CSFs, and the other is concerned with the implementation effectiveness of CSFs. The 5-point scale for importance gave 1 = Not important, 2 = Slightly important, 3 = Moderately important, 4 = Quite important, and 5 = Very important, and the second scale for implementation effectiveness gave 1 = Not implemented, 2 = Slight implemented, 3 = Moderate implemented, 4 = Quite a lot implemented, 5 = Effective implemented).

7.3.1 Importance factors

Table 7.3 presents the descriptive measures and measure of strength for importance of CSFs for Kuwaiti and UK organisations in success in KM.

Table 7.3 Importance factor: Descriptive measures and strength (MS)

		Kuwait				UK			Overall	
No	CSF	Mean	Rank	Standard deviation	MS %	Mean	Rank	MS %	Mean	Rank
13	Ensuring top management commitment	4.89	1	.39	97	4.78	7	95	4.85	1
33	Establishing user-friendly information systems.	4.82	2	.39	96	4.65	11	91	4.76	3
34	Creating culture that supports innovation, learning and knowledge sharing	4.80	3	.46	95	4.83	4	96	4.81	2
24	Improving technology infrastructure	4.78	4	.47	95	4.00	29	75	4.51	19
22	Having reward and recognition for actual performance improvement	4.77	5	.48	94	4.35	21	84	4.63	13
15	Encouraging employees to participate in both internal and external new learning opportunities	4.76	6	.48	94	4.52	14	88	4.68	7
5	Gathering information and creating knowledge	4.75	7	.49	94	4.70	8	93	4.73	4
2	Having knowledge infrastructure in both hard and soft aspects.	4.73	8	.54	93	3.96	31	74	4.46	21
30	Having an accurate and effective knowledge	4.73	9	.45	93	4.61	12	90	4.69	6
25	Using network such as Internet, intranet, e-repository	4.70	10	.55	93	4.39	18	85	4.60	15
28	Allocating adequate budgeting to fund and support KM projects	4.70	11	.55	93	4.52	15	88	4.64	12
31	Keeping continuous learning	4.67	12	.52	92	4.52	16	88	4.62	14
26	Keeping the lines of communication open.	4.64	13	.53	91	4.70	9	92	4.66	9
21	Making clear purpose and language.	4.61	14	.58	90	4.35	22	84	4.52	18
14	Providing the employees with adequate information	4.60	15	.58	90	4.91	2	98	4.71	5
27	Facilitating multiple channels for knowledge transfer and share	4.58	16	.66	89	4.04	27	76	4.39	26
18	Having Knowledge management (KM) strategy	4.57	17	.62	89	4.09	26	77	4.40	25
6	Transferring knowledge between functions	4.56	18	.72	89	4.83	5	96	4.65	10
29	Promoting ongoing employee contributions	4.56	19	.55	89	4.39	19	85	4.50	20
32	Creating friendly culture	4.56	20	.55	89	4.22	24	81	4.44	22
20	Using effective measurement of performance	4.55	21	.55	89	4.17	25	79	4.42	23

Table 7.3 (continued)

		Kuwait				UK			Overall	
No	CSF	Mean	Rank	Standard deviation	MS %	Mean	Rank	MS %	Mean	Rank
19	Applying standard, flexible knowledge structure	4.53	22	.69	88	4.00	30	75	4.35	28
35	Getting feedback from customers regarding the organisation's services	4.53	23	.94	88	4.57	13	89	4.54	17
7	Sharing knowledge between individuals	4.52	24	.59	88	4.91	3	98	4.66	8
16	Supporting team-based approaches to problem solving	4.51	25	.59	88	4.04	28	76	4.35	27
8	Sharing knowledge with members of other work groups within the organisation	4.49	26	.66	87	4.70	10	92	4.56	16
9	Sharing information and knowledge	4.45	27	.82	86	5.00	1	100	4.64	11
23	Accessing the majority of knowledge within the organisation	4.39	28	.72	85	4.48	17	87	4.42	24
4	Appointing Chief Knowledge Officer (CKO)	4.34	29	.83	84	3.74	32	69	4.13	32
3	Using knowledge mapping technique	4.31	30	.79	83	3.43	34	61	4.01	34
17	Encouraging and empowering employees	4.30	31	.82	83	3.74	33	69	4.10	33
1	Organisation seeking human values of employees	4.28	32	.93	82	4.39	20	85	4.32	29
12	Involving employees in decision-making	4.27	33	.91	82	4.26	23	82	4.26	31
10	Integrating KM in business activities	4.00	34	1.14	75	4.83	6	96	4.28	30
11	Gaining knowledge about vendors	3.83	35	1.21	70	3.23	35	56	3.63	35

A descriptive summary of the selected CSFs (for the UK and Kuwaiti organisations) along with their respective MS is presented below:

1. Q 13 (Top management support and commitment) 97 %.
2. Q 33 (Establishing user-friendly information systems) 96 %.
3. Q 34 (Creating culture that supports innovation, learning and knowledge sharing) 95 %.
4. Q 24 (Improving technology infrastructure) 94.5%.

5. Q 22 (Having reward and recognition for actual performance improvement) 94 %.

6. Q 15 (Encouraging employees to participate in both internal and external new learning opportunities) 94 %.

7. Q 5 (Gathering information and creating knowledge) 94 %.

8. Q 30 (Having an accurate and effective knowledge) 93 %.

9. Q 2 (Having knowledge infrastructure in both hard and soft) 93 %.

10. Q 28 (Allocating adequate budgeting to fund and support KM projects) 92.5 %.

11. Q 25 (Using network such as Internet, intranet, e-repository) 93 %.

12. Q 31 (Keeping continuous learning) 92 %.

13. Q 26 (Keeping the lines of communication open) 91 %.

14. Q 21 (Making clear purpose and language) 90 %.

15. Q 14 (Providing the employees with adequate information) 90 %.

Upon carefully analysing Q35 (Getting feedback from customers concerning the organisations services) the score for this question is 88%. This score is lower than the researcher expected. The researcher maintains that customer feedback is imperative for the provision of good service and organisational competitive advantage.

The researcher considers the abovementioned factors to be imperative towards the effective and successful implementation of KM.

The researcher considers the above 15 factors as those that could most affect the implementation and success of KM.

The lowest 2 factors in the Kuwaiti public sector organisations in terms of the relative degree of importance are:

1. Q10 (Gaining knowledge about vendors) 70 %.

2. Q11 (Integrating KM in business activities) 75 %.

Even though these factors are the low in importance for the Kuwaiti organisations, they are, however, relatively important factors as the score for these is over 70 %.

Similarly, the 12 factors in descending order of importance for the UK organisations are:

9, 14, 7, 34, 6, 13, 5, 26, 8, 33, and 30. Of these factors, only factor '9' exhibited MS of 100%. The UK organisations exhibited a MS range of 56 to 100.

7.3.2 Implementation effectiveness factors

As in Table 7.3, Table 7.4 shows descriptive measures for the implementation effectiveness of the factors within the Kuwaiti public sector organisations. It is clear that the degree of effectiveness of implementation is opposite to that from importance.

All mean scores (or measures of strength) of all factors were in the lower half of the scale (i.e. less than 3.78, or less than 55 % in MS).

Table 7. 4 Implementation effectiveness factors: Descriptive measures and measures of strength (MS)

		Kuwait				UK			Overall	
No	CSFs	Mean	Rank	Standard deviation	MS %	Mean	Rank	MS %	Mean	Rank
25	Using network such as Internet, intranet, E-Repository	3.78	1	1.06	70	3.57	1	64	3.71	1
24	Improving technology infrastructure	3.60	2	.93	65	2.87	12	47	3.35	2
15	Encouraging employees to participate in both internal and external new learning opportunities	3.36	3	1.11	59	3.22	4	56	3.31	3
33	Establishing user-friendly information systems	3.25	4	1.18	56	2.96	7	49	3.15	5
13	Ensuring top management commitment	3.16	5	1.06	54	2.61	21	40	2.97	10
2	Having knowledge infrastructure in both hard and soft aspects	3.14	6	1.23	54	2.43	25	36	2.89	13
26	Keeping the lines of communication open	3.11	7	1.11	53	3.30	2	58	3.18	4
5	Gathering information and creating knowledge	3.07	8	1.16	52	3.00	5	50	3.04	6

Table 7.4 (continued)

		Kuwait				UK			Overall	
No	CSFs	Mean	Rank	Standard deviation	MS %	Mean	Rank	MS %	Mean	Rank
14	Providing the employees with adequate information	3.02	9	1.10	51	2.96	8	49	3.00	8
32	Creating friendly culture	3.02	10	1.00	51	2.83	14	46	2.96	11
1	Organisation seeking human values of employees	3.00	11	1.24	50	2.70	16	42	2.90	12
16	Supporting team-based approaches to problem solving	3.00	12	1.21	50	3.00	6	50	3.00	9
31	Keeping continuous learning	2.93	13	1.15	48	3.26	3	57	3.04	7
21	Making clear purpose and language.	2.89	14	1.17	47	2.48	22	37	2.75	17
29	Promoting ongoing employee contributions	2.76	15	1.09	44	2.70	17	43	2.74	18
9	Sharing information and knowledge	2.75	16	1.08	44	2.91	11	48	2.81	14
27	Facilitating multiple channels for knowledge transfer and share	2.74	17	1.15	44	2.65	19	41	2.71	19
22	Having reward and recognition for actual performance improvement	2.73	18	1.13	43	2.65	20	41	2.70	20
22	Having reward and recognition for actual performance improvement	2.73	18	1.13	43	2.65	20	41	2.70	20
30	Having an accurate and effective knowledge	2.70	20	1.06	43	2.70	18	42	2.70	21
6	Transferring knowledge between functions.	2.67	21	1.11	42	2.30	26	33	2.54	25
35	Getting feedback from customers regarding the organisation's services	2.66	22	1.31	42	2.96	10	49	2.76	16
17	Encouraging empowering employees	2.64	23	1.17	41	2.48	23	37	2.59	23
34	Creating culture that supports innovation, learning and knowledge sharing	2.56	24	1.20	39	2.78	15	45	2.64	22
28	Allocating adequate budgeting to fund and support KM projects	2.52	25	1.21	38	2.22	31	31	2.42	27
23	Accessing the majority of knowledge within the organisation	2.50	26	1.05	38	2.09	32	27	2.36	31
20	Using effective measurement of performance	2.48	27	1.17	37	2.30	27	34	2.42	26
19	Applying standard, flexible knowledge structure	2.43	28	1.11	36	2.26	30	32	2.37	30
8	Sharing knowledge with members of other work groups within my organisation	2.42	29	1.10	36	2.48	24	37	2.44	26
11	Gaining knowledge about vendors	2.41	30	1.26	35	2.29	29	32	2.37	29
12	Involving employees in decision-making	2.40	31	1.19	35	2.87	13	47	2.56	24
18	Having knowledge management (KM) strategy	2.30	32	1.13	33	2.30	28	33	2.30	32
3	Using knowledge mapping techniques	2.22	33	1.11	30	1.52	35	13	1.99	33
4	Appointing Chief Knowledge Officer (CKO).	1.96	34	1.30	24	1.87	33	22	1.93	34
10	Integrating KM in business activities	1.91	35	1.33	23	1.87	34	22	1.90	35

The following 11 factors for Kuwaiti organisations with the highest implementation MS scores are (as extracted from table 7.4).

1. Q25 (Using network such as Internet, intranet, e-repository) 69.5 %.
2. Q24 (Improving technology infrastructure) 65 %.
3. Q15 (Encouraging employees to participate in both internal and external new learning opportunities) 59 %.
4. Q33 (Establishing user-friendly information systems) 56 %.
5. Q13 (Ensuring top management commitment) 54 %.
6. Q2 (Having knowledge infrastructure in both hard and soft aspects) 53.5 %.
7. Q26 (Keeping the lines of communication open) 53 %.
8. Q5 (Gathering information and creating knowledge) 52 %.
9. Q32 (Creating friendly culture) 50.5 %.
10. Q14 (Providing the employees with adequate information) 50.5 %.
11. Q1 (Organisation seeking human values of employees) 50 %.

Similarly, the lowest 4 MS scoring factors are (as extracted from table 7.4).

1. Q10 (Integrating KM in business activities) 23 %.
2. Q4 (Appointing Chief Knowledge Officer (CKO)) 24 %.
3. Q3 (Using knowledge-mapping techniques) 30 %.
4. Q18 (Having knowledge management (KM) strategy) 32.5 %.

The analysis shows that the factors considered being most significant and hence implemented by the Kuwaiti organisations are Q25 and Q24. These two factors fundamentally address the issues related to IT and IS. This, then clearly suggests that the Kuwaiti public sector focuses primarily on these type of factors (IT & IS) at the

expense of other KM implementation related factors. By contrast, the factors that exhibit the highest implementation MS in the UK (as extracted from table 7.4) are:

Factors 25, 26, 31, 15, 5 and 16, as well as the lowest for factors 3, 10, 4 and 23. The high score for UK organisation implementation is 64 % (which is for moderate implementation) whilst and the lowest score is 13 %, which is for very low implementing.

7.3.3 Gap between Importance and Implementation effectiveness factors

From the above factor analysis (importance and implementation effectiveness), it is possible to determine the level of gap and then assess as to why the Kuwaiti organisations are unable to exploit KM to its full potential.. The following table present the descriptive measures and measure of strength for the various items.

Table 7.5 Gap analysis: descriptive measures and measure of strength (MS)

		Kuwait			UK		Overall	
Gap No	Item	Mean	Rank	Standard deviation	Mean	Rank	Mean	Rank
4	Appointing Chief Knowledge Officer (CKO).	2.36	1	1.35	1.9	13	2.2	2
18	Having knowledge management (KM) strategy	2.27	2	1.26	1.8	17	2.1	5
34	Creating culture that supports innovation, learning and knowledge sharing	2.23	3	1.21	2.0	8	2.2	3
28	Allocating adequate budgeting towards fund and support of KM projects	2.18	4	1.21	2.3	4	2.2	4
19	Applying standard, flexible knowledge structure	2.11	5	1.15	1.7	18	2.0	9
3	Using knowledge mapping technique	2.09	6	1.24	1.9	14	2.0	10
10	Integrating KM in business activities	2.09	7	1.46	3.0	1	2.4	1
8	Sharing knowledge with members of other work groups within my organisation	2.07	8	1.16	2.2	5	2.1	6

Table 7.5 (Continued)

		Kuwait			UK		Overall	
Gap No	Item	Mean	Rank	Standard deviation	Mean	Rank	Mean	Rank
20	Using effective measurement of performance	2.07	9	1.26	1.9	15	2.0	11
22	Having reward and recognition for actual performance improvement	2.05	10	1.29	1.7	19	1.9	13
30	Having an accurate and effective knowledge	2.05	11	1.07	2.0	9	2.0	12
6	Transferring knowledge between functions.	1.89	12	1.25	2.5	2	2.1	7
23	Accessing the majority of knowledge within the organisation	1.89	13	1.08	2.4	3	2.1	8
12	Involving employees in decision-making	1.87	14	1.16	1.4	35	1.7	20
35	Getting feedback from customers regarding the organisation's services	1.86	15	1.23	2.0	10	1.8	15
27	Facilitating multiple channels for knowledge transfer and share	1.83	16	1.10	1.4	26	1.7	21
29	Promoting ongoing employee contributions	1.80	17	1.14	1.7	20	1.8	16
7	Sharing knowledge between individual	1.77	18	1.14	2.0	11	1.8	17
5	Gathering information and creating knowledge.	1.73	19	1.23	1.7	21	1.7	22
21	Making clear purpose and language.	1.73	20	1.17	1.9	16	1.8	18
31	Keeping continuous learning	1.73	21	1.11	1.3	29	1.6	24
13	Ensuring top management commitment	1.72	22	1.03	2.2	6	1.9	14
9	Sharing information and knowledge	1.70	23	1.25	2.1	7	1.8	19
17	Encouraging empowering employees	1.66	24	1.14	1.3	30	1.5	27
2	Having knowledge infrastructure in both hard and soft aspects	1.58	25	1.26	1.5	24	1.6	25
14	Providing employees with adequate information	1.58	26	1.14	2.0	12	1.7	23
33	Establishing user-friendly information systems.	1.57	27	1.15	1.7	22	1.6	26
26	Keeping the lines of communication open.	1.53	28	1.04	1.4	27	1.5	28

Table 7.5 (Continued)

		Kuwait			UK		Overall	
Gap No	Item	Mean	Rank	Standard deviation	Mean	Rank	Mean	Rank
32	Creating friendly culture	1.52	29	1.00	1.4	28	1.5	29
16	Supporting team-based approaches to problem solving	1.51	30	1.18	1.0	33	1.4	30
11	Gaining knowledge about vendors	1.40	31	1.19	.90	34	1.2	33
15	Encouraging employees to participate in both internal and external new learning opportunities	1.40	32	1.16	1.3	31	1.4	31
1	Organisation seeking human values of employees	1.30	33	1.24	1.7	23	1.4	32
24	Improving technology infrastructure	1.16	34	1.00	1.1	32	1.2	33
25	Using network such as Internet, intranet, E-Repository	.91	35	1.01	.83	35	.9	35

To identify the gap between relative importance and implementation effectiveness for each of the factors used in Tables 7.3 and 7.4, the researcher created a gap variable for each factor by subtracting the rated score for importance from the implementation effectiveness score, using the raw data collected from Kuwaiti public sector organisations variables, represented by gaps 1 to 35.

Table 7.5 shows the descriptive measures of the gap variables. For the Kuwaiti organisations, the factors with the highest gaps between importance and implementation effectiveness are:

1. Q4 (Appointing Chief Knowledge Officer (CKO)), mean 2.36.
2. Q18 (Having Knowledge management (KM) strategy), mean 2.27.
3. Q34 (Creating culture that supports innovation, learning and knowledge sharing), mean 2.23.

4. Q28 (Allocating adequate budgeting to funding and support KM projects), mean 2.18.
5. Q19 (Applying Standard, flexible knowledge structure), mean 2.11.

Similarly, the factors exhibiting the lowest gaps are:

1. Q25 (Using network such as Internet, intranet, e-repository), mean .91.
2. Q24 (Improving technology infrastructure), mean 1.16.

These gaps confirm the research key question that management in the Kuwaiti public sector is unable to make total use of KM aspects in the way organisations conduct their day-to-day business, despite the existing IT resources available to them. Further, the lowest two gaps indicate that the IT resources are available to the Kuwaiti organisations. The 'mean averaged' analysis associated with importance, implementation and the relative gap for the 35 CSFs for the Kuwaiti public sector organisations are now presented in table 7.6. Further, these analyses are graphically presented in Figure 7.2 (a) and Figure 7.2 (b).

Table 7.6 Importance versus Implementation effectiveness of CSFs

Item	Import. Mean	Implement. Mean	Gap Mean
1	4.28	3	1.3
2	4.73	3.14	1.58
3	4.31	2.22	2.09
4	4.34	1.96	2.36
5	4.75	3.07	1.73
6	4.56	2.67	1.89
7	4.52	2.71	1.77
8	4.49	2.42	2.07
9	4.45	2.75	1.7
10	4	1.91	2.09
11	3.83	2.41	1.4
12	4.27	2.4	1.87
13	4.89	3.16	1.72

Table 7. 6 (continued)

Item	Import. Mean	Implement. Mean	Gap Mean
14	4.6	3.02	1.58
15	4.76	3.36	1.4
16	4.51	3	1.51
17	4.3	2.64	1.66
18	4.57	2.3	2.27
19	4.53	2.43	2.11
20	4.55	2.48	2.07
21	4.61	2.89	1.73
22	4.77	2.73	2.05
23	4.39	2.5	1.89
24	4.78	3.6	1.16
25	4.7	3.78	0.91
26	4.64	3.11	1.53
27	4.58	2.74	1.83
28	4.7	2.52	2.18
29	4.56	2.76	1.8
30	4.73	2.7	2.05
31	4.67	2.93	1.73
32	4.56	3.02	1.52
33	4.82	3.25	1.57
34	4.8	2.56	2.23
35	4.53	2.66	1.86

Figure 7.2A Importance versus Implementation effectiveness of CSFs

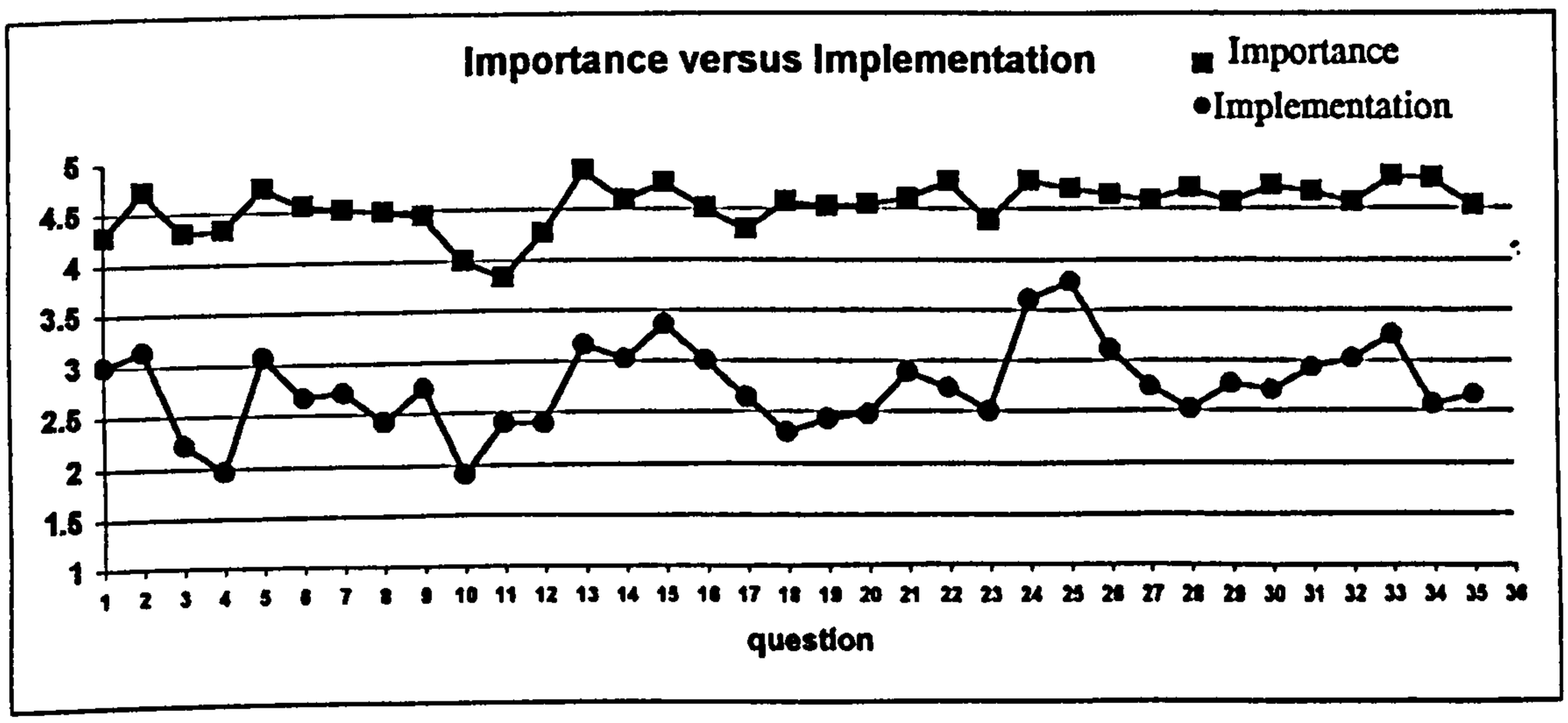


Figure 7.2B Gap between Importance and Implementation effectiveness of CSFs

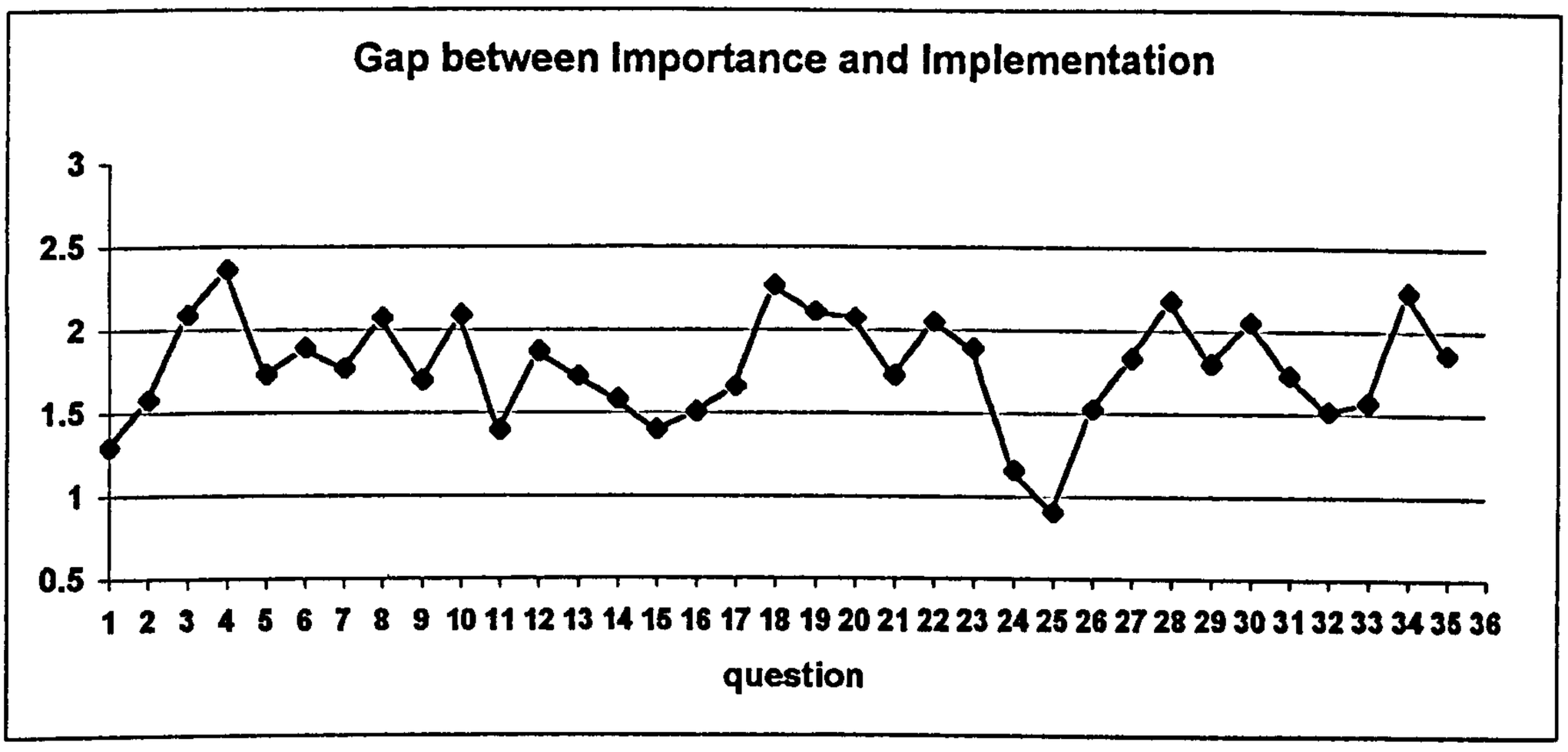


Table 7.7 and Figures 7.3A and 7.3B show the same mean scores sorted according to the degree of importance, from highest to lowest .

