Knowledge management in distributed organisations:
Developing a meta-level framework

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I dedicate this work to Goddess Saraswathi, the mother of knowledge and wisdom

“Shri Saraswathi namahstubhyam varade kaama ruupini
twaam aham praarthane devii vidyaadaanam cha dehi me”

“I bow to Goddess Saraswathi who fulfils the wishes of the devotees. I pray you to enlighten me with knowledge”
Abstract

The emergence of the knowledge economy has necessitated many organisations to recognise knowledge as a crucial resource, and created an intricate managerial challenge – “knowledge management (KM)”. Because of the cultural, operational and other business complexities, this challenge is more acute for distributed organisations. In the last few years, several theories have been put forward for practising KM. However, given the abstract nature of the subject area, there is little consensus on the components and ways of knowledge management in distributed organisations. Much of the current research is carried out on one or a very few organisational elements of knowledge management. The critical and fundamental relationships between all the elements are often ignored. The need for empirical theories, principles and methods for knowledge management is widely acknowledged in the extant management literature. Thus, the primary motivation for this research is to develop a broad-based theory in the form of a holistic framework for managing enterprise knowledge in distributed organisations. This dissertation attempts to answer a complex research question: “how to manage enterprise knowledge in distributed organisations?”.

The research study is carried with an interpretive paradigm to explore and describe various factors influencing knowledge management practice in distributed organisations. The empirical data is collected using the case study research strategy. In-depth case studies were conducted at six large distributed organisations in Germany, India, and the United Kingdom. The studied organisations include Alcatel, Daimler Chrysler, Hewlett Packard, Oracle Corporation, UK National Health Service, and Wipro Technologies. The empirical material that was collected was further analysed using grounded theory approach.

This dissertation provides the findings of this study in the form of several factors influencing the knowledge management practice in distributed organisations. These factors include leadership, organisational structure, evangelisation, communities of practice, reward systems, time allocation, business processes, recruitment, infrastructure and physical attributes. Based on this study, the challenges, management strategies, and best practices are described for each of these KM factors. Consequently, a meta-level KM practice framework has been developed by combining the identified KM factors into four core organisational
dimensions; Business focus, Culture, Process and Infrastructure (BCPI). The BCPI framework is constructed by integrating the findings of this study with the current literature in the KM subject arena. The BCPI framework appreciates and describes the interrelationships between various organisational elements impacting the knowledge management function.
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List of abbreviations

AI = Artificial Intelligence
BPCI = Business Focus, Culture, Process, and Infrastructure
BPI = Business Process Innovation
BPM = Business Process Management
BPR = Business Process Reengineering
CoP = Communities of Practice
EIP = Enterprise Information Portal
EKP = Enterprise Knowledge Portal
ESOPS = Employee Share Options
G = Goal of this dissertation
GP = General Practitioner
HP = Hewlett Packard
HRM = Human Resource Management
IC = Intellectual Capital
ICT = Information and Communication Technologies
IS = Information Systems
IT = Information Technology
KM = Knowledge Management
MBTI = Myers-Briggs Type Indicator
MIS = Management Information Systems
NHS = National Health Service
OB = Organisational Behaviour
OL = Organisational Learning
P = Research Problem of this dissertation
Q1 = First research question of this dissertation
Q2 = Second research question of this dissertation
Q3 = Third research question of this dissertation
1 Introduction

“The search for truth is in one way hard and in another way easy, for it is evident that no one can master it fully or miss it wholly. But each adds a little to our knowledge of nature, and from all the facts assembled there arises certain grandeur”. - Aristotle

1.1 Setting the scene

Emergence of the knowledge economy has changed the business dynamics in the industrial world. In many global economies, the conventional resources of competence are now replaced by knowledge (Drucker, 1993). World Bank (1998) in its development report notes that “for countries in the vanguard of the world economy, the balance between knowledge and resources has shifted so far towards the former that knowledge has become perhaps the most important factor determining the standard of living......today’s most technologically advanced economies are truly knowledge based”. The arrival and significance of knowledge economy is widely acknowledged in the academic and business spheres. Nonaka (1987) advocates knowledge as a sure source of lasting competitive advantage in an economy where the only certainty is uncertainty. Several other authors, in management sciences, have consistently emphasised that the major competitive advantage for a corporation lies in its knowledge (Drucker, 1968; Bell, 1973; Toffler, 1990, Nonaka, 1994).

Quintas (2002) notes that today’s organisations need to continually regenerate and develop knowledge to address the gathering pace of change across several dimensions including markets, competition, globalisation, technology and innovation. Many organisations across the world have realised the significance of knowledge and imparted strategic focus towards its effective management. For instance, Louis Gerstner (Hackett, 2000), Chairman of IBM, notes that:

"the age-old levers of competition—labour, capital, and land—are being supplemented by knowledge, and the most successful companies.....will be those that....exploit knowledge about the
customer behaviour, markets, economies, and technology faster and more effectively than their competitors. They will use knowledge to adapt quickly, seizing opportunities and improving products and services, of course, but just as important, renewing the ways they define themselves, think, and operate”.

However, this recognition of knowledge as a core organisational resource in the last decade has created a grand business challenge – “knowledge management”. The challenge of knowledge management is intricate in distributed organisations because of their business characteristics.

1.2 Knowledge management in distributed organisations

Conventionally, an organisation is defined as a collection of people working together to achieve a common purpose. If an organisation has people working from various geographical locations it can be termed as a distributed organisation (Scott, 1998; Schermerhorn, 2005). Practising KM is a complex issue in distributed organisations because of several inherent characteristics. These include factors such as knowledge dispersion, cultural variances, organisational size, communication complexities, diverse systems, and business processes (Cramton, 2001; Davenport, 2000; Lam, 1997; Malhotra, 2004; O’Leary, 1998; Rumizen).

Distributed organisations require specific concepts, theories and frameworks to address various inherent KM challenges. For example, O’Leary (1998) notes that managing knowledge in distributed organisations is a complex task because of geographical dispersion of knowledge workers. There is also a widespread recognition and agreement about the significance and need to manage enterprise knowledge in distributed organisations. However, the avenues of knowledge management for these organisations are inadequate and disparate. There is a lack of coherent understanding of the ways to manage this valuable organisational resource (Burton-Jones, 1999; Croasdell et al., 2002; Kluge et al., 2001; Malhotra, 2004b; Wilson, 2002).

1.3 Motivation for this research

During the last decade, KM has been witnessing significant interest from research communities and emerging as a formal discipline in organisational studies. The rising awareness of the emergence of global knowledge economy combined with its impact on the business organisations is contributing to an
augmented attention towards knowledge management. Some major KM areas currently being researched encompass the Communities of Practice (CoP), Organisational Learning (OL), Intellectual Capital (IC), Organisational culture, Change management, Business process management, Collaboration technologies, and Content management, and Artificial Intelligence (AI).

However, much of the current research is carried out on one of the organisational dimensions or elements of knowledge management such as organisational culture, technological infrastructure, human resource management, or process management (Lewis, 2002; Natarajan & Shekhar, 2000; Nissen et al., 2000; Remus & Schub, 2003; Sveiby, 2001). For instance, Natarajan & Shekar (2000) focus only on technology aspect of KM. Whereas, Nissen et al. (2000), addresses KM mainly through process dimension. The critical and fundamental relationships between various organisational elements are often ignored. While there is an apparent necessity for in-depth research along the above individual dimensions, developing theories of KM by appreciating the interrelationships between various organisational elements is also an immediate and important requisite. The need for the integrated empirical theories, principles, and methods for knowledge management is widely acknowledged in the extant management literature (Zack, 1999; Thoben et al., 2000; Bouthillier & Shearer, 2002; Tuomi, 2002; Madanmohan & Navelkar, 2003; Susman & Majchrzak, 2003;). KM practitioners and managers in organisations today need such theories for developing and implementing comprehensive KM strategies covering all organisational dimensions to achieve business value.

Thus, the primary motivation for this research is to develop a broad-based theory in the form of a holistic framework for managing enterprise knowledge in distributed organisations. The proposed framework also aims to serve as a generic template for practicing KM in distributed organisations. This dissertation adopts a meta-level view of knowledge management focusing on a composite set of the factors influencing knowledge management function. Through empirical research, this dissertation will attempt to examine and find the key organisational elements and their interrelationships impacting knowledge management. A further motivation is to contribute to the field of knowledge management in bridging the gap between theory and practice by developing principles, methods, and processes for practising KM and embedding them into the proposed framework. Therefore, the theoretical and practical contributions from this study would be closely integrated.
1.4 Research problem
This dissertation will study the ways of managing enterprise knowledge in distributed organisations by concentrating on the core organisational elements. The research problem has two major components; 1) finding the core organisational factors or elements for practising knowledge management and 2) developing a framework for managing enterprise knowledge based on the identified factors. Precisely this dissertation aims to answer the following research problem (P).

“How to manage enterprise knowledge in distributed organisations while encompassing the fundamental organisational elements?”

1.5 Research goal and objectives
The goal (G) of this dissertation is to address the research problem (P) by developing a holistic framework for practising knowledge management in distributed organisations. Within this context, the following objectives are to be addressed in this research project.

1) To provide a critical literature review of various concepts, theories and frameworks of knowledge management.

2) To develop a group (based on literature review) of organisational elements which can influence knowledge management.

3) To conduct empirical studies at selected distributed organisations, with established knowledge management programmes, for understanding how various principal organisational elements can be managed in order to effectively manage the enterprise knowledge.

4) To evaluate and discuss the findings of this study against contemporary KM literature.

5) To develop a knowledge management framework based on the findings of an empirical study and the expertise gained from the current KM literature.
1.6 Research methodology

Interpretivist research paradigm is adopted for this study to solve the defined research problem and to achieve the charted objectives. The data is collected using case study methodology. Case study methodology, a qualitative research approach, is often preferred in answering the ‘How’ and ‘Why’ questions (Yin 1994). There is also a widespread acknowledgement of qualitative research as a valuable and valid approach in management research. The qualitative methodologies are often applied in KM and other related subject areas such as information systems and organisational learning (Ardichvilli, et al., 2003; Avison et al., 1999; Benbasat et al., 1987; Croasdell, 2002; Markus, 1997; Myers, 1997;).

Grounded theory approach is employed to analyse the empirical material collected from the case organisations. Grounded theory is a widely recognised methodology for analysing qualitative data (Creswell, 1998; Charmaz, 2000; Hussey & Hussey, 1997; Strauss & Corbin, 1998). Various coding techniques of the grounded theory are used extensively to analyse the empirical data and to develop a meta-level KM framework for distributed organisations (Glaser & Strauss, 1967; Strauss & Corbin, 1998). A detailed description and rationale of the adopted research paradigm and methodologies are provided in chapter 3.

1.7 Research focus and boundaries

The following sub-sections provide a brief overview of the research focus, related subject areas, approaches, and perspectives adopted for this dissertation.

1.7.1 Positioning of the thesis

This dissertation focuses on developing a set of factors and a broad based framework for practicing knowledge management in distributed organisations. The proposed framework is intended to serve as a meta-level guiding theory for practising KM in these organisations. It would not concentrate on providing exhaustive steps for KM practice, intentionally leaving room for customised usage of the framework depending on the organisational specificities. However, the KM factors developed through this study aim to provide specific strategies, measures, and best practices to guide organisations in managing their enterprise knowledge.
1.7.2 Related subject areas

The related subjects such as organisational learning, information systems, and intellectual capital will be investigated in the perspective of knowledge management. In some other research contexts these issues may be treated as individual research subjects rather than being part of KM subject arena.

1.7.3 Applicability of the framework

The knowledge management framework to be developed through this research project addresses the subject of knowledge management in the perspective of distributed organisations. Many of such organisations can be large scale business and some of them could be global conglomerates. Hence, certain aspects and components of the proposed framework might not be relevant for some small businesses operating from a single location. However, the framework might be applicable for small businesses with distributed work force (e.g. Sales force).

1.7.4 Holistic approach

The research project takes a holistic approach towards the constituent elements of knowledge management such as organisational culture, business process management, and technology, rather than taking an emphasis or orientation towards these individual elements.

1.7.5 Approach toward Technologies

This dissertation adopts a conceptual view of the knowledge management tools and technologies. As the technologies used in KM are evolving at rapid pace, taking a precision view of individual technologies would not be a practical approach. Discussing each of the vendor technologies in detail may not be possible and viable as there are numerous technological options for practicing KM. Therefore, wherever possible, the Information and Communication Technologies (ICT) will be discussed conceptually rather than concentrating on various vendors or versions.

1.8 Thesis structure

Figure 1.1 provides an overview of the process or workflow adopted for this research study. The following sub-sections provide the structure of this thesis by giving a brief description of the lay out and the content of the chapters.
1.8.1 Chapter 2: Background

This chapter provides a critical review of current literature in the knowledge management landscape. This review will encompass books, refereed journals, conference papers, published case studies, and other literature in the KM subject.
arena. This chapter provides a working definition for “knowledge” and “knowledge management” by reviewing various philosophical and authoritative views on the subject. The chapter discusses the rationale, recent developments, challenges, research directions and other important aspects of knowledge management in the perspective of distributed organisations. On the basis of a critical review, the chapter attempts to develop some hypothetical foundations and research questions for this empirical study.

1.8.2 Chapter 3: Research methodology and design
This chapter provides an in-depth discussion of the ontological, epistemological and methodological foundations for this research study. It provides arguments for the selection of research paradigm and methodologies for data collection and analysis. The chapter also presents the criteria for sample selection and provides a brief description for each of the organisations under study. It also gives an overview of the participants of this research study.

1.8.3 Chapter 4: Findings, Analysis and developing a KM framework
In this chapter the findings of the study are analysed, discussed, and critically appraised against the current KM literature. Here, the conceptual relationships would be established between the case study findings and the elements derived during literature review. Based on the analytic findings of the study, a comprehensive set of factors and a broad-based framework will be constructed for practising KM in distributed organisations.

1.8.4 Chapter 5: Conclusion and further work
This chapter provides a summary of findings of this research study with a critical discussion on its implications. It discusses the contributions made by this dissertation to KM discipline, and provides certain limitations of the findings. This chapter also outlines some directions for further research work to evaluate and enhance the findings of this empirical study.

1.8.5 Appendix B: Research instrument
A copy of the questionnaire instrument, used for this research study, is provided here.
1.8.6 Appendix C: Selected paper

A copy of a journal paper, accepted in the *Journal of Knowledge Management*, is provided here.

**Summary**

This current chapter provided a precise background to the knowledge management arena by setting the scene for this dissertation. This chapter outlined the research problem and set the objectives, scope, and boundaries for this research study. It has also given a precise description of the research strategy adopted for this project.
2 Background

"To repeat what others have said, requires education, to challenge it, requires brains”.
- Mary Pettibone Poole

Introduction

Based on a critical review of the current literature on epistemology, knowledge management and business studies, this chapter presents an in-depth discussion on the meaning of the term ‘knowledge’, and constructs a working definition for ‘knowledge management’. This chapter covers the rationale, recent developments, challenges, research directions, and other important aspects of knowledge management subject arena. It also attempts to explore the core organisational elements affecting knowledge management in distributed organisations. These elements would serve as the hypothetical foundations for this research study. Based on the research problem and a critical review of the KM literature, the research questions are formulated for this study.

2.1 What is knowledge?

The Compact Oxford English Dictionary (Weiner & Simpson, 1991), states that knowledge is “the fact of recognising as something known about”. Although slightly variant, The Chambers 20th Century Dictionary (Kirkpatrick et al., 1983) provides similar but slightly varied description of knowledge. It describes knowledge as the “assured belief: that which is known”. However, all the major descriptions emphasise the meaning of knowledge on the first part of the term (know) and underscore the later part of the term (ledge) as a mere analytical pronunciation. The roots of the word “know” are generally traced from several ancient languages. The predecessors include Cnawan (in Old English), Kna (in Old Norse), Cnaan (in Old German), Gnoscere (in Latin), Gignoskein (in Greek) and Zna-ti (in Old Slavonic). Several meanings can be seen for the term ‘know’ which include; an assured belief, acquaintance, cognisance, recognise, information, instruction, enlightenment, learning and practical skill (Weiner & Simpson, 1991, Kirkpatrick et al., 1983 & Macmillan Dictionary, 2002).
However, knowledge has a broader meaning and scope in the knowledge management landscape. This greater scope, rich meaning and complexity can be derived from the history of western philosophy. Much of the contemporary literature in knowledge management avoids a detailed philosophical discussion about the meaning and definition of knowledge. This persistent escapism caused a widespread confusion in the theory and practise of KM. The definition of “knowledge” remained contentious ever since the discussion of the term started in recorded history. Over the centuries the term attracted a great deal of attention from philosophers. The study of knowledge emerged as a broad discipline in philosophy known as Epistemology. Many philosophers including, Socrates, Plato, Aristotle, Descartes, Locke, Kant and Russell, attempted to provide various useful insights to the nature of knowledge. However the initial description of knowledge, provided by Plato, still remains as a widely accepted theory (Nonaka & Takeuchi, 1995).

2.1.1 Plato’s theory of knowledge

Plato (427-347 BC), an eminent Greek philosopher of the medieval times, was first to provide a formal description of the term “knowledge” in his work, the Theatetus. Plato’s theory of knowledge is based on the composition of the dialogues which had supposedly taken place during 4th Century B.C., between his teacher, Socrates and another scholar, Theatetus. This comprehensive dialogue conclusively defines knowledge as the “justified true belief” (Cornford, 1935). Justification, Truth and Belief (JTB) are the three criteria that are applied to examine whether a given proposition qualifies as knowledge. This traditional examination of propositions is known as JTB analysis (Nozick, 1981). According to this, an individual(S) knows a proposition (P) if and only if,

(i) $p$ is true;
(ii) $S$ believes that $p$;
(iii) $S$ is justified in believing that $p$

For example, John($S$) knows that “there was an earth quake in Japan yesterday” ($p$). To consider $p$ as knowledge,

(i) The earth quake should have really occurred in Japan yesterday
(ii) John should believe that there was an earth quake in Japan yesterday
(iii) John should have justification for his belief that there was an earth quake in Japan yesterday
The first condition, that the proposition should be true is a basic criterion. In the above example, if there was no earthquake in Japan yesterday, then $p$ cannot be considered as knowledge because it is not true. John may believe that there was an earthquake in Japan because someone wrongly told him. He might also have a justification that earthquakes occur frequently in Japan.

The second condition requires an individual to believe in the proposition. For instance in the above example, if John does not believe that there was an earthquake in Japan yesterday, but casually says to his friend that there was an earthquake in Japan yesterday. As a mere coincidence if it turns out that there was really an earthquake in Japan yesterday, then $p$ cannot be said as knowledge, even though John has justification for $p$.

The third condition, the justification part of JTB analysis, is a more complex criterion. In the above example, if John has no justification or a valid reason for believing that an earthquake occurred in Japan yesterday then the proposition cannot be considered as knowledge even if it turns out to be true.

While there is a widespread acceptance of the definition of knowledge as the "justified true belief", there are fundamental differences among philosophers on the justification of beliefs. In the contemporary epistemological literature, Gettier's (1963) counter examples for this definition of knowledge, insists that the JTB notion of knowledge is inadequate. However other philosophers argue that these counter examples arise because of the misinterpretation of justification and truth conditions of the definition (Goldman, 1967; Lehrer & Paxson, 1969; Nozick, 1981).

Plato proposed that justification is achieved by reasoning rather than by the sensory perception or experience. However this view is criticised by his student, Aristotle, who proposed that that all human knowledge comes at first from senses and experience. These divergent views of Plato and Aristotle later emerged as two distinct paths in Epistemology, the Rationalism and the Empiricism respectively. The rationalists assume that knowledge is gained through reasoning while the empiricists claim that the knowledge is gained through induction or sensory experience (Burneyeat, 1981).
2.1.2 Rationalism

The platonic view of knowledge is further developed by René Descartes (1596-1650), who is widely regarded as the father of modern philosophy. Descartes, in his work, The *Discourse on Method*, proposed the following four laws of rationalism (Descartes & Cress, 1998; Haldane & Ross, 1911).

- To accept nothing as true that is not recognized by the reason as clear and distinct;
- To analyze complex ideas by breaking them down into their simple constitutive elements, which reason can intuitively apprehend;
- To reconstruct, beginning with simple ideas and working synthetically to the complex;
- To make an accurate and complete enumeration of the data of the problem, using both induction and deduction methods.

Descartes' rationalism sees knowledge as accessible only by reason and not by the senses. He devised the “method of doubt”, for gaining certain and absolute knowledge. This method is widely recognised as Cartesian method of rationalism. Setting aside all former pre-suppositions, this method proposes that we must doubt everything through reasoning until we reach certainty. Beginning in a free and simple way, Descartes questions the existence of everything including himself and says "I think therefore I am" (*cogito ergo sum*). He infers that his existence is certain as he cannot think or doubt something, without his existence. Making this as the first point of certain knowledge, he asserts that knowledge can be developed through deduction. Descartes made mathematics the model for all science, applying its deductive and analytical methods to all fields of knowledge. His method emerged as Continental rationalism, an approach to philosophy based on the thesis that human reason can in principle be the source of all knowledge (Broughton, 2002; Descartes & Cress, 1998; Haldane & Ross, 1911).

The continental rationalism is furthered by Baruch Spinoza (1632-1677) and Gottfried Leibniz (1646-1716). They both concurred that, in principle, all knowledge, including scientific knowledge, could be gained through the use of reason alone. However, they accepted that in practise this was not possible for human beings except in specific subjects such as mathematics. Spinoza's rationalism does not proceed at the expense of empirical observation. His theory of knowledge suggests that the universe is a single substance, capable of infinite attributes, but known through two of them: physical "extension" and "thought."
Spinoza viewed that “Adequate ideas” are a coherent logical association of physical experiences. In contrast to Spinoza, Leibniz returned to a concept of a transcendent God, much closer to the position held by Descartes. Leibniz set forth his concept of reality in his major work, Monadology. He describes monads as the unique metaphysical units of force that are not affected by external criteria. Although each monad develops individually, they are interrelated through a logical “pre-established harmony,” involving a hierarchy of monads culminating in God, the monad of monads. Through his arguments, Leibniz stated that the God was responsible for the ordering of the monads into a rational universe which was “the best of all possible worlds”. The following extract from his work summarises his view that God was the basis of our knowledge (Leibniz, 1714; Mates, 1986).

“...it is the knowledge of necessary and eternal truths which distinguishes us from mere animals, and gives us reason and the sciences, raising us to knowledge of ourselves and God. It is this in us which we call the rational soul or mind”

His rationalistic epistemology was characterized both by a deductive process of argumentation, with special attention being given to mathematical methodology, and by the anchoring of all knowledge in the nature of God.

**2.1.3 Empiricism**

In variance to the deductive method of rationalists, the Empiricists propose induction as the logic of scientific discovery and gaining new knowledge. Francis Bacon (1561-1626), the founder of modern inductive method, pioneered logical systemisation and scientific procedure. He is commonly regarded as the originator of the saying “knowledge is power” (Russell, 1961). Bacon’s scientific method is quite different from the Cartesian method. He believed that there was a rigorous "organ," or method, for making scientific discoveries and proposed that knowledge is gained through observation and experience rather than reasoning and intuition. His method suggests that by using inductive logic one could develop lowest degree of general laws from the observations about particular cases. From a number of such laws he hoped to reach the next level of generality and so on. Thus one would finally develop the most fundamental and comprehensive laws of nature. This view that all the scientific knowledge is derived from observation alone is called empiricism (Bacon, 1605; Russell, 1961).
John Locke (1632-1704), the founder of British empiricism, was also a major critic of the Cartesian rationalism. Through his work, the *Essay Concerning Human Understanding*, he gave a systematic expression to the empiricist doctrine expounded by Bacon (Locke, 1994). Locke's theory emphasizes the importance of the experience of the senses in pursuit of knowledge rather than intuitive speculation or deduction. He regarded the mind of a person at birth as a *tabula rasa*, a blank slate upon which experience imprints knowledge. He did not believe in the intuition or theories of innate conceptions.

George Berkeley (1685-1553) also supported the empirical notion of knowledge, proposing that any knowledge of the empirical world is to be obtained only through direct perception. He suggested that our perceptions of objects are all perfectly accurate and objective and claimed that thinking about what we perceive can be erroneous. In his work, *A Treatise concerning the Principles of Human Knowledge*, Berkeley asserted that the ideal form of scientific knowledge is to be obtained by pursuing pure de-intellectualized perceptions. Through such perceptions, we would be able to obtain the deepest insights into the natural world. According to him, the goal of all science is to de-intellectualize or de-conceptualize, and thereby purify, our perceptions (Luce, 1945).

Influenced by Locke and Berkeley, David Hume (1711-1776), furthered the empiricist school of thought, proposing that knowledge can only come from previous experience. He rejected the idea of priori knowledge and believed that the reasoning alone cannot deduce true knowledge. Through his work, *An Inquiry Concerning Human Understanding*, Hume demonstrates that there is no way to rationally make any claims about future occurrences. His theory claims that all our ideas, which form the basis of our knowledge, are derived from impressions that we take in from the outside world. He grouped perceptions and experiences into one of the two categories; impressions and ideas. The ideas are memories of sensations but impressions are the cause of sensation. Hume suggested that ideas were just dull imitations of impressions. He intended to prove that reason and rational judgments are mere habitual associations of distinct impressions or experiences.

### 2.1.4 Synthesis of Continental rationalism and British empiricism

The two schools of epistemology, Continental rationalism and British empiricism, were brought together by Immanuel Kant (1724-1804). Initially a rationalist, Kant was later influenced by Hume’s work. Kant says “though all our knowledge
begins with experience, it does not follow that it all arises from experience” (Kant & Kemp, 1965). In his work, *The Critique of Pure Reason*, Kant emphasizes that although our knowledge is derived from experience, it is possible to have knowledge of objects in advance of experience. By supporting the notion of a priori knowledge, Kantian philosophy tilts towards rationalism. A *priori* proposition is one that can be known to be true, or false, without reference to experience, except so far as experience is necessary for understanding its terms. In his doctrine, the *transcendental idealism*, Kant argues that the mind knows objects in the world only by means of sensible forms, space and time, which it produces itself. Without these forms, Kant argues, knowledge would not be possible because the mind would have no way to order or structure the data given to it by the senses.

George W.F. Hegel (1770-1831) and Karl Marx (1818-1883) have also attempted to synthesise the concepts of rationalism and empiricism. Criticising the transcendental idealism of Kant, Hegel proposed that the Philosophy is about the knowing of the Absolute, in which all oppositions are overcome. In his work, *The Phenomenology of Mind* (1807), Hegel maintains that knowledge is not separated from or external to the absolute reality. He suggests that knowledge in itself is the reality, and that the reality is mental and spiritual. He argued that the reality is rational and logical. Knowledge reaches its goal when it arrives at the Absolute, and when it no longer has to search beyond itself, because in the Absolute it finds itself. For Hegel, knowledge begins with the sensory perception, which becomes more subjective and rational through the process of dialectic purification. Hegel viewed the dialectic as a process of achieving the absolute knowledge through the reconciliation of thesis and antithesis. The dialectic process retains what is rational by rejecting what is not rational to ultimately reach the absolute (Hegel & Baillie, 1967).

Retaining the Hegelian dialectic, Marx proposed that knowledge results from the fact that copies, reflections, or photographs of matter are present in the mind. He argued that the matter determines consciousness, and knowledge must be conceived in a realistic fashion. For Marx, the true method of knowing consists solely in the science combined with technical practice. Though knowledge is essentially sense knowledge, rational thought is necessary to organise these experiential data. Marxist epistemology sets itself up as absolute naive realism of the empiricism. However, the peculiarity of Marxist materialism lies in the fact that it combines this realistic outlook with pragmatism. He says “It is not the consciousness of men that determines their being, but on the contrary, their
social being that determines their consciousness." Marx believed that all contents of our consciousness are determined by economic and social forces, particularly those related to means of production.

2.1.5 Positivism, Phenomenology, Pragmatism and Critical rationalism

Many other philosophical views of epistemology have emerged in the 19th and 20th centuries. Some prominent theories of knowledge include positivism, phenomenology, pragmatism and critical rationalism.

Positivism was founded by Auguste Comte (1798-1857), the 'Father of Sociology'. Positivism insists that all knowledge comes from the 'positive' information of the observable experiences of the natural world. Furthered by the Vienna Circle, the positivistic view of epistemology strongly supports conventional empiricism and rejects metaphysical propositions. Positivists argue that logical reasoning and empirical experience are the only sources of knowledge. A.J. Ayer popularised logical positivism through his work *Language, Truth, and Logic* (Ayer, 1936). While continuing in the line of British Empiricism, he proposed the verification principle which states "A statement is literally meaningful if and only if it is either analytic or empirically verifiable."

In contrast to the positivism, the phenomenology examines the questions of metaphysics and states that the Knowledge is discovered through open, unbiased description of experience, without any attribution of cause or other explanation. It claims to achieve knowledge about the nature of consciousness, a distinctive kind of first-person knowledge, through a form of intuition. Edmund Husserl, the founder of phenomenology, says that the Phenomenology can lead to a science that is not possible through natural philosophy because natural philosophy depends for all of its knowledge on knowledge of the existence of things in nature, in spite of the fact that physical being is not the only kind of being (Husserl, 1965). Launched in the first half of the 20th century, the philosophical tradition of phenomenology is furthered by Martin Heidegger, Maurice Merleau-Ponty, Jean-Paul Sartre and others.

However, pragmatism takes a different standpoint on knowledge. For pragmatists, what is important about knowledge is that it solves certain problems that are constrained both by the world and by human purposes. William James (1907) and John Dewey (1929) supported the pragmatic view of epistemology. The pragmatic school sees knowledge as a set of theories or
models that attempt to represent the environment in such a way as to maximally simplify problem-solving. However, pragmatism does not give a clear answer to the question where knowledge or models come from. One assumption is that these models are created from parts of other models and empirical data on the basis of experimentation combined with some intuition. It is also assumed that no model can ever hope to capture all relevant information, and even if such a complete model would exist, it would be too complicated to use in any practical way. Therefore, it suggests accepting the parallel existence of different models, even though they may seem contradictory. The model which is to be chosen depends on the problems that are to be solved. The basic criterion is that the model should be as simple as possible and produce correct predictions or problem-solutions that can be tested (Heylighen, 2000).

The epistemic nature of pragmatism is characterized by its insistence on consequences, utility, and practicality of the knowledge. Pragmatists argue that what should be taken as true is that which most contributes to the human good over the longest course. True ideas work when applied to our experience, false ideas do not. Old ideas that no longer work are replaced by new ideas that work when applied to practical situations. Pragmatism objects to the view that human concepts and intellect represent reality, and holds that it is only in the struggle of intelligent organisms with the surrounding environment that theories and data acquire significance (Dewey, 1929; Heylighen, 2000; James, 1907).

Supporting the pragmatic view that knowledge is meant to solve problems, the Critical rationalism proclaims the hypothetical nature of knowledge. Karl Popper coined the term ‘Critical rationalism’, and proposed that the systems of thought can be rationally criticized and evaluated, although concrete proof of such a system is impossible. In his works, The Poverty of Historicism (Popper, 1957) and The Open Society and its Enemies (Popper, 1966), Popper defended conventional rationalism. He suggested that human knowledge generally, is irreducibly hypothetical, and is generated by the creative imagination in order to solve problems that have arisen in specific social settings. He also noted that a verificationist approach is less likely to result in new discoveries, as it simply seeks to confirm the beliefs of the scientist. He developed falsifiability as his criterion of demarcation between what is and is not genuinely scientific knowledge. He advocated that a theory should be accounted scientific if and only if it is falsifiable. For a proposition to be falsifiable, it must be possible in principle to make an observation that would show the proposition to be false,
even if that observation has not been made. For example, the proposition "All swans are white" would be falsified by observing one black swan.

2.1.6 Contemporary definitions of knowledge and inadequacies

Nonaka & Nishiguchi (2001) argue that the JTB definition of knowledge is an absolute, static and nonhuman view of knowledge and fails to address the relative, dynamic and humanistic dimensions of knowledge. Several other authors in the KM arena also disregard the epistemological theories, stating that these are impractical in present-day scenarios (Hislop, 2005). In contrast, the philosophical theories and definitions discussed above take a comprehensive view of knowledge and concentrate on many aspects. Exhaustive deliberations have been made in these theories about what knowledge means, how it is created, and its characteristics.

However, the contemporary descriptions of knowledge often lack such in-depth treatment and concentrate only on a few aspects or dimensions of it. In the current KM literature several definitions were put forward to define and describe the nature of knowledge. Many KM theories and practice frameworks were developed based on these descriptions. Following are some widely referred definitions of knowledge in the contemporary KM literature.

A) "A fluid mix of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organisations, it often becomes embedded not only in documents or repositories but also in organisational routines, processes, practices and norms".
   - Davenport & Prusak (2000)

B) "A Dynamic human process of justifying personal belief toward the truth".
   - Nonaka & Nishiguchi (2001)

C) "Information in context to produce an actionable understanding".
   - Rumizen (2002).

D) Knowledge is information that changes something or somebody -- either by becoming grounds for actions, or by making an individual (or an institution) capable of different or more effective action”.
   - Drucker (2003).

E) "Truths and beliefs, perspectives and concepts, judgments and expectations, methodologies and know-how". - Wiig (1993).
The above definitions provide some important insights to the nature of knowledge. However, these may not stand logically valid when they are subjected to the rigorous epistemological treatment. For instance many of the above descriptions (A, C and D) treat knowledge as a type of information, without stating the qualifying criteria for knowledge. Many of these definitions do not mention how such information is created in the first place. Drucker (2003) provides a useful characteristic feature of knowledge in essence that knowledge changes something and causes an effective action. In case of B, the implicative features of knowledge are not mentioned, and it would be erroneous to assume a process itself as knowledge. Definition E is incomplete as it is difficult to consider all truths, beliefs, and perspectives as knowledge.

2.1.7 A working definition for this thesis: A new theory of knowledge

The inadequacies observed in various definitions call for a comprehensive theory and definition for the term “knowledge”. To address these challenges, this thesis proposes the “theory of rational imagination” and presents a working definition for the term. This definition adds a new dimension to knowledge and resonates with its contemporary usage. The proposed definition draws the themes from both rationalism and empiricism by encompassing the principles of Kantian philosophy, Pragmatism and Critical rationalism. The Theory of rational imagination defines knowledge as the,

“Concepts, built through rational imagination, which can bring positive change to the universe of discourse”.