Table 7. 7 Importance sorted

Item	Import. Mean	Implement. Mean	Gap Mean
13	4.89	3.16	1.72
33	4.82	3.25	1.57
34	4.8	2.56	2.23
24	4.78	3.6	1.16
22	4.77	2.73	2.05
15	4.76	3.36	1.4
5	4.75	3.07	1.73
30	4.73	2.7	2.05
2	4.73	3.14	1.58
28	4.7	2.52	2.18
25	4.7	3.78	0.91
31	4.67	2.93	1.73
26	4.64	3.11	1.53
21	4.61	2.89	1.73
14	4.6	3.02	1.58

Table 7. 7 (continued)

Item	Import. Mean	Implement. Mean	Gap Mean
27	4.58	2.74	1.83
18	4.57	2.3	2.27
6	4.56	2.67	1.89
29	4.56	2.76	1.8
32	4.56	3.02	1.52
20	4.55	2.48	2.07
19	4.53	2.43	2.11
35	4.53	2.66	1.86
7	4.52	2.71	1.77
16	4.51	3	1.51
8	4.49	2.42	2.07
9	4.45	2.75	1.7
23	4.39	2.5	1.89
4	4.34	1.96	2.36
3	4.31	2.22	2.09
17	4.3	2.64	1.66
1	4.28	3	1.3
12	4.27	2.4	1.87
10	4	1.91	2.09
11	3.83	2.41	1.4

Figure 7.3A Importance versus Implementation effectiveness

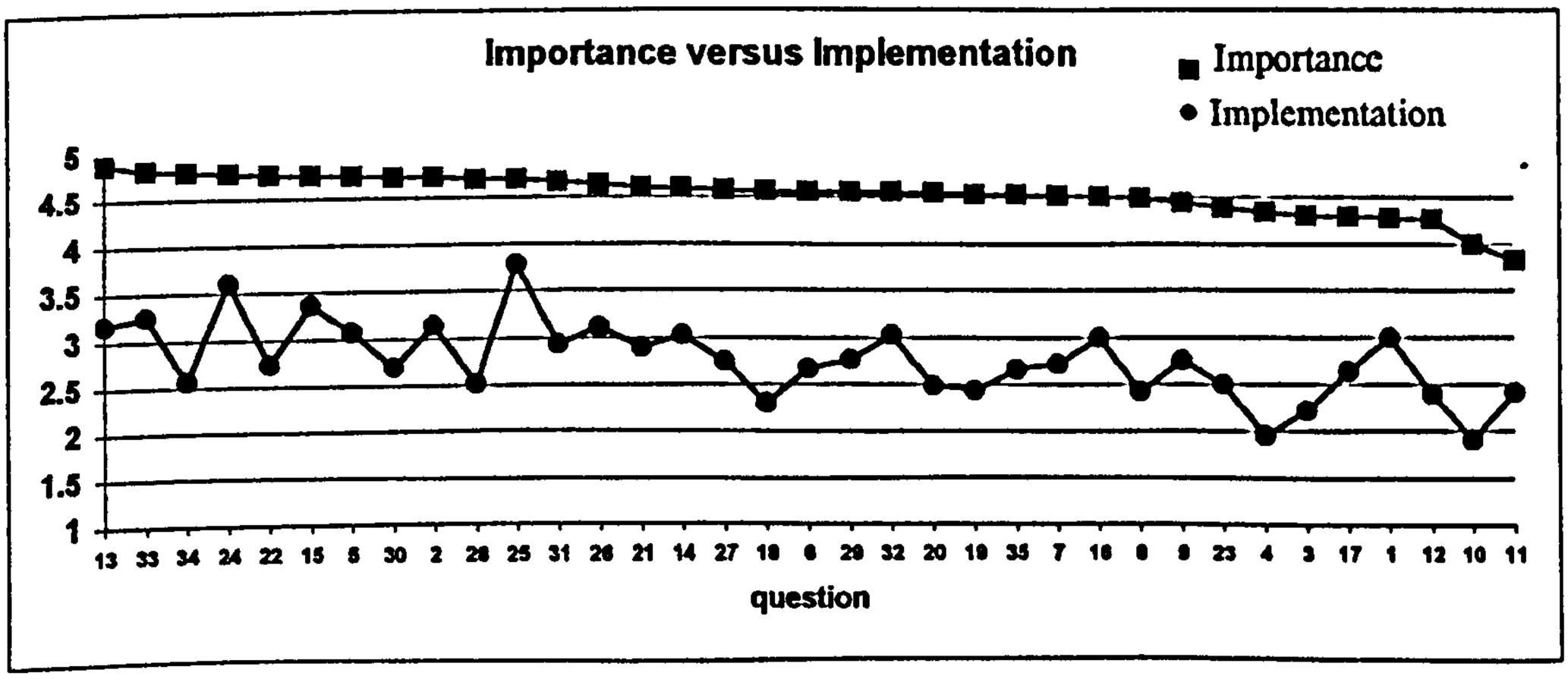
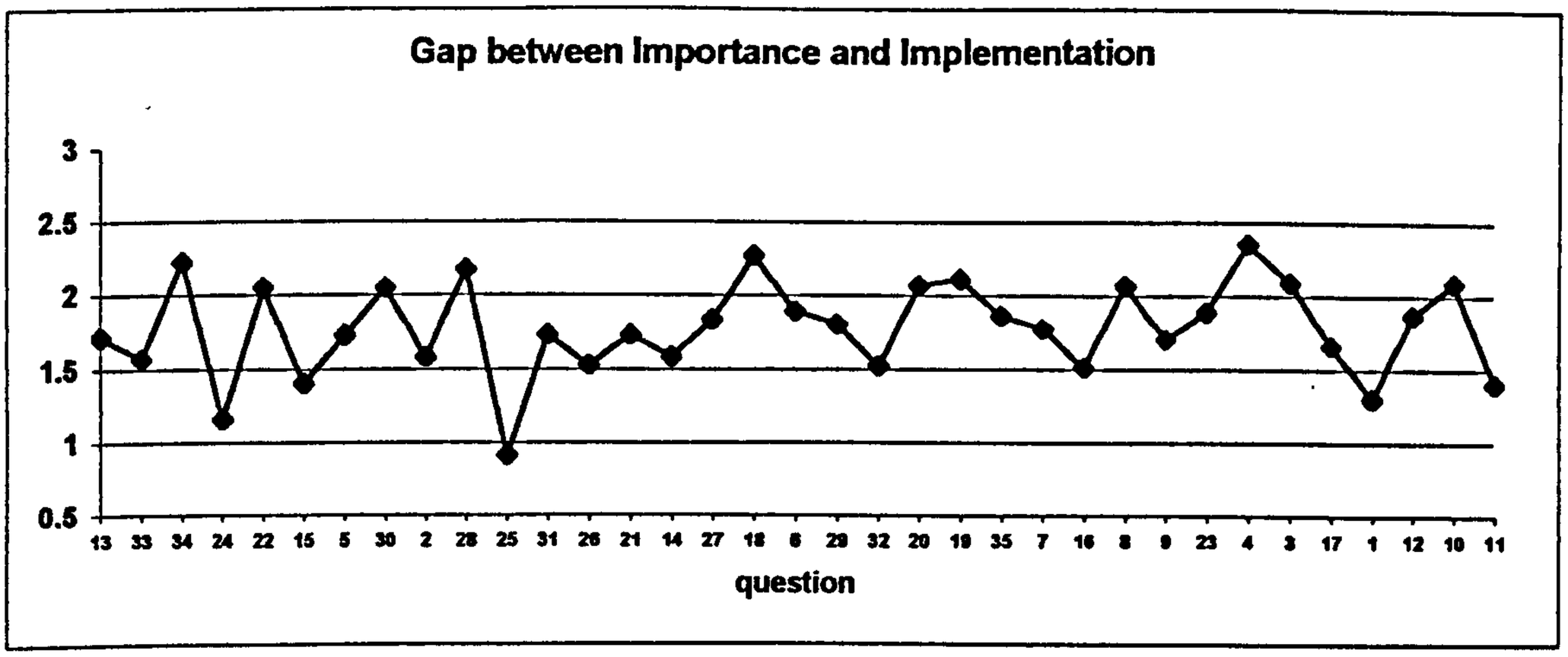


Figure 7.3 B Gap between Importance and Implementation effectiveness



Next, Table 7.8 and Figures 7.4A and 7.4B show the same mean scores sorted according to the degree of implementation effectiveness, from highest to lowest.

Table 7.8 Implementation sort

Item	Import. Mean	Implement. Mean	Gap Mean
25	4.7	3.78	0.91
24	4.78	3.6	1.16
15	4.76	3.36	1.4
33	4.82	3.25	1.57
13	4.89	3.16	1.72
2	4.73	3.14	1.58
26	4.64	3.11	1.53
5	4.75	3.07	1.73
14	4.6	3.02	1.58
32	4.56	3.02	1.52
16	4.51	3	1.51
1	4.28	3	1.3
31	4.67	2.93	1.73
21	4.61	2.89	1.73
29	4.56	2.76	1.8
9	4.45	2.75	1.7

Table 7. 8 implementation sorted

Item #	Import. Mean	Implement. Mean	Gap Mean
27	4.58	2.74	1.83
22	4.77	2.73	2.05
7	4.52	2.71	1.77
30	4.73	2.7	2.05
6	4.56	2.67	1.89
35	4.53	2.66	1.86
17	4.3	2.64	1.66
34	4.8	2.56	2.23
28	4.7	2.52	2.18
23	4.39	2.5	1.89
20	4.55	2.48	2.07
19	4.53	2.43	2.11
8	4.49	2.42	2.07
11	3.83	2.41	1.4
12	4.27	2.4	1.87
18	4.57	2.3	2.27
3	4.31	2.22	2.09
4	4.34	1.96	2.36
10	4	1.91	2.09

Figure 7.4A Importance versus Implementation effectiveness

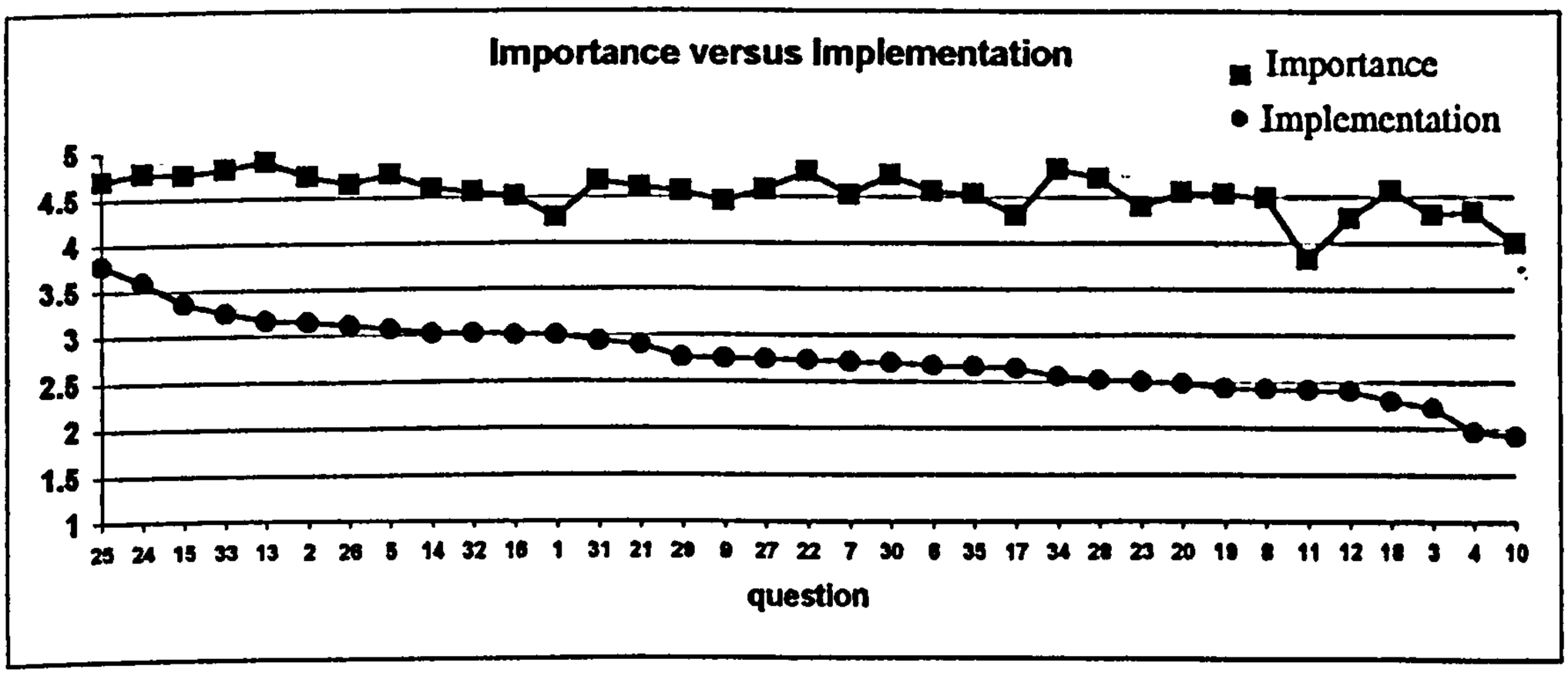
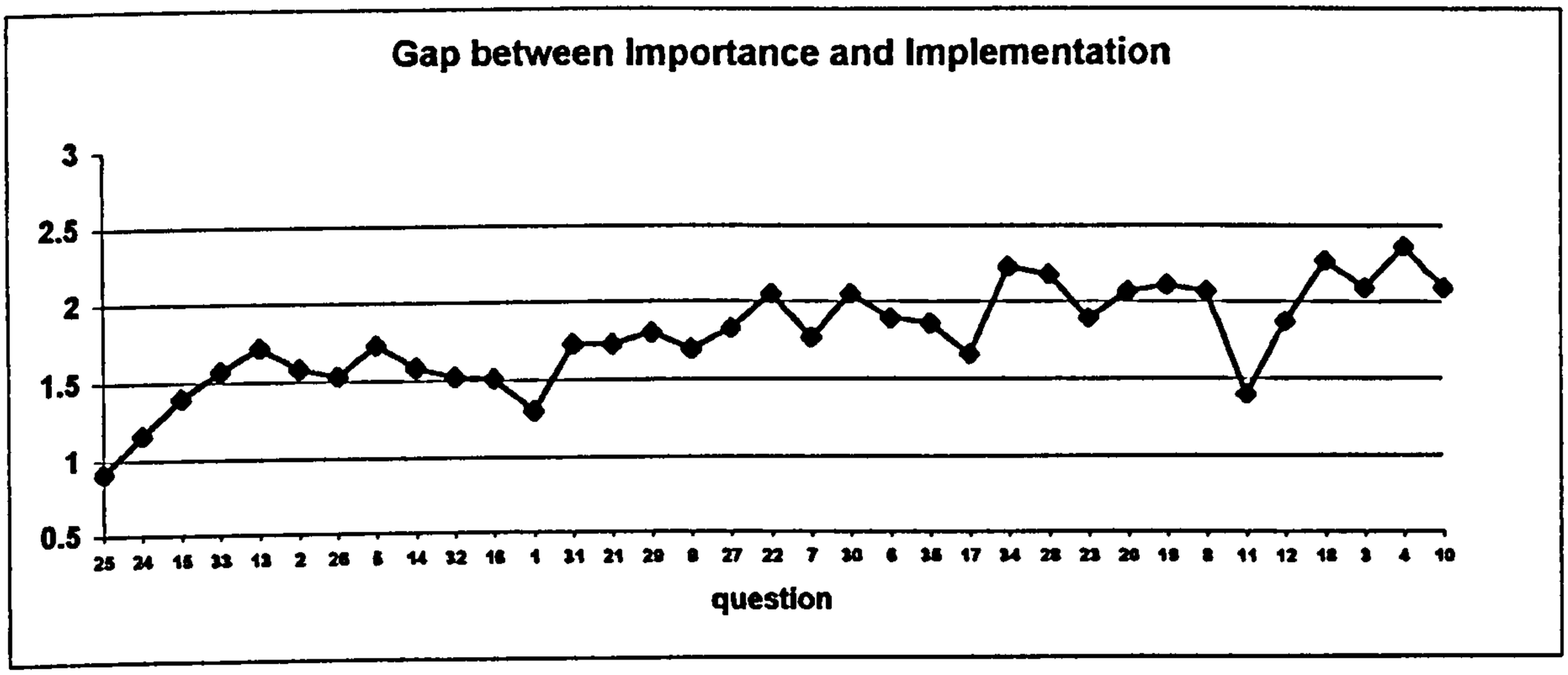


Figure 7.4B Gap between Importance and Implementation effectiveness



Next, Table 7.9 and Figures 7.5A and 7.5B show the same mean scores sorted according to the degree of gap from highest to lowest.

Table 7.9 Gap sort

Item	Import. Mean	Implement. Mean	Gap Mean
4	4.34	1.96	2.36
18	4.57	2.3	2.27
34	4.8	2.56	2.23
28	4.7	2.52	2.18
19	4.53	2.43	2.11
3	4.31	2.22	2.09
10	4	1.91	2.09
8	4.49	2.42	2.07
20	4.55	2.48	2.07
22	4.77	2.73	2.05
30	4.73	2.7	2.05
6	4.56	2.67	1.89
23	4.39	2.5	1.89
12	4.27	2.4	1.87
35	4.53	2.66	1.86

Table 7.9 (continued)

Item	Import. Mean	Implement. Mean	Gap Mean
27	4.58	2.74	1.83
29	4.56	2.76	1.8
7	4.52	2.71	1.77
5	4.75	3.07	1.73
21	4.61	2.89	1.73
31	4.67	2.93	1.73
13	4.89	3.16	1.72
9	4.45	2.75	1.7
17	4.3	2.64	1.66
2	4.73	3.14	1.58
14	4.6	3.02	1.58
33	4.82	3.25	1.57
26	4.64	3.11	1.53
32	4.56	3.02	1.52
16	4.51	3	1.51
11	3.83	2.41	1.4
15	4.76	3.36	1.4
1	4.28	3	1.3
24	4.78	3.6	1.16
25	4.7	3.78	0.91

Figure 7.5A importance versus implementation effectiveness

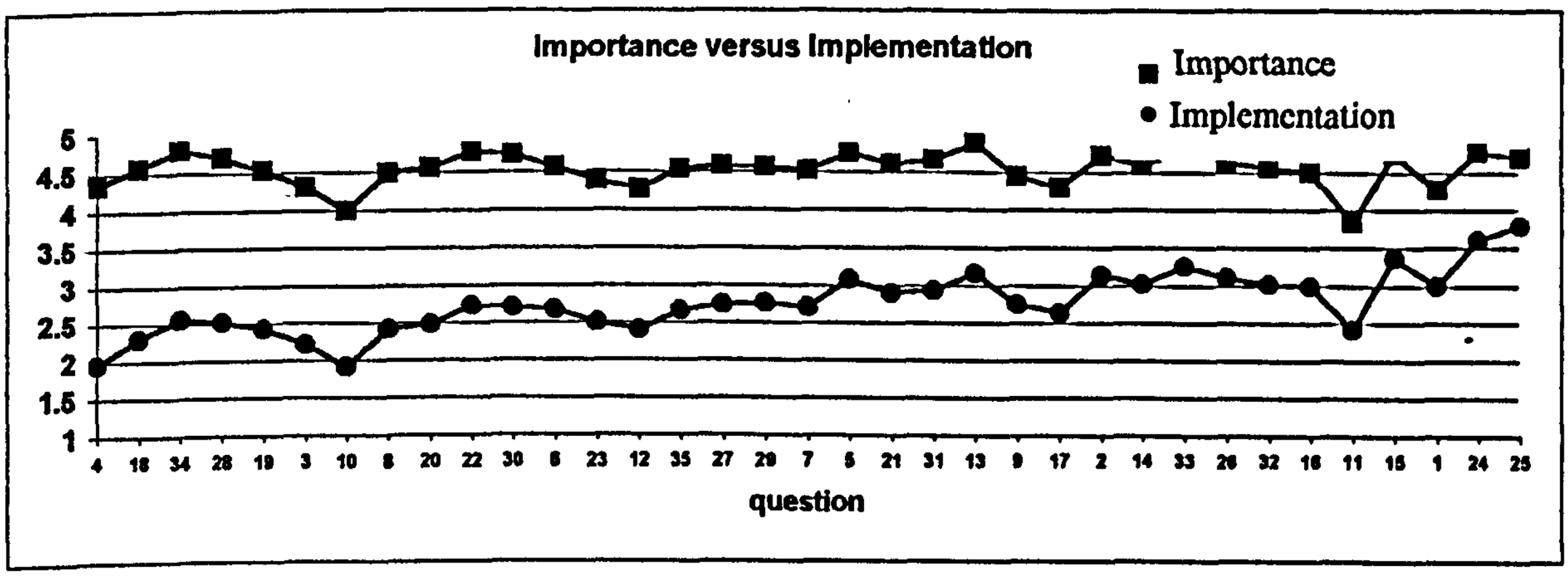
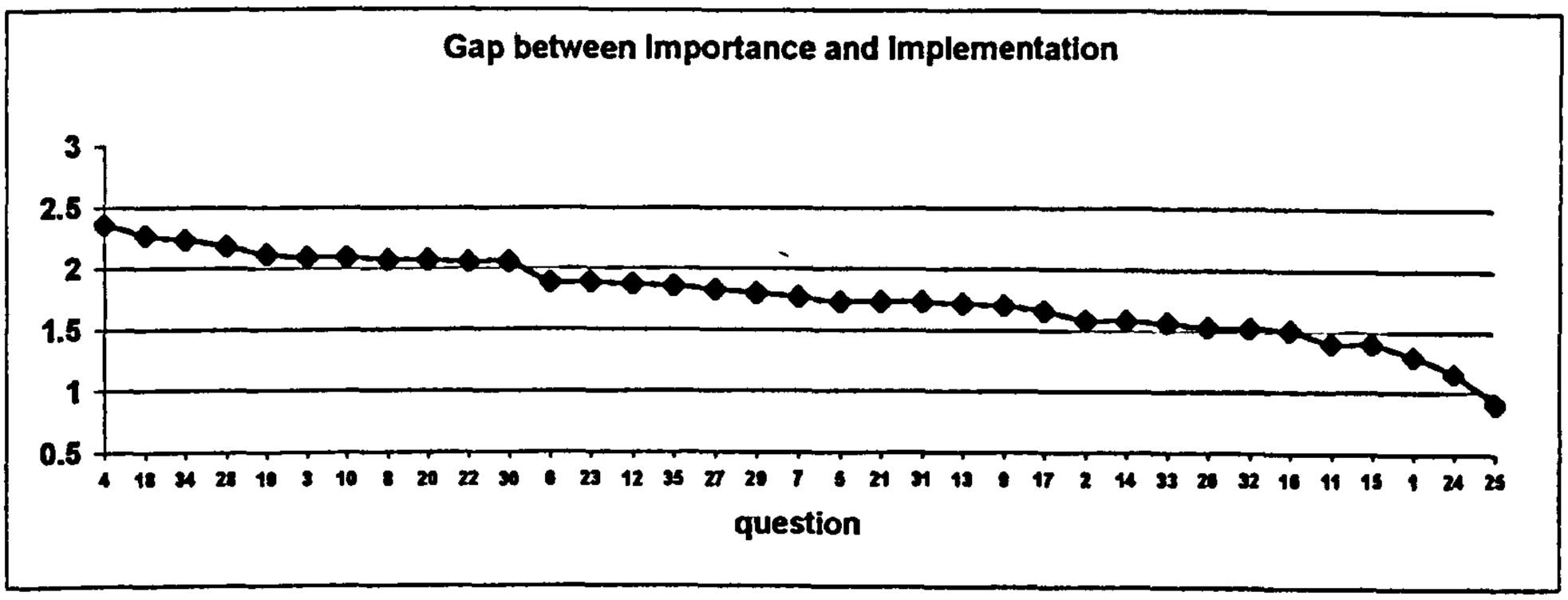


Figure 7. 5B Gap between Importance and Implementation effectiveness



Furthermore, T-Test used to get the degree of the significance of the gap between the important factors and their respective implementation (the significance for all these factors are .000). This clearly indicates that there is a gap between the importance (as perceived by the employees) and the reality of implementation (see appendix 1).