The concepts(C) in the above definition can be ideas, theories, interpretations, beliefs, models, views or hypotheses. Rational(R) denotes that such concepts should have a sound logical reason. Without a valid reason, such concepts remain as mere beliefs and do not hold any epistemic value. The term Imagination (I) necessitates that C must be imagined or thought by the individual or a group of individuals proposing it. This condition is essential to differentiate between the new knowledge that is to be created and the knowledge that already exists. Such rationally imagined concepts should also be able to provide positive change (Pc) to the Universe of Discourse (UoD). The Pc in this context denotes the benefits that can be made possible by C. However, Pc is largely relative because a benefit or a positive change to an individual can be
a potential detriment for others. This problem of relative nature of $P_c$ can be addressed by supplementing the $UoD$ element to the theory. Here the $UoD$ represents the infinite and ever-expanding environment around us. Assuming that the majority of the individuals initially seek benefits for themselves, an individual’s $UoD$ begins with himself. It can then expand to his family, organisation, society, nation, and so on. Yet, the possibility of concepts providing universal benefits cannot be ruled out. Ideally all knowledge should be focused towards bringing universal positive changes and all individuals should continually try to expand their Universe of Discourse.

It can be argued that if all knowledge is created only through rational imagination, where does the knowledge created through empirical investigation fit in. It can be stated that all empirical investigations begin with a hypothesis that is resulting from rational imagination. These hypotheses can be based on the instances of individual experiences with the objective world. However, without imagination an individual cannot develop rational concepts or a hypothesis. Though many scientific inventions and discoveries are based on human experience with the objective world, such experiences alone cannot produce knowledge. Knowledge is often created by developing, testing and proving such hypotheses resulting from the objective experiences. Mere experiences without the rational imagination cannot create new knowledge nor have any epistemic value. For instance, many people have experienced or seen the objects falling on to the Earth. However, it was Isaac Newton, who first developed the concepts of gravitational force. If so many people had experienced the concept of gravitational force, why were they not able to produce the knowledge of Earth’s gravitation? The answer essentially lies in the rational imagination through which individuals develop concepts and theories. However, our understanding of the world and correlated experiences play a great role in the process of knowledge creation.

2.2 Knowledge management in distributed organisations

2.2.1 What is knowledge management

Conventionally, management is defined as the process of planning, organising, leading and controlling the use of resources to accomplish performance goals (Schermerhorn, 2005). The first three management characteristics, planning, organising and leading, hold seamlessly in the context of knowledge management. However, control of knowledge is a complex issue, if not, an
impossible task in the knowledge management arena. Thus, there is a widespread criticism on the usage of the term, knowledge management (Sveiby, 2001, Kontzer, 2001 & Wilson, 2002). However, the term knowledge management has been widely used in the field to denote several theories, concepts and practices and may not necessarily denote the controlling aspect. Davenport and Prusak (1998a), defines knowledge management as,

“A method that simplifies the process of sharing, distributing, creating, capturing, and understanding of a company’s knowledge”.

In principle, these methods deal with the conscious management of organisational knowledge through a set of all potential organisational initiatives. This research project adopts the above definition. Although the author agrees with the deficiency in the usage of the term knowledge management, this thesis continues with the notion of knowledge management because of its wider usage.

2.2.2 Why knowledge management is important?
Several issues have influenced organisations to recognise the significance of knowledge management. The emergence of the knowledge economy and globalisation are often cited as the prominent causes for this growing significance (Drucker, 2000; Prusak, 2001; Rumizen, 2002). Peter Drucker first described the characteristics of the knowledge economy in his renowned works, “The Landmarks of Tomorrow” and “The Age of Discontinuity” (Drucker, 1959; Drucker, 1969). He predicted that the major changes in society would be brought about by knowledge workers and the way people use information in their work. He says “to remain competitive, may be even to survive, businesses will have to convert themselves into organisations of knowledgeable specialists” (Drucker, 1987). These knowledgeable specialists, who are characterised by the level of their formal education, will become the largest working group. Thus, education and development, and to some degree training, will be the central concern of a knowledge society. Drucker (2001) also suggests that knowledge economy and knowledge work have the following three important characteristics.

- Borderlessness, because knowledge travels even more effortlessly than money.
- Upward mobility, available to everyone through easily acquired formal education.
The potential for failure as well as success. Anyone can acquire the "means of production", i.e., the knowledge required for the job, but not everyone can win.

The importance of knowledge management also stems out from the critical challenges and opportunities faced by the present-day organisations. The high levels of market competition, shrinking product cycles, constant need for innovation, cost cutting and layoffs have created a complex set of challenges for the present-day organisations. In this business context, knowledge has been emphasised as a crucial organisational resource to achieve sustainable competitive advantage. This emphasis resulted in imparting strategic status to knowledge management and triggered the commencement of formal KM programs in many organisations (Davenport, 2000; Hertog & Huizenga, 2000; Nonaka & Takeuchi, 1995; Skyrme 1999; Teece, 1998).

2.2.3 Distributed organisations

Conventionally, an organisation is defined as a collection of people working together to achieve a common purpose. If an organisation has people working from various geographical locations it can be termed as a distributed organisation (Scott, 1998; Schermerhorn, 2005). Many of the present-day organisations, especially the large ones, are spread across the regions, nations and continents. These organisations must cope with management of people working in different locations, cultures, time zones, systems, and processes.

In management literature, distributed organisations are referred by several characteristic designations such as networked organisations, global organisations or multinational corporations (MNCs). For instance, Lipnack & Stamps describe a networked organisation “as the place where independent people and groups act as independent nodes, link across boundaries, to work together for a common purpose; it has multiple leaders, lots of voluntary links and interacting levels”. Conversely, Schermerhorn (2005) defines a multinational corporation as “a business with extensive operations in more than one country”. The basic characteristic among these descriptions is distributed nature of the organisation. Many distributed organisations may not be global or multinational corporations. Most of the public sector organisations are the classic examples of this category. Some of the small, medium and relatively large businesses are distributed within a given country. However, all these categories of organisations share common managerial challenges attributable to the
geographical distribution of the organisation. Because of this commonality and broader scope, the thesis adopts the term ‘distributed organisation’.

### 2.2.4 KM problems and challenges in distributed organisations

Knowledge management is a complex issue in distributed organisations because of several inherent characteristics. These include factors such as geographical dispersion, cultural variances, organisational size, communication complexities, diverse systems and business processes (Cramton, 2001; Davenport, 2000; Lam, 1997; Malhotra, 2004; O’Leary, 1998; Rumizen, 2002).

Perhaps, the geographical dispersion of knowledge workers is the foremost character that has significant impact on the KM practice in distributed organisations. O’Leary (1998) argues that KM is difficult when participants are in the same location; geographical dispersion only makes it harder because many traditional knowledge flows (e.g. face to face communication) are simply not present. As enterprise knowledge is dispersed, knowledge preservation in the individual branches, poses a significant challenge. In such circumstances, an extensive need emerges to share and re-use the knowledge between the geographical locations. However, the flow of knowledge between the dispersed knowledge workers may not be an easy task. Crampton (2001) believes that the communication complexities, between the dispersed organisational members, amplify the problem of knowledge sharing.

Cultural Variances between the individual branches of distributed organisation can also influence the knowledge management efforts. These variances can be intricate to the globally distributed organisations. Hagstrom and Hedlund (1998) discuss the lateral dispersion of knowledge across various cultures and locations. They view knowledge as an archipelago where the islands are distinct from each other, rather than a mountain, where from the top we can see all the rest. Supporting this view, Davenport (2000) notes that addressing the cultural issues, is one of the biggest challenges in knowledge management.

The large size of many distributed organisations, especially the multinational corporations, provides both potential benefits and problems (Hislop, 2005). On the positive side, various divisions of such organisations create a wide knowledge base with a high degree of extensity and intensity. These characteristics demand the organisations to create, transfer, and exploit
knowledge globally among many activities, processes and knowledge areas (Hedlund, 1994; Nonaka & Teece, 2001).

The diversity in the usage of technology and business processes, among various divisions of a distributed organisation, present another important KM challenge. Malhotra (2004) argues that the management and coordination of diverse technology architectures, data architectures, and system architectures poses obvious knowledge management challenges. These challenges result from the need for integrating diverse systems, and data sources across internal business processes. (Hislop, 2005; Lam, 1997)

In addition, several other factors such as downsizing and outsourcing can also impact the knowledge management practice in distributed organisations (Davenport & Prusak, 1998). All these characteristics demand specific concepts, theories and frameworks of knowledge management for distributed organisations.

2.3 Knowledge management theories and frameworks

While there is a widespread recognition and agreement about the significance and need to manage organisational knowledge, the avenues of knowledge management are disparate. Distributed organisations need specific frameworks which can address the inherent knowledge management challenges discussed before. In the last ten years, many theories have been put forward for practising knowledge management. A wide array of organisational factors and concepts are cited as influencing elements for creation, sharing and utilisation of enterprise knowledge. These factors include the organisational culture, people, incentives, leadership, business processes and technology (Drucker, 1999; Delong & Fahey, 2000; Gupta and Govindarajan, 2000; Harper 2000; Wenger, et al., 2002).

Certain literature in the subject tends to orient the KM theories and frameworks towards a particular track or an organisational element. These tracks include, process orientation, people orientation and technology orientation (Lewis, 2002; Natarajan & Shekhar, 2000; Nissen et al., 2000; Remus & Schub, 2003; Sveiby, 2001). Given the abstract nature of the subject area, there is little consensus on the components and ways of knowledge management. Several unanswered questions remain regarding the creation, sharing and utilisation of knowledge. The following sections describe some important theories in the subject.
2.3.1 Nonaka & Takeuchi: Theory of knowledge creation: SECI and Ba

Nonaka & Takeuchi (1995) proposed that human knowledge is created through a spiralling process of interactions between explicit and tacit knowledge. Tacit knowledge is personal, context specific and therefore hard to formalise and communicate. Polanyi (1966), in his famous aphorism about tacit knowledge says “We know much more than we can tell”. Conversely, explicit knowledge can be expressed in words and numbers and shared in the form of data, scientific formulae, specifications, manuals and the like. It can be easily transferred across individuals formally and systematically. In contrast to Polanyi’s distinction between explicit and tacit knowledge, Nonaka and Takeuchi view that these two types of knowledge are not totally separate. They suggest that these two forms of knowledge are complementary entities, which “interact with and interchange into each other”. Based on the assumption that knowledge is created through the interactions between explicit and tacit knowledge, the framework proposes four different modes of knowledge conversion: Socialisation, Externalisation, Combination and Internalisation (SECI). Fig. 2.1 depicts the knowledge spiral of these four different modes of conversion (Nonaka & Takeuchi, 1995; Nonaka and Nishiguchi, 2001; Polanyi, 1966).

![Fig. 1.1 Four modes of knowledge conversion (Nonaka and Takeuchi, 1995)](image)

*Socialisation* is a process of sharing experiences and thereby creating tacit knowledge such as mental models and technical skills. This occurs predominantly through direct observations, imitations, interactions, on-the-job training, apprenticeships and informal meetings. Socialisation mode may not require linguistic expressions as it involves direct experience. It enables transfer
of tacit knowledge within individuals resulting in the creation of new knowledge in tacit form. For example, an engineer gains the knowledge of structural designing only after years of work experience and apprenticeship. Such knowledge may not be easily possible just by reading books and other materials.

**Externalisation** process involves articulation of tacit knowledge into explicit concepts. Through this process tacit knowledge is converted into explicit knowledge. The explicit concepts may take various forms such as metaphors, analogies, hypotheses, or models. Externalisation process generally requires a language to express tacit knowledge and encompass techniques which help to express ideas. For instance to explain the concept of maximising the passenger space in its cars, the Honda Motor Company used the metaphor of “Automobile Evolution”. This metaphor has been applied to draw tacit knowledge from its employees and make it explicit to build the next generation cars.

**Combination** process involves conversion of explicit knowledge into more complex and systematic explicit knowledge. It encompasses the collection of organisational information from telephone conversations, meetings, documents and other avenues. Reconfiguration of such disparate information through sorting, adding, combining and categorising can lead to new knowledge. This however requires social processes and an effective communication mechanism for diffusion of explicit knowledge. For example, a department store may collect comprehensive information about its customers and combine it in an organised way to create its own customer knowledge base. Such knowledge base can be used in developing marketing strategies and targeting customers effectively.

**Internalization** is a process of learning whereby explicit knowledge becomes embodied into tacit knowledge. This requires the individual to identify and gain the relevant knowledge from the organisational knowledge base. This may encompass the training and exercises which would allow the individuals to access the knowledge realm of the entire organisation. Thus, the process of internalisation actualises the organisational concepts about the strategy, tactics, innovation, and improvement. For instance, an employee can read the organisational knowledge such as customer service best practices and digest the underlying concepts which in turn will become his tacit knowledge.

Nonaka and Takeuchi’s (1995) theory also proposes five conditions or requirements at the organisational level to promote knowledge management.
1) Organisational intention in the form of a strategy to acquire, create, accumulate, and exploit the knowledge.

2) Providing autonomy to individual employees in learning and working.

3) Promoting fluctuation and creative chaos to stimulate interaction between the organisation and the external environment.

4) Enable redundancy i.e. intentional overlapping of information about the business activities, management responsibilities, and the organisation as a whole. Such redundancy can create avenues for people to gain and share organisational knowledge.

5) Provision of requisite variety of knowledge to the employees by combining information differently, flexibly and quickly. Equal access to such requisite variety enables people to deal with challenges posed by the environment.

Nonaka, in his theory of knowledge creation, uses the concept of ‘Ba’. This concept was originally developed by Kitaro Nishida (1921, 1960), a Japanese philosopher. In the context of knowledge creation, Nonaka (2001) defines Ba as a platform where knowledge is created, shared and exploited. Ba can be thought of as a shared space for emerging relationships which can be physical (e.g. An Office or a dispersed business space), virtual (e.g. email or teleconference), mental (e.g. Shared experiences, ideas, or ideals), or any combination of these.

Table 2.1 A summary of four types of Ba or knowledge conversion modes

<table>
<thead>
<tr>
<th>Type of Ba</th>
<th>Characteristics</th>
<th>Knowledge conversion mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Originating Ba</td>
<td>Where individuals share feelings, emotions, experiences and mental models, through direct experience.</td>
<td>Socialisation: Tacit to Tacit</td>
</tr>
<tr>
<td>Interacting Ba</td>
<td>Where individual’s mental models and skills are converted into common terms and concepts, through dialogue.</td>
<td>Externalisation: Tacit to Explicit</td>
</tr>
<tr>
<td>Cyber Ba</td>
<td>Where new explicit knowledge is combined with existing information and systematised to diffuse throughout the organisation.</td>
<td>Combination: Explicit to Explicit</td>
</tr>
<tr>
<td>Exercising Ba</td>
<td>Where internalisation process is facilitated through focused training with senior mentors and colleagues, insisting on active participation and on job training.</td>
<td>Internalisation: Explicit to Tacit</td>
</tr>
</tbody>
</table>
Four types of Ba have been described which correspond to the four stages of the SECI model. Each type of ba is suitable for one of the four knowledge conversion modes. They serve as the platforms for the specific steps in the knowledge creation spiral and speed up the process of knowledge creation. Table 2.1 provides summarises the four types of Ba.

2.3.2 Davenport & Prusak: Knowledge Markets

Davenport and Prusak (1998) propose that knowledge originates, and is applied in the minds of knowledge workers. In organisations, it often becomes embedded in documents, repositories, routines, processes, practices, and norms. They suggest that organisations behave and function as knowledge markets comprising knowledge buyers, sellers and brokers. A knowledge market has its own shifting hierarchy based on who knows what and how useful they are. The knowledge buyers are the people seeking knowledge to resolve an organisational issue or problem. Conversely, knowledge sellers are the people with an internal market reputation having substantial knowledge about a process, subject or an organisational issue on hand. Finally, the knowledge brokers are the people who make connections between buyers and sellers of knowledge. These brokers communicate incessantly with people who need knowledge and those who have it, and serve as gatekeepers and boundary spanners of knowledge markets. For instance, the corporate librarians often serve as knowledge brokers because of their wide relationships with employees in the organisation.

Knowledge markets may be characterised from other conventional markets by the pricing and payment mechanisms. Generally, firms pay in cash to consultants and others when they buy knowledge from outside the organisation. In contrast, the exchange of money is rarely involved in knowledge transactions within the organisation. Reciprocity, reputation, and altruism serve as the foundations for the internal knowledge transactions. A knowledge worker will take the time and effort to share knowledge if he expects the favor to be returned when it is his turn to seek or buy knowledge. Another motivating factor in the knowledge markets is to gain organisational reputation for sharing knowledge. Some knowledge workers may simply enjoy sharing knowledge and helping others altruistically. However, the effective operation of the knowledge markets requires development of trust in the organisational environment. This can be achieved through the management efforts such as rewarding knowledge
sharing activities and eradicating the knowledge hoarding culture in the organisation.

The knowledge markets theory emphasizes that knowledge management involves three core processes: generation, codification and transfer of knowledge.

*Knowledge generation* refers to activities that increase the stock of organisational knowledge either by external acquisition or by internal generation. This includes hiring external consultants, research & development efforts and learning from other organisations.

*Knowledge codification* process puts the organisational knowledge into a proper format, so that people who need it can access and use it seamlessly. This involves the development of an organisational knowledge base with knowledge maps, best practices, models and case studies. Information and communication technologies play a major role in the process of knowledge codification.

*Knowledge transfer* process occurs through personal conversations between people. Since organisations behave as knowledge markets, they should create market spaces and places where this trading and sharing of knowledge can happen. Provision of facilities such as water coolers, talk rooms, knowledge fairs, and open forums become important venues for sharing knowledge.

Davenport and Prusak also suggest that the organisational culture plays a major role in the knowledge management processes. Several other authors support this notion and advocate that organisational culture should be the focal point of KM programmes (Bock, 1999; Krogh et al., 2000; Nonaka & Takeuchi, 1995; Rastogi, 2000). Development of an effective knowledge culture may involve several managerial efforts such as building trust and providing rewards and recognition for employees. This also involves creation of knowledge roles and skills in the organisational structure for performing knowledge management activities. Several roles are suggested which include, Chief Knowledge Officer (CKO), Knowledge Integrator, Knowledge Librarian and Knowledge Editor (Davenport & Prusak, 1998).
2.3.3 Wenger: Communities of Practice

Lave and Wenger (1991) coined and described the term, Communities of Practice (CoPs) as, “an activity system that includes individuals who are united in action and in the meaning of action has for them and for a larger collective”. This theory proposes that individuals acquire knowledge through a social process where people can participate in communal learning at different levels depending on their level of authority or seniority in the group. Based on the anthropological foundations, the proponents of CoP advocate the context specific learning. They also suggest organisations to focus on how individuals come to be members of a community of practice. The process of community formation was named as legitimate peripheral participation. Through this process an individual from outside moves into the core of the group. Lave and Wenger believe that this process is an essential aspect of learning, which “traditional education” fails to recognize and utilize. Communities of Practice may be formed even in the areas outside business such as housing, parenting, health, education and other areas of practise associated with the human society.

Wenger et al., (2002) believe that Communities of Practice play an important role in knowledge management by connecting isolated pockets of expertise across an organisation. CoPs may also transcend organisational boundaries and be formed with suppliers, business partners, distributors, consumers other organisations across national borders. They suggest that cultivation of CoPs in strategic areas of an organisation is a practical way to manage knowledge as an asset. While agreeing the existence of both explicit and tacit knowledge, the authors argue that the tacit knowledge of an organisation is far more valuable, dynamic and very difficult for competitors to replicate. Sharing this tacit knowledge requires interaction and informal learning processes such as story telling, conversation, coaching, and apprenticeship, of the kind that Communities of Practice provide.

The core elements of a CoP include a domain of knowledge, a community of people, and the shared practise they are developing. The CoP environment allows for interactions, relationships and sharing of ideas between the community members. People form CoPs for a variety of reasons; 1) to maintain peer connections 2) to gain and share knowledge or 3) to respond to external changes and challenges. The formation of a CoP initially requires finding a common ground between all the members of the community. The common ground can be a similar problem, a passion, or an opportunity. Usually a
community coordinator is needed to define this common ground, identify important issues and plan events for the CoP. However, the central function of a CoP is to share knowledge in free-flowing, creative ways that foster new approaches to problems. Communities of Practice can drive business strategy, generate sales, solve problems, develop & promote best practices, develop people’s skills, and help companies recruit and retain talent. Wenger & Snyder (2000) notes that the paradox of such communities is that they are self-organising and resistant to supervision and interference, and simultaneously they require specific managerial efforts for their development and integration with organisations. The communities can only be fully leveraged if they are integrated with the organisation.

Communities of Practice can play a great role in the context of distributed organisations, where people with varied expertise in a given domain are spread over several geographical locations. The distance and large membership size makes it hard for people to know each other and share their expertise. The present day global organisations operate in multiple countries with employees from different cultural backgrounds, leading to communication difficulties. To address these knowledge sharing challenges, Wenger et al., (2002) suggest designing distributed communities based on the following four principles.

1) Achieve alignment among all stakeholders in the community.

2) Develop a structure that acknowledges and promotes both local variations and global connections. For instance, a large community of practice can be broken into topic-focused cells to achieve clarity.

3) Develop a rhythm to maintain community visibility through technology-mediated communications and face-to-face meetings.

4) Build private spaces for community members to develop and organise personal profiles systematically. (Chua, 2002; Wenger et al., 2002)

2.3.4 Sveiby: IT-Track KM and People-Track KM

Sveiby (1994; 1997; 2000) dismisses the existence of explicit knowledge and describes it as mere "information". His theory of knowledge management asserts that organisations need to realize that unlike information, knowledge is embedded in people and knowledge creation occurs in the process of social
interaction. However, some of his concepts converge with Nonaka & Takeuchi’s theory of knowledge creation, in a sense that human knowledge is created through social processes. Sveiby (2004) describes knowledge management by looking at the existing practices in the KM subject area. He classifies KM practices into two broad themes or tracks: 1) Information Technology Track KM (IT-track) and 2) People-Track KM.

Sveiby regards IT-track knowledge management as mere information management. This track is guided by the researchers and practitioners from the computer science and information science backgrounds. Sveiby argues that the people in the IT-track view the knowledge as objects that can be identified and handled in information systems. Hence the major focus of this KM is the construction of Information Systems (IS), Artificial Intelligence (AI) tools, groupware systems, intranets, extranets etc.

Conversely the People-track KM is guided by the researchers and practitioners from the educational backgrounds such as philosophy, psychology, sociology, or business management. They are primarily involved in assessing, changing and improving human skills and/or behaviour. They view knowledge as process, a complex set of dynamic skills, know-how etc, that is constantly changing. Sveiby (2004) suggests that the people track KM, which is still in its infancy, is the most promising because the issues in this track are about how to maximize the ability of people in creating new knowledge. It focuses on building the human infrastructure and environments that are conducive to knowledge sharing in the organisations. This infrastructure enables people to collaborate, spend time on proper dialogue, and share knowledge.

2.3.5 Snowden: Story telling for knowledge management

David Snowden (1999) notes that the use of stories, in the context of KM, is a rediscovery of an important natural skill that has bound societies for centuries. He describes story telling as a dynamic knowledge disclosure mechanism that creates a largely self sustaining and low-cost means of knowledge capture and reuse. The essence of the approach is to select a representative sample of projects and then reassemble the people of the original project team for each of the selected projects. These project teams are then called for a one day story telling workshop. In addition to the story tellers, the workshop group also comprises of trained observers.
In the story telling process, the participants are allowed and encouraged to recollect their collective project experiences through a reunion. Snowden suggests that if the story telling process is well conducted, it creates a series of anecdotes, humorous incidents, lessons learnt, observations and plain narrative. During this process the observers identify the decisions, judgements, problems resolved or unresolved, and chart these together with associated information flows. When the story telling comes to a natural conclusion, the observers present their model for validation. Then the group as a whole charts and analyses the knowledge assets and their characteristics for each decision/judgement/problem resolution cluster. The knowledge assets used in each resolution cluster can be tacit or explicit. When the knowledge assets disclosed in the story telling workshops are consolidated, relevant decisions are to be made on managing the organisational knowledge assets.

2.3.6 Other theories of knowledge management

Several other concepts and theories of knowledge management can be found in the current literature. For instance, Skyrme (1999) proposes that knowledge is created, shared and evolved by knowledge networking which involves human and computer networking. He suggests that organisations should build these knowledge networks and become collaborative enterprises by combining managerial efforts with effective usage of technologies. Collins (2003) also advocates the usage of technology in enterprise knowledge management. He focuses on developing a comprehensive technology infrastructure in the form of knowledge portals for managing information and enabling employee collaboration. While acknowledging the significance of technology infrastructure in KM, Kluge et al. (2001), emphasises on the creation of an effective organisational culture that encourages the usage and sharing of the enterprise knowledge.

Peter Senge (1990) takes the ‘learning organisation’ path to enterprise knowledge management. He defines learning organisation as “a particular vision of an enterprise that has the capacity to continually enhance its capabilities to shape its future”. The concept of a learning organisation is one in which learning is a continuous, cyclic and interactive process. Here the global competitiveness is achieved by turning actionable knowledge into a fountainhead of innovative product/process. This in itself creates new avenues and drives for further learning.
Conversely, The European Committee for Standardisation (CEN, 2004) adopts a comprehensive view of knowledge management concentrating on several organisational factors such as the organisational strategy, employee skills, process, and culture and time management. However, each of these organisational factors is not described in depth and the finite strategic options for managing these factors are not addressed. The individual and collective role, of various organisational elements in KM, has not been explained. Moreover, the framework’s applicability and generalisability to distributed organisations is limited because of the lack of empirical evidence and methodological rigour in the construction of this framework.

2.4 Need for a comprehensive KM framework for distributed organisations

2.4.1 Limitations in the current knowledge management theories

An in-depth review of the current KM literature has identified some limitations in the current KM theories. These theoretical inadequacies and the challenges faced by distributed organisations in KM, offer enormous scope for further research in the subject. The theories, concepts and frameworks discussed above have provided grand contributions to the field of knowledge management. However, in the context of distributed organisations, they have several limitations. Perhaps, the major limitation of these theories is lack of a comprehensive view of knowledge management in distributed organisations. Croasdell et al. (2002) supports this position and note that the KM research community is still in a theory building stage.

Although disparate, most of the current KM theories and frameworks emphasise one or a few organisational factors. For instance, Nonaka and Takeuchi (1995) provide great insights to the types of knowledge and ways of knowledge creation. Several cases were drawn from Japanese and American corporations such as Honda, Canon, NEC, GE and Kraft, to illustrate the ways of knowledge creation. However, the theory excessively concentrates on the process of knowledge creation while sidelining the other aspects such as organisation and diffusion of corporate knowledge. The authors pay little attention to knowledge integration, and tend to underplay the role of technology in knowledge management.
Conversely, Davenport and Prusak (1998), focus on the creation of effective knowledge markets for managing organisational knowledge. While their theory provides a list of cultural factors influencing KM, it does not provide detailed strategies and descriptions for managing the cultural complexities of KM. The inherent relationship between KM and various technologies is not covered extensively. The role of business processes in the context of KM is also overlooked to a large extent.

Most of the other theories are specific in nature and address a single or a very few factors affecting knowledge management. The CoP theory reveals and describes the ways of collaboration between distributed or virtual communities (Lave & Wenger, 1991; Wenger et al., 2002). Whereas, the ‘people track’ knowledge management focuses on social processes in the organisation (Sveiby, 1994; 1997; 2000). The story telling concept concentrates only on the process of sharing tacit knowledge and avoids other important issues (Snowden, 1999).

Moreover, certain literature in the KM subject tends to orient the whole KM frameworks towards a particular organisational dimension. These tracks include, process orientation, people orientation and technology orientation (Lewis, 2002; Natarajan & Shekhar, 2000; Nissen et al., 2000; Remus & Schub, 2003; Sveiby, 2001).

In contrast, distributed organisations need to concentrate on an array of organisational factors for effective knowledge management. These factors include the organisational learning, employee collaboration, corporate culture, organisational structure, leadership, rewarding systems, business processes, information systems, and communication technologies (Drucker, 1999; Delong & Fahey, 2000; Gupta and Govindarajan, 2000; Harper 2000; Wenger, et al., 2002; Welch & Welch, 2005).

The majority of the KM theories discussed above fail to present the collective influence of various organisational elements on knowledge management. Several authors have reported failures in knowledge management practice (APQC, 2005; Dragoon, 2004; Malhotra, 2004). For instance, an ambitious KM program at the Children’s Hospital in Boston was abandoned and then restructured to suit the practical requirements of the organisation (Dragoon, 2004). Many of such KM failures can be attributed to the lack of proper understanding and rigorous frameworks. Some of the existing frameworks are either very complex to practise, or have a particular KM element orientation. There is also a dearth of
empirical evidence about how each of the organisational factors can be managed in the KM practice. For example, it is difficult to find proven concepts and theories in the current literature demonstrating the effective organisational structures for KM. Croasdell et al. (2002) also support this view and note that the knowledge management research community is in infancy. Therefore, the KM subject arena needs to develop sound and empirical theories and frameworks to emerge as an established discipline.

2.4.2 A new meta-level knowledge management framework

The inadequacies in KM theories raise the need for a meta-level or comprehensive KM framework for distributed organisations. Such a framework should address the discussed complexities and challenges of knowledge management. The proposed KM framework for distributed organisations should focus on achieving the following objectives.

1. **Comprehensive:** The framework should explore and describe an array of important organisational issues affecting knowledge management in distributed organisations. Table 2.2 shows a number of such organisational issues identified during the literature review. These issues would serve as foundations in the exploration of organisational factors and in the development of the proposed KM framework. It should be noted that this list serves as a guide for the research study and is not intended as a rigid hypothesis for the study.

<table>
<thead>
<tr>
<th>Table 2.2 Organisational issues affecting KM in distributed organisations</th>
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<tbody>
<tr>
<td>Agility in organisations</td>
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<tr>
<td>Change management</td>
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<tr>
<td>Collaboration</td>
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<td>Communities of Practice(CoPs)</td>
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<tr>
<td>Competitiveness</td>
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<td>Customer orientation</td>
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<td>Decision making</td>
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<td>Empowerment</td>
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<td>Enterprise Information Portal</td>
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<td>Expert systems</td>
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<td>Extranet</td>
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<tr>
<td>Flexibility</td>
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<tr>
<td>Front-end managers</td>
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<td>Group motivations</td>
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<tr>
<td>Groupware</td>
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<tr>
<td>Human Resource Management</td>
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<tr>
<td>Incentives</td>
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<td>Individual behaviour</td>
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<tr>
<td>Individual motivations</td>
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<td>Informal employee relationships</td>
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<td>Innovation</td>
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(Source: Author)
2. **Empirical & rigorous:** The proposed KM framework should be developed on the basis of an empirical research study. A rigorous multidisciplinary study would be needed to unravel the tapestry linking various organisational elements affecting KM in distributed organisations. To achieve this objective, knowledge management practices should be studied at organisations that have substantial experience in KM practice. Proven research methodologies should be used to conduct the research study and analyse the findings. This empirical approach and academic rigour is needed to generalise the findings and embed them in the proposed KM framework.

3. **Simple and agile:** The proposed KM framework should be simple, so that the KM practitioners can understand and implement its principles in a seamless way. The framework should also be agile so that organisations can adapt and use it according to their specific requirements. In essence the core principles of the framework should be defined at a meta-level so that they are appropriate for customisation.

### 2.5 Research questions

A critical review has revealed that current KM literature does not offer an appropriate framework for managing enterprise knowledge in distributed organisations. Therefore, our main research problem ("How to manage enterprise knowledge in distributed organisations?") remains unanswered. To address these deficiencies in KM theories and concepts, we need to develop an effective, comprehensive and meta-level knowledge management framework. Based on our literature review, three broad based research questions were derived to address the identified research challenges and empirical inadequacies. These questions attempt to explore and describe the fundamental factors of knowledge management in distributed organisations and aid in the construction of the proposed KM framework. The following are the three research questions formulated for this research project.

**Q1.** What are the major factors affecting knowledge management in distributed organisations?
Q2. How do various organisational factors influence knowledge management in distributed organisations?

Q3. What strategies, initiatives and measures should distributed organisations take for each of the factors to manage the enterprise knowledge effectively?

Summary
This chapter provided a critical discussion on the definition of ‘knowledge’. Based on a literature review, working definitions are derived for the terms ‘knowledge’ and ‘knowledge management’. This chapter has also noted certain limitations in KM subject arena in the context of knowledge management practice in distributed organisations. An in-depth discussion of the renowned KM theories and frameworks has exposed the need for a comprehensive KM framework for these organisations. Finally, three definitive research questions were formulated to address the research problem and goal charted for this study.
3 Research methodology

"It is, in fact, nothing short of a miracle that the modern methods of instruction have not entirely strangled the holy curiosity of inquiry". – Albert Einstein

Introduction

This chapter provides a comprehensive description and rationale for the research methodology adopted for this study. It is based on an in-depth discussion of various research paradigms and their underlying ontologies, epistemologies, and methodologies. These underlying philosophical foundations provide directions and avenues for addressing the research problem, derived questions, and the goal of this study. An effective paradigm and consequent methodological choice essentially differentiates the everyday haphazard observations from systematic knowledge search. They give an endeavour to be specific, objective, well focussed and systematic to the extent that one could replicate the research for advancing knowledge in the given field. Therefore, being explicitly aware of the research paradigms and available methodological choices is of paramount importance in scientific research. The chapter provides a critical analysis of these choices in conjunction with the research questions and provides the rationale for employing a particular research paradigm and methodology (Bernstein, 1983; Black, 1999; Delanty, 1997; Denzin & Lincoln, 2000; Guba, 1990).

3.1 KM research: problem, goal and questions

There is no general agreement in the KM community about the research paradigms and methodologies. However, the nature of enquiry in knowledge management subject area gives us some important indications regarding the type of paradigm to be adopted. Several authors suggest that the choice of the research methodology depends on the problem to be solved and the research questions to be answered (Denzin & Lincoln, 2000; Silverman, 2005, Yin, 2002). For instance, Miles & Huberman (1984) assert that "knowing what you want to
find out leads inexorably to the question of how you will get the information”. These suggestions point us towards a review of the core research problem, goal, and the associated questions formulated for this dissertation. In the introductory chapter, the following research problem (P) was stated for this dissertation:

“How to manage enterprise knowledge in distributed organisations?”