7.4 Knowledge Management Benefits

This section attempts to measures the benefits that could be derived from managing knowledge, respondents were asked to respond to 29 statement that indicate the achievement of benefits resulting from KM implementation, on a scale of 1 = Not achieved, 2 = Slightly achieved, 3 = Moderately achieved 4 = Largely achieved, 5 = Significantly achieved.

Table 7.10 Knowledge Management Benefits

		Kuwait			UK		Overall	
Gap No	Item	Mean	Rank	Standard deviation	Mean	Rank	Mean	Rank
16	Better decision making	4.40	1	.50	4.50	1	4.43	1
6	Innovating and deliver high quality products	4.38	2	.58	4.26	9	4.34	4
7	Improving innovation and new service development	4.38	3	.58	4.35	6	4.37	2
20	Increasing employees' satisfaction	4.36	4	.53	4.27	8	4.33	6
8	Increasing productivity of workers	4.33	5	.52	4.43	2	4.37	3
15	Improving employees' efficiency	4.29	6	.55	4.43	3	4.34	5
29	Improving relevant (group) competencies	4.27	7	.62	2.24	20	3.62	11
18	Ensuring knowledge-workers stay with organisation	4.24	8	.53	4.30	7	4.26	7
23	Reaching faster and better solution of problems	4.20	9	.94	4.05	11	4.15	8
3	Improving cycle time and operational excellence	3.42	10	1.01	2.26	18	3.03	16
2	Knowledge loss prevented	3.41	11	1.30	4.39	4	3.75	9
17	Sharing and learning	3.36	12	1.13	2.71	14	3.15	14
1	Leveraging investment in human capital	3.30	13	1.11	4.22	10	3.61	12
9	Making organisation focus on core business and on critical organisation knowledge	3.27	14	1.21	2.39	15	2.97	17
14	Capturing information and creating knowledge	3.27	15	1.17	3.09	12	3.21	13
21	Improving communication between knowledge-workers	3.27	16	1.17	4.39	5	3.66	10
26	Improving alignment between business strategy and technology infrastructure for knowledge sharing and development	3.27	17	1.27	2.26	19	2.97	18
4	Creating greater customer intimacy and satisfaction	3.22	18	1.05	2.22	22	2.86	19
27	Enhancing synergy between knowledge-workers	3.20	19	1.29	1.95	26	2.80	22
5	Minimising duplication of effort and loss of knowledge	3.18	20	1.19	3.00	13	3.12	15
25	Enhancing employee retention rates by recognising value of employees' knowledge	3.18	21	1.19	1.90	27	2.77	24

Table 7.10 (continued)

		Kuwait			UK		Overall	
Gap No	Item	Mean	Rank	Standard deviation	Mean	Rank	Mean	Rank
22	Operating with minimum fixed assets and overhead	3.14	22	1.28	2.32	16	2.86	20
19	Eliminating redundant or unnecessary processes	3.13	23	1.22	2.27	17	2.85	21
24	Competitive advantage.	3.09	24	1.21	2.11	24	2.79	23
10	Reducing loss of intellectual capital from employees who leave	3.02	25	1.28	2.09	25	2.70	26
12	Early warning of potential changes	3.02	26	1.26	2.23	21	2.75	25
28	Sharing information globally	2.93	27	1.32	1.90	28	2.60	27
11	Identifying new business opportunities through better KM	2.86	28	1.27	1.45	29	2.39	29
13	Giving power to employees	2.73	29	1.09	2.17	23	2.54	28

From table 7.10, 16 ranks first with Kuwaiti and UK organisations, and the following 9 variances for Kuwaiti organisations with the highest mean scores are:

1. Q.16 (Better decision-making) mean 4.40.
2. Q.6 (Innovating and deliver high quality products) mean 4.38.
3. Q.7 (Improving innovation and new service development) mean 4.38.
4. Q.20 (Increasing employees' satisfaction) mean 4.36.
5. Q.8 (Increasing productivity of workers) mean 4.33.
6. Q.15 (Improving employees' efficiency) mean 4.29.
7. Q.29 (Improving relevant (group) competencies) mean 4.27.
8. Q.18 (Ensuring knowledge-workers stay with organisation) mean 4.24
9. Q. 23 (Reaching faster and better solution of problems) mean 4.20

And the lowest three scores are:

1. Q. 28 (Sharing information globally) mean 2.93.
2. Q. 11 (Identifying new business opportunities through better KM) mean 2.86.
3. Q. 13 (Giving power to employees) mean 2.73.

The UK organisations, the highest eleven of the KM benefits scores are:

1. Q. 16 (Better decision making) mean 4.50
2. Q. 8 (Increasing productivity of workers) mean 4.43
3. Q. 15 (Improving employees' efficiency) mean 4.43
4. Q. 2 (Knowledge loss prevented) mean 4.39
5. Q. 21 (Improving communication between knowledge-workers) mean 4.39
6. Q. 7 (Improving innovation and new service development) mean 4.35
7. Q. 18 (Ensuring knowledge-workers stay with organisation) mean 4.30
8. Q. 20 (Increasing employees' satisfaction) mean 4.27
9. Q. 6 (Innovating and deliver high quality products) mean 4.26
10. Q. 1 (Leveraging investment in human capital) mean 4.22
11. Q. 23 (Operating with minimum fixed assets and overhead) mean 4.05

And the lowest four scores are:

1. Q. 11 (Identifying new business opportunities through better KM) mean 1.45
2. Q. 28 (Sharing information globally) mean 1.90
3. Q. 25 (Enhancing employee retention rates by recognising value of employees' knowledge) mean 1.90
4. Q. 27 (Enhancing synergy between knowledge-workers) mean 1.95

There are eight benefits that present a similar correlation for the Kuwaiti and the UK organisations (thus illustrating agreement), these benefits are: (1) better decision-

making, (2) increasing productivity of workers, (3) improving employees' efficiency, (4) ensuring knowledge-workers stay with organisation, (5) improving innovation and new service development, (6) increasing employees' satisfaction, (7) innovation and delivery of high quality products, and (8) operating with minimum fixed assets and overhead. Further, the UK organisations exhibit three additional benefits, these are: (1) knowledge loss prevented, (2) improving communication between knowledge-workers, and (3) leveraging investment in human capital.

The following is the last measurement of this study that attempts to identify the problems that could be faced by management during KM implementation.

7.5 Obstacles to implementation of KM

This part focuses on the problem that may occur during KM implementation in the Kuwaiti and UK public sector organisations, and It consisted 12 factors regarding the employees culture. Respondents were asked to rate the level of obstacles faced during KM implementation (using a scale ranging from 1 = Not an obstacle to 5 = Severe obstacle).

Table 7.11 Obstacles to implementation of KM: descriptive measures and measures of Strength (MS)

		Kuwait				UK			Overall	
No	Item	Mean	Rank	Standard deviation	MS %	Mean	Rank	MS %	Mean	Rank
4	Employees guard their knowledge to protect their position	4.20	1	1.38	80	3.70	2	68	3.34	10
3	Employees think no one has the right to share their knowledge	3.98	2	1.01	75	3.35	7	58	3.69	3
2	Employees see their knowledge as something private	3.87	3	1.03	72	2.83	10	46	3.59	4
8	Slow and non-user-friendly client-server databases.	3.80	4	.87	70	3.52	5	63	4.51	6
12	Low priority and resource for knowledge gathering	3.79	5	1.07	70	2.48	12	37	3.22	12

Table 7.11 (continued)

		Kuwait				UK			Overall	
No	Item	Mean	Rank	Standard deviation	MS %	Mean	Rank	MS %	Mean	Rank
6	Employees lack motivation to learn or share knowledge	3.78	6	.90	70	2.83	11	46	3.46	7
9	Lack of ability to navigate the knowledge network to find the right people and data	3.77	7	.96	66	2.91	9	48	3.40	8
7	Employees lack resources to capture and synthesise organisational learning	3.64	8	1.13	66	3.14	8	54	3.58	5
5	Employees are unwilling to learn.	3.60	9	.89	65	3.57	4	64	3.70	2
10	Turning tacit knowledge to explicit	3.19	10	.97	55	3.74	1	69	3.38	9
11	Linking KM to bottom-line results	3.19	11	1.17	55	3.43	6	61	3.28	11
1	Employees see their knowledge as power	3.16	12	.80	54	3.61	3	65	3.73	1

Table 7.11 shows the obstacles towards implementation of KM in Kuwaiti and UK organisations. The following are the 6 highest scores for Kuwaiti organisations.

1. Q.4 (Employees guard their knowledge to protect their position) 80 %.
2. Q.3 (Employees think no one has the right to share their knowledge) 75 %.
3. Q.2 (Employees see their knowledge as something private) 72 %.
4. Q.8 (Slow and non-user-friendly client-server databases) 70 %.
5. Q.12 (Low priority and resource for knowledge gathering) 70 %.
6. Q. 6 (Employees lack motivation to learn or share knowledge) 70 %.

The lowest scores are:

1. Q1 (Employees see their knowledge as power) 54 %.
2. Q10 (Turning tacit knowledge to explicit) 55 %.
3. Q11 (Linking KM to bottom-line results) 55%.

Similarly, the highest scores for the UK organisations are:

1. Q.10 (Turning tacit knowledge to explicit) 69 %.

2. Q.4 (Employees guard their knowledge to protect their position) 68 %.
3. Q.1 (Employees see their knowledge as power) 65. %.
4. Q.5 (Employees are unwilling to learn.) 64 %.
5. Q.8 (Slow and non-user-friendly client-server databases) 63%.
6. Q.11 (Linking KM to bottom-line results) 61%.

The lowest scores are:

1. Q.12 (Low priority and resource for knowledge gathering) 37 %.
2. Q.6 (Employees lack motivation to learn or share knowledge) 46 %.
4. Q.2 (Employees see their knowledge as something private) 46 %.

Based on the standard deviation for the Kuwait organisations, there is an agreement on items 1, 8 (.8, .87 standard deviation, respectively), Similarly there is a disagreement on item 4 (with 1.38 standard deviation). Results in Table 7.11b clearly show that the Kuwaiti organisations believe that the top management is the greatest obstacle in the way of KM implementation.

7.6 Factor analysis method

Factor analysis is a method used to identify questions that relate to each other, from the cause and effect perspective of the score for CSFs (importance, implementation effectiveness and gap). To summarise the dimensionality of the 35 factors used in this section, factor analysis is used for each of these three groups of CSF factors:

In each factor analysis, the following rules were used

1. Stopping rule for factoring is taken as eigenvalue $\geq$ 1.0 (default stropping rule in SPSS).
2. Extraction method: principle component method.

3. To maximise the separation between factors the varimax rotation method is adopted for the obtained factors.

7.6.1 Factor analysis for Importance

The factor analysis for the importance items presented in Table 7.12A shows that 10 factors were extracted. These factors accounted for over 85 % of total variance for the 35 original items. Table 7.12A also presents the percentage contribution of each of these factors to the total variance, and Table 7.12B presents the factor loadings for each factor (questions with the highest magnitude are considered to be the main questions in the factor).

Factor 1 consists of 5 original items: 4,24,26,27,28. This factor explained 12.5 % of the total variance in the 35 original items. The factor loadings of these 5 questions were the highest in this factor, all with positive sign. This indicates that these questions are affected by each other (i.e. they are interdependent), and this effect is in the same direction (i.e. if one of these increases, the others will increase, and vice versa).

Table 7.12A Factor analysis for Importance: Total variance explained

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13.656	39.018	39.018	4.356	12.447	12.447
2	3.710	10.600	49.619	4.215	12.043	24.490
3	2.158	6.166	55.785	3.956	11.303	35.793
4	2.045	5.842	61.627	3.119	8.912	44.704
5	1.726	4.931	66.558	3.057	8.735	53.439
6	1.660	4.743	71.301	2.895	8.270	61.709
7	1.497	4.276	75.577	2.446	6.989	68.698
8	1.232	3.520	79.096	2.352	6.719	75.417
9	1.085	3.100	82.196	1.738	4.965	80.383
10	1.007	2.878	85.074	1.642	4.691	85.074

- % of total variance explained by each factor
- cumulative % of total variance explained by factor.

Table 7.12B Summary of Importance factors analysis

Factor rank	% of variance	Main questions in factor	Factor named
1	12.5	4,24,26,27,28	KM infrastructure
2	12.05	2,5,13,14,15,16	Top management commitments
3	11.3	10,11,12,14,17	KM strategy
4	8.9	18,19,29	KM structure
5	8.7	30,31,32,33,34	Change management programme
6	8	6,9,22	KM systems
7	7	21,25,33	Technology
8	6.7	1,20,23	Culture change
9	5	7,8	KM process
10	4.7	3,35	Improving performance
Total	85.074	_____	_____

Table 7.12B, summarises the factor analysis that determines the Importance factors. All 35 variables are reduced to 10 factors by data reduction:

- Factor 1: this factor interpretation 12.5 % of the 10 factors, and includes variables 4,24,26,27,28.
- Factor 2: interpretation 12.05 % of the 10 factors, and includes 2,5,13,14,15,16.
- Factor 3: interpretation 11.3 % of the 10 factors, and includes 10,11,12,14,17.
- Factor 4: interpretation 8.9 % of the 10 factors, and includes 18,19,29.
- Factor 5: interpretation 8.7 % of the 10 factors, and includes 30,31,32,33,34.
- Factor 6: interpretation 8 % of the 10 factors, and includes 6,9,22.
- Factor 7: interpretation 7 % of the 10 factors, and includes 221,25,33.
- Factor 8: interpretation 6.7 % of the 10 factors, and includes 1,20,23.
- Factor 9: interpretation 5.% of the 10 factors, and it includes 7,8.
- Factor 10: interpretation 4.7 % of the 10 factors, and includes 3,35.

7.6.2 Factor analysis for implementation effectiveness

The factor analysis of implementation effectiveness presented in Table 7.13A shows that 7 factors were extracted. These factors explain 83 % of total variation of the 35 original questions. Table 7.13A also presents the percentage contribution of each of these factors to the total variance. Table 7.13B presents the factor loadings for each factor (the main questions in each factor).

Factor 1 consists of 7 original items: 3,4,22,23,28,29,35. This factor explains 18.75 % of the total variance in the 35 original items. The factor loadings of these questions were the highest in this factor, all with positive sign, which indicates that these items are affected by each other, and this effect is in the same direction (i.e. if one increase the others will increase, and vice versa).

Table 7.13A Factor analysis for Implementation: Total variance explained

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	19.421	55.488	55.488	6.564	18.754	18.754
2	2.561	7.317	62.805	6.196	17.702	36.456
3	1.984	5.667	68.472	4.427	12.649	49.105
4	1.450	4.144	72.616	4.354	12.440	61.544
5	1.347	3.847	76.463	4.122	11.777	73.321
6	1.246	3.559	80.023	2.204	6.297	79.618
7	1.042	2.978	83.000	1.184	3.382	83.000

- % of total variance explained by each factor
- cumulative % of total variance explained by factor.

Table 7.13B Summary of Implementation factors analysis

Factor No.	% of variance	Main variables in factor	Factor label
1	18.754	3,4,22,23,28,29,35	KM infrastructure
2	17.702	5,6,7,12,13,14,15,16,31	KM systems
3	12.649	1,2,9,22,30,31,32	KM strategy
4	12.440	24,25,26,27,33,34	Technology
5	11.777	11,17,20,21	Change management programme
6	6.297	8,10	KM processes
7	3.382	19	KM structure
TOTAL	83.000	———	———

Table 7.13B summarises the factor analysis that determine the implementation factors. All 35 variables are reduced in 7factors by data reduction, these factors are:

- Factor 1: this factor represents 18.754 % of the 7 factors, and it includes variables 3,4,22,23,28,29,35.
- Factor 2: represents 17.702 % of the 7 factors, and it includes 5,6,7, 12,13, 14, 15,16,31.
- Factor 3: represents 12.649 % of the 7 factors, and includes 1,2,9,22,30, 31, 32.
- Factor 4: represents 12.440 % of the 7 factors, and includes 24,25,26,27,33, 34.
- Factor 5: interpretation 11.777 % of the 7 factors, and includes 11,17,20,21.
- Factor 6: interpretation 6.297 % of the 7 factors, and includes 8,10.
- Factor 7: interpretation 3.382 % of the 7 factors, and includes 19.

7.6.3 Factor analysis for Gap

The factor analysis of gap presented in Table 6.14A shows that 6 factors were extracted. These factors explain 80 % of total variance of the 35 original questions. Table 7.14A also presents the percentage contribution of each of these factors to the total variance, and Table 7.14B presents the factor loading for each factor (the main items in each factor).

Factor 1 consists of 9 original items: 6,7,12,13,14,15,16,17,26. This factor explains 17.9 % of the total variation in the 35 original items. The factor loadings of these 9 questions were the highest in this factor, all with positive sign, which indicates that these questions are affected by each other and this effect is in the same direction (i.e. if one increases, the others will increase, and vice versa).

Table 7.14A Factor analysis for Gap: Total variance explained

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	19.225	54.929	54.929	6.280	17.943	17.943
2	2.769	7.911	62.840	5.325	15.214	33.156
3	1.926	5.504	68.344	5.034	14.384	47.540
4	1.478	4.224	72.568	4.672	13.349	60.889
5	1.352	3.863	76.432	3.379	9.654	70.543
6	1.298	3.708	80.140	3.359	9.597	80.140

- % of total variance explained by each factor
- cumulative % of total variance explained by factor.

Table 7.14B Summary of Gap factor analysis

Factor No.	% of variance	Main variables in factor	Factor label
1	17.9	6,7,12,13,14,15,16,17,26	KM systems
2	15	1,2,3,8,9,10,11,19	KM strategy
3	14	27,30,31,32,34	Change management programme
4	13	4,5,18,23,28,29,35	Top management support
5	9.7	24,25,29,33	Technology
6	9.6	20,21,22	KM structure
Total	80.140	———	———

Table 7.14B summarises the factor analysis that determine the gap factors. All 35 variables are reduced in 6 factors by data reduction, these factors are:

- Factor 1: this factor represents 17.9 % of the 6 factors, and includes variables 6,7,12,13,14,15,16,17,26.

- Factor 2: represents 15 % of the 6 factors, and includes 1,2,3,8,9,10,11,19.
- Factor 3: represents 14 % of the 6 factors, and includes 27,30,31,32,34.
- Factor 4: represents 13 % of the 6 factors, and includes 4,5,18,23,28,29,35.
- Factor 5: represents 9.7 % of the 6 factors, and includes 24,25,29,33.
- Factor 6: represents 9.6 % of the 6 factors, and includes 20,21,22.

7.6.4 Factor analysis for KM benefits

The factor analysis of KM benefits presented in Table 7.15A shows that 4 factors were extracted. These factors explain 81.894 % of total variance of the 29 original items. Table 7.15A also presents the percentage contribution of each of these factors to the total variance, and Table 7.15B presents the factor loading for each factor (the main items in each factor).

Factor 1 consists of 7 original items: 6,7, 8, 11,12,13, and 19. This factor explains 23.417 % of the total variation in the 29 original items. The factor loadings of these 7 questions were the highest in this factor, all with positive sign, which indicates that these items are affected by each other and this effect is in the same direction (i.e. if one increases, the others will increase, and vice versa).

Table 7.15A Factor analysis for KM benefits: Total variance explained

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	20.526	70.779	70.779	6.791	23.417	23.417
2	1.114	3.842	74.622	6.657	22.955	46.372
3	1.081	3.727	78.349	5.443	18.770	65.143
4	1.028	3.545	81.894	4.858	16.751	81.894

- % of total variance explained by each factor
- cumulative % of total variance explained by factor.

Table 7.15B Summary of KM benefits factor analysis

Factor No.	% of variance	Main variables in factor	Factor label
1	23.417	6,7,8,11,12,13,19	Managing Productivity of Efficiency
2	22.955	2,14,15,23,24,25,26,27,28	Competent People
3	18.770	1,3,4,5,9,10,16	Quality Decision Making
4	16.751	17,18,20,21,22,29	Employees' satisfaction
Total	81.894	———	———

Table 7.15B summarises the factor analysis that determine the KM benefits factors. All 29 variables are reduced in 4 factors by data reduction, these factors are:

- Factor 1: this factor represents 23.4 % of the 4 factors, and includes variables 6,7,8,11,12,13,19.
- Factor 2: represents 22.95 % of the 4 factors, and includes 2, 14, 15, 23, 24, 25,26,27,28.
- Factor 3: represents 18.77 % of the 4 factors, and includes 1,3,4,5,9,10,16.
- Factor 4: represents 16.75 % of the 4 factors, and includes 17,18,20,21,22,29.

7.6.5 Factor analysis for obstacles to implementing KM

The factor analysis for obstacles to implementing KM presented in Table 7.16A shows that 3 factors were extracted. These factors explain 64.190 % of total variance of the 12 original items. Table 7.16A also presents the percentage contribution of each of these factors to the total variance, and Table 7.16B presents the factor loading for each factor (the main items in each factor).

Factor 1 consists of 5 original items: 2,3,4,6, and 7. This factor explains 26.399 % of the total variation in the 12 original items. The factor loadings of these 5 items were the highest in this factor, all with positive sign, which indicates that these items are affected by each other and this effect is in the same direction (i.e. if one increases, the others will increase, and vice versa).