However, a critique of existing literature has revealed that the current KM concepts, theories and frameworks were insufficient to address the above research problem. Most of the existing KM theories focus on one or a few organisational elements. In the context of distributed organisations, these theories ignore a comprehensive view of KM. Therefore, the following goal (G) has been defined for this research study:

“To develop a comprehensive meta-level framework for managing enterprise knowledge in distributed organisations”

Precisely, the development of the stated KM framework solves the research problem of this study. In order to develop such a framework, this research needs to address the aforementioned deficiencies in KM practice and theory. Based on the literature review, three broad based research questions (Q1, Q2, and Q3) were constructed to address the identified research challenges and empirical inadequacies. Having defined the research questions, the next step is to select an appropriate research paradigm. The paradigm selection process requires a thorough understanding and evaluation of the available choices against the research questions.

3.2 Determination of research paradigm

Kuhn (1962) gave its contemporary meaning to the term ‘paradigm’ when he adopted it to refer “the set of practices that define a scientific discipline during a particular period of time”. He notes that a paradigm constitutes four fundamental elements; 1) what is to be observed and scrutinized 2) the kind of questions that are supposed to be asked and probed for answers in relation to this subject 3) how these questions are to be asked and 4) how the results of scientific investigations should be interpreted. This description is useful in understanding how scientific research within a given subject area is conducted and how knowledge claims gain credibility (Khazanchi & Munkvold, 2003; Kuhn, 1962; Clark & Clegg, 2000).
The treatment of paradigm has evolved since Kuhn’s introduction of the term to scientific research. Guba (1990) simply defines a paradigm as “a set of beliefs that guides action”. Conversely, Wittgenstein (1968) notes that a paradigm is basically a “world-view”. However, there is a widespread agreement in the scientific research community that a paradigm constitutes three philosophical foundations: Ontology, Epistemology, and Methodology. The following paragraphs briefly describe these three characteristics of paradigms (Burrell & Morgan, 1979; Denzin & Lincoln 2000; Hunt, 1994; Kuhn, 1962; Philips, 1987).

- **Ontology**, i.e., the metaphysical study of the nature of being and existence. Having strong implications for the conceptions of reality, Ontology tries to find out the existence of entities and their categories. For instance, ontological assumptions in the conduct of inquiry within a paradigm might specifically characterize the nature of reality.

- **Epistemology**, i.e., the study of the nature of knowledge, its scope, its origin, its presuppositions and foundations, and its validity. Epistemology attempts to distinguish true knowledge from false. It provides a set of criteria for evaluating knowledge claims and establishing whether such claims are warranted.

- **Methodology**, i.e., a procedure by which knowledge is to be generated. Methodology guides the research design and data collection. However, different methodologies can be used for a given ontological or epistemological perspective.

Based on the above philosophical foundations, several classifications were made regarding the research paradigms. While there is a broad consensus on what constitutes a paradigm, there is no agreement on the classification. Fitzgerald and Howcroft (1998) group the research paradigms into two broad categories: Positivist and interpretivist. However, Guba and Lincoln (1994) propose four paradigms: positivism, post-positivism, critical theory and constructivism. Some social scientists segregate the paradigms as positivist and phenomenological (Burrell & Morgan, 1979; Easterby-Smith *et al.*, 1991). Here, a three-fold classification is adopted which is suggested by several researchers in social sciences (Chua, 1986; Denzin & Lincoln 2000; Klien & Myers, 2001; Myers, 1997; Orlikowski and Baroudi, 1991). According to this, paradigms are categorised into positivist, critical theory and interpretivist. The following
sections describe these three research paradigms and evaluate their applicability to the research problem of this study.

3.2.1 Positivist

Positivist paradigm is based on the naïve realistic ontology, and objectivist or dualist epistemology. Naïve realism is a view that the world is exactly as it appears. It is a theory that proposes that things are perceived directly. Objectivism or dualism proposes that there is an underlying reality that exists independent of our perception and consciousness. Positivists assume that reality is objectively given and can be described by measurable properties which are independent of the observer (researcher) and his or her instruments (Myers, 1997). Generally, the positivists use experimental and quantitative methods to gain world knowledge (Denzin & Lincoln 2000).

Orlikowski and Baroudi (1991) suggest that the positivist paradigm is a suitable approach if there are testable hypotheses, quantified variables, and the ability to draw inferences about a population from a sample of that population. These characteristics of positivist paradigm have been successfully applied in natural sciences which deal with the objective world. This success in natural sciences motivated the social scientists to adopt the positivist approach (Capra, 2002; Hussey & Hussey, 1997).

However, the applications of the positivist paradigm in knowledge management discipline are limited because the subject area deals with human behavior, culture and action. Burrell and Morgan (1979) ascertain that the research enquiry in business and management area is generally subjective, which is in contrast to the objective nature of the positivist enquiry. The described philosophical background also suggests that the positivist paradigm is suitable for testing a theory rather than developing a new theory. Glaser & Strauss (1967) support this notion and propose that a theory is grounded in data rather than presumed at the outset of a research study. Since the goal of this research is to develop a new KM theory or framework, these propositions signify the incompatibility of the positivist paradigm to the context of this study. The literature review indicated that there is a lack of comprehensive KM theories that address the complex needs of distributed organisations (Croasdell et al., 2002).

Moreover, Banks (1998) argues that positivist research fails to respect and understand the socio-cultural contexts. The research questions, derived for this
study, require studying the multiple organisational facets including culture. Many social scientists propose that the assessment of cultural factors require thorough investigation that includes learning about the history of an organisation, visiting the place, talking to the employees, and observing their behaviour (Rousseau, 1990; Schein, 1999). The positivist paradigm seals such avenues of enquiry and concentrate on the measurement of variables rather than the exhaustive exploration of a phenomenon. In these circumstances, Rollinger (1999) suggests the phenomenological paradigms as effective alternatives. He notes that phenomenology tries to extract the essential features of our experiences and the essence of what we experience. Phenomenology generally accords with the critical theory, and constructivist or interpretivist paradigms (Denzin & Lincoln 2000; Rollinger, 1999).

Therefore, in an emerging discipline, such as knowledge management, the positivist research paradigm has limited applicability. The research problem, goal, and questions of this study also demonstrate the incompatibility of positivist paradigm. Therefore, the phenomenological approaches i.e. critical theory and interpretivism have to be considered.

3.2.2 Critical theory

Critical theory is based on the historical realist ontology, and subjectivist or transactional epistemology. Historical realism suggests that the world is not a universe of facts that exists independent of the observer. The realists believe that the virtual reality is shaped by social, political, cultural, economic, and gender values crystallised over time. The subjectivist epistemology suggests that objective observation is impossible. It advocates that all the knowledge is generated or justified in the context of the researcher’s framework and assumptions. Generally, the critical theorists use dialogic or dialectic methodologies to gain knowledge (Denzin & Lincoln, 2000; Orlikowski & Baroudi, 1991).

The ontological and epistemological positions of critical theory are opposite and extreme to those of positivism. Critical researchers assume that the social reality is produced and reproduced by people. They argue that the ability of people to change their social and economic circumstances is constrained by various forms of social, cultural and political domination (Habermas, 1971 & 1973; Horkheimer 1982 & 1993; Myers, 1997). Therefore, the critical theorists aim to eliminate the causes of alienation and domination by changing the status quo. For instance,
Comstock (1982) argues that researchers should take a stance and share responsibility for social changes. The main task of critical research is to explicate and critique the restrictive and alienating conditions in the contemporary society while focusing on the oppositions, conflicts, and contradictions. This methodology draws its techniques heavily from the model of psychoanalysis proposed by Sigmund Freud (Crotty, 1998).

As critical theory aims to remedy logical contradictions in existing theories, its usage in the new theory development in an emerging discipline, such as knowledge management, is limited. The critical theory approach has been implicitly used to explicate the questions for this research. However, the philosophical assumptions of critical theory are not practical and applicable to find the answers for our research questions. Critical theory challenges the questionable assumptions about organisations, and often takes a dialectic approach. But the scarcity of empirical and prerogative assumptions in the current KM literature implies the incompatibility of critical theory to further resolve the research problem of this study.

A critique of current KM theories has shown that there is a need for developing a comprehensive KM practice framework for distributed organisations. Development of such a practical framework needs studying and observing organisations closely. Just a critique may not provide the answers for the complex research questions of this study. Therefore, interpretive paradigm, another phenomenological approach has to be considered. However, the critical theory approach may be used at a later stage to critique the findings and existing socio-political scenarios (Gephart, 1999; Orlikowski & Baroudi, 1991).

3.2.3 Interpretivist

Interpretivist paradigm is based on relativist ontology and subjectivist or transactional epistemology. Relativism is a belief that the knowledge is relative to the observer. Relativists suggest that the reality is not something that exists outside the observer, but rather is determined or constructed by the experiences, social background, and other factors of the observer. Based on this assumption, the interpretivist paradigm is sometimes referred to as constructivism (Denzin & Lincoln, 2000). Generally, hermeneutics or qualitative methodologies are used to gain knowledge through interpretivist paradigm (Boland, 1991 & 1985).
There are clear similarities between the critical theory and interpretivist research paradigms. They both include the epistemological notion that objective observation is not possible. Because of the closer epistemological standpoints, the difference between critical theory and interpretivist paradigms is rather ambiguous. However, Klein (1999) suggests that critical theory is much more theory-oriented than interpretivism. Moreover, the critical theory is of transformative nature, implying a focus on changing social and economic circumstances. Conversely, the interpretivist research can be regarded as more 'neutral' and descriptive in this sense (Khazanchi & Munkvold, 2003). Schwandt (1994) notes that the interpretive research seeks to understand social members' definition of a situation. The paradigm helps in building a second order theory or theory of members' theories. This theory building ability of the interpretive paradigm facilitate in achieving the research goal of this study i.e. to develop a comprehensive or a meta-level theory for KM practice (Schutz, 1973).

The philosophical foundations of the interpretivist paradigm offer many avenues to answer the research questions of this study. For instance, interpretivism assumes that the human experience and knowledge creation is a process of interpretation of meanings and actions in the social world. This focus on interpretation is of specific relevance to this research study in knowledge management. Answering the derived research questions requires observation and interpretation of cultures, KM strategies, and practises in distributed organisations. A generalisation of the findings of this study can lead to the construction of the proposed knowledge management framework.

The literature review has revealed that there is a dearth of empirical theories in knowledge management. In such a scenario, the selected paradigm should not require priori hypotheses. Klien & Myers (2001) suggest that the interpretive research does not predefine dependent and independent variables, but focuses on the full complexity of human sense-making as the situation emerges. These characteristics improve the compatibility of interpretivist paradigm to this research study. The derived questions for this research also demand us to study several organisational factors such as technology, leadership, rewards, collaboration, culture, and organisational structure. Several researchers suggest interpretivist paradigm in such scenarios, where the knowledge to be acquired is plural, dynamic, and socially embedded (Spender, 1996; Kogut & Zander, 1996; Klien & Myers, 2001).
Glaser & Strauss (1967) also suggest qualitative methods such as ethnography, interviews, observation, and grounded theory development for the interpretivist work. They argue that these methods are effective in the development of a theory where none existed. Mittman (2001) also believes that qualitative research is an important methodological option in conducting management research. He notes that qualitative research, with its emphasis on understanding complex, interrelated and/or changing phenomena, is particularly relevant to the challenges of conducting management research. As the KM practice involves a high degree of management aspects and actions, the use of qualitative methods for data collection and analysis is particularly relevant in the context of this research study. Several authors suggest that the methodologies, most often used by the interpretivist researchers, include qualitative analysis, exploratory analysis, induction, field experiments, and idiographic experiments (Denzin & Lincoln, 2000; Fitzgerald & Howcroft, 1998; Myers, 1997).

Therefore, the interpretivist paradigm and qualitative research path are adopted to answer the derived research questions, and to develop the proposed KM framework. Having ascertained to use the qualitative research path, an appropriate methodology need to be selected for data collection. The following sections explore and evaluate various qualitative data collection approaches to adopt a methodology that is suitable and practical to address the research questions of this study.

### 3.3 Determination of research methodology

Based on the evaluative discussions, the interpretive paradigm has been determined as the most appropriate philosophical approach to achieve the research goal of this study. The paradigm choice encompassed the adoption of the relativist ontology, subjectivist epistemology and qualitative methodologies. Denzin and Lincoln (2000) indicate that the next logical step in the research process is to adopt a particular qualitative methodology or research strategy for the study. Several social scientists suggest that a research strategy put paradigms of interpretation into motion and connect the research to specific methods of collecting and analysing empirical materials (Denzin and Lincoln, 2000; Myers, 1997; Psathas, 1995; Silverman, 2005; Yin, 2002).

Many qualitative methodologies are suggested for an interpretive form of enquiry. These include action research (Rapoport, 1970; Clark, 1972),
ethnography (Lewis, 1985), life history (Hatch & Wisniewski, 1995), testimonio (Beverley, 2000), clinical model (McWhinney, 1989; Miller & Cabtree, 1999) case study (Stake, 2000; Yin, 2002) and grounded theory (Glaser & Strauss, 1967; Strauss & Corbin, 1998). Each of these methodologies provides a set of skills, assumptions, and practices that help the researchers to move from a paradigm to the empirical world.

However, some of the above research methodologies are inappropriate because of their remoteness to the research problem and the field of this study. LeCompte and Preissle (1993) asserts that the effectiveness of a given research strategy or methodology depends on its ability to gather the information required for answering specific research questions. Therefore, the methodologies such as life histories and clinical models are not considered here. The qualitative methodologies that are often used in the fields that are analogous to knowledge management would be considered for this study. The subject areas such as the information systems, business process management, and organisation behaviour are similar to the knowledge management discipline and can guide the methodology selection process. In these subject contexts, many social scientists (Creswell, 1998; Denzin & Lincoln, 2000; Hussey & Hussey, 1997; Myers, 1997; Silverman, 2005) suggest four major qualitative research strategies: action research, case study, ethnography and grounded theory. Myers (1999) emphasises that "it is important, for anyone considering employing a certain research methodology, to be aware of the potential benefits and risks beforehand, and to know in which set of circumstances it might – or might not – be appropriate". Therefore, these four qualitative choices are evaluated against the goal (G) and questions (Q1, Q2 and Q3) of this research study to select an appropriate methodology.

3.3.1 Action research

Kurt Lewin (1947a & 1947b) coined the term ‘action research’ to describe a particular kind of research that united the experimental approach of social science with programmes of action to address social problems (Schwandt, 1997). The research tradition has its roots in John Dewey’s experimentalist educational research. It has been applied in other subject areas such as psychology and medicine (Blum, 1955; McKernan, 1996; Sussman & Evered, 1978). In Rapoport’s (1970) definition "the action research aims to contribute both to the practical concerns of people in an immediate problematic situation
and to the goals of social science by joint collaboration within a mutually acceptable ethical framework”. As this research study is concerned with the problem of KM practice, action research may serve as a valuable alternative. Therefore, a close examination of the underlying assumptions and processes of action research, is needed to assess its suitability for this study.

Baskerville (1999) advocates that action research is based on two key assumptions: 1) social settings cannot be reduced for study and 2) action brings understanding. In this research context, it is possible to study a sample of distributed organisations to examine their KM strategies and then develop a framework based on the best practices observed. It is not absolutely necessary to implement changes in order to develop the intended framework. It is also difficult to implement the KM changes for a research purpose as it involves initiatives across several organisational issues. A failure in such a research venture can prove detrimental to the organisation concerned. It has also been argued before that there is a lack of coherent understanding in KM literature about the strategies that are to be followed for effective KM practice in distributed organisations. In such a scenario, it is also difficult to persuade organisations to participate in an action research project.

The complex and protracted nature of the action research process also indicates its incompatibility with the problem context of this study. Blum (1955) viewed the action research as a two staged process: diagnostic and therapeutic. First, the diagnostic stage involves a collaborative analysis of a social situation, by the researcher and the subjects of the research. At this stage the knowledge of social domain is produced through a theory construction process. Next, the therapeutic stage involves collaborative change experiments. In this stage, changes are introduced and the effects are studied. Based on the results new knowledge about the social environment is generated. These two processes would consume a considerable amount of time to accomplish our research goal. For a research project of PhD stature, it is difficult to persuade several organisations to participate in action research for a significant time span, and implement the intended changes in their business domains.

Moreover, the research goal of this study is to develop a general and meta-level KM framework that can be applied in distributed organisations. In achieving this goal various factors and strategies, influencing KM practice in distributed organisations, need to be studied. Based on the empirical data, this research intends to generalise the identified factors and related strategies, and embed
them into the proposed framework. Therefore, the generalisation of the study findings is a crucial issue for this research. However, action research does not provide proper mechanisms for generalisation. Scholl (2004) notes that action research is situational i.e. the process if repeated would not be identical, nor would it produce identical results. The action research projects help build and test theory. Generalisability, as typically pursued in traditional research, is not a main thrust of action research. Checkland (1981) also supports this argument and says “the characteristics of scientific enquiry, such as reductionism, repeatability, and refutation are not ideals of valid knowledge from action research”.

In summary, five major issues indicated the incompatibility of the action research to this study: 1) Lack of proven KM principles that can be implemented as part of an action research 2) Organisational access constraints 3) Time span constraints 4) Emphasis of the research method on studying only one organisation or social context and 5) Deficiency of generalisation mechanisms.

3.3.2 Ethnography

Creswell (1998) describe ethnography as a research methodology in which the researcher studies an intact cultural group in a natural setting over a prolonged period of time by primarily collecting observational data. Originated from anthropology, the ethnography is characterised by the fact that it is the process and product of describing and interpreting the cultural behaviour (Schwandt, 1997). Lewis (1985) notes that ethnographers immerse themselves in the life of people they study and seek to place the phenomena studied in their social and cultural context. As this strategy involves exhaustive study, it may serve as a valuable alternative in our research context. It provides an opportunity for a comprehensive study of various factors influencing KM practice.

Several authors (Creswell, 2003; Tedlock, 2000; Fraenkel & Wallen, 1990; Lewis, 1985) indicate that the study of culture in a given environment is the core purpose of employing this research strategy. But the goal of this research demands studying many organisational dimensions such as culture, business processes and technology in several organisational contexts, so that the findings can be generalised, and a KM practice framework developed. Myers (1999) supports this argument, and advocate that the lack of breadth is a disadvantage of the ethnographic research methodology. He notes that an ethnographer
usually studies just the one organisation or the one culture. This in turn leads to an in-depth knowledge of a particular context and situation.

Moreover, an ethnographic study requires the researcher to spend a significant amount of time in the field (Bryman, 2004; Lewis, 1985; Myers, 1999). In the context of this research study, it demands gaining organisational access for an extended period of time. Studying KM practices through ethnographic route involves close observation of social and political issues in an organisation, which can be sensitive when disclosed to the outer world. While it is easy to gain access to a given society and study their culture, it can be difficult to gain organisational access for an extended period of time.

The above arguments suggest that the ethnography approach would not be suitable for this research study. The generalisability constraints and possible complications of gaining organisational access over an extended period of time, weigh against the adoption of this research methodology to achieve the research goal.

3.3.3 Grounded theory
In their pioneering work, Barney Glaser and Anselm Strauss (1965, 1967 & 1968) first articulated and elaborated the grounded theory methodology. In contrast to the priori theoretical orientation in sociology, they held that theories should be “grounded” in data from the field, especially in actions, interactions, and social processes of the people. The centrepiece of grounded theory approach is the development or generation of a theory closely related to the context of the phenomenon being studied (Creswell, 1998). Grounded theory, in its essential form, consists of systematic inductive guidelines for collecting and analysing empirical materials to build middle-range theoretical frameworks that explain collected empirical materials (Charmaz, 2000). In grounded theory, the researcher typically conducts 20-30 interviews based on several visits “to the field” to collect interview data to saturate the categories. Here a category represents a unit of information composed of events, happenings and instances. The researcher begins analysis of data, while he or she collects the data, to form a theory (Strauss & Corbin, 1990).

However, grounded theory has been criticised for its failure to acknowledge implicit theories which guide work at an early stage (Bryman, 1988; Silverman, 2005). The research strategy is of greatest value when the researcher has little
knowledge of the subject field of qualitative inquiry. It advocates ignoring the previous knowledge so that the analytic and substantive theory can emerge (Creswell, 1998). However, we have described several concepts and theories of knowledge management (in chapter 2) which would be used as a basis to conduct this research study. Moreover, in a broad discipline such as knowledge management, it is difficult to collect data until the categories are saturated. The goal of this research project is to develop a meta-level KM framework encompassing several key organisational elements. Excessive focus on each of the organisational elements would make the construction of the proposed framework impossible. Creswell (1998) also supports this argument and notes that the grounded theory researcher faces the difficulty of determining when categories are saturated or when the theory is sufficiently detailed.

The above evaluations indicate that the grounded theory methodology has some limitations in the context of this research study, especially in the data collection mechanisms. Silverman (2005) also notes that the grounded theory “can also degenerate into a fairly empty building of categories or into a mere smokescreen used to legitimise purely empiricist research”. Therefore, the grounded theory strategy is not opted for the data collection phase of this study.

However, most of the weaknesses of the grounded theory methodology, discussed above, are related to field study or data collection. The data analysis approaches of grounded theory can provide some valuable inputs (Hussey & Hussey, 1997). Therefore this strategy would be used at the data analysis stage of this study.

3.3.4 Case study

Some social scientists consider “the case” as an object of study (Stake, 1995) while others consider it as an absolute research methodology (Merriam, 1998; Stoecker, 1991; Yin, 1994). Here, we treat case study as a research methodology to explore the possibility of its adoption to this research context. Yin (2002) defines case study methodology as “an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”. The perplexity in the relationship between various organisational factors and knowledge management practice, illustrates the appropriateness of case study enquiry in our subject domain.
The case study methodology has been increasingly used as a research tool in social sciences and is often advocated as a suitable method for research in organisational and management studies (Hamel, 1993; Perry & Kraemer, 1986; Yin, 2002). As the research goal (G) involves studying several organisational dimensions and management strategies, the case study strategy can serve as a valuable alternative. Moreover, it is a flexible method in terms of the underlying philosophical assumptions and can be used in both the positivist and interpretive research paradigms (Benbasat, 1987; Walsham, 1993 & 1995; Yin, 2002). The methodology also supports the explorative and descriptive nature of the research questions derived for this study. These characteristics of case study approach indicate that it can serve as a valuable alternative for this study. Therefore, the case study methodology needs to be explored further and deeper to evaluate its suitability to this research context.

Yin (1994; 2002; 2003) and others (Alavi & Carlson, 1992; Benbasat, 1987; Merriam, 1998; Stake, 1995; Walsham, 1993 & 1995) enumerate several characteristics of case study strategy which indicate its appropriateness to our research context. Listed below are some of the features and their relevance to address the problem, goal, and questions of this research study.

R1) The case study methodology is able to address a broad research topic (Yin, 2002): This feature makes case study approach as an effective option as the research problem (P) is concerned about a broad research topic i.e. knowledge management in distributed organisations.

R2) The case study methodology is used to cover complex multivariate conditions (Yin, 2002): This attribute is valuable for this study as the research goal (G) is to develop a KM framework encompassing several organisational factors impacting knowledge creation, sharing, and utilisation. These factors are multidimensional and include organisational culture, reward systems, leadership, teamwork, business processes, and technologies.

R3) The case study methodology relies on multiple sources of evidence (Creswell, 1998; Yin, 2002): This flexibility serves as a beneficial quality as this research study needs to gather, explore, and analyse the empirical materials from several organisational sources to answer the derived research questions (Q1, Q2, & Q3). These sources of evidence may include
interviews, observations, documentation, physical artefacts, and archival records.

R4) The explanatory questions such as “how” and “why” are likely to lead to the use of case studies as a research strategy (Yin, 1994): This fundamental character of the case study methodology makes it an ideal route to address the research problem (P) i.e. How to manage knowledge in distributed organisations?

R5) The case study methodology is preferred in examining contemporary events, but when the relevant behaviours cannot be manipulated (Yin, 1994): It has been argued before that it is difficult to gain access to several organisations, implement changes in them, and study the impact to develop the intended KM practice framework. In such a scenario the case study method serves as a valuable alternative to study existing KM practices in distributed organisations and to develop a framework based on the findings and analysis.

R6) The case study strategy is used when the enquirer has little control over the events being studied (Yin, 1994): As this methodology does not require gaining control over an organisational scenario, it is easy to convince organisations for the research study.

R7) The case study approach, in specific, is often used in conditions where several elements and multiple dimensions of a subject need to be studied exhaustively (Alavi & Carlson, 1992; Benbasat, 1987; Eisenhardt, 1989; Yin, 2002): In this study, several organisational dimensions and their interrelationships need to be explored and described to develop the intended KM framework for distributed organisations. Thus, the case study method helps in achieving the research goal (G).

R8) The case studies are thought to be instrumentally useful in furthering the understanding of a problem, issue, concept, and so on (Stake, 1995): It has been argued before that there is a lack of comprehensive understanding and empirically proven concepts in the knowledge management discipline. As KM is an emerging discipline, which is in theory building stage, the case study methodology serves as an excellent approach for this study.
The case study approach tries to illuminate a decision or set of decisions: why they were taken, how they are implemented, and with what result (Schramm, 1971): To answer the research questions, especially Q3, this research study needs to explore and describe the knowledge management strategies that have been successful in distributed organisations. Their rationale and the impact have to be deliberated so that the best practices can be generalised and embedded in the intended framework.

In case studies, the goal is to do a “generalising” and not a “particularising” (Lipset et al., 1956): The generalisation capability of the methodology is an essential requirement for this research study as the goal (G) is to develop a KM framework that can be applied to distributed organisations.

All the above characteristics (R1 to R10) indicate the appropriateness of the case study methodology to the research context. However, like any other research method, the case study approach is not free from criticism. Some limitations of the research strategy were raised over the years, questioning the empirical validity of the case study findings (Yin, 2002). The limitations that are relevant to this research study should be evaluated and addressed accordingly before adopting the methodology (Silverman, 2005). Perhaps, the major limitation is related to the ability of case study method in generalisation of the findings (Glesne & Peshkin, 1992; Kennedy, 1976). Yin (1994) asserts that it is possible to generalise theories from a single case study. In spite of this assertion, to overcome the criticism accorded to generalisability, and to improve the rigour, the multiple case study approach will be adopted for this study.

Herriott and Firestone (1983) suggest that the evidence from multiple cases is often considered more compelling, and overall study is therefore regarded as being more robust. Another main argument in favour of multiple-case study is that it improves theory building. By comparing two or more cases, the researcher would be in a better position to establish the circumstances in which a theory will or will not hold. The comparison between the multiple cases can also reveal concepts that are relevant to an emerging theory (Bryman, 2004; Eisenhardt, 1989; Yin, 1984). However, Dyer and Wilkins (1991) argue that a multiple-case study approach tends to mean that the researcher pays less attention to the specific context and more to the ways in which the cases can be contrasted. In this research study, the rationale for choosing the multiple-case study approach is to find the similarities in organisational characteristics and
best practices facilitating effective knowledge management. The core intention here is not to find contrasting characteristics between the cases. Therefore, the above criticism regarding the multiple-case studies is not applicable to this research context. Moreover, care would be taken at the design stage to select a diverse range of case organisations at multiple locations.

Other limitations in the case study method are related to the bias of evidence, and the capabilities of the researcher in conducting the case studies. These issues are common with any other research method and can be addressed by adopting stringent protocols for the research design and analysis (Hoaglin et al., 1982; Yin, 1994).

A thorough evaluation of the case study methodology has revealed its suitability to this research study. The characteristics (R1 – R10) of the research methodology are favourable to address our research problem (P), goal (G) and questions (Q1, Q2, and Q3). The major impediments of the case study method can be addressed through an effective research design and data analysis. Therefore, the case study methodology is adopted for conducting this research study. Within the case study strategy, the multiple case studies route is selected for improving the richness and generalisability of the findings.

3.4 Research design

In the previous section the rationale is provided for choosing the case study methodology for this study. Yin (1994) states that the next task is to develop a research design for the case study investigation. He defines research design as “the logical sequence that connects the empirical data to a study’s initial questions and, ultimately to its conclusions”. Bryman (2004) supports this description and states that a research design provides a framework for the collection and analysis of the data. Summarising the significance of the research design, Yin (1994) says “Colloquially, a research design is an action plan for getting from here to there – where ‘here’ is an initial set of questions and ‘there’ is defined as conclusions”. Therefore, an appropriate research design needs to be developed for this study to address the research problem and arrive at the conclusions. Yin (2003) suggests that the case study design comprises of the following five core components:
1) A study’s questions
2) Its propositions if any
3) Its units of analysis
4) The logic linking the data to the propositions and
5) The criteria for interpreting the findings.

The first two components were addressed through a critical review of current KM literature (chapters 1 and 2). The first component necessitates the development of the study’s questions. The research problem (P) and three broad-based research questions (Q1, Q2 and Q3) were already derived for this study. The second component calls for the development of hypothetical propositions for the proposed study. However, Denzin and Lincoln (2000) argue that the hypothesis or priori theory development is a characteristic of positivist research design. They note that, in interpretive research, priori design commitments may block the introduction of new understandings. Because of the interpretivist paradigm and explorative nature, this research study deliberately stays away from the priori theory development. Hussey and Hussey (1997) support this notion and advocate that “a theoretical framework is a collection of theories and models from the literature which underpins a positivistic research study”. Therefore, this research study does not emphasise the priori theory development. However, Yin (2003) suggests that even an explorative case study should have some purpose. He notes that “Instead of propositions, the design for an exploratory study should state this purpose, as well as the criteria by which an exploratory study will be judged successful”. The research problem, goals, objectives, and questions that were already charted for this study would guide the enquiry.

The following sub-sections build the third, fourth and fifth design components. The first subsection, the units of analysis, enumerates the criteria for case selection and provides a detailed description of the selected case organisations. The second subsection, data collection, describes the adopted techniques and the types of empirical materials to be gathered. The third section, data analysis, addresses the last two design components. It describes, the logic linking the data to the defined research questions. It also defines the criteria for interpreting the findings of the study (Yin 2003).

3.4.1 The units of analysis (cases)

The units of analysis refer to the cases to be studied as part of the research. The case selection or sample selection process is an important aspect of the
research design that directly determines the quality and relevance of the empirical data to be collected and ultimately shape the conclusions. Yin (1994) notes that the selection of appropriate units of analysis results from the accurate specification of the primary research questions. The research questions (Q1, Q2 and Q3) defined for this study requires studying several organisational factors such as organisational culture and business processes. An effective understanding of such critical organisational phenomenon depends on choosing the appropriate cases for the study (Stake, 2000; Miles & Huberman, 1994).

The case organisations for this empirical study were selected through a purposive sampling. The intention was to achieve a fine diversity in the responses, and to qualify the collected data for generalisation of the observed phenomena. In case study research, several authors suggest purposive sampling to build variety and intensity (Stake, 2000; Miles & Huberman, 1994; Yin 2003). In purposive sampling, the researchers need to select the units of research, based on the characteristics or attributes that are important to the evaluation (Smith, 1983; Patton, 1990; Yin, 2002). A mixed sample of six large organisations are selected for this study, on the basis of several characteristics such as the size, industry sector, operational distribution, knowledge intensivity, and maturity of the KM practices. Based on the problem, goal, and questions of this research study, the following criteria (C1 to C6) are defined to select the case organisations and the interviewees for the study.

C1. The cases should be large organisations with more than 1000 employees.
C2. The case organisations should be distributed i.e. operate from several (ten or more) geographical locations.
C3. The case organisations and the interviewees should be involved in a knowledge intensive work.
C4. The case organisations should have definitive knowledge management programmes.
C5. Each of the case organisations should be from a unique industry sector or a cultural background (nation).
C6. The interviewees should be actively involved in the knowledge management programmes.

Based on the above criteria, six distributed organisations were chosen for the research study. Five of them are global businesses while one organisation is a public sector health service provider in the United Kingdom. Most of these organisations have definitive knowledge management strategies and
implementation programmes. To achieve a rich mixture of responses, interviews were conducted in distinctive geographical locations and industry segments. Details of the organisations and interview locations are provided in table 3.1.

Table 3.1 An overview of the case organisations

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Research Study Country</th>
<th>Total no. of employees</th>
<th>Distribution of operations</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle Corporation</td>
<td>United Kingdom</td>
<td>41,000</td>
<td>100 countries</td>
<td>Software products &amp; services</td>
</tr>
<tr>
<td>National Health Service (NHS)</td>
<td>United Kingdom</td>
<td>1,300,000</td>
<td>Multiple locations in UK.</td>
<td>Healthcare services</td>
</tr>
<tr>
<td>Alcatel</td>
<td>Germany</td>
<td>151,000</td>
<td>130 countries</td>
<td>Telecommunications products and services</td>
</tr>
<tr>
<td>Daimler Chrysler</td>
<td>Germany</td>
<td>384,000</td>
<td>200 countries</td>
<td>Automobiles</td>
</tr>
<tr>
<td>Hewlett Packard (HP)</td>
<td>India</td>
<td>140,000</td>
<td>178 countries</td>
<td>Computer Hardware Products and related services</td>
</tr>
<tr>
<td>Wipro Technologies</td>
<td>India</td>
<td>41,000</td>
<td>35 countries</td>
<td>IT services, consumer care and lighting</td>
</tr>
</tbody>
</table>

KM programs at many of these organisations have been widely acknowledged. Some of them have won the Most Admired Knowledge Enterprise (MAKE) awards over the last few years: HP in 2004 (Teleos, 2004) and Wipro in 2003 (Teleos, 2003). These base factors in case selection have strengthened the research study by giving an opportunity to identify and generalise the best practices in knowledge management.

The following sub-sections provide brief descriptions of the case organisations selected for this study. The descriptions include the organisational background, case study context, interviewees’ profiles, and the case selection rationale. Other information, such as the interviewee names and location specifics, is deliberately excluded from these descriptions because of the ethical reasons, and to comply with the data protection regulations.