Table 7.16A Factor analysis for obstacles to implementing KM: Total variance

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.355	36.295	36.295	3.168	26.399	26.399
2	1.823	15.193	51.488	2.771	23.092	49.491
3	1.524	12.702	64.190	1.764	14.699	64.190

- % of total variance explained by each factor
- cumulative % of total variance explained by factor.

Table 7.16B Summary of obstacles to implementing KM analysis

Factor No.	% of variance	Main variables in factor	Factor label
1	26.399	2,3,4,6,7	People culture
2	23.092	5,8,9,12	Top management commitment
3	14.699	1,10,11	Organisation policy
Total	64.190	———	———

Table 7.16B summarises the factor analysis that determine the obstacles to implementing KM factors. All 12 variables are reduced in 3 factors by data reduction, which are:

- Factor 1: this factor represents 26.399 % of the 3 factors, and includes variables 2,3,4,6,7.
- Factor 2: represents 23.092 % of the 3 factors, and it includes 5,8,9,12.
- Factor 3: represents 14.699 % of the 3 factors, and includes 1,10,11.

7.7 Reliability

Reliability analysis allows the researcher to study the properties of measurement scales and the items that make them up. The reliability analysis procedure calculates a number of commonly used measures of scale reliability, and also provides information about the relationships between individual items in the scale that determine the extent to which the items in the questionnaire are related to each other

The following are the factors of reliability of importance, implementation, gap factors, and obstacles to implementing KM.

7.7.1 Factors Reliability of Importance

Based on the results of table 7.17, the reliability of the 10 factors solutions was further assessed by calculating Cronbach's Alpha for each of the factors. The Alpha values were within the acceptable level for all of them, e.g. the highest score is factor 1which is (.8755) and the lowest score is for factor 10 which is (.5455). These results indicate that the factor analysis solution is reliable.

Table 7.17 Factors Reliability of Importance

Factor	Variable in factor	Alpha	Max. Alpha after deleting variable	Variable deleted
1	X5: 4a, 24a, 26a, 27a, 28a	0. 8755	0.8717	5.26a
2	X5: 2a, 5a, 13a, 14a, 15a, 16a	0. 8754	0.8633	5.13a
3	X5: 10a, 11a, 12a, 14a, 17a	0.7972	0.7710	X5.10a
4	X5: 18a, 19a,29a	0.7257	0.7743	X5.29a
5	X5: 30a, 31a,32a, 33a, 34a	0.8311	0.8265	X5.30a
6	X5: 6a, 9a, 22a	0.6831	0.6588	X5.9a
7	X5: 21a, 25a,33a	0.7490	0.6914	X5.33a
8	X5: 1a, 20a, 23a	0.6061	0.5840	X5.1a
9	X5: 7a, 8a	0.8292	———	———
10	X5: 3a, 35a	0.5455	———	———

7.7.2 Factors Reliability of Implementation

Table 7.18, presents the reliability of the 7 factors solutions. This was further assessed by calculating Cronbach's Alpha for each of the factors. The Alpha values were within the acceptable level for all of them, e.g. the highest score is factor 1 whish is (.9589) and the lowest score is factor 6 which is (.5550). These results indicate that the factor analysis solution is reliable.

Table 7.18 Factors Reliability of Implementation

Factor	Variable in factor	Alpha	Max. Alpha after deleting variable	Variable deleted
1	X5: 3b, 4b, 22b, 23b, 28b, 29b, 35b	.9589	.9572	X5.22b
2	X5: 5b, 6b, 7b, 12b, 13b, 14b, 15b, 16b	.9392	.9496	X5.10b
3	X5: 1b, 2b, 9b, 22b, 30b, 31b, 32b	.9334	.9367	X5.12b
4	X5: 24b, 25b, 26b, 27b, 33b, 34b	.9194	.9133	X5.24b
5	X5: 11b, 17b, 20b, 21b	.8896	.8816	X5.11b
6	X5: 8b, 10b,	.5550	-------	-------
7	X5: 19b,	-------	-------	-------

7.7.3 Factors Reliability of Gap

Table 7.19, presents the reliability of the 6 factors solutions. This was further assessed by calculating Cronbach's Alpha for each of the factors. The Alpha values were within the acceptable level for all of them, e.g. the highest score is factor 1 whish is (0.9504) and the lowest score is factor 6 which is (0.8538). These results indicate that the factor analysis solution is reliable.

Table 7.19 Factors Reliability of Gap

Factor	Variable in the factor	Alpha	Max. Alpha after deleting variable	Variable deleted
1	X5: 6, 7, 12, 13, 14, 15, 16, 17, 26	0.9504	0.9491	X5.13 and X5.17
2	X5: 1, 2, 3, 8, 9, 10, 11, 19	0.8995	0.8993	X5.10
3	X5: 27, 30, 31, 32, 34	0.9229	0.9210	X5.22
4	X5: 4, 5, 18, 23, 28, 29, 35	0.8975	0.8916	X5.29
5	X5: 24, 25, 29, 33	0.8208	0.8441	X5.29
6	X5: 20, 21, 22	0.8538	0.8338	X5.22

7.7.4 Factors Reliability of benefits

Table 7.20, presents the reliability of the 4 factors. The solutions was further assessed by calculating Cronbach's Alpha for each of the factors. The Alpha values were within the acceptable level for all of them, e.g. the highest score is factor 2 which is (.9681) and the lowest score is factor 4 which is (.9369). These results indicate that the factor analysis solution is reliable.

Table 7.20 Factors Reliability of benefits

Factor	Variable in the factor	Alpha	Max. Alpha after deleting variable	Variable deleted
1	X6: 6,7,8,11,12,13,19,	.9565	.9532	X6.13
2	X6: 2,14,15,23,24,25,26,27,28	.9681	.9653	X6.14
3	X6: 1,3,4,5,9,10,16	.9411	.9386	X6.4
4	X6: 17,18,20,21,22,29	.9369	.9402	X6.22

7.7.5 Factors Reliability of Obstacles

Table 7.21, presents the reliability of the 3 factors. The solutions was further assessed by calculating Cronbach's Alpha for each of the factors. The Alpha values were within the acceptable level for all of them, e.g. the highest score is factor 1 which is (.8211) and the lowest score is factor 2 which is (.5575). These results indicate that the factor analysis solution is reliable.

Table 7.21 Factors Reliability of Obstacles

Factor	Variable in the factor	Alpha	Max. Alpha after deleting variable	Variable deleted
1	X7: 2,3,4,6,7	.8211	.8308	X7.6
2	X7: 1,10,11	.5575	.5374	X7.11
3	X7: 5,8,9,12	.7874	.7632	X7.12

7.8 Research questions

The main question that the research attempts to answer is "*Why is management in the Kuwaiti public sector unable to make total use of KM aspects in the way organisations conduct their day-to-day business, despite the existing IT resources available to them?*"

Table 7.22 Percentage of tools

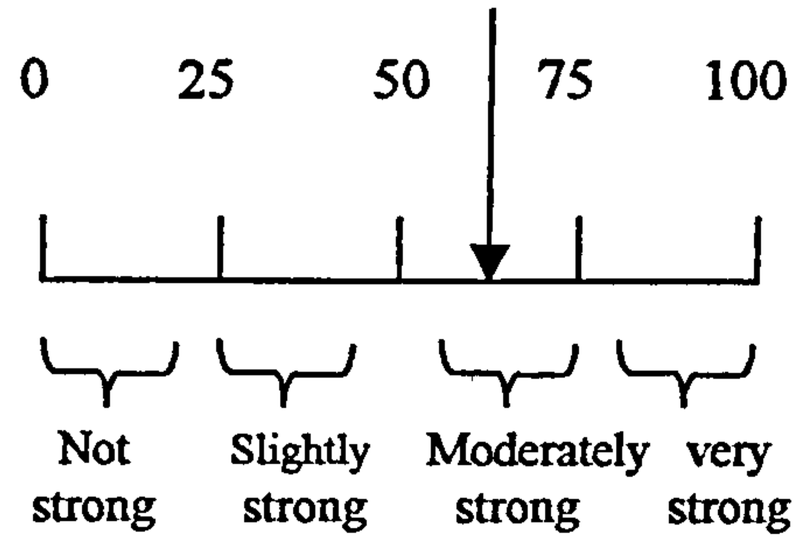
No	Tools	Valid %
1	Network	80%
	Internet	68%
2	E-mail	57.8%
	Web site	55.6%
	Intranet	53%
3	Data warehouse	44.4%
	World wide web	44.4%
	E-repository	37.8%
4	Groupware	11%
	Extranet	6.7%
	Videoconferencing	4.4%

It is clear from table 7.22, that the technology tools mostly used in the Kuwaiti public sector organisations are network connection and Internet facilities, then e-mail, Web site and Intranet tools, which are moderately used in these organisations. The least used are groupware, extranet and videoconferencing, which are considered to be new and more advanced tools in IT. These results clearly indicate that Kuwaiti public organisations do not adopt new technology quickly; rather, there is a gap between the introduction of this technology and their respective implementation.

Table 7.23 main research question: descriptive means and MS

Main Q and Q_SUB 2

Item	Measure
N	45
Mean	**3.5407**
Median	3.6667
Std. Deviation	.96279
Maximum	1.00
Maximum	5.00



The scale of these items is 1 to 5. The conversion of the mean of this scale (to determine MS) is carried out in the following manner:

(3.541- 1) * 25 = 64 %.

Table 7.23 summarise the overall mean of the items that are considered for answering the first part of the main items and sub question 3 of the study (i.e. questions Q5.24B, 25B, and 33B). Further, the table presents the descriptive measures and the MS for the overall mean of these items. From the MS of the overall mean (64 %), the researcher concludes that the actual current IT implementation is approximately 64 % in the Kuwaiti public sector organisations, which is considered a moderate extent of IT use.

The next Table 7.24 summarises the descriptive measures and MS for KM system use.

Table 7.24 Summary of descriptive measures and MS for KM system use

SUB 1

Item	Measure
N	45
Mean	2.6700
Median	2.6087
Std. Deviation	.84124
Minimum	1.00
Maximum	4.91

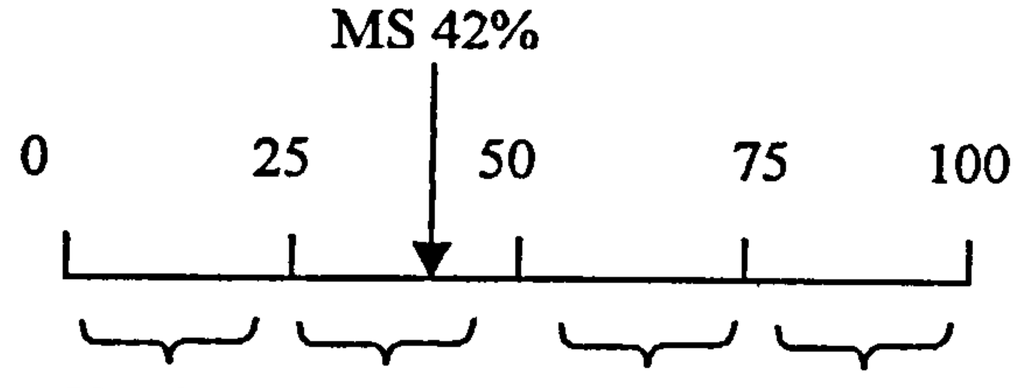


Table 7.24 summarises the descriptive measures and MS for KM system use, and also the overall mean of the items that are considered for answering Question 1 (i.e. Questions Q5.1B to 35B). The table presents the descriptive measures and the measure of strength for the overall mean of these items. From the MS of the overall mean (42 %), the researcher concludes that the current KM implementation is approximately 42% within the Kuwaiti public sector organisations, which is considered to be a low usage of KM.

Table 7.25, next summarises the overall mean of the questions considered for answering sub question 2 of the study (i.e. items 5.1B, 5.2B, 5.3B, 5.4B, 5.5B, 5.15B, 5.18B, 5.19B, 5.23B, 5.28B, 5.30B, 5.34B, and 5.35B.). The table presents the descriptive measures and the MS for the overall mean of these questions. From the MS of the overall mean (41 %), the researcher concludes that these are implemented in almost 41 % of the Kuwaiti public sector organisations, which is considered a low usage of clear plans and policies of Kuwait public sector organisations related to KM activities.

Table 7.25 Summary of descriptive measures and MS for Clear plans and policies related to KM activities.

SUB 2 Item	Measure
N	45
Mean	2.6540
Median	2.6923
Std. Deviation	.89611
Minimum	1.00
Maximum	5.00

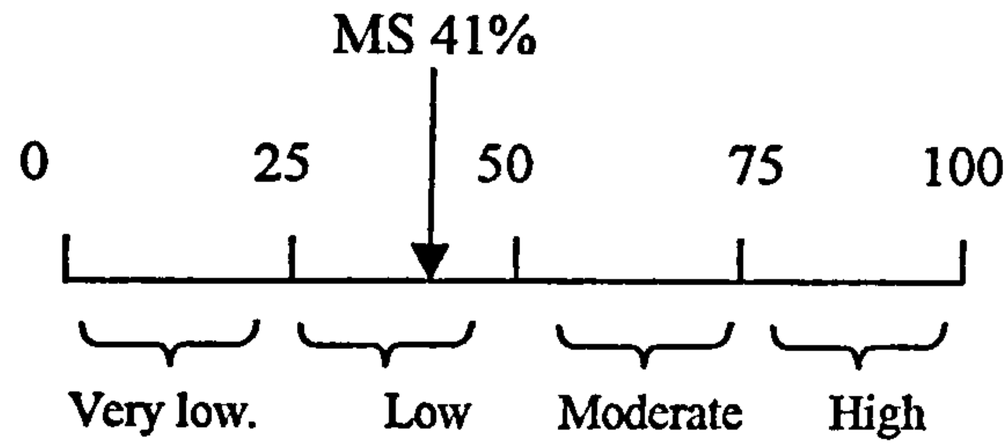


Table 7.26 summarises the descriptive measures and MS Kuwaiti public sector organisations. The table indicates that the Kuwaiti public sector organisations face many difficulties and challenges concerning the implementation of KM.

Table 7.26 Summary descriptive measures and MS for Difficulties and challenges KM implementation.

SUB4 and 7 Item	Measure
N	45
Mean	3.6312
Median	3.6923
Std. Deviation	.5429
Minimum	2.54
Maximum	4.77

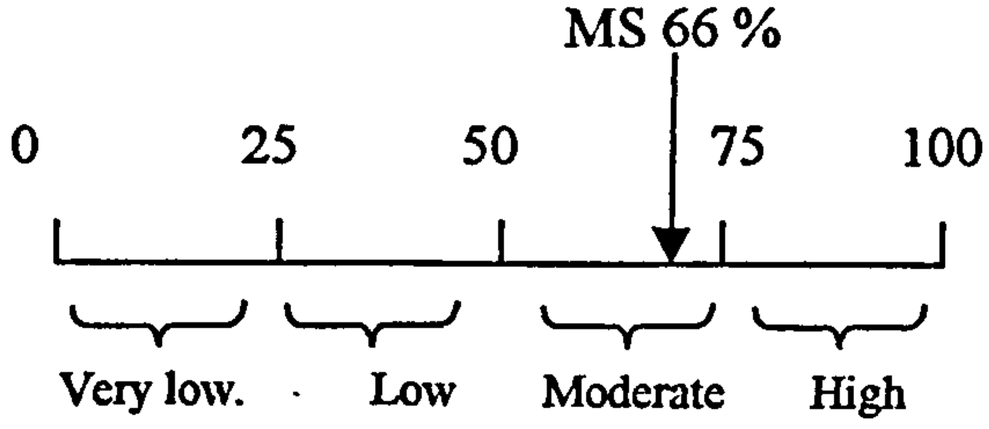


Table 7.26 summarises the overall mean of the items that are considered for answering sub item 4 and 7 of the study (i.e. items Q5.13B, and all of items from 7.1 to 7.12). The table presents the descriptive measures and the MS for the overall mean of these items. From the MS of the overall mean (66 %), the researcher concludes that these are implemented in almost 66 % of the Kuwaiti public sector organisations, which is considered moderate. This indicates that the Kuwaiti public sectors face difficulties and challenges regarding KM implementation.

7.9 Summary

This chapter has presented the quantitative primary data analysis for the survey which spanned 45 Kuwaiti and 23 UK public sector organisations.

First, the descriptive issues related to the KM were highlighted. The respective measure of strength (MS) for these KM issues was then analysed and determined. This was done for both the Kuwaiti and UK PSOs. Thereafter, to prioritise the issues they were ranked and their respective mean value was determined.

Second, the CSFs were examined for of importance for both the Kuwaiti and the UK PSOs. Here, the data were analysed by statistical methods in order to arrive at the mean and standard deviation values for the CSFs importance. Similarly, the measure of strength and the associated rank for the respective CSF were determined.

Third, the CSFs were examined for implementation effectiveness for both the Kuwaiti and the UK PSOs. Here, the data collated were also analysed by statistical methods in order to arrive at the mean and standard deviation values for the CSFs importance. Similarly, the measure of strength and the associated rank for the respective CSF is determined.

Fourth, the gap between the importance and implementation effectiveness factors was analysed and computed, again for both the Kuwaiti and the UK PSOs. The parameters derived here are: mean, rank and the standard deviation. Thereafter, the derived information concerning the gap associated with the importance and implementation effectiveness was presented graphically.

Fifth, the same statistical analysis was then applied to analyse the KM benefits as perceived by both the Kuwaiti and the UK PSOs. The resulting data output is reflected by in the mean, rank and the measure of standard deviation.

Sixth, the obstacles to KM implementation in both the Kuwaiti and the UK public sector organisations were analysed. These are essentially descriptive measures reflected in variable (factor) measures of strengths.

Seventh, the factor analysis concerning implementation effectiveness for both, the Kuwaiti and the UK PSOs was computed. This was done by extraction of sums of squared loadings and rotation sums of squared loadings. For each of the methods used (i.e. extraction and rotation), the percentage of variance and the cumulative variance for each of the components was computed. Thereafter, the gap analysis (see Chapter Four, for example) technique was applied to compute the gap between the importance and implementation effectiveness factors.

An identical methodology (to step six) was applied to conduct factor analysis of KM benefits and KM implementation obstacles.

Eight, the reliability analysis was carried out. In essence, the reliability analysis computes a number of commonly used measures of scale reliability, and also provides

information about the relationship between the individual items in the scale that determines the extent to which the items in the questionnaire are related to each other. The factors of reliability are: Importance, Implementation, Gap factors and Obstacles to KM implementation.

For each of the factors mentioned, the variables in the factors were identified. Thereafter, the alpha value was determined, and then if necessary, a given variable within the factor was deleted. The maximum alpha value after the deletion of the variable was then computed again.

In short, the survey findings from all parts of the survey instrument were analysed and possible indications from the outcomes were highlighted. Analysis of variance procedure was used to assess and test the main factors in KM implementation. This chapter has also offered T-Test procedure to get the degree of significance of the gap between the important factors and their respective implementation. Similarities and differences between the experience of KM systems in Kuwaiti and UK PSOs were considered and analysed.

Further discussion and interpretation of the findings in the context of other empirical survey research are presented in Chapter 8.

CHAPTER EIGHT

Discussion and Proposed Model

CHPTER 8: DISCUSION AND MODEL PROPOSAL

8.1 Introduction

One exploratory aim of the present research has been:

"*To Investigate why the management in the Kuwaiti public sector organisations is unable to make total use of KM aspects in the way organisations conduct their day-to-day business, despite the vast array of IT resources available to them*".

In an attempt to answer the above questions (i.e. the subject matter of the thesis), various sets of data for a number of organisations belonging to the Kuwaiti public sectors have been collated and analysed have both qualitatively and quantitatively, and have been reported in Chapters 6 and 7, respectively.

The present chapter provides a comprehensive discussion on the analysis of the results and finding of the quantitative and qualitative data presented in chapter six, and seven, and a triangulation between the quantitative and qualitative data with examination of relevant literature.

At the moment, KM implementations are a shifting business, and we believe it is time to examine it and learn from it. Further, we selecting the KM implementation because we expect to gain some value advantages.

A short summary of the traditional models (and their respective shortcomings) follows. Thereafter, a proposed generic model for the effective implementation of KM suggested based on holistic perspective

8.2 KM Applicability

It is generally found that more and more organisations of different sizes and from different sectors are beginning to embrace KM. The concept of 'global village' and virtual organisations (enabled by the recent advances in technology, e.g. world wide web, etc.) have increased the rate of flow of information. Gupta and Iyar (2000) state that organisations must apply KM-related processes and concepts to capture, transfer, archive and retrieve knowledge. This would in turn enable the organisation to leverage its KMS to further leverage employees' knowledge and organisation assets in order to help reduce organisational operation costs and cycle times.

Further, Malhotra (1998) suggests that the organisational KMS could be exploited to yield improved performance and increased employee satisfaction.

The evidence from both the Kuwaiti and the UK public sector organisations suggests that organisations do use KMS to store and retrieve knowledge.

8.3 Main Stimulus to Adopt KM

The recent advances in technology and Internet have dramatically altered the manner in which information is processed and stored. This, in turn, has had major implications for the way in which the organisational-based knowledge is managed. In today's knowledge-based (and driven) economy, organisations have embraced the reality that knowledge based assets are often more valuable than the (hard) capital assets. Certain organisations (Alazmi and Zairi 2003) maintain that the concept of intellectual capital is imperative towards organisational competitive advantage. This can be attained by leveraging knowledge more effectively. To this end, Skyrme (2002b) suggests that there are seven keys to leveraging knowledge (see Chapter 2).

It can thus be said that whilst the recent advances in IT and Internet appear to be one of the main drivers behind KM adoption by organisations, there is however ample evidence to suggest that organisations adopt KM for business benefits.

8.4 Survey findings

8.4.1 KM Issues

As KM is still a relatively maturing phenomenon, there exist many issues related to it. These can range from the misconceptions regarding KM to the implementation of KM at the organisational level.

The American Productivity and Quality Center (APQC) (2001) attempted to illustrate the barriers resulting from issues that act as a hindrance to successful implementation of KM (see Chapter 2).

The present research shows that the mean score for the 19 questions concerning KM issues and KM as used by the Kuwaiti organisations ranges from 4.53 to 2.98. Further, the Kuwaiti sample illustrates strong MS for the questions asked. The results clearly indicate that the Kuwaiti organisations are aware of KM issues and concepts, even though the term KM is not very well known (nor very commonly used). On the other hand, the UK organisations exhibit a score that ranges from 4.5 to 2.53. This also represents a positive correlation.

8.4.2 Importance Factors (CSFs)

The organisations participating in the survey were asked to assess 35 CSFs and to rank them in terms of criticality of importance for successful KM.

The top four aggregated results for the Kuwaiti public sector along with the respective measure of strength (in brackets) is indicated below:

1. Top management support and commitment (97 %)
2. Establishing user-friendly information systems (96%)
3. Creating culture that supports innovation, learning and knowledge sharing (95 %)
4. Improving technology infrastructure (95%)

These results clearly indicate that most Kuwaiti organisations perceive the top management commitment to be crucial towards KM.

The top four results of the factors in terms of the criticality of importance for the UK public sector organisations along with their respective measure of strength (in brackets) is indicated below:

1. Sharing information and knowledge (100 %)
2. Providing the employees with adequate information (98 %)
3. Sharing knowledge between individuals (98 %)
4. Creating culture that supports innovation, learning and knowledge sharing (96 %)

The above results clearly indicate that sharing information and knowledge is perceived to be very important for KM. Several interviewees stated that employees are reluctant to share knowledge and hence guard their knowledge closely.

The slight discrepancy between the results for the Kuwaiti and the UK public sector organisations for the criticality of the importance of the factors can be attributed to the cultural differences that exist between Kuwait and the UK.

8.4.3 Implementation Factors (CSFs)

The success of KM implementation effectiveness is dependent upon a number of factors. The accurate measurement of these factors is crucial for successful KM implementation.

Zairi (1994) suggests that the function of measurement is to develop a method for generating a class of information that will be useful in a wide variety of problems and solutions. A comprehensive review of the secondary literature reveals that there is not yet a clear best practice approach used in measuring the successful implementation of KM-related projects. Also, Alazmi and Zairi (2002, 2003) stated that making knowledge available to the right people at the right time is crucial for building and sustaining an organisation's competencies.

APQC (2000) believe that KM is at the heart of organisation's business and it supports the ability of every organisation to proper.