3.4.1.1 Case A: Oracle Corporation

Organisational background

Oracle Corporation is a global IT conglomerate with annual revenues of $11.8 billion (2004). It is engaged in the development, marketing, distribution, and servicing of computer software that enables the organisations to manage their businesses worldwide. The company was founded in 1977, and is headquartered at Redwood Shores, California. It offers database, middleware and applications
software. These encompass database management software, application server software, development tools, data hubs, and collaboration software. The software is used to automate business processes and to provide the business intelligence for financials, projects, marketing, sales, order management, procurement, supply chain, manufacturing, service, and human resources. Oracle technology can be found in nearly every industry around the world and in 98 of the Fortune 100 companies. Oracle is the first software company to develop and deploy 100 percent internet-enabled enterprise software across its entire product line: databases, business applications & application development, and decision support tools. Oracle also offers other services such as consulting and education. In the United States, the company markets its products and services primarily through its own direct sales and service organisation, and internationally through the companies that are members of the Oracle Partner Network. Oracle operates in more than 100 countries and employs around 41,000 people. The company operates under three major geographical zones; North America, Europe Middle East & Africa (EMEA), and Asia Pacific (Oracle, 2004).

**Context and description of the interviewees**

Oracle EMEA division, in the United Kingdom, is selected for this case study. The UK office serves as the Oracle’s headquarters for its overall operations in Europe, Middle East and Africa (EMEA). Two senior directors at Oracle EMEA were selected for the interviews. One of the interviewees is the Knowledge Management Director for the division. The interviewee is responsible for developing and implementing KM strategies, programmes and projects in Oracle EMEA. The second interviewee is the e-business director for the division, and is responsible for delivering advanced thought leadership programmes designed to identify how technology delivers new forms of business value. The interviewee is actively involved in the knowledge management programmes throughout the EMEA division.

**Case selection rationale**

Being the world’s second largest software company, Oracle serves as a valuable case for studying knowledge management practices in a knowledge intensive industry. For organisations in the software industry, knowledge is said to be the only resource for competitive advantage. With the constant need for innovation, high levels of competition and shrinking product cycles, knowledge remains as an obvious strength for survival to the software businesses. The industry’s reliance on knowledge capital for business growth surpasses many industries in
global markets. The case provides an excellent opportunity to study the role and practise of knowledge management in innovation, product development, marketing, and customer service from a global perspective.

### 3.4.1.2 Case B: UK National Health Service (NHS)

**Organisational background**

In the United Kingdom, the National Health Service (NHS) was set up in 1948 to provide comprehensive health services to the people. The UK Department of Health (DH) provides funding, direction, and overall support to the NHS and acts as its governing body. The NHS is recognised as one of the best health care providers in the world by the World Health Organisation (WHO, 2004). The UK NHS is divided into various divisions on a geopolitical basis. These are the NHS in England, Scotland, Wales, The Isle of Man, and the Channel Islands. The NHS employs more than 1.3 million staff making it the largest employer in Europe.

NHS provides all healthcare services to the patients through Strategic Health Authorities, Primary Care Trusts, Mental Health Trusts, Foundation Trusts, Ambulation Trusts, and GP Practices. Each of these entities deals with the specific health care activities at various levels of patient necessities. Figure 3.1 depicts an overview of the functioning and organisation of the NHS (NHS, 2004).

*Figure 3.1 An overview of the functioning and organisation of the NHS*
Context and description of the interviewees

In the case of NHS, two different knowledge contexts were chosen for the study. Two doctors, a GP and a Specialist Consultant, were selected as interviewees. The GP is from a full-fledged GP Practise, and the Specialist Consultant is from a major NHS trust. In the NHS system, the GPs are the doctors who look after the health of the people in their local communities, and deal with a wide range of health problems. They usually work with a team comprising of the other healthcare professionals such as midwives, health visitors, physiotherapists, and occupational therapists. GPs are at the front-end of the NHS healthcare system, providing first level of contact and care to the patients. They and their teams also provide health education and advice on things like smoking and diet, run clinics, give vaccinations, and carry out simple surgical operations. If GPs cannot deal with a problem on their own, they will usually refer the patients to a hospital to see a consultant, with specialised knowledge, for tests and treatment.

In NHS there are several types of consultants working in various speciality departments. These specialities are Cardiology, Neurology, Dermatology, Gastroentology, Accident & Emergency, Renal Medicine, Oncology etc. In this case study, a Specialist Consultant from the Accident & Emergency (A&E) was chosen as an interviewee. The A & E department was specifically chosen because of the knowledge complexity involved in it. Because of emergency scenarios of the patients and unpredictability of the workload, it is a highly sensitive and knowledge intensive specialty. It is the only hospital based specialty where a complete spectrum of illness and injury are managed. A great level of collaboration and knowledge sharing is needed in this department to treat the patients effectively. There is also an enormous opportunity to develop and share the best practices. A&E doctors are generalists, in the broadest sense of the term, who specialise in resuscitation. A number of A&E specialists also develop their own sub-specialty interests. There are close working links between general practitioners, the local ambulance service, inpatient hospital specialties and the A&E Department.

Case selection rationale

Medicine can be considered as the epitome of knowledge professions because of its colossal impact on the progression of the mankind. The professional requirements such as high levels of education, frequency of knowledge updation and skills enhancements, make it an ideal example of the knowledge work. NHS
provides a good organisational context to study the knowledge characteristics of medical professionals, especially the doctors such as General Practitioners (GPs) and Speciality Consultants. There are several other roles in NHS, such as finance managers and pharmacists, which can be considered under the knowledge work. However, only the doctors are chosen for this research study because they are the core people in functioning of the NHS.

3.4.1.3 Case C: Alcatel

Organisational background
Alcatel is a global telecommunications conglomerate headquartered in Paris, France. The company operates in 130 countries and has over 151,000 employees generating annual revenues of Euro 12.3 Billion (Alcatel, 2004). Its principal activities are in the areas of communications, transmissions, and energy infrastructures. Alcatel provides telecommunications equipment and services to the fixed line and wireless telecommunications operators, Internet service providers, governments, and other businesses worldwide. Alcatel is organised along markets with three business groups: the Fixed Communications Group, the Mobile Communications Group and the Private Communications Group. The Fixed Communications Group offers access, data/IP, NGN, Voice, Voice over IP, optics, network & service management, applied applications and professional services. The Mobile Communications Group provides products and services such as radio access, core network hardware and software, installation, maintenance, and operation services. The Private Communications Group produces enterprise products that include traditional telephone systems, IP telephone systems, call centre systems, and IP networking products. The group also offers control and signalling systems for trains and subways. In addition, the company plans, designs, installs, operates, and maintains networks for wire-line carriers, wireless carriers, satellite operators, cable service providers, transport companies, utility companies, oil and gas companies, and government institutions.

Context and description of the interviewees
In this case the German headquarters of Alcatel was selected for the study. The German division is selected because it is a major market for Alcatel’s products and services. The German division is involved in all aspects of Alcatel’s business including the research & development, production, marketing, sales, and service. A manager, responsible for the HR process management, was selected
for the interview. The interviewee is actively involved in the knowledge management and business process reengineering programmes at the division.

Case selection rationale
Alcatel can serve as an effective case to explore knowledge management practices in telecommunications industry which is also a highly knowledge intensive field. This case provides an opportunity to study the KM practices, and its role in global collaborations and innovation. As the selected interviewee is from Human Resources function, the study can serve as a valuable resource for exploring the soft aspects of knowledge management.

3.4.1.4 Case D: Hewlett-Packard

Organisational background
Hewlett-Packard Company (HP) provides products, technologies, solutions, and services to the individual consumers, businesses, and governments worldwide. The company was founded in 1939 by Bill Hewlett and Dave Packard and is headquartered in Palo Alto, California. With annual revenues of over $85 Billion, HP is the world leader in the imaging and printing markets. The company has 140,000 employees (2004) working in 178 countries around the world. It operates in the following seven business segments (HP, 2004):

- Personal Systems Group: Provides commercial and consumer personal computers, workstations, handheld computing devices, digital entertainment systems, and calculators.
- Imaging and Printing Group: Offers home and business imaging, printing & publishing systems, digital imaging products, printer supplies, and consulting services.
- Enterprise Storage and Servers: Provides servers, storage solutions, and software solutions.
- HP Services: provides multi-vendor services, such as maintenance, consulting, integration, and outsourcing
- HP Financial Services: Provides value-added financial services.
- Software: This segment provides software solutions to manage enterprise customers’ technology infrastructure, operations, applications, and business processes.
- Software and Corporate Investments: Markets certain network infrastructure products and gigabit ethernet switch products. It also provides the licensing of HP technology to third parties.
Context and description of the interviewees

In the case of HP, the research study was conducted at its Global e-Business Operations division in India. It is a Business Process Outsourcing (BPO) arm for the HP financial services business segment. This Indian subsidiary operates as a cost centre and employs around 3,000 people. It is predominantly involved in performing back-office work for HP's global finance operations. The work includes, transaction processing for debit and credit, records and order processing, vendor payables, freight cost management, and fixed assets tracking. One senior manager is selected for the interview. The interviewee is involved in knowledge management, employee training, and development.

Case selection rationale

HP's Global e-business division serves as a unique case to study the knowledge management activities in an outsourcing context. The division handles various financial operations of the company that are outsourced from several global locations. The case provides an opportunity to study how the collaboration and knowledge transfer takes place between this division and the outsourcing divisions. There is also a possibility to study best practice management, usage of technology and cultural complexities regarding knowledge management in an outsourcing scenario. The KM programmes at HP are widely recognized by the Most Admired Knowledge Enterprise (MAKE) award in 2004 (Teleos, 2004).

3.4.1.5 Case E: Wipro

Organisational background

Wipro group is a significant global player in the IT services, solutions, and services. The company was incorporated in 1945 and is headquartered in Bangalore, India. The group employs over 41,000 employees and operates in 35 countries with overall annual revenues of US $ 1.35 billion (Wipro, 2004). The company’s principal activities are to offer information technology products and services. These include software solutions, consulting, business process outsourcing (BPO) services, and research & development services in the areas of hardware and software design. The company operates in three segments: Global IT Services and Products (GISP), India and Asia Pacific IT Services and Products (IAISP), and Consumer Care and Lighting (CCL). GISP segment offers enterprise IT services, technology infrastructure support services, research and development services, and BPO Services. This segment markets its products through direct sales force with locations in the United States and Europe. IAISP segment offers technology products and services, such as personal desktop
computers, servers, notebooks, storage products, networking solutions, packaged software, technology integration, IT management, infrastructure outsourcing, custom application development, and consulting. This segment also provides enterprise solutions, and research and development services. IAISP segment markets its products through direct sales force and channel partners in India, Asia Pacific, and Middle-East regions. CCL segment manufactures hydrogenated cooking oil, soaps and toiletries, light bulbs and fluorescent tubes, and lighting accessories. This segment markets its products through distribution networks and direct sales force in India.

**Context and description of the interviewees**

In case of Wipro, the Global IT Services and Products (GISP) division was selected for the study. The division is the major contributor to the group’s revenues and deals with the complex IT services projects from global customers. In this division, three managers who are involved in knowledge management functions were selected for the interviews. One of the interviewees is the Head of Knowledge Management for the division. The remaining two interviewees are middle managers who are responsible for KM activities related to various customer segments or verticals such as retail, pharmaceutical, telecom, automobile, and aerospace industries.

**Case selection rationale**

IT services outsourcing has become a major phenomenon in global business. India has emerged as a market leader in providing offshore IT services to businesses worldwide. The market forces and trends continue to increase its role in the global IT services industry (Gartner, 2004). Being a premier IT company (third largest) in India, Wipro serves as a valuable case study in this highly knowledge intensive sector. The IT outsourcing business requires high levels of collaboration and knowledge transfer between the customer and service provider. Therefore, Wipro provides a valuable opportunity for studying the KM practices in a complex scenario. The company develops most of the technologies, needed for KM activities, on its own. It has also won the Most Admired Knowledge Enterprise (MAKE) award in 2003 (Teleos, 2003).

**3.4.1.6 Case F: Daimler Chrysler**

**Organisational background**

DaimlerChrysler AG is a global automobile conglomerate operating in 200 countries and employing over 384,000 people. The company is headquartered in
Stuttgart, Germany and has generated annual revenues over EUR 142.1 billion (USD 192.3 billion) in 2004. The group engages in the development, manufacturing, distribution, and sale of various automotive products and services worldwide. It operates in four segments: Mercedes Car Group, Chrysler Group, Commercial Vehicles, and Services. Mercedes Car Group segment designs, produces, and sells Mercedes-Benz passenger cars, Maybach luxury sedans, and Smart compact passenger cars. Chrysler Group segment offers cars, pick-up trucks, sport-utility vehicles and vans under various brand names such as Chrysler, Jeep, Dodge, Pacifica, and PT Cruiser. The Commercial Vehicles segment offers vehicles, including vans, trucks, buses, off-highway buses, Hyundai Motor Company (HMC) vehicles, and Mitsubishi Fuso Truck & Bus Corporation (MFTBC) vehicles. The Services segment offers customized financing and leasing packages for retail and wholesale customers in the automotive sector. The company also provides financing to dealers for property, plant, and equipment purchases, and vehicle inventory. DaimlerChrysler markets its products and services through dealers and wholesale distributors. The company has strategic partnerships with MFTBC, Mitsubishi Motors Corporation, General Motors Corp., BMW Group, and HMC.

Context and description of the interviewees
Three employees, who are involved in knowledge management activities in various business functions, were selected for the interviews. The first interviewee is a manager responsible for International Knowledge Management in the Passenger Car Division of DaimlerChrysler. This interviewee develops and implements KM strategies to facilitate collaborations and knowledge transfer between the DaimlerChrysler divisions in various countries. For example, the interviewee is actively involved in creating, organising, and sharing the advertising knowledge between worldwide DaimlerChrysler marketing departments. The second interviewee is also from the same office and is responsible for the technology aspects of the knowledge management. This interviewee manages the knowledge portal/ extranet of the company. He is involved in activities such as creating user profiles, gathering and organising content, and constantly updating the knowledge portal. The third interviewee is a Knowledge Transfer executive from the Business Process Management function. This interviewee is responsible for identifying and sharing business process knowledge and best practices throughout the worldwide Daimler Chrysler divisions.
Case selection rationale

Daimler Chrysler serves as a useful case for studying global knowledge management practices in the automotive industry context. It is a complex industry environment where the company is involved in several knowledge intensive activities such as research, design, development, marketing, sales, and service of various vehicles. The company also needs to collaborate with several other companies such as global suppliers, logistics providers, marketing agencies, regulators, and governments in various operating countries. The business processes are also complex and needs intense collaboration between various functions and divisions. Therefore, the company provides a fine case environment to study some complex knowledge activities from a global manufacturing perspective.

3.4.2 Data Collection

Several social scientists suggest that employing rigorous data collection procedures is one of the characteristics of a good qualitative study (Creswell, 1998; Silverman, 2005; Yin, 2003). They emphasise that the qualitative researchers need to collect data from multiple sources. Stake (2000) also notes that the qualitative researchers employ various procedures to reduce the likelihood of misinterpretation. These procedures are generally referred to as data triangulation. Denzin (1970) defines triangulation as “the combination of methodologies in the study of the same phenomenon. In this study a combination of data sources will be used to collect the empirical material. Yin (2003) suggests six major sources of gathering the data or evidence in the case study methodology. These are documentation, archival records, interviews, direct observations, participant observation, and physical artefacts. This research study considers all these sources in order to triangulate the data.

The interviews are the core method of data collection and would be based on a semi-structured interview instrument developed through a literature review. Interview method is preferred in this study to achieve the objective of exploring various factors influencing knowledge management in distributed organisations. Silverman (1985) notes that interview data display realities, which are neither biased nor accurate, but simply ‘real’. Kvale (1996) also advocates the interview method to seek and describe the meanings of central themes, in the life world of the subjects such as organisational culture. The questionnaire is designed to allow respondents to drive and describe the content within the boundaries of the formulated research questions.
The interviewees would be the directors, senior managers, knowledge managers and functional heads, who play a significant role in the development and implementation of KM strategies in their respective organisations. In each of the organisations, up to three managers would be interviewed to get a varied and comprehensive account of the KM practice. The time span of each interview may range from three to eight hours, and in some cases can spread across two weeks to suit the schedules of the respondents. All Interviews would be recorded with the prior permission of the respondents, and conducted at the respective organisations.

To obtain an in-depth view of the knowledge management practice, various internal documents of the case organisations would be studied exhaustively. These may include the strategy documents, white papers, best practices, presentations, and previous research papers. In addition, the intranets, extranets, and other technology components of the case organisations would be explored during each case study. This will help to understand and analyse the KM infrastructure and their usage patterns. During and after each interview, notes would be made to describe important observations that are relevant to the research questions (Creswell, 2003).

The empirical materials collected during each case study would be coded and reviewed frequently to improve the data collection process and its products. Crawford et al. (2004) emphasise that the data collection and analysis should be an interwoven process, prompting the sampling of new data. Silverman (2005) also notes that the “data analysis should not only happen after all the data has been safely gathered”. He suggests transcribing the interviews even if a researcher has only one interview record. Charmaz (1995) supports this notion and proposes that data should be studied as it emerges. Therefore, the following systematic review protocols are introduced in the design to enhance the data collection process of this research study.

D1. The data should be coded and reviewed after each interview.

D2. The semi structured questionnaire instrument should be enhanced after Each interview based on the key review findings.
D3. After completion of each case study, all the collected empirical data should be reviewed as a whole, and the questionnaire should be enhanced accordingly.

3.4.3 Data analysis: Grounded theory approach

In the case study methodology, the data analysis phase comprises of the fourth and fifth components of the research design i.e. linking data to propositions and criteria for interpreting the findings. Yin (2003) notes that these are the least well developed components of the case study research design. Several other social science researchers argue that there are no clear and accepted set of conventions to analyse qualitative data. However, they generally suggest the non-quantifying methods for analysing the qualitative data in interpretive research studies (Hussey & Hussey, 1997; Morse, 1994; Robson, 1993; Yin, 2004). Some of the frequently used non-quantifying methods include the general analytical procedure, cognitive mapping, data displays, grounded theory and quasi-judicial method (Bromley, 1986; Kelly, 1955; Miles & Huberman, 1994; Strauss & Corbin, 1990).

Crawford et al (2004) note that the grounded theory and content analysis are the two main approaches for analysing the qualitative data. However, several authors suggest that the content analysis approach incline towards the positivist paradigm because of its emphasis on the priori theory building and hypothesis testing nature (Flick, 1998; Locke, 2001). This research study is more of an explorative nature and does not have a hypothetical theory to employ the content analysis approach. Hussey and Hussey (1997) note that the grounded theory approach is becoming increasingly popular for analysing qualitative data in business research. Therefore the grounded theory approach can be considered as a valuable alternative for the data analysis phase of this study.

While selecting the research strategy for the data collection, the case study methodology was preferred over the other qualitative approaches such as grounded theory and ethnography. However, the grounded theory is often used as an approach at the data analysis stage irrespective of the data collection approach employed. It is mentioned as one of the most influential approaches to the qualitative data analysis (Creswell, 1998; Hussey & Hussey, 1997, Myers, 1997; Strauss & Corbin, 1998). Locke (2001) suggests that it is difficult to locate grounded theory in a particular research paradigm. However, grounded theory approach resonates with the interpretivist paradigm because of its
commitment to study the social world, and rejection of a priori theorising (Strauss & Corbin, 1998). Therefore, the rationale for employing the grounded theory is strengthened in this interpretivist research study. Moreover, the data analysis methods of grounded theory are used extensively in the organisational studies (Charmaz, 1995). As this research study is about knowledge management in distributed organisations, the grounded theory serves as a valuable data analysis method. Because of its focus on theory building, this method also helps in developing the proposed KM framework. Thus, the grounded theory has been adopted as the data analysis method for this study.

Strauss and Corbin (1998) suggest a highly influential and structured process of data analysis using the grounded theory approach. This process comprises of four analytical coding techniques; Open Coding, Axial Coding, Selective Coding, and Coding for Process. At the Open Coding step the data is categorised or disaggregated into various units. At the Axial Coding step, the relationships between the categories are identified. During the Selective Coding stage, the categories are integrated into a theory. The Coding for Process stage involves defining a series of evolving sequences of action/interaction that occur over time and space, changing or sometimes remaining the same in response to the situation or context. These four coding techniques are analytic types and it does not necessarily follow that the researcher moves from open through axial to selective coding in a strict, consecutive manner. Hussey and Hussey (1997) note that although there are separate levels of coding, in practise, they are often carried out simultaneously. These four coding steps of the grounded theory approach are employed for this study’s data analysis phase (Strauss & Corbin, 1998).

A line-by-line coding approach is adopted for the data analysis in this study. This approach is suggested as the most generative way of coding. Table 3.2 summarises the four analytical coding steps and their application to the research study. Each of these steps assists in incremental solving of the core research problem (P) of this study i.e. How to manage enterprise knowledge in distributed organisations? The following sub-sections provide detailed descriptions of how each of these coding techniques will be applied in analysing the empirical data of this study to achieve the stated research goal (G) i.e. "To develop a comprehensive and meta-level framework for managing enterprise knowledge in distributed organisations". 
3.4.3.1 Open Coding

The open coding is a process of developing categories of concepts, and themes emerging from the data. It is the first analytical step which focuses on the discovery of concepts by breaking the data into discrete incidents, ideas, events, and acts. It is an ‘open’ process in that the data is explored without making any prior assumptions about what we might discover. Strauss and Corbin (1998) describe a concept as an abstract representation of an event, object, or action/interaction that a researcher identifies as being the significant element in data. They advocate the concepts as the building blocks of theory and suggest that “to uncover, name and develop concepts, we must open up the text and expose the thoughts, ideas and meanings contained therein”. The concepts identified from the data are labelled with names which represent or stand for them.

Table 3.2 Application of grounded theory coding techniques in the data analysis

<table>
<thead>
<tr>
<th>Analysis stage</th>
<th>Description</th>
<th>Research questions/goal addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open coding</td>
<td>- Discovering and labelling the concepts based on the case study data.</td>
<td>• Using the developed Categories as the factors influencing KM in distributed organisations. Thus the categories address the first research question (Q1) of this study.</td>
</tr>
<tr>
<td></td>
<td>- Abstracting and grouping the concepts into categories and sub-categories.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Developing the categories further in terms of their properties and dimensions</td>
<td></td>
</tr>
<tr>
<td>Axial coding</td>
<td>- Relating the categories to sub-categories by reassembling the data.</td>
<td>• Identifying and describing the causal conditions and consequences for each factor influencing KM. Thus the Axial coding stage helps in addressing the second and third research questions (Q2 and Q3).</td>
</tr>
<tr>
<td></td>
<td>- Identifying the variety of conditions, action/interactions and consequences associated with categories.</td>
<td></td>
</tr>
<tr>
<td>Selective coding</td>
<td>- Reducing data from cases into concepts and relational statements for explaining the KM practices</td>
<td>• The core categories serve as the fundamental KM elements for the KM framework development. Thus the selective coding step assists in addressing the research goal (G).</td>
</tr>
<tr>
<td></td>
<td>- Deciding and defining core categories representing the main theme of research</td>
<td></td>
</tr>
<tr>
<td>Coding for Process</td>
<td>- Identifying and describing the flow of work that is represented in data as happenings and events.</td>
<td>• Assists in presenting the KM practices as a process at conceptual level.</td>
</tr>
<tr>
<td></td>
<td>- Capturing the dynamic qualities and varied scenarios of action/interaction</td>
<td>• Describes the dynamic nature knowledge management in distributed organisations.</td>
</tr>
</tbody>
</table>
Based on their similarities, the discovered concepts are then grouped together into the categories. The categories are at a higher level of abstraction when compared to the concepts. They are appropriately named based on the knowledge management issue they represent. The name of a category may result from the imagery or meaning it evokes when examined comparatively or in context. The name may also be taken from the words of the respondents themselves (often referred as “in vivo codes”). The categories discovered at the open coding step can be formulated as the factors affecting knowledge management in distributed organisations. Thereby, the open coding assists in answering the first research question (Q1) of this study. It should be noted that the categories, factors, and phenomenon will be used synonymously in this context (Glaser & Strauss, 1967, Strauss & Corbin, 1998, 1997).

Once the categories are identified, the sub-categories will be developed for each of the categories. Sub-categories are the theoretical elements that pertain to a category, giving it further clarification and specification. The sub-categories specify a category further by denoting information such as when, where, why and how a phenomenon is likely to occur. New categories or KM factors are developed through a process of constant comparisons. Each time an instance of a category is found, it is compared with previous instances. If the new instance does not fit the original definition of a KM factor, then the definition would be modified or a new KM factor would be created. The developed KM factors will be differentiated while closely examining the data for the differences and similarities. This will allow a fine discrimination and differentiation among the KM factors. As these factors are derived by comparing the data from each case, they are generally relevant to all cases in the study. It is the details included under each KM factor, through the specification of its properties and dimensions, which bring out the case differences and variations.

For each category or KM factor, the properties and dimensions are identified from the data. The properties are the general characteristics of a category while the dimensions represent the location of a property along a continuum range. Based on the alignment of properties along various dimensions, the patterns are formed for each KM factor. These patterns can be used as the best practices for each of the identified KM factors or categories. Substantiating codes of data will be displayed to support the development of the concepts, categories, and sub-categories. These bits of data will serve as the basis for the KM factors identified as the influencing elements of KM practice in distributed organisations.
3.4.3.2 Axial Coding

The purpose of axial coding is to begin the process of reassembling data that were fractured during the open coding. Procedurally, axial coding is the act of relating categories to subcategories along the lines of their properties and dimensions. The properties and dimensions of a category are further developed with the axial coding. This involves identifying and describing the variety of causal conditions, actions/interactions and consequences associated with a category or phenomenon. All of these will serve as the definitive characteristics for the categories or KM factors developed during the open coding. Connecting links are also established between a category and its sub-categories through statements denoting how they are related to each other. The statements will be made by looking for the cues in the data that denote how major categories might relate to each other (Strauss & Corbin, 1998).

The axial coding step assists in identifying and describing the causal conditions and consequences for each of the identified KM factor or category. Thus the axial coding step addresses the second and third research questions (Q2 & Q3) of this study. The second question (Q2) focuses on identifying and describing the existing causal conditions and resulting consequences for each of the factors influencing the knowledge management practice in the organisations under study. Whereas, the third question (Q3) focuses on identifying and describing the existing best practices and ideal scenarios for each of the identified KM factors. The resulting situations from such practices and scenarios would also be described here. Thus, the axial coding step facilitates in identifying the patterns of KM practices for each of the category or KM factor.

3.4.3.3 Selective Coding

Selective coding is a process of refining and integrating the categories to form a larger theoretical scheme of core categories. Through selective coding a theory is developed based on the core categories. The central categories or core categories are those which represent the main theme of research. The core category consists of all products of analysis condensed into few words that seem to explain what “this research is all about”. Two conditions guide the development of the core categories. First, a core category must be central, that is many major categories can be related to it. Second, a core category must appear frequently in the data. This means that in almost all cases there are
indicators pointing to that core category. During this stage the data from many cases is reduced into concepts and relational statements that can be used to explain, in a general sense, what is happening regarding KM in distributed organisations. Relational statements which represent the voices from many cases are constructed out of data (Strauss & Corbin, 1998).

In essence, each of the core categories developed at the selective coding stage will encompass several KM factors influencing KM practice. They serve as the fundamental elements for developing the KM framework for distributed organisations. They represent major organisational dimensions which need to be addressed for practising knowledge management. Therefore, the selective coding process provides crucial inputs for achieving the goal (G) of this research study.

3.4.3.4 Coding for Process

Strauss and Corbin (1998) describe a process as a series of evolving sequences of action/interaction that occur over time and space, changing or some time remaining the same in response to the situation or context. The action interaction may be strategic, taken in response to the problematic situations, or it can be routine, carried out without much thought. It may be orderly, interrupted, sequential, coordinated, or in some cases, a complete chaos. The action/interaction process is made by its evolving nature and its varying forms, rhythms and pacing, all related to some purpose. Process demonstrates the ability of individuals, groups, and organisations to respond to and shape the situations in which they find themselves.

Analysing the data for process provides a sense of life or movement to the theory and assists in the discovery and integration of the variations. Analysing data for process is carried simultaneously with the other coding techniques. A process is represented in data by the happenings and events that may or may not occur in continuous forms or sequences. It can always be located in any organisational context. Process usually can be broken into subprocesses. Usually, these are individual tactics, strategies, and routine actions that make up the larger act (Strauss, 1987; Strauss and Corbin, 1998).

The coding for process can reveal the conceptual stages or steps in KM practice within various cases. During this coding, the processes are specifically named, conceptually developed, and systematically connected within the theoretical
framework that will be developed by using the other stages of coding. The coding for process enables us to present knowledge management as a process by describing how various KM practices evolve, over time, in distributed organisations. During this coding, the flow of work is defined and the dynamic qualities and varied scenarios of KM actions/interactions are captured.

3.4.4 Data analysis protocols: Data accuracy and triangulation

The data collected through the interviews and other organisational sources, will be examined to remove incomplete and ambiguous information. A thorough review of interview records and a series of post-interview communications will be carried out with the respondents to ensure the data accuracy.

Many researchers in social sciences suggest using triangulation techniques at the data analysis phase to improve the validity and reliability of the research findings (Denzin, 1970; Jick, 1979; Miles & Huberman, 1984; Easterby-Smith et al., 1991). Hussey and Hussey (1977) suggest that the usage of different approaches, methods, and techniques in the same study can overcome the potential bias and sterility. Therefore, data triangulation and investigator triangulation will be employed in this study to improve the accuracy, reliability, and validity of the findings. As part of data triangulation, the interview data of a case will be verified and evaluated by constant comparisons with the data collected from other sources within that case organisation. As part of the investigator triangulation, the data will be analysed and compared by different researchers independently. This triangulation also helps in achieving the accuracy and consistency in the research findings.

The following five qualifying criteria (T1 to T5) will be adopted during the data analysis stage to determine the factors influencing KM in distributed organisations. The factors meeting these criteria are presented with selective examples or codes of data to support the arguments and conclusions.

T1. Each factor should be mentioned and supported by the respondents from two or more organisations under study.

T2. Each factor should have played significant role in shaping the KM practice in two or more organisations under study.
T3. Respondents should have provided instances of how a particular factor has influenced the knowledge management and the way it has been managed in their respective organisations.

T4. Each factor should be clearly identified by two or more researchers during the discrete analysis of the gathered data.

T5. The interview data supporting each factor should be eligible for triangulation with the verifiable data from the internal documents of the respective organisations.

3.5 Research ethics: Considerations and protocols

Several authors suggest that we need to consider various ethical issues while conducting research (Bryman, 2004; Christians, 2000; Coolican, 1992; Hussey & Hussey, 1997; Rudestam & Newton, 1992). In summary, they note that the following ethical issues should be considered and followed by the researchers in organisational studies.

1. Protection of the interests of the subject firms or case organisations
2. Safeguarding the privacy, confidentiality and anonymity of the participants
3. Obtaining the informed consent of the participants
4. Maintaining dignity and
5. Ensuring the accuracy of data while publishing the research findings.

These issues are important aspects in the context of this research study as it involves collecting data through interviews and other sources from several organisations. Stake (2000) also advocates these ethical practises, asserting that the value of the best research is not likely to outweigh injury to a person exposed. He emphasises that the “qualitative researchers are guests in the private spaces of the world. Their manners should be good and their code of ethics strict”. Therefore, the relevant research ethics need to be valued and followed throughout this research study. The following ethical protocols are charted in order to follow the ethical practises at the three major stages of this research study: data collection, analysis, and publication.

E1) The particulars of the case organisations are separated from the analytical arguments and conclusions. However, a detailed description is provided for
each of the case organisations to give an idea of the sample that is being studied.

E2) The particulars of the respondents were deliberately separated from the analysis and conclusions.

E3) Data accuracy will be ensured at various stages of this study using triangulation.

E4) Consent of the organisations and respondents will be obtained, wherever necessary, before publishing the work based on this research study.

E5) The empirical material will be safeguarded during and after this research project, to protect the privacy of the respondents and the organisations involved in the study.

Summary
This chapter provided an evaluative discussion on various philosophical viewpoints of research. Based on these discussions interpretivist paradigm is adopted as philosophical foundation for this study. A thorough analysis of various research methodologies has resulted in the selection of case study methodology for data collection. However, grounded theory approach has been opted for data analysis because of a lack of sound data analysis techniques in case study methodology.
4 Analysis and framework development

“The men of experiment are like the ant, they only collect and use; the reasoners resemble spiders, who make cobwebs out of their own substance. But the bee takes the middle course: it gathers its material from the flowers of the garden and field, but transforms and digests it by a power of its own. Not unlike this is the true business of philosophy (science); for it neither relies solely or chiefly on the powers of the mind, nor does it take the matter which it gathers from natural history and mechanical experiments and lay up in the memory whole, as it finds it, but lays it up in the understanding altered and digested. Therefore, from a closer and purer league between these two faculties, the experimental and the rational (such as has never been made), much may be hoped”.

– Francis Bacon

Introduction

This chapter presents the findings of this empirical study and the proposed knowledge management framework. The chapter is segregated into two major sections. The first section presents the analytical findings from the six case studies conducted during this dissertation. This section is primarily based on the open, axial, and selective coding techniques of the grounded theory approach. The study findings are discussed simultaneously by comparing with the current KM literature. The analysis and discussion are combined to ensure the transparency and integrity between the findings, interpretations, and conclusions. The second section of the chapter presents a meta-level knowledge management framework for distributed organisations. This framework is constructed by combining the analytical findings of this study with the expertise gained from the contemporary KM literature. The process coding technique of the grounded theory approach is used in the framework development.

4.1 Findings, analysis, and discussion

The open coding and axial coding phases, of grounded theory analysis, have resulted in identifying a total of 25 factors influencing KM in distributed organisations. These factors directly answer the first question (Q1) drafted for this research study. For each of these KM factors, various concepts, characteristic properties, and strategies are described in detail. The concepts represent the base elements or building blocks for each factor. The properties describe how each factor influences the knowledge management function in
distributed organisations. The strategies for each factor represent the initiatives, techniques, measures, activities, and tactics that are being followed by the organisations to manage the enterprise knowledge effectively. The concepts and characteristics aligned to each of the KM