The organisations participating in the survey were asked to assess the effectiveness of a number of factors associated with implementation of KM. The top four aggregated results for the Kuwaiti public sector organisation, along with their respective measure of strength (in brackets) is shown below:

1. Using networks such as Internet, intranet (70 %)
2. Improving technology infrastructure (65 %)
3. Encouraging employees to participate in both internal and external new learning opportunities (59 %)
4. Establishing user friendly information systems (56 %)

The above results show that the factors considered to be of most significance and hence implemented by the Kuwaiti organisations are (1) and (2) above. These two factors

fundamentally address the issues related to IT and IS. This, then, clearly suggests that the Kuwaiti public sector organisations focus primarily upon the hard (IT) type of factors at the expense of other (softer) KM implementation-related factors.

By contrast, the four factors that exhibit the highest implementation measure of strength for the UK public sector organisations are:

1. Using networks such as Internet, intranet (64 %)
2. Keeping lines of communication open (58 %)
3. Continuous learning (57 %)
4. Encouraging employees to participate in both einternal and external new learning opportunities (56 %)

The comparison of the implementation factors between the Kuwaiti and the UK public sector organisations show that the KPSOs are heavily biased towards the hard aspects of KM, whereas the UK PSOs, whilst still leaning towards the hard aspects, simultaneously attempt to implement certain soft KM aspects. The vast and common availability of MIS and IS is considered to be the underlying and supporting factor that acts as an enabler towards certain softer aspects of KM in UK.

8.4.4 Gap Analysis for Importance and Implementation of CSFs

The results of the survey for the importance and implementation were scrutinised for the purposes of gap analysis (the gap analysis methodology is presented in Chapter 7).

The results show that for the Kuwaiti organisations, the top four factors with the highest gap between importance and implementation effectiveness are:

1. Appointing chief knowledge officer (mean 2.36)
2. Having a knowledge management strategy (2.27)

3. Creating a culture that supports innovation, learning and knowledge sharing (mean 2.23)
4. Allocating adequate budgeting to fund KM project (mean 2.18)

The above gaps clearly confirms the research key question that management in the Kuwaiti public sector is unable to make total use of KM aspects in the way organisations conduct their day-to-day business, despite the existing IT resources available to them. Further, the lowest two gaps are concerned with the IT (hard) aspects, and indicate that the IT resources are indeed available to the Kuwaiti public sector organisations in abundance.

Similarly, the gap analysis for the UK public sector organisations show that the top four factors exhibiting the highest gaps are:

1. Integrating KM in business activities (mean 3.)
2. Transferring knowledge between functions. (mean 2.5)
3. Accessing the majority of knowledge within the organisation (mean 2.4)
4. Allocating adequate budget towards funding and support of KM (mean 2.3)

8.4.5 KM Benefits

There are many and multiple benefits that an organisation can derive from the successful implementation of KM. Such benefits, can in general, be divided into two categories:

1. Intangible benefits
2. Tangible benefits

However, this study reveals that the intangible benefits are more realised by the organisations rather than the tangible benefits. To this end, Sveiby (1997a) suggest a measurement tool known as the intangible assets monitor.

This tool has a presentation format which displays a number of relevant indicators for measuring intangible assets. It consists of three dimensions:

1. External structure indicators,
2. Internal indicators, and
3. Competence indicator

Research, however, indicates that although organisations have heard of some of the above-mentioned tools/methodologies, a large majority of organisations do not actually use any tools or a systematic methodology to measure or capture the value generated by or due to the management of knowledge.

The present research systematically attempted to measure the benefits that could be derived as a consequence of KM. The participants of the survey were asked 29 questions that indicated the achievement of benefits resulting from KM implementation. The results show that the top four benefits of KM as perceived by the Kuwaiti PSOs:

1. Better decision making (mean 4.40)
2. Innovation and delivery of high quality goods (mean 4.38)
3. Improving innovation and new service development (mean 4.38)
4. Increasing employee satisfaction (mean 4.36)

Similarly, the top four KM benefits as perceived by UK PSOs are:

1. Better decision making (mean 4.50)
2. Increasing productivity of workers (mean 4.43)
3. Improving employee efficiency (mean 4.43)
4. Knowledge loss prevented (mean 4.39)

Of the benefits assessed, there are eight benefits that present a similar correlation for the UK and the Kuwaiti organisations. This illustrates a good harmony, indicating that

organisations all over the globe are in pursuit of deriving similar benefits by effectively attempting to exploit KM.

8.4.6 Abstract to KM implementation

The study shows that the obstacles towards implementation of KM in Kuwaiti and UK organisations. See Table 8.1 shows the 6 highest scores for Kuwaiti and UK, and the 3 lowest scores as well.

Table 8.1 Obstacles to KM implementation

		Kuwait			UK	
NO.	Items	Highest score	Lowest score	Standard deviation	Highest score	Lowest score
1	Employees guard their knowledge to protect their position	80 %.		1.38	68%	
2	Employees think none has the right to share their knowledge	75%		1.01		
3	Employees see their knowledge as something private	72%		1.03		46%
4	Slow and non-user-friendly client-server databases	70%		.87	63%	
5	Low priority and resource for knowledge gathering	70%		1.07		37%
6	Employees lack motivation to learn or share knowledge	70%		.9		46%
7	Employees see their knowledge as power		54 %	.8	65%	
8	Turning tacit knowledge to explicit		55 %	.97	69%	
9	Linking KM to bottom-line results		55 %	1.17	61%	
10	Employees are unwilling to learn			.89	64%	

The items on which both Kuwaiti and UK organisations have agreed are 1 and 4, while there are some items highest in the former but lowest in the latter (7,8, and 9). In contrast, some are lowest in UK PSOs but highest in Kuwaiti (3,5 and 6).

Based on the standard deviations (Table 7.10) for the Kuwait organisations, there is an agreement on items 4 and 7 in Table 8.1 (.8, .87 standard deviation, respectively), Similarly, there is a disagreement on item 1 (with 1.38 standard deviation). Results in Table 7.11 clearly show that the Kuwaiti organisations believe that the top management is the greatest obstacle in the way of KM implementation.

The research shows this factor exhibits a significant gap (13 % variance). The factor analysis reveals that there exists a correlation between top management commitment and change management programme.

8.5 Case Studies Findings

As mentioned in Chapter 6, the interview questions were categorised into four categories: top management commitment, KM processes, IT infrastructure, and change management programme (see Table 6.1).

8.5.1 Top management commitment

Top management support is mainly concerned with supporting hard or IT infrastructure, and that might explain why KM is not applied. But ten of the organisations surveyed are willing to apply and support KM implementation when they have sufficient processes to support a KM infrastructure. Top management commitment and support is one of the most significant success factors of KM. This is consistent with Davenport and Prusak (1998), Davenport et al. (1998), Trussler (1998), Liebowitz (1999), Choi (2000), Skyrme (2000), Skyrme and Amidon (2000), Streele (2000), and Heisig (2001).

Most of the Kuwaiti and UK organisations have support from top management, but the question is "Is this support proper and strong enough to develop the organisation's activities?". Based on the interviews, it is clear that some of organisations feel bad towards the top management because they do not get appropriate support. Also, because the KM concept is mature and new management, the top managements are not aware and qualified to understand new technology, as well as being unwilling to develop or adopt any new notion. In the researcher's point view, the top management are lazy and nobody monitors their activities (e.g. if they develop the organisation or not, it does not make any difference or benefits for them).

One interviewee stated:

> *"There exists a good relationship among the top management, but not necessarily between the top management and the employees. To resolve this, appropriate communication processes must be put in place".*

Further, it is found that the top management within the KPSOs does not promote the effective performance management for its employees. This, in turn, is attributed directly to the absence of adequate KM performance support systems. The benefits derived from KM are not measured either; for example, it was found that within the KPSO there is very little or no emphasis on employee or system productivity (nor is it measured appropriately). Instead, irrelevant measures are in place that capture the wrong type of information concerning employees and systems (i.e. number of hours worked, etc.). By definition, the function of management (or a management system) is to deliver the objectives of the organisation through its employees and systems in a productive and efficient manner. In the light of this definition and our earlier findings, it then becomes clear that the KPSOs' top management is clearly failing to exploit the productivity of its employees, thus impacting on the organisational deliverables, and hence the objectives.

8.5.2 KM process

Some authors (Chan, 1999; Snyder and Wilson, 2000) believe that there are different definitions of KM. Newman (1999) defined KM as finding ways to create, identify, capture, transfer organisational knowledge to the people who need it, and what people need to know to do their jobs efficiently. The Kuwaiti and UK organisations agree with the Newman definition.

Processes in KM are useful to focus on in developing a KM strategy, and these processes are creating, capturing, transferring, and sharing knowledge (Radding, 1998; Bassi, 2000; Bednar, 2000; Mertins et al. 2001).

The researcher means by KM processes creating, capturing, transferring, and sharing for using. KM is vital if the organisation is to create more teamwork and support employees' learning and sharing information and knowledge. O'Brien and Crauise (1995) stated that when workers are more creative, more team-oriented, more willing to share ideas, KM is more effective.

Almost all organisations do not have KM processes (see Table 6.4). Three of them used transferring and sharing information between the employees, but not under KM processes or systems, and this happens accidentally. Because the relationship between employees and their boss is one of a friendly nature, the better relationship enables them to help each other. Also, eleven of them have skill transfer, which is part of KM processes, as well as having a database for troubleshooting related to computer- oriented problems, whereas two of the UK organisations have KM processes in place.

8.5.3 IT infrastructure

As mentioned in Chapter 6, Kuwaiti and UK organisations have an IT infrastructure, and they are able to have the latest technology that they need. They believe that IT can support KM processes (e.g. networks, Internet, intranet).

One of the drivers behind the recent surge in KM is the emerging advances in technology. As both KM and the associated technology are undergoing the maturity phase, there still exists much room for improvement and standardisation (Radding, 1998; Duffy, 2000; Morse, 2000).

The results of the interviews show that whilst a number of organisations use content management systems (CMS) to capture and customise knowledge, these tools are however at times inadequate to meet the substantial and changing needs of the organisations. With the exception of a few CMS, Internet and intranets, there exists no evidence to suggest that a bespoke KM software is used by any of the organisation featured in the survey. Further, the usage of the legacy systems imposes constraints upon the integration of KMS, and hence disrupts the seamless flow of knowledge from one channel to another.

8.5.4 Change management programme

All interviewees believe that their organisations attempt to develop their employees to give them opportunities to improve their skills by providing training courses and on the right subject for their job description. In these organisations, seven of them (two UK) have an excellent system for their employees, the subjects fit well with the employees' job, and they continue to improve employees' skills and their productivity. In contrast, nine of them (one UK) do not pay any attention to their employees, the subjects of their training do not fit with the employees' job, and they do not have the right training strategy. For that reason, no employee has a clear policy on how to do his or her job,

everyone is doing the same job in different ways, and employees are always complaining.

Most of the interviewees mentioned that changing culture is not easy, some said it takes at least two years. In the light of the researcher own experience, it depends on the country first, then on the personality of employees, and thirdly on the strength of the organisation. The main factor that could help an organisation is motivation of people. Larson (1999) stated that it is important to first consider the company's cultural environment before implementing KM. Organisations that want capture the knowledge of their workers must grow a culture that support teamwork and knowledge sharing. Employees may not share with others if they do not get benefits, so the organisation must take responsibility bringing about the change in mind place required to implement KM.

Without proper trainers and training procedures, knowledge creation would not be possible. Gordon (1999) stated that training professionals should play an important role in the success of KM. As mentioned in Chapter 3, KM has two types of strategy: codification strategy, centred around the computer, and personalisation strategy, related to people as a way of meeting and communicating. Also, Gordon proposed two training strategies: codification and personalisation. Under the codification approach, organisations use a computer database to organise, store, and retrieve information.

Further, it is found that the following practices carried out within the KPSO act as a hindrance to the effective management of change:

- Focus on short-term results
- Reactive approach

- Functional organisation perspective (e.g. will only share knowledge and information with the people from the same department)
- Limited sense of personal responsibility of organisational success
- No sense of unity (i.e. us and them scenario)
- Employees are not encouraged or motivated to learn new things, whereas consultants are
- Problems or complaints do not get attended to straight away
- No structured development of employees
- No culture of nurturing ideas (or welcoming of new and innovative ideas).

8.6 General findings (triangulation)

8.6.1 KM Challenges

As KM is a relatively maturing phenomenon, there exist many challenges for KM. These range from cultural issues, top management commitment and other barriers that act as a hindrance towards the successful implementation of KM. The survey attempted to capture such challenges (both qualitatively and quantitatively).

The findings of the primary and the secondary data analysis are in harmony, indicating that inadequate top management commitment, inappropriate change management, and lack of KM processes are some of the major challenges responsible for the lack of successful KM implementation.

The result of the survey of CSFs is consistent with the case studies' finding that all of the Kuwaiti organisations believe that top management support is the most important factor for successful KM

8.6.2 CSFs categories

The study findings show a worldwide spread of implementation of KM. Further, this study clearly reveal that KM is being adopted in organisation of all size, from small to very large, and are applicable to all sectors and types of organisation. ABQC (2000) believe that KM is at the heart of organisation's business and it supports the ability of every organisation to prosper. Drucker (1995) writes, " Knowledge has become the key economic resource and the dominant-and perhaps even the only source of comparative advantage."

Successes depend on a top management supporting and a clear strategic logic for KM process. Radding (1998) said that if top management does not strongly support KM in word, exploit, and the behaviour of individual executive, ant KM effort would be stressed.

8.6.2.1 Top management commitment

All of study findings in this research confirm that the factor of top management commitment and support is the most important critical factor in KM implementation (see Chapters 6 and 7). This result is in agreement with previous study finding (Jummarkar, 1996; Shein, 1998; Anonymous, 2001; Mouritsen et al., 2001; Wijnhoven, 2001; Begbie and Chudry, 2002; Bornemann and Leitner, 2002; Choy and Lee, 2002; Demers, 2002; Fox, 2002; Kannan and Akhilesh 2002; Pablos, 2002; O'Dell, 2003; Palmer, 2003) it is no surprise that this is so; a review of literature reveals the emphasis placed on top management commitment and support (e.g. Davenport et al., 1998; Trussler, 1998; Liebowitz, 1999b; Choi, 2000; Streele, 2000; Heisig, 2001; Skyrme, 2002a).

The results from all study methods in this research suggest that the factor of top management commitment and support and the success of the KM implementation are positively linked. Results from the secondary data analysis show that about 92% of organisations identified that this factor was a critical for their successful implementation of KM implementation (see table 4.9) and result from survey suggested similar importance (see Tables Table 7.3, 7.11B). Moreover, the case study reveals that this factor was crucial to achievement of KM success (see Chapter6).

In essence, the decision-making should look to the KM system as a business solution rather than an IT solution. Top management should fulfil their controlling function to avoid pitfalls or failure in implementation, as the absence of this cause major KM failure.

Clearly, the study result emphasise that the top management commitment and support are instrumental in the successful implementation of KM. Moreover, top management commitment is not only needed for initiation KM implementation. It is essential to sustain the same level of commitment all the way during implementation and subsequent running of the KM implementation.

8.6.2.2 KM process

As supported by Macintosh (1998), Radding (1998), Bassi (2000), Bednar, (2000), and Mertins et al. (2001), all Kuwaiti and UK organisations strongly agreed that having a strong and structure KM process is a crucial condition for success. KM process is the main tool that keeps employees working properly. The Kuwaiti and UK cases studied note that by using KM process like creating, transferring, and sharing knowledge, supporting with training, learning and technology, will help leverage organisational capabilities, for example saving time and reducing cost, getting useful information with

no duplication, exchanging experience between the employees, and workers doing their job efficiently. Its best practices include using newsletters, face-to-face e-mail meeting and seminar.

This study clearly reveals that KM process is a major tool in the leverage organisations' knowledge (see section 2.9). The survey results show the KM process is viewed as one of the most critical factors (see Table 7.2). This result harmonises with the some authors perceive (e.g. Davenport and Prusak, 1998b, Bassi 2000, Bednar, 2000).

Although the secondary data case studies reveal that KM process is one of the most successes of many organisations which adopt KM implementation (see Figure 4.8).

Successful KM implementation requires a full and deliberate KM process, the researcher consider these processes as the heart of KM implementation, based on literature review (LR), case studies, and survey KM process is the most critical success factors for KM implementation.

8.6.2.3 IT infrastructure

The majority of authors maintain that there exists a strong relationship between KM and IT (Sierhuis, 1996; Bassi, 1997; 2000; Malhotra, 1998; Manasco, 1999; Duffy, 2000; Lim et al., 2000; Snyder, 2000; Vaast, 2000; APQC, 2001b; Heisig, 2001; Mertins, 2001). On the other hand however, some authors maintain that IT contributes little assistance toward KM, and that it is possible to manage knowledge without IT (Poynder, 1998; Chait, 1999; Newman, 1999; O'Dell and Grayson, 2000; Morse 2000).

In fact, from this researcher's point of view, the KM and IT are complementary, and IT plays the main role in KM processes such as communications, capturing, transferring,

and storing knowledge. It is unthinkable implementing KM effectively and efficiently without IT.

Managers need information systems that help them in tracking and building the organisation's collective knowledge, leverage knowledge. Davenport et al. (1998) identified two of the most critical factors for successful KM implementation. (1) Establishment of a broad IS infrastructure based on desktop computing and communications. (2) Utilisation of the network technology infrastructure such as the Internet, Lotus Notes, and global communications systems for effective transfer of knowledge.

Successful development of KM requires an organisation to think in terms of applications and how people use applications, not systems and software (King, 1999).

Initially, the result of qualitative and quantitative analysis revealed that all Kuwaiti and UK organisations have well-built IT infrastructure (see Tables 6.4 and 7.3). 16 case studies in this research agreed that including IT in the KM implementation is indispensable to achieve KM success, and the survey results show that the IT factor affects KM implementation, and there is a positive strong correlation between successful KM implementation and effective use of IT. Also, secondary case studies clearly reveal that IT and success of KM implementation are positively linked (see Figure 4.9). The research also indicated that much emphasis is placed upon the hard aspects (Technology, IT infrastructure) to the detriment of the softer issues.

In essence, IT infrastructure is crucial for KM implementation. It is very important to deliver the required IT skills for employees to be able run the KM process, but also

there is a major need to get benefits from managing knowledge, and the organisation should exploit data and information stored in IT and turn them into knowledge.

8.6.2.4 Change Management Programme

A review of the relevant organisational experiences shows that the change management programme was one of the main primary concerns of many organisations which adopted a KM system.

The study clearly reveals that change management programme and the success of KM implementation are positively linked. All Kuwaiti and UK organisations in this research agreed that including a change management programme in the KM systems is essential to achieve KM success, whereas the survey results show that the change management factor affects the implementation of the KM system, and there is a positive strong correlation between successful KM and effective management of KM (see Tables 7.11b, 7.12b and 7.13b). Also, they show that learning and training, change culture are the most effective strategies of a change management programme. This result concurs with the previous studies (Anonymous, 2001; Mouritsen et al., 2001).

A review of literature reveals the emphasis placed on top management commitment and support (e.g. Davenport et al., 1998; Davenport and Prusak, 1998b; Trussler, 1998; Finneran, 1999; Liebowitz, 1999b; Bassi, 2000; Choi, 2000; Skyrme and Amidon, 2000; Streele, 2000; Skyrme, 2002a). A review of all Kuwaiti and UK organisations in this study reveals that there is no common methodology for a change management programme (see Chapter 6). In other words, organisational experience in implementing a change management programme was wide and varied. However, six of the case studies have proper change management (Petroleum Corporation, Science Research organisation, Public Civil Information organisation, Social organisation, Public Sector

Benchmarking Service, and Department of Trade and Industry, Construction Sector Unit.

As supported by many practitioners and previous studies (e.g. Wijnhoven, 2001; Begbie and Chudry, 2002; Bornemann and Leitner, 2002; Choy and Lee, 2002; Demers, 2002; Fox, 2002; Kannan and Akhilesh 2002; Pablos, 2002; O'Dell, 2003; Palmer, 2003) organisations recognised that without top management commitment they could not have had an effective change management programme. In other words, they all agreed that the top management was a major tool in the programme.

Effective communication, proper training and learning, and user involvement in the design process were also found to be the most effective change management strategies in the all the Kuwaiti and UK organisation case studies. The result is in agreement with some authors' perceptions (e.g. Davenport et al., 1998; Trussler, 1998).

The research philosophy is knowledge is people, so organisations should involve employees with management, e.g. to explain how can they contribute effectively to meeting the organisation's goal. Kaufman (1992) stated that employee involvement is significant for organisational accomplishment. Indeed, using participative management, the employees can present their problem and could gain the solution and be self-reliant. Subsequently, employee involvement is a crucial factor in successful KM implementation, because the environment of knowledge creation and sharing is unthinkable without employees' involvement.

Most of the Kuwaiti and UK organisations do not have an obvious policy to follow, and it is clear that Kuwaiti organisations do not have a clear plans and policies related to KM activities (see Table 7.23). As well, one of the UK organisations believes that top

management do no place a understandable strategy for employees to follow and many of the KM-related communication processes are either missing or are too complicated. (see sections 6.3.3.2 and 6.3.3.4).

8.7 Proposed Integrated Generic Model

This study has highlighted a number of factors considered to be successful for KM implementation which follows an holistic approach at the organisational level. It is thus appropriate to combine these factors (by category) to form a generic model. However, before proposing the new model, a brief description of the organisational vogue with respect to the various measurements is considered.

8.7.1 Traditional Models and Measurements

A large majority of organisations are not getting the benefits that they wish to derive from the respective measurement systems. Many of the organisations have attempted to implement traditional models such as the 'balanced score card'. In these uncertain times, there is a huge impetus to simply revert to managing the organisation just on the financial. However, one must remember that:

"You can not shrink your way to greatness".

The lack of success of the traditional models could be attributed to the fact that these models are either:

1. Static or
2. Not fully integrated

Indeed, managing knowledge is much more than having an IT infrastructure in place. It is about:

1. Keeping the measurement and the management system relevant
2. Extracting the maximum value (knowledge) from the sea of data/information

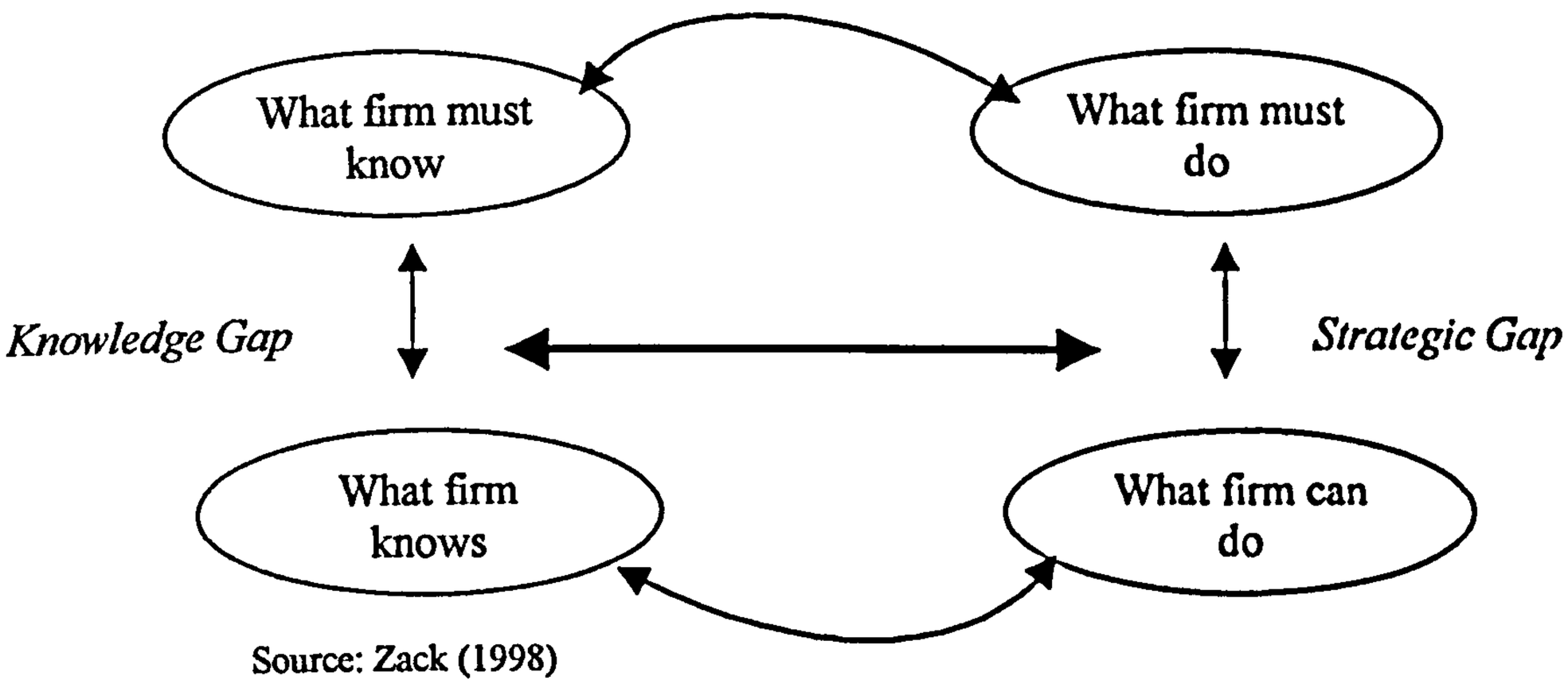
3. Closing the loop to ensure appropriate action follows measurement
4. Underpinning strategy deployment with measurement, knowledge management and other inter-related factors

To this end, an integrated KM model exhibiting dynamic elements is presented.

8.7.2 Zack Model

Zack (1998) attempts to illustrate knowledge gap in the following manner:

Figure 8.3 Knowledge Gap



Source: Zack (1998)

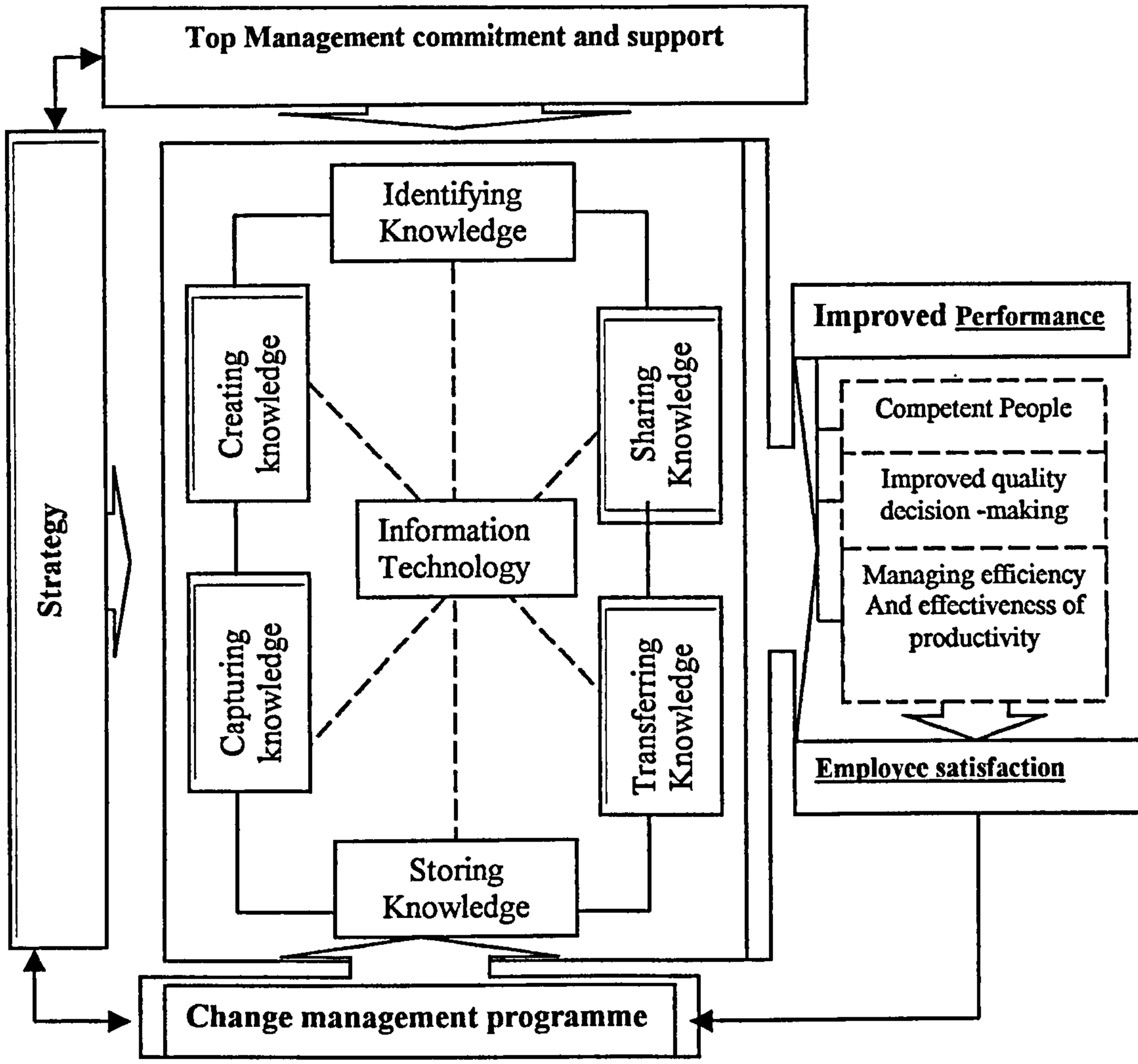
Zack (1998) suggests that there is a strategic gap between what a firm must do to compete and what it actually does in practice. Strategy, then, represents how the firm balances its competitive "cans" and "musts" to develop and protect its strategic position. Further, knowledge gap is the gap between what a firm must know and what it actually knows. In summary, Zack's model has four elements:

1. What firm must do
2. What firm can do
3. What firm must know
4. What firm knows

8.7.3 Proposed Model

The generic proposed model is presented in Figure 8.2.

Figure 8.2 Model for best practice KM



The model has five elements:

1. Strategy
2. Top management commitment and support
3. Change management programme
4. Knowledge management systems
5. Improved performance and Employee satisfaction

All of the elements of the model are highly and critically interdependent. In other words, failure in one factor can have a ripple effect. Further, there does not exist a best practice model (approach) that can detect the root cause of the Kuwaiti organisations (or organisations in general) which are unable to exploit KM to its full potential (a validation criterion for the model will be presented in a later section).

In its current format, the model is a map for any organisation thinking about or auditing KM. The map allows the organisations to focus on all the elements to make the project a success, and help avoid expensive pitfalls and delays.

The following sections provide detailed discussion of the key elements of the proposed model based on the results of this study.

8.7.3.1 Dominant Factors

This study indicates that there are many factors that should be clearly visible and monitored at all stages of KM implementation and audit. They include strategy, top management commitment, change management programme, and information technology. Each of these factors consists of a number of elements. These factors are found to be highly interdependent. They are hypothesised to play a more prime role in KM implementation, and are thus termed 'dominant'. Also, they should be clearly observable and monitored at all stages of KM implementation.

8.7.3.2 Top Management Commitment

Top management commitment must be an integral part of KM, and should examine and focus beyond the technical aspects to the organisation's KM change requirements. Moreover, the top management commitment and support does not end with KM initiation and facilitation, rather it should be ongoing and never ending. Further, the top management should identify competent and committed individuals (teams) within the organisation, and encourage them to become KM champions.

Davenport et al. and Van Buren (1998) identified top management and support as one of the most important critical factors for successful knowledge implementation. Goh (1998) stated that effective KM not possible unless top management empower employees and show a strong commitment to the organisation.

Overall, top management plays a main role not only in beginning KM implementing but also during the whole project. To exert their top management commitment in KM Implementation as KM process: (1) they must have sufficient knowledge; (2) they must have realistic expectation of KM results; (3) they must communicate with employees; and (4) they must have the ability to coordinate the different interests of functional unites in the KM implementation process.

8.7.3.3 Strategy

The decisions made at this level are the responsibility of the top management. This level can be envisaged as the process of establishing overall KM goals and of planning how to achieve those goals. Further, continuous organisational evaluation and benchmarking activity must take place to ensure that the organisational KM strategy is aligned.

8.7.3.4 Change Management

Change management is essential to prepare a company to embrace successful KM and its implementation. An effective change management programme will ensure a smooth implementation of KM with minimum resistance.

The change management strategy should cover many aspects, like communication, user involvement, formal training and education of all users at all levels, organisational and

cultural readiness for change, KMS user feedback, and many other factors (mentioned in the previous chapters).

8.7.3.5 KM systems

The strategy concerning organisational IT infrastructure for KM should be planned carefully, taking into account elements of scenario planning. By aligning IT with the organisational business strategy, savings would be achieved by avoiding issues such as legacy systems and unnecessary systems migration.

Leaders must know that IT cannot create knowledge; only people can do that, but IT enables it to spread out faster and easier. It suppose that managers rely on IT tools due to that enable them to convert data into information and then into knowledge, as well as to capture, collect, communicate, organise, and distribute information and knowledge.

Radding (1998) states that managers must view the organisation as a human community, capable of providing diverse meanings to the information outputs generated by technological systems, and by technology an organisation can set up a bulletin board on the LAN or Web site on the corporate intranet, where people working on a particular project or within a department can share ideas, post questions, and receive responses

8.7.4 Proposed Model

Although our model results support the proposed model, here we propose a theoretical construct that would enable the validation of the model in a dynamic manner.

Zack (1998) analyses knowledge gap using four variables (under two categories).

1. Strategic gap:

    (a) What firms must do = a

    (b) What firms can do = b

2. Knowledge gap

(a) What firms must know = c

(b) What firms know = d

Clearly, the strategic gap will be nominal when:

(b/a) = 1

Similarly, the knowledge gap will also be nominal when the ratio:

(d/c) = 1

For the purposes of simplicity, we take these analyses, and postulate that our model can exhibit three states, when tested dynamically. These states are:

1. (b/a).(d/c) = 1 *State of Harmony*

2. (b/a).(d/c) < 1 *State of Concern*

3. (b/a).(d/c) = 0 *Defunct State*

The change brought about by the internet in the way in which the information and knowledge flows in or across organisation, demands that a KMS system must be updated continuously.

The strategic and knowledge variables are derived from the proposed integrated model. For the sake of simplicity, the testing of the presenting model is confined to four variables, there is no reason why these variables can not be expanded in the future, as the model evolves or is integrated into other management disciplines. The flexible nature of the model, caters for this perfectly.

By using the model in a dynamic manner, one of the above-mentioned states should be arrived at. Thereupon, it then becomes very easy to do the root cause analysis and underpin the reason as to why the organisations are unable to exploit KM fully.

8.8 Summary

This chapter has discussed the results of quantitative and qualitative data presented in literature Review, and Chapters six and seven. Moreover, this chapter has identified a series of critical issues (and success factors) that must be considered to ensure successful KM.

For the quantitative data, other empirical surveys were used for comparisons, thus enabling more findings to emerge. Similarly, besides the comparative analysis of the primary cases, an attempt was made to see how these cases compare with other organisational experience reported in secondary case studies. In particular, through the Kuwaiti and UK public organisations case studies on KM implementation were analysed in more detail, and elements of success were discussed in the context of the primary cases description.

The element validated through primary and secondary data were consolidated, and a generic model for holistic KM implementation was derived and proposed. The core aspects of the model, the expected roles of and contributions made by each, and the overall integrated aspects which together can result in optimum impact on performance outcomes have all been scrutinised.

However, most of the factors are related to the 'softer issues', and are found to be highly interdependent. These factors culminate in the proposed integrated generic model for KM. Further, the proposed model is hypothesised to deliver, dynamically, a comprehensive approach to successful KM.

CHAPTER NINE

Conclusion and Recommendations

CHAPTER 9: CONCLUSION AND RECOMENDATION

9.1 Introduction

This chapter presents an overall summary of this research study. It provides a description of the major findings resulting from the study, and it also outlines its contribution to both research and practice. A discussion is provided on its limitations. Finally, the chapter outlines several directions which have emerged from this study and concluding remarks.

9.2 Overview of Research

As KM is a relatively maturing concept, both research and practice in this field are still immature. At the concept level, there exist ambiguities and confusions within the literature around KM definitions, terms, tools and techniques.

From a research point of view, many writings about KM appear to lack empirical evidence, and their focus is often on particular elements, such as IT (for example.), at the cost of other crucial aspects. Indeed, this is one of the reasons for KM failure. Estimates of KM failure rates are projected to be around 70 %, where a failure is interpreted to mean that all of the major objectives were not met by the effort.

It then comes as no surprise that there has been a call for a holistic approach to KM and its implementation within an organisation. Yet, studies that have attempted to investigate the elements that make up this approach, and the processes that demonstrate its successful implementation are still significantly few and fragmented. KM indeed is a complex phenomenon because it involves aspects from the entire business.

It includes strategy, top management commitment, change management programme and KMS. Studying it holistically does therefore entail unifying several schools of thought and research into one integrative perspective which can build a strong base for more informed research and successful best KM practices.

This study has sought to contribute to this area of research and practice. It adopts the holistic view and has reviewed a large body of literature relevant to KM concerning many issues that an organisation encounters. Based on the literature, elements that constitute the holistic approach and their inter-relationships were extensively covered and described. The initial holistic approach thus identified was then explored in the field through a complementary empirical investigation using a combination of questionnaire survey and case studies. The survey has attempted to assess the level of importance of the factors that constitute the holistic approach to KM implementation, identifying the CSFs and the level of their respective criticality.

Further, the survey also attempts to gain an assessment of criticality of the CSFs distilled from the literature. The use of case studies, on the other hand, aimed at investigating how various factors related to holistic KM are being operationalised in real organisational settings. Through this type of investigation, the study proposed a generic integrated model for holistic KM implementation and audit within the organisation. Further, to complement the model, the study proposed a theoretical construct that complements the proposed integrated model, thus enabling it to be applied in a dynamic manner.

9.2.1 Key Findings

Despite the limitations of the study amid several generalisations, it provides several significant findings. The summary of the conclusions related to these findings are now presented below.

First, the study findings have shown that KM implementation issues are generic and are not based on organisation nationality, and that UK organisations are slightly ahead in the level of awareness and familiarity with the softer aspects of KM.

Second, organisations have not yet been able to fully achieve the benefits of KM at a high level. Findings have also shown that realisation of KM benefits tends to increase as KM implementation becomes more successful.

Third, organisations tend to attach a high priority and significance to the hard (IT) aspects, at the expense of the softer issues. It is felt that this is perhaps one of the underlying factors for the degradation of KM within organisations.

Fourth, the study reveals that a large number of organisations do not have systems or mechanisms in place to capture the value derived as a result of KM implementation. This again is due to the fact that organisations are far too 'busy' implementing and prioritising the hard IT infrastructure elements related to KM. If organisations continue solely to implement IT-related aspect of KM without introducing the adequate measurement systems, it will be very difficult for the Kuwaiti or the UK public sector organisations to leverage or improve organisational KM.

Fifth, there is a significant degree of variance within the KM strategy concerning the Kuwaiti PSOs. The top management is far too focused on purchasing the IT systems and getting them up and running. The purchasing of the IT systems is driven by the IT

factors rather than the strategic factors. This results in the strategic gap, giving rise to 'strategic mis-alignment' at the organisational level.

Further, it is found that within the KPSO there is no scenario planning related to the strategy that is carried out.

Sixth, the strategic 'mis-match' results in ambiguities between the benefits that are actually perceived to be important and what is actually implemented in reality. This continually results in lack of appropriate KM technology. It is found that this then creates misconceptions concerning KM and its benefits.

Seventh, the change management programmes run within the prescribed organisations are usually ineffective. This is due to the lack of 'true' commitment from management, and employees' reluctance to change. True change is perceived as a threat, and in the absence of a well defined strategy, top management embarks upon change initiatives that effectively results in zero net gain for the organisation (i.e. change for the sake of change).

Difficulties in managing change effectively and creating a culture for change are considered to be critical for successful KM implementation.

Eighth, due to lack of structured programme for employees development, there exist fundamental gaps within key employees concerning knowledge related to KM. This is found to prevent employees from truly appreciating the benefits of KM and its successful implementation.

Ninth, top management commitment is absolutely crucial for successful implementation of KM, and thereafter to exploit KM to its full potential.

The top management within the KPSOs does not promote KM effectively. The factor analysis has revealed that the 'top management' factor category yields a significant variance score. Further, factor analysis reveals that there exists a correlation between top management commitment and change management programme.

Finally, based on the overall findings of this study, a proposed integrated generic model for holistic KM implementation was developed. Detailed descriptions and illustrations were given for the workings of the key elements of the model, based on empirical investigation of primary case studies, exhibiting diverse organisational experience with KM. More descriptions were also given through a comprehensive review of secondary case studies in the KM literature. The fundamental driving constituents of the model are strategy, top management commitment and change management, These three elements integrate to tunnel into the KMS, which then results in the relevant and other desired benefits. The loop then continues in a dynamic manner.

The study examined many of the traditional models. A basic element was derived from the Zack model to test the proposed model in a dynamic manner. The study shows that this would function in such a manner that, at a given point in time, the model will be found in a particular state. The fact that the model is in a given state will then in turn simplify the process of root cause analysis.

9.3 Contribution of the Study

This study aimed to contribute to research and practice. As theory in the field of KM is still not fully-developed and inadequate, this study can be considered as a step towards theory building. It has brought together a large body of KM-relevant literature, and unified diverse schools of thought into one integrative perspective. In particular, the study has been uniquely effective in identifying and describing components that make

up the holistic approach to KM. Not only did this study provide an empirical assessment of the essential elements in KM implementation, but it also assessed the CSFs of importance and implementation for KM distilled from a comprehensive review of relevant literature. The study has also attempted to clarify the confusions surrounding the concepts and practice of KM. It has shown that successful KM implementation is a phenomenon that is crucial in organisational sustainable competitive advantage, which calls for the participation of every individual, and most significantly, top management. It has also provided a dynamic model which takes into consideration the integrative aspects, which is supported by IT and presents the possibility to handle change in a nearly perpetual manner, in order to deliver sustainable performance.

The overall findings of this study can guide future work to areas where there is a potential for further cumulative and positive research. As has been found from the findings of this study, successful implementation is far from the narrowly-focused perspective, and research in this field has to take a broad approach. The traditional models are considered static, and the proposed dynamic model thus presents excellent foundation upon which can be laid the future framework for complementary research that aim to enhance understanding of the various elements constituting KM and their respective inter-relationships. This study has also provided contextual and situational insights into how the organisations from different country backgrounds have implemented and dealt with KM. The evidence and factors emerging from these experiences have provided useful insight into the importance of different factors and variables. Again, these variables can be further 'tuned' in future research to provide more profound and analytical models.

From a practical point of view, this research has provided several major contributions. As many organisations have suffered from low success rates with their KM implementation and its full utilisation, this study has provided useful guidelines in the form of the critical elements and factors that can engender success or otherwise in KM efforts.

From this study, practitioners can derive a better understanding of the activities that are undertaken by organisations, and the way these activities are being dealt with can result in different forms of results. The model proposed by this study should enable the practitioners to audit and manage knowledge much more effectively.

The results from this research are expected to be of great benefit to top managers, information system executives, strategic planners, business managers, and others who are implementing or planning to implement KM

9.4 Limitations of the Study

As is the case with other research studies, this study has a number of limitations that need to be discussed. These limitations are mainly related to the broadness of the topic under investigation, representativeness and generalisability issues, lack of homogeneous organisational experiences, time constraints, and the limited access to information.

As established earlier, KM is an area of research where theory is still inadequate. This pushed for an option to follow an exploratory approach in this study. This is particularly the case as the research seeks to develop a holistic and integrative understanding of KM, a feature which demands broadening the scope of the study in reviewing a large body of relevant literature and collecting a huge set of appropriate data. However, while the researcher has endeavoured to meet such a requirement by reviewing various bodies of

literature and seeking different types of data from both primary and secondary sources, it is not possible to claim that the empirical investigation of this study has come across all issues related to this perspective, at least those issues presented in the literature. Time frame and limited access to organisational information are the main constraints. Given the limited time frame, a complete investigation of the phenomenon under consideration, especially with case studies, could not be undertaken. Though all possible efforts were made to interview as many people as possible in each company studied, lack of time was seen as the main inhibitor to this. With more time given for investigation, more rich data could be obtained. Even with the use of a questionnaire survey, more time would allow for conducting more than one survey, or using the initial analysis of responses to iterate the collection process in order to gain further data. Furthermore, the nature of KM practices suggests that measuring impacts of KM implementation and exploitation might be difficult to quantify over a short period of time. This may lead to choosing a longitudinal case study approach, which can most appropriately capture the organisational experience from initiation to completion stages. However, time constraints have inhibited this study from venturing into such a research. Following this approach is also bound by the often limited access to information provided by organisations, another limitation that this study has suffered from.

As KM aims to help users of the concept achieve a competitive position, organisations that embark on it consider the information surrounding their efforts as private. Moreover, revealing information about how the change takes place as part of KM efforts may lead to disclosure of some organisation-specific practices. Therefore, KM is dealt with in many organisations as a sensitive issue. As a result, many organisations do not express willingness to participate in studies that seek information about their KM experiences. Others which accept participation hesitate to reveal some types of

information. This, undoubtedly, should have an effect on the richness of the data collected, and will leave some issues of the study unclear. In the case of this study, organisations participating in the case studies varied in their willingness to share information with the researcher. However, all efforts were made to ensure that important information was provided, though correctness and accuracy of data cannot be guaranteed. It is possible that some information was hidden, or given in a misleading form. However, this problem is less in the questionnaire survey, as organisations and respondents have the option not to reveal their names. Overall, the level of these discrepancies was kept to a minimum through triangulation of evidence at the data collection level. Nevertheless, getting the highest level of quality data from participants is another limitation of this study.

The practice of KM has inherited the confusion that surrounds its definitions and concepts. It is therefore no surprise that organisations will have different perspectives and knowledge on KM., and thus different practices. The lack of a common language regarding KM may cause bias in the data collection process, as data of various quality levels are given.

As mentioned in Chapter 5, the questionnaire was translated into Arabic language for the Kuwaiti organisations by the researcher, and it took a long time to make the proper translation and easy for the respondents to understand and to be encouraged to complete it.

Another limitation to this study is in representativeness and generalisability issues. As the sample targeted by this study was hard to reach with a full random selection, it cannot be considered as representative of its population. The lack of a mailing list of organisations involved in KM is the reason for this case. Although high quality mailing

lists were used to draw the sample, generalisation of findings is restricted. The case studies also represent non-homogeneous experiences with KM, as they approach it differently. Though this diversity enriches the data collected, it inhibits generalisation and further comparisons, especially with the size of the sample being small. As well access to public sector organisations themselves was a constraint, which made the researcher use convenience sampling to conduct the case study research.

9.5 Recommendations for Future Research

As the number of various organisations implementing KM continues to grow, further research is needed to expand the finding from this study and to provide more conclusive answers. Despite its attempt to be exhaustive and cover a broad area of research, there are many areas in which future research is needed.

1. Through the review of the literature, and from the data collection process, it has been found that there is a lack of common and standardised terms and definitions for KM. This has been reflected in organisational perceptions of KM concepts and practices. Even the concept of KM is not fully developed, embedded and comprehended by organisations. Therefore, there is a great need for more research which solicits opinions and perceptions of both academic and practitioners of KM definitions and terms, and develops a clearer and common use of the KM terms. This study can be considered as a good starting point in this area of research, since it embraces a holistic perspective that unifies different focuses and definitions.

2. The integrated dynamic model proposed by this study provides ample opportunities for further refinement and testing. A number of hypotheses can be derived from the

findings, and they can be statistically tested using a number of variables to investigate the various components of the model and their inter-relationships.

3. The model also calls for a micro type of research, where each component is examined through exploratory studies that can provide better understanding of the internal working of their elements, and the mechanisms by which the role of each in KM implementation and effectiveness can be improved.

4. The fragmented nature of the research concerning KM suggests that there is a lack of methodological research constructs and variables suitable for conducting KM research. In the measurement area, for instance, research has difficulties in measuring the benefits incurred or the improvements in productivity due to KM. Further, there is no comprehensive measure to determine the success of KM implementation.

9.6 Concluding Remarks

There is a pressing need to develop multi-level measures that could more accurately provide assessment of the efforts and related factors.

As KM is a long-term programme involving change, especially when propelled by organisational driver, it is more likely that a longitudinal type of research will be most suitable for studying such a phenomenon. This approach allows for more data to be collected, and enables more complete and refined assessment to be made, and consequently more rigorous evidence to emerge.

Research that designs its quantitative and qualitative samples to be heterogeneous, representing different sector, cultures approaches and KM configurations, should enable the emergence of more research findings, and facilitates comparative kinds of studies.

In view of the assessment related to the future of KM concepts and practice, it would be interesting for researchers to explore how the concepts and practices of KM are being integrated with other recently-emerging management approaches, like Customer Relationship Management (CRM) and E-commerce, and E-marketing. It is expected that organisations will begin to face the challenge of embracing different management tools in a complementary manner.

With the rapid evolvement of e-commerce, business dynamics have and are continuing to change perpetually. The flow and amount of information (enabled by the internet) is continuing to increase exponentially. The disciplines associated with the management and measurement of such information and knowledge must evolve at the same pace otherwise gaps will results that may cause the relevant and associated management processes to become rogue. In order to minimise such discrepancies, it is imperative that researchers from broader fields should increase the level of collaborations in a manner so as to adopt a truly (and timely) integrated approach towards KM.

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Appendix

Appendix 1.1 T-Test (The Gap between Importance and Implementation)

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Importance, Organisation seeking human values of employees.	43	4.28	.93	.14
Importance, Having knowledge infrastructure in both hard and soft	44	4.73	.54	8.20E-02
Importance, Using knowledge mapping technique	45	4.31	.79	.12
Importance, Appointing Chief Knowledge Officer (CKO).	44	4.34	.83	.13
Importance, Gathering information and creating knowledge.	44	4.75	.49	7.36E-02
Importance, Transferring knowledge between functions.	45	4.56	.72	.11
Importance, Sharing knowledge between individual	44	4.52	.59	8.90E-02
Sharing knowledge with members of other work groups within my organisation	45	4.49	.66	9.86E-02
Sharing information and knowledge	44	4.45	.82	.12
Integrating KM in business activities	44	4.00	1.14	.17
Gaining knowledge about vendors	42	3.83	1.21	.19
Involving employees in decision-making	45	4.27	.91	.14
Ensuring Top management commitment	44	4.89	.39	5.83E-02
Providing the employees with adequate information	45	4.60	.58	8.65E-02
Encouraging employees to participate in both internal and external new learning opportunities	45	4.76	.48	7.22E-02
Supporting team-based approaches to problem solving	45	4.51	.59	8.77E-02
Encouraging Empower employee	44	4.30	.82	.12
Having Knowledge management (KM) strategy	44	4.57	.62	9.42E-02
Applying Standard, flexible knowledge structure	45	4.53	.69	.10
Using Effective measurement of performance	44	4.55	.55	8.26E-02
Making Clear purpose and language.	44	4.61	.58	8.73E-02

Appandix 1 T-Test (The Gap between Importance and Implementation)

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Having reward and recognition for actual performance improvement	44	4.77	.48	7.17E-02
Accessing the majority of knowledge within the organisation	44	4.39	.72	.11
Improving technology infrastructure	45	4.78	.47	7.03E-02
Using network such as Internet, intranet, E-Repository	44	4.70	.55	8.34E-02
Keeping the Lines of communication open.	45	4.64	.53	7.89E-02
Facilitating multiple channels for knowledge transfer and share	43	4.58	.66	.10
Allocating adequate budgeting to funding and support KM projects	44	4.70	.55	8.34E-02
Promoting ongoing employee contributions	45	4.56	.55	8.14E-02
Having an accurate and effective knowledge	45	4.73	.45	6.67E-02
Keeping continuous learning	45	4.67	.52	7.78E-02
Creating friendly culture	45	4.56	.55	8.14E-02
Establishing User-friendly information systems.	45	4.82	.39	5.76E-02
Importance, Creating culture that supports innovation, learning and knowledge sharing	44	4.80	.46	6.96E-02
Importance, Getting feedback from customers regarding the organisation's services	45	4.53	.94	.14
Effectiveness, Organisation seeking human values of employees.	44	3.00	1.24	.19
Effectiveness, Having knowledge infrastructure in both hard and soft	43	3.14	1.23	.19
Effectiveness, Using knowledge mapping technique	45	2.22	1.11	.16
Effectiveness, Appointing Chief Knowledge Officer (CKO).	45	1.96	1.30	.19
Effectiveness, Gathering information and creating knowledge.	45	3.07	1.16	.17
Effectiveness, Transferring knowledge between functions.	45	2.67	1.11	.17

Appandix 1 T-Test (The Gap between Importance and Implementation)

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Effectiveness, Sharing knowledge between individual	45	2.71	1.16	.17
Sharing knowledge with members of other work groups within my organisation	45	2.42	1.10	.16
Sharing information and knowledge	44	2.75	1.08	.16
Integrating KM in business activities	44	1.91	1.33	.20
Gaining knowledge about vendors	44	2.41	1.26	.19
Involving employees in decision-making	45	2.40	1.19	.18
Ensuring Top management commitment	44	3.16	1.06	.16
Providing the employees with adequate information	45	3.02	1.10	.16
Encouraging employees to participate in both internal and external new learning opportunities	45	3.36	1.11	.17
Supporting team-based approaches to problem solving	45	3.00	1.21	.18
Encouraging Empower employee	45	2.64	1.17	.17
Having Knowledge management (KM) strategy	44	2.30	1.13	.17
Applying Standard, flexible knowledge structure	44	2.43	1.11	.17
Using Effective measurement of performance	44	2.48	1.17	.18
Making Clear purpose and language.	44	2.89	1.17	.18
Having reward and recognition for actual performance improvement	44	2.73	1.13	.17
Accessing the majority of knowledge within the organisation	44	2.50	1.05	.16
Improving technology infrastructure	43	3.60	.93	.14
Using network such as Internet, intranet, E-Repository	45	3.78	1.06	.16
Keeping the Lines of communication open.	45	3.11	1.11	.17
Facilitating multiple channels for knowledge transfer and share	42	2.74	1.15	.18

Appandix 1 T-Test (The Gap between Importance and Implementation)

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Allocating adequate budgeting to funding and support KM projects	44	2.52	1.21	.18
Promoting ongoing employee contributions	45	2.76	1.09	.16
Having an accurate and effective knowledge	43	2.70	1.06	.16
Keeping continuous learning	44	2.93	1.15	.17
Creating friendly culture	44	3.02	1.00	.15
Establishing User-friendly information systems.	44	3.25	1.18	.18
Effectiveness, Creating culture that supports innovation, learning and knowledge sharing	43	2.56	1.20	.18
Effectiveness, Getting feedback from customers regarding the organisation's services	44	2.66	1.31	.20

Appendix 1.2 One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Importance, Organisation seeking human values of employees.	30.038	42	.000	4.28	3.99	4.57
Importance, Having knowledge infrastructure in both hard and soft	57.637	43	.000	4.73	4.56	4.89
Importance, Using knowledge mapping technique	36.485	44	.000	4.31	4.07	4.55
Importance, Appointing Chief Knowledge Officer (CKO).	34.539	43	.000	4.34	4.09	4.59
Importance, Gathering information and creating knowledge.	64.535	43	.000	4.75	4.60	4.90
Importance, Transferring knowledge between functions.	42.166	44	.000	4.56	4.34	4.77
Importance, Sharing knowledge between individual	50.833	43	.000	4.52	4.34	4.70
Sharing knowledge with members of other work groups within my organisation	45.532	44	.000	4.49	4.29	4.69
Sharing information and knowledge	36.037	43	.000	4.45	4.21	4.70
Integrating KM in business activities	23.250	43	.000	4.00	3.65	4.35
Gaining knowledge about vendors	20.565	41	.000	3.83	3.46	4.21
Involving employees in decision-making	31.297	44	.000	4.27	3.99	4.54
Ensuring Top management commitment	83.807	43	.000	4.89	4.77	5.00
Providing the employees with adequate information	53.206	44	.000	4.60	4.43	4.77
Encouraging employees to participate in both internal and external new learning opportunities	65.899	44	.000	4.76	4.61	4.90
Supporting team-based approaches to problem solving	51.412	44	.000	4.51	4.33	4.69
Encouraging Empower employee	34.601	43	.000	4.30	4.05	4.55
Having Knowledge management (KM) strategy	48.485	43	.000	4.57	4.38	4.76
Applying Standard, flexible knowledge structure	43.811	44	.000	4.53	4.32	4.74
Using Effective measurement of performance	55.029	43	.000	4.55	4.38	4.71

Appendix 1.2 One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Making Clear purpose and language.	52.825	43	.000	4.61	4.44	4.79
Having reward and recognition for actual performance improvement	66.563	43	.000	4.77	4.63	4.92
Accessing the majority of knowledge within the organisation	40.284	43	.000	4.39	4.17	4.61
Improving technology infrastructure	67.989	44	.000	4.78	4.64	4.92
Using network such as Internet, intranet, E-Repository	56.411	43	.000	4.70	4.54	4.87
Keeping the Lines of communication open.	58.900	44	.000	4.64	4.49	4.80
Facilitating multiple channels for knowledge transfer and share	45.309	42	.000	4.58	4.38	4.79
Allocating adequate budgeting to funding and support KM projects	56.411	43	.000	4.70	4.54	4.87
Promoting ongoing employee contributions	55.983	44	.000	4.56	4.39	4.72
Having an accurate and effective knowledge	71.000	44	.000	4.73	4.60	4.87
Keeping continuous learning	59.944	44	.000	4.67	4.51	4.82
Creating friendly culture	55.983	44	.000	4.56	4.39	4.72
Establishing User-friendly information systems.	83.664	44	.000	4.82	4.71	4.94
Importance, Creating culture that supports innovation, learning and knowledge sharing	68.923	43	.000	4.80	4.66	4.94
Importance, Getting feedback from customers regarding the organisation's services	32.219	44	.000	4.53	4.25	4.82
Effectiveness, Organisation seeking human values of employees.	16.062	43	.000	3.00	2.62	3.38
Effectiveness, Having knowledge infrastructure in both hard and soft	16.788	42	.000	3.14	2.76	3.52
Effectiveness, Using knowledge mapping technique	13.484	44	.000	2.22	1.89	2.55
Effectiveness, Appointing Chief Knowledge Officer (CKO).	10.122	44	.000	1.96	1.57	2.34

Appendix 1.2 One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Effectiveness, Gathering information and creating knowledge.	17.796	44	.000	3.07	2.72	3.41
Effectiveness, Transferring knowledge between functions.	16.147	44	.000	2.67	2.33	3.00
Effectiveness, Sharing knowledge between individual	15.673	44	.000	2.71	2.36	3.06
Sharing knowledge with members of other work groups within my organisation	14.808	44	.000	2.42	2.09	2.75
Sharing information and knowledge	16.874	43	.000	2.75	2.42	3.08
Integrating KM in business activities	9.548	43	.000	1.91	1.51	2.31
Gaining knowledge about vendors	12.648	43	.000	2.41	2.02	2.79
Involving employees in decision-making	13.476	44	.000	2.40	2.04	2.76
Ensuring Top management commitment	19.857	43	.000	3.16	2.84	3.48
Providing the employees with adequate information	18.476	44	.000	3.02	2.69	3.35
Encouraging employees to participate in both internal and external new learning opportunities	20.261	44	.000	3.36	3.02	3.69
Supporting team-based approaches to problem solving	16.686	44	.000	3.00	2.64	3.36
Encouraging Empower employee	15.152	44	.000	2.64	2.29	3.00
Having Knowledge management (KM) strategy	13.444	43	.000	2.30	1.95	2.64
Applying Standard, flexible knowledge structure	14.558	43	.000	2.43	2.09	2.77
Using Effective measurement of performance	14.031	43	.000	2.48	2.12	2.83
Making Clear purpose and language.	16.424	43	.000	2.89	2.53	3.24
Having reward and recognition for actual performance improvement	16.036	43	.000	2.73	2.38	3.07
Accessing the majority of knowledge within the organisation	15.862	43	.000	2.50	2.18	2.82
Improving technology infrastructure	25.433	42	.000	3.60	3.32	3.89

Appendix 1.2 One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Using network such as Internet, intranet, E-Repository	23.826	44	.000	3.78	3.46	4.10
Keeping the Lines of communication open.	18.762	44	.000	3.11	2.78	3.45
Facilitating multiple channels for knowledge transfer and share	15.445	41	.000	2.74	2.38	3.10
Allocating adequate budgeting to funding and support KM projects	13.827	43	.000	2.52	2.15	2.89
Promoting ongoing employee contributions	16.953	44	.000	2.76	2.43	3.08
Having an accurate and effective knowledge	16.710	42	.000	2.70	2.37	3.02
Keeping continuous learning	16.922	43	.000	2.93	2.58	3.28
Creating friendly culture	20.056	43	.000	3.02	2.72	3.33
Establishing User-friendly information systems.	18.212	43	.000	3.25	2.89	3.61
Effectiveness, Creating culture that supports innovation, learning and knowledge sharing	13.965	42	.000	2.56	2.19	2.93
Effectiveness, Getting feedback from customers regarding the organisation's services	13.456	43	.000	2.66	2.26	3.06

Appendix 2 Questionnaire

FOR TOTAL QUALITY MANAGEMENT

UNIVERSITY OF BRADFORD, UNITED KINGDOM

September 2002

Dear _____

Knowledge Management Systems (KMS)

We are carrying out research on the implementation of IT-based Knowledge Management Systems. Our project is a comparative study of the Kuwait and UK public sectors with the specific aim of building a best practice model for KM implementation in conjunction with IT.

For our purposes, knowledge management is a formalised, integrated approach to identifying and managing an organisation's knowledge assets. These knowledge assets may include knowledge-bases, documents, policies, and procedures, as well as expertise and experience across the organisation.

A major part of the study aims to assess the success factors in implementing KM. For this purpose, we are therefore approaching a number of organisations both in the UK and Kuwait to invite them to participate in a survey relating to their experiences in implementing initiatives such as KM and the role of IT in that process. The intended outcome is to develop KM model which can assist organisations in the public sector with their quest for creating a competitive advantage using intellectual capital as the key asset.

It would be greatly appreciated if you could complete the enclosed questionnaire regarding the experience of your own organisation in the implementation of KM. The analysis of all the questionnaires will provide the basis for identifying best practices, highlighting the key critical factors, and building a proposed model for the implementation of IT-based KM.

We would very much appreciate your participation, since the success of the research is dependent upon receiving the maximum number of responses possible. Your answers will of course be treated confidentially and the information will be used only for the purpose of the study. The questionnaire has been designed to make completion easy.

I am very pleased to send you a copy of the summary of findings of the survey. If you would like to receive one, please fill in the little box at the end of the questionnaire.

We look forward to receiving your completed questionnaire in the near future. For your convenience, we enclosed a stamped addressed envelope.

Thank you for your co-operation.

Yours sincerely,

Prof. Mohamed Zairi,
Head of the European Centre for TQM

Mutiran Alazmi
PhD researcher

Knowledge Management Systems (KMS)

1. About Your Organisation

1. Based in: Kuwait ☐
   United Kingdom (UK) ☐

2. Name of organisation _____

   Public Utilities ☐ (Please specify) _____

3. Size of organisation (no. of employees)

   Less than 100 ☐ 101–200 ☐ 201-300 ☐ 301-400 ☐ 401-500 ☐ More than 500 ☐

2.About You

1. Your role in the organisation _____ 2. Sex Male ☐ Female ☐

3. Are/were you involved in KM? Yes ☐ No ☐ If yes, for how many years? ☐☐

3. Information Technology

1. What Technology tools does your organisation use for knowledge management (KM) application?
   Internet ☐ Intranet ☐ Extranet ☐ Network ☐
   Groupware ☐ Data warehouse ☐ Web site ☐
   Others (Please specify) .....

2. Which of the following is most effective to communicate in KM in your organisation?
   Word wide web (WWW) ☐ Electronic repository ☐ E-mail ☐ Videoconferencing ☐
   Others (Please specify) .....

3. Which is the most effective method for measuring KM in your organisation?
   The Balanced Scorecard (BSC) ☐ Scandia Navigator ☐
   The Intangible Assets Monitor ☐ Matrix structure (capturing, sharing, measuring, and learning) ☐
   Others (Please specify) .....

4. Who is primarily responsible for planning the KM?

   Chief Executive Officer (CEO)☐ Chief Information Officer (CIO) ☐ IT/IS manager ☐

   Consultants ☐ Chief Knowledge Officer (CKO) ☐ Other ☐.....
   .....

4. Knowledge Management Issues

The following statements describe various issues of knowledge management. Please circle 1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly agree.

Item No.	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	KM means finding ways to create, identify, capture, and distribute organisational knowledge to the people who need it	1	2	3	4	5
2	Since organisational knowledge assets have become more important, my organisation will see greater emphasis on KM in the future.	1	2	3	4	5
3	Categorisation and organisation of knowledge will be a core competence for every firm	1	2	3	4	5
4	KM is vital for organisation success in the future	1	2	3	4	5
5	KM will gradually become a more important issue in the future	1	2	3	4	5
6	Intellectual capital will be the primary way in which businesses measure their value	1	2	3	4	5
7	I believe the knowledge management programme fits our organisation	1	2	3	4	5
8	The KM programme can contribute to our organisation's product or services competitiveness.	1	2	3	4	5
9	KM programme can improve our organisation's overall performance and sustainable competitiveness.	1	2	3	4	5
10	The organisation's structure should be built on confidence	1	2	3	4	5
11	Employees' productivity is measured effectively.	1	2	3	4	5
12	A KM specialist, such as Chief Knowledge Officer (CKO) or an external consultant, is needed for effective management of knowledge.	1	2	3	4	5
13	KM processes are capturing and creating, storing, transferring, and sharing knowledge.	1	2	3	4	5
14	Knowledge itself cannot be managed, only its processes.	1	2	3	4	5
15	Success or failure of companies depends on how well they use these processes	1	2	3	4	5
16	KM strategy is composed of Codification strategy regarding information, and Personalisation strategy regarding people	1	2	3	4	5
17	Our organisation uses Codification strategy	1	2	3	4	5
18	Our organisation uses Personalization strategy	1	2	3	4	5
19	Our organisation uses both strategies, Codification and personalisation	1	2	3	4	5
20	If you use a different KM strategy, please specify: ----------					

5. Knowledge Management Critical Success Factors

1. Please complete the two scales below for the level of **importance** and **implementation effectiveness** of the factors listed. Based on your experience, please indicate the level of importance of each factor for the successful implementation of KM in your organisation. Please indicate the level of actual implementation of KM in your organisation.

5 = Very important
4 = Quite important
3 = Moderately important
2 = Slightly important
1 = Not important

5 = Effective implemented
4 = Quite a lot of implemented
3 = Moderate implemented
2 = Slight implemented
1 = Not implemented

Importance **Implementation effectiveness**

Item No.	Not important	Slightly Important	Moderately important	Quite important	Very important	Factors	Not implemented	Slight i implemented	Moderate implemented	Quite a lot of implemented	Effective implemented
1	1	2	3	4	5	Organisation seeking human values of employees.	1	2	3	4	5
2	1	2	3	4	5	Having knowledge infrastructure in both hard and soft	1	2	3	4	5
3	1	2	3	4	5	Using knowledge mapping techniques	1	2	3	4	5
4	1	2	3	4	5	Appointing Chief Knowledge Officer (CKO).	1	2	3	4	5
5	1	2	3	4	5	Gathering information and creating knowledge.	1	2	3	4	5
6	1	2	3	4	5	Transferring knowledge between functions.	1	2	3	4	5
7	1	2	3	4	5	Sharing knowledge between individuals	1	2	3	4	5
8	1	2	3	4	5	Sharing knowledge with members of other work groups within my organisation	1	2	3	4	5
9	1	2	3	4	5	Sharing information and knowledge	1	2	3	4	5
10	1	2	3	4	5	Integrating KM in business activities	1	2	3	4	5
11	1	2	3	4	5	Gaining knowledge about vendors	1	2	3	4	5
12	1	2	3	4	5	Involving employees in decision-making	1	2	3	4	5
13	1	2	3	4	5	Ensuring top management commitment	1	2	3	4	5
14	1	2	3	4	5	Providing employees with adequate information	1	2	3	4	5
15	1	2	3	4	5	Encouraging employees to participate in both internal and external new learning opportunities	1	2	3	4	5
16	1	2	3	4	5	Supporting team-based approaches to problem solving	1	2	3	4	5
17	1	2	3	4	5	Encouraging empowering employees	1	2	3	4	5

- Please complete the two scales below for the level of **importance** and **implementation effectiveness** of the factors listed. Based on your experience, please indicate the level of importance of each factor for the successful implementation of KM in your organisation. Please indicate the level of actual implementation of KM in your organisation.

5 = Very important
4 = Quite important
3 = Moderately important
2 = Slightly important
1 = Not important

5 = Effective implemented
4 = Quite a lot of implemented
3 = Moderate implemented
2 = Slight implemented
1 = Not implemented

Item No.	Not important	Slightly important	Moderately important	Quite important	Very important	Factors	Not implemented	Slight i implemented	Moderate implemented	Quite a lot of implemented	Effective implemented
18	1	2	3	4	5	Having knowledge management (KM) strategy	1	2	3	4	5
19	1	2	3	4	5	Applying standard, flexible knowledge structure	1	2	3	4	5
20	1	2	3	4	5	Using effective measurement of performance	1	2	3	4	5
21	1	2	3	4	5	Making clear purpose and language.	1	2	3	4	5
22	1	2	3	4	5	Having reward and recognition for actual performance improvement	1	2	3	4	5
23	1	2	3	4	5	Accessing the majority of knowledge within the organisation	1	2	3	4	5
24	1	2	3	4	5	Improving technology infrastructure	1	2	3	4	5
25	1	2	3	4	5	Using network such as Internet, intranet, e-repository	1	2	3	4	5
26	1	2	3	4	5	Keeping the lines of communication open.	1	2	3	4	5
27	1	2	3	4	5	Facilitating multiple channels for knowledge transfer and share	1	2	3	4	5
28	1	2	3	4	5	Allocating adequate budgeting to funding and support KM projects	1	2	3	4	5
29	1	2	3	4	5	Promoting ongoing employee contributions	1	2	3	4	5
30	1	2	3	4	5	Having an accurate and effective knowledge	1	2	3	4	5
31	1	2	3	4	5	Keeping continuous learning	1	2	3	4	5
32	1	2	3	4	5	Creating friendly culture	1	2	3	4	5
33	1	2	3	4	5	Establishing user-friendly information systems.	1	2	3	4	5
34	1	2	3	4	5	Creating culture that supports innovation, learning and knowledge sharing	1	2	3	4	5
35	1	2	3	4	5	Getting feedback from customers regarding the organisations services	1	2	3	4	5
36	1	2	3	4	5	Other:.....	1	2	3	4	5

6. Knowledge Management Benefits

1. Please indicate the achievement of benefits resulting from your KM implementation (1= Not achieved, 2= Slightly achieved, 3= Moderately achieved, 4= Largely achieved, 5= Significant achieved).

Item No.	Benefits	Not achieved	Slightly achieved	Moderately achieved	Largely achieved	Significant achieved
1	Leveraging investment in human capital	1	2	3	4	5
2	Knowledge loss prevented	1	2	3	4	5
3	Improving cycle time and operational excellence	1	2	3	4	5
4	Creating greater customer intimacy and satisfaction	1	2	3	4	5
5	Minimising duplication of effort and loss of knowledge	1	2	3	4	5
6	Innovating and deliver high quality products	1	2	3	4	5
7	Improving innovation and new service development	1	2	3	4	5
8	Increasing productivity of workers	1	2	3	4	5
9	Making organisation focus on core business and on critical organisation knowledge	1	2	3	4	5
10	Reducing loss of intellectual capital from employees who leave	1	2	3	4	5
11	Identifying new business opportunities through better KM	1	2	3	4	5
12	Early warning of potential changes	1	2	3	4	5
13	Giving power to employees employees	1	2	3	4	5
14	Capturing information and creating knowledge	1	2	3	4	5
15	Improving employees' efficiency	1	2	3	4	5
16	Better decision making	1	2	3	4	5
17	Sharing and learning	1	2	3	4	5
18	Ensuring knowledge-workers stay with organisation	1	2	3	4	5
19	Eliminating redundant or unnecessary processes	1	2	3	4	5
20	Increasing employees' satisfaction	1	2	3	4	5
21	Improving communication between knowledge-workers	1	2	3	4	5
22	Operating with minimum fixed assets and overhead	1	2	3	4	5
23	Reaching faster and better solution of problems	1	2	3	4	5
24	Competitive advantage.	1	2	3	4	5
25	Enhancing employee retention rates by recognising value of employees' knowledge	1	2	3	4	5
26	Improving alignment between business strategy and technology infrastructure for knowledge sharing and development	1	2	3	4	5
27	Enhancing synergy between knowledge-workers	1	2	3	4	5
28	Sharing information globally	1	2	3	4	5
29	Improving relevant (group) competencies	1	2	3	4	5
30	Other: _____	1	2	3	4	5

7. Obstacles to Implementing KM

1. Based on your own experience, please rate the following obstacles you may have encountered in KM
   1= Not an obstacle, 2 = Insignificant obstacle, 3 = Minor obstacle, 4 = Major obstacle, and 5 = Severe obstacle

Item No.	Obstacles	Not an obstacle	Insignificant obstacle	Minor obstacle	Major obstacle	Severe obstacle
1	Employees see their knowledge as power	1	2	3	4	5
2	Employees see their knowledge as something private	1	2	3	4	5
3	Employees think no one has the right to share their knowledge	1	2	3	4	5
4	Employees guard their knowledge to protect their position	1	2	3	4	5
5	Employees are unwilling to learn.	1	2	3	4	5
6	Employees lack motivation to learn or share knowledge	1	2	3	4	5
7	Employees lack resources to capture and synthesise organisational learning	1	2	3	4	5
8	Slow and non-user-friendly client-server databases.	1	2	3	4	5
9	Lack of resources to capture and synthesise organisational learning	1	2	3	4	5
10	Lack of ability to navigate the knowledge network to find the right people and data	1	2	3	4	5
11	Turning tacit knowledge to explicit	1	2	3	4	5
12	Linking KM to bottom-line results	1	2	3	4	5
13	Low priority and resource for knowledge gathering	1	2	3	4	5
14	Other:.....					

8. About your suggestions and comments on KM

1. Your own suggestions and comments on the topic of KM will be welcome here.

Thank you for your time and trouble in completing this questionnaire.

Please do not hesitate to contact me to answer any questions you might have.

UK

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Emm Lane
Bradford W Yorkshire
BD 9 4JL
E-mail: m.alazmi@bradford.ac.uk
Phone: 079001 844 66
01274 235313
Fax: 01274 234311

Thank you for your co-operation

Then if you would like a summary of the study results, please complete the following details

Name : _____

Organisation: _____

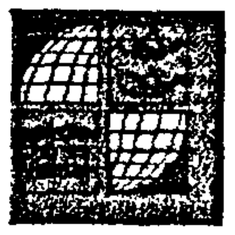
Phone No.: _____ Fax No: _____

Address : _____

_____

E-mail : _____

Appendix 3 Questionnaire



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إدارة الجودة الشاملة
جامعة براد فورد, المملكة المتحدة

عزيزي .....

إدارة نظم المعرفة
Knowledge Management System (KMS)

يجرى إعداد هذا البحث حول تطبيق أنظمة إدارة المعرفة على أساس تكنولوجيا المعلومات.وهو يعتبر دراسة مقارنة للقطاع العام الكويتي و البريطاني ويهدف إلى بناء نموذج عملي مثالي من أجل تطبق إدارة المعرفة بالارتباط مع تكنولوجيا المعلومات.

ونعني بإدارة المعرفة بأنها الطريق الأمثل للوصول وللتعرف على أصول المؤسسة الفكرية لإدارتها والاستفادة منها. وان هذه الأصول يمكن أن تكون قواعد بيانات أو مستندات أو سياسات والإجراءات المهمة الخاصة بالمؤسسة، بالإضافة إلى التجربة والخبرة المكتسبة من خلال المؤسسة.

يهدف جزءا رئيسيا من الدراسة إلى تقييم العوامل الأساسية لنجاح تطبيق إدارة المعرفة. ولهذا الغرض فقد تمت الاستعانة بعدد من المؤسسات في القطاع العام في كل من دولة الكويت والمملكة المتحدة للمشاركة في الدراسة معتمدة على خبراتهم في بديهيان تطبيق إدارة المعرفة ودور تكنولوجيا المعلومات في تلك العملية. وذلك بهدف بناء وتطوير نموذج إدارة المعرفة والذي من خلاله يمكن مساعدة المؤسسات في القطاع العام لخلق وإيداع فرص التنافس مستخدمة باعتبار العامل الفكري (الرأسمال الفكري) كأصل أساسي وجوهري من أصول المؤسسة.

ومن دواعي سرورنا مقدرتكم على تكملة الاستبيان المرفق الذي يعكس تجربة وخبرة مؤسستكم في مجال تطبيق إدارة المعرفة، وإن تحليل جميع بنود الاستبيان سوف توفر القاعدة الأساسية لتحديد الممارسات والتطبيقات المثالية، ملقية الضوء على العوامل الحرجة والرئيسية لاقتراح بناء نموذج مثالي لتطبيق إدارة المعرفة معتمدة على تكنولوجيا معلومات.

إننا سوف نكون شاكرين لكم وممتنين مشاركتكم، حيث أن نجاح هذا البحث يعتمد على تلقي العدد الأقصى من الاستجابات الممكنة. وبالطبع فان إجابتكم سوف يتم التعامل معها بسرية كاملة، وإن المعلومات سوف تستخدم فقط من أجل تحقيق هدف الدراسة فقط. كما أنة تم تصميم هذا الاستبيان لجعل تكملته أكثر سهولة.

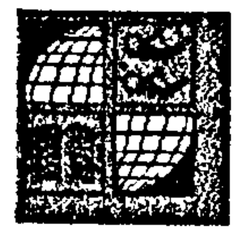
إننا على أتم الاستعداد والامتنان لأن نرسل لكم نسخة من ملخص النتائج التي توصلت إليها الدراسة. وإذا رغبتم في ذلك نرجو ملء المربع الصغير في نهاية هذا الاستبيان.

إننا نتطلع لأن نتلقى استبيانكم الكامل في المستقبل القريب. ومن أجل راحتكم يرجى الاتصال على الرقم **5656555** أو **9044313** حتى يتسنى لنا جمع الاستبيان.

شاكرين لكم تعاونكم

المخلص
أ.د محمد زائيري
رئيس المركز الأوروبي لإدارة الجودة الشاملة

مطيران عبدالله العازمي
باحث (دكتوراه)



إدارة الجودة الشاملة
جامعة براد فورد, المملكة المتحدة

إدارة نظم المعرفة

Knowledge Management Systems (KMS)

1- فيما يخص مؤسستكم

1- مكان المؤسسة ☐ دولة الكويت ☐ المملكة المتحدة

2- اسم المؤسسة .....

☐ مرفق عام . نرجو تحديد الخدمات .....

3- حجم المؤسسة (عدد العمالة)

☐ اقل من 100 ☐ 100 - 200 ☐ 201 - 300 ☐ 301 - 400 ☐ 401 - 500 ☐ اكثر من 500

2- فيما يخصكم

1- المسمى الوظيفي.....

2- الجنـــس، ☐ ذكر ☐ أنثى

3- هل تشارك أو شاركت في إدارة المعرفة ؟ ☐ نعم ☐ لا

إذا كان الجواب نعم، كم عدد السنوات ؟ ☐☐

3- تكنولوجيا المعلومات

1- ما هي الأدوات التكنولوجية التي تستخدمها مؤسستكم من أجل تطبيق إدارة المعرفة؟

☐ Data warehouse ☐ Groupware ☐ Network ☐ Extranet ☐ Intranet ☐ Internet

☐ نرجو تحديد ما إذا كان هناك أدوات أخرى ..... ☐ Web site

2- أي من الأدوات الاتصال التالية تعتبر أكثر فعالية في إدارة المعرفة في مؤسستك؟

☐ Videoconferencing ☐البريد الإلكتروني ☐المخزن الإلكتروني ☐ Ward wide web(www)

☐ نرجو تحديد ما إذا كان هناك أدوات أخرى .....

3- ماهي الطريقة الأكثر فعالية لقياس إدارة المعرفة في منظمتك ؟

☐ The Intangible Assets Monitor ☐ Scandia Navigator ☐ The Balanced Scorecard (BSC)

☐ Matrix structure (capturing, sharing, measuring, and learning)

☐ نرجو تحديد ما إذا كان هناك أدوات أخرى .....

4. من المسؤول الأول عن تخطيط إدارة المعرفة؟

مدير تكنولوجيا المعلومات ☐ IT/IS manager

مسئول المعلومات الرئيسي ☐ Chief Information Officer (CIO)

المدير التنفيذي ☐ Chief Executive Officer (CEO)

استشاريين ☐ Consultants

مسئول المعرفة الرئيسي ☐ Chief Knowledge Officer (CKO)

☐أخرى .....

4- إدارة المعرفة

البيانات التالية تصف مختلف أساسيات إدارة المعرفة. نرجو وضع دائرة على الإجابة التي ترونها مناسبة (1) لا أوافق بشدة (2) لا أوافق (3) حيادي (4) أوافق (5) أوافق بشدة

رقم البند	الموضـــوع	أوافق بشدة	أوافق	حيادي	لا أوافق	لا أوافق بشدة
1	تعني إدارة المعرفة ايجاد الطرق للإبداع والحصول على معرفة المؤسسة للاستفادة منها ونقلها للموظفين الذين يحتاجون إليها لأداء عملهم بكفاءة	5	4	3	2	1
2	بما أن أصول المعرفة للمؤسسة أصبحت أكثر أهمية، فإن مؤسستي سوف تركز بشكل اكثر على إدارة المعرفة في المستقبل	5	4	3	2	1
3	تنظيم وتصنيف المعرفة سوف تكون الكفاءة الأساسية لكل المؤسسات	5	4	3	2	1
4	تعتبر إدارة المعرفة عامل مهم وحيوي لنجاح المنظمة في المستقبل	5	4	3	2	1
5	سوف تصبح تدريجيا إدارة المعرفة اكثر أهمية في المستقبل	5	4	3	2	1
6	الرأسمال الفكري سوف يكون السبيل الأساسي الأول والذي من خلاله تقيس الأعمال التجارية قيمتها	5	4	3	2	1
7	أعتقد أن برنامج إدارة المعرفة يناسب منظمتنا	5	4	3	2	1
8	برنامج إدارة المعرفة يستطيع المساهمة في منتجات منظمتنا أو الخدمات التنافسية	5	4	3	2	1
9	برنامج إدارة المعرفة يستطيع المساهمة في تطوير أداء مؤسستنا بالكامل والاستمرارية على قدرتها التنافسية	5	4	3	2	1
10	تنظيم المؤسسة يجب أن يبنى على الثقة	5	4	3	2	1
11	تقاس إنتاجية الموظفين بفاعلية	5	4	3	2	1
12	أخصائي إدارة المعرفة, مثل مسئول المعرفة الرئيسي أو الاستعانة بمستشار خارج المؤسسة , ضروري لتفعيل إدارة المعرفة	5	4	3	2	1
13	عمليات إدارة المعرفة هي عبارة عن ابتكار معرفة جديدة و تخزينها و نقلها إلى موظفين المؤسسة و المشاركة بها	5	4	3	2	1
14	المعرفة بذاتها لا يمكن إدارتها وإنما يمكن إدارة عملياتها	5	4	3	2	1
15	نجاح أو فشل المؤسسات يعتمد على كيفية استخدامهم بشكل جيد لعمليات إدارة المعرفة	5	4	3	2	1
16	تتألف استراتيجية إدارة المعرفة من استراتيجية التصنيف التي تتعلق بالمعلومات والاستراتيجية الشخصية المتعلقة بالأشخاص	5	4	3	2	1
17	تستخدم منظمتنا استراتيجية التصنيف	5	4	3	2	1
18	تستخدم منظمتنا الاستراتيجية الشخصية	5	4	3	2	1
19	تستخدم مؤسستنا كل من الاستراتيجيتين: التصنيف والأشخاص	5	4	3	2	1
20	وإذا كنت تستخدم استراتيجية مختلفة، نرجو تحديدها					

5- عوامل نجاح إدارة المعرفة

نرجو إكمال المستويين المدرجين أدناه لمستوى الأهمية ومستوى فعالية التطبيق للعوامل المدرجة. معتمدا على تجربتك وخبرتك.
نرجو الإشارة إلى مستوى الأهمية لكل عامل من أجل التطبيق الناجح للإدارة المعرفة في مؤسستك. كما يرجى الإشارة على المستوى الحقيقي لتطبيق إدارة المعرفة في مؤسستكم

5 = مهم جدا
4 = مهم إلى حد ما
3= مهم بشكل معتدل
2 = مهم قليلا
1 = غير مهم

5= مطبق بفاعلية
4 = مطبق إلى حد ما
3 = مطبق بشكل متوسط
2 = مطبقة بشكل بسيط
1 = غير مطبق

الأهمية | فعالية التطبيق

رقم البند	غير مهم	قليل الأهمية	مهم بشكل معتدل	مهم إلى حد ما	مهم جدا	العوامـــل	غير مطبق	مطبقة بشكل بسيط	مطبق بشكل متوسط	مطبق إلى حد ما	مطبق بفاعلية
1	1	2	3	4	5	المنظمة دائما تبحث عن القيم البشرية للموظفين	1	2	3	4	5
2	1	2	3	4	5	توفير بنية تحتية للمعرفة من أجهزة وموارد بشرية	1	2	3	4	5
3	1	2	3	4	5	استخدام تقنية رسم وتخطيط المعرفة	1	2	3	4	5
4	1	2	3	4	5	تعيين مسئول رئيسي للمعرفة	1	2	3	4	5
5	1	2	3	4	5	جمع المعلومات و تكوين المعرفة	1	2	3	4	5
6	1	2	3	4	5	نقل المعرفة بين الوظائف	1	2	3	4	5
7	1	2	3	4	5	المشاركة لتبادل المعرفة بين الفرد	1	2	3	4	5
8	1	2	3	4	5	المشاركة لتبادل المعرفة مع فرق العمل للإدارات الأخرى التابعة للمؤسسة	1	2	3	4	5
9	1	2	3	4	5	المشاركة بالمعلومات و المعرفة	1	2	3	4	5
10	1	2	3	4	5	إدماج إدارة المعرفة في أنشطة الأعمال التجارية	1	2	3	4	5
11	1	2	3	4	5	الحصول على المعلومات والمعرفة عن الموزعين والموردين	1	2	3	4	5
12	1	2	3	4	5	إشراك الموظفين في صنع القرار	1	2	3	4	5
13	1	2	3	4	5	ضمان دعم والتزام الإدارة العليا	1	2	3	4	5
14	1	2	3	4	5	تزويد الموظفين بالمعلومات الكافية	1	2	3	4	5
15	1	2	3	4	5	تشجيع الموظفين على المشاركة في التدريب والتعليم سواء في داخل المؤسسة أو من خارجها	1	2	3	4	5
16	1	2	3	4	5	الدعم والتشجيع على تكوين وإنشاء فرق العمل للقيام على حل المشاكل	1	2	3	4	5
17	1	2	3	4	5	التشجيع على تفويض الموظفين بعطائهم صلاحيات	1	2	3	4	5

نرجو إكمال المستويين المدرجين أدناه لمستوى **الأهمية** ومستوى **فعالية التطبيق** للعوامل المدرجة. معتمدا على تجربتك وخبرتك.
نرجو الإشارة إلى مستوى الأهمية لكل عامل من أجل التطبيق الناجح للإدارة المعرفة في مؤسستك. كما يرجى الإشارة على المستوى الحقيقي لتطبيق إدارة المعرفة في مؤسستكم

الأهمية

5 = مهم جدا
4 = مهم إلى حد ما
3= مهم بشكل معتدل
2 = مهم قليلا
1 = غير مهم

فعالية التطبيق

5= مطبق بفاعلية
4 = مطبق إلى حد ما
3 = مطبق بشكل متوسط
2 = مطبقة بشكل بسيط
1 = غير مطبق

رقم البند	غير مهم	قليل الأهمية	مهم بشكل معتدل	مهم إلى حد ما	مهم جدا	العوامـــــل	غير مطبق	مطبقة بشكل بسيط	مطبق بشكل متوسط	مطبق إلى حد ما	مطبق بفاعلية
18	1	2	3	4	5	استخدام استراتيجية إدارة المعرفة	1	2	3	4	5
19	1	2	3	4	5	تطبيق وتنظيم المعرفة بأسلوب بسيط و مرن	1	2	3	4	5
20	1	2	3	4	5	استخدام قياس فعال لأداء العمل	1	2	3	4	5
21	1	2	3	4	5	توضيح الهدف والأساليب المتبعة	1	2	3	4	5
22	1	2	3	4	5	تطبيق مبدأ المكافأة والتقدير لتحسين أداء العمل الفعلي	1	2	3	4	5
23	1	2	3	4	5	إمكانية الوصول والتعرف على المعرفة العامة للمؤسسة	1	2	3	4	5
24	1	2	3	4	5	تحسين البنية التحتية للتكنولوجيا	1	2	3	4	5
25	1	2	3	4	5	استخدام الشبكات مثل E-repository (Type of databases), intranet, internet	1	2	3	4	5
26	1	2	3	4	5	جعل خطوط الاتصال مفتوحة بشكل دائم لإمكانية الحصول على المعلومات بأي وقت	1	2	3	4	5
27	1	2	3	4	5	توفير القنوات المتعددة لسهولة انتقال المعرفة و المشاركة بها	1	2	3	4	5
28	1	2	3	4	5	تخصيص ميزانية كافية لتمويل ودعم مشاريع إدارة المعرفة	1	2	3	4	5
29	1	2	3	4	5	التشجيع المستمر لمساهمات الموظف	1	2	3	4	5
30	1	2	3	4	5	الحصول على معرفة دقيقة وفعالة	1	2	3	4	5
31	1	2	3	4	5	الحث على دوام استمرارية التعليم وكسب الخبرات	1	2	3	4	5
32	1	2	3	4	5	غرس روح التعاون بين الموظفين	1	2	3	4	5
33	1	2	3	4	5	إنشاء نظم معلومات سهلة الاستخدام	1	2	3	4	5
34	1	2	3	4	5	خلق جو عمل مناسب لدعم الابتكار والتعليم و المشاركة في المعرفة والخبرات بين الموظفين	1	2	3	4	5
35	1	2	3	4	5	الحصول على الملاحظات من العملاء بخصوص خدمات المنظمة	1	2	3	4	5
36	1	2	3	4	5	أخرى	1	2	3	4	5

6. فوائد إدارة المعرفة

يرجى الإشارة إلى تحقيق الفوائد الناتجة من تطبيق إدارة المعرفة 1 = لم يتم تحقيقها, 2- حققت بشكل بسيط, 3- حققت بشكل متوسط 4 - تم تحقيقها إلى حد كبير 5- حققت بشكل مهم وتام

	الفوائد	لم يتم تحقيقها	حققت بشكل بسيط	حققت بشكل متوسط	تم تحقيقها إلى حد	حققت بشكل مهم
1	زيادة الاستثمار في القوة البشرية	1	2	3	4	5
2	منع فقدان المعرفة	1	2	3	4	5
3	تحسين وقت الدورة المستندية وجودة العمل	1	2	3	4	5
4	خلق صداقة حميمة مع العميل وكسب رضاه	1	2	3	4	5
5	الحد من ازدواجية العمل وفقدان المعرفة	1	2	3	4	5
6	الابتكار وتقديم منتجات ذو جودة عالية	1	2	3	4	5
7	تطوير الابتكار وتحسين الخدمات الجديدة	1	2	3	4	5
8	زيادة إنتاجية الموظفين	1	2	3	4	5
9	جعل المؤسسة تركز على جوهر العمل وعلى خبرة ومعرفة المؤسسة الأساسية	1	2	3	4	5
10	الحد من خسارة القدرة الفكرية عند مغادرة الموظفين المؤسسة	1	2	3	4	5
11	التعرف على فرص العمل الجديدة من خلال إدارة المعرفة	1	2	3	4	5
12	التنبؤ المبكر للتغيرات المحتملة	1	2	3	4	5
13	إعطاء سلطة وقوة للموظفين	1	2	3	4	5
14	إمكانية الحصول على المعلومات وابتكار وخلق معرفة جديدة	1	2	3	4	5
15	تحسين فعالية الموظفين	1	2	3	4	5
16	اتخاذ قرار أفضل	1	2	3	4	5
17	توفير فرص للمشاركة والتعلم	1	2	3	4	5
18	ضمان بقاء الموظفين ذو المعرفة في المؤسسة	1	2	3	4	5
19	إزالة العمليات الفائضة أو غير ضرورية	1	2	3	4	5
20	زيادة رضا الموظفين	1	2	3	4	5
21	تحسين الاتصال بين العمالة ذو المعرفة والاختصاص	1	2	3	4	5
22	إمكانية تشغيل المؤسسة بأقل أصول ثابتة ومصاريف	1	2	3	4	5
23	سرعة الوصول مع افضل الحلول للمشاكل	1	2	3	4	5
24	إعطاء فرص اكثر للتنافس	1	2	3	4	5
25	تعزيز نسبة التركيز والانتباه عند الموظف من خلال إدراك قيمة المعرفة لدى الموظفين	1	2	3	4	5
26	تحسين التخطيط بين استراتيجية العمل والبنية التحتية للتكنولوجيا لأجل المشاركة بالمعرفة وتطويرها	1	2	3	4	5
27	تعزيز التعاون والتوافق بين الموظفين ذو المعرفة	1	2	3	4	5
28	شمولية المشاركة بالمعلومات عالميا	1	2	3	4	5
29	تطوير الكفاءة المناسبة عن طريق فرق العمل	1	2	3	4	5
30	اخرى.....	1	2	3	4	5

7- معوقات تطبيقات إدارة المعرفة

اعتمادا على خبرتك، نرجو تحديد نسبة المعوقات التالية التي يمكن أن تكون قد واجهتها في إدارة المعرفة. نرجو وضع دائرة على الإجابة التي ترونها مناسبة,1 = لا يوجد إعاقة, 2- = إعاقة غير مهمة,3- إعاقة بسيطة 4- إعاقة مهمة, 5- إعاقة قاسية

رقم البند	العوائـــــق	إعاقة قاسية	إعاقة مهمة	إعاقة بسيطة	إعاقة غير مهمة	لا يوجد إعاقة
1	يرى الموظفين معرفتهم على أنها قوة	5	4	3	2	1
2	يرى الموظفون أن حيازتهم للمعرفة هي من خصوصياتهم	5	4	3	2	1
3	يعتقد الموظفين أن لا أحد له الحق مشاركتهم معرفتهم	5	4	3	2	1
4	يدافع الموظفون عن خبراتهم المعرفية للحفاظ على مراكزهم و حمايتها	5	4	3	2	1
5	لا يرغب الموظفون في التعلم	5	4	3	2	1
6	يفتقر الموظفون لما يحفزهم لاكتساب المعرفة و تبادلها فيما بينهم	5	4	3	2	1
7	يفتقر الموظفون لوسائل جمع رصيد المؤسسة من المعرفة	5	4	3	2	1
8	بطئ نظم قواعد البيانات و صعوبة استخدامها	5	4	3	2	1
9	عدم توفر القدرة على تحديد مصادر المعرفة المناسبة من أشخاص و بيانات	5	4	3	2	1
10	تحويل المعرفة الضمنية(الغير واضحة) إلى معرفة واضحة	5	4	3	2	1
11	ربط نظم إدارة المعرفة بالنتائج النهائية	5	4	3	2	1
12	عدم إعطاء أولوية لجمع المعرفة وقلة مصادرها	5	4	3	2	1
13	أخرى	5	4	3	2	1

8- بشأن مقترحاتك وتعليقاتك على إدارة المعرفة

نشكركم على السماح لنا بقليل من وقتكم في إكمال هذا الاستبيان

لا تتردد بالاتصال بنا للإجابة على استفساراتكم

UK

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شكرا على تعاونكم

إذا رغبتم الحصول على نسخة من ملخص نتائج الدراسة , نرجو ملء البيانات الآتية

الاســـم : _____

اسم المؤسسة _____

رقم الهاتف _____ رقم الفاكس _____

العنوان

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البريد الإلكتروني

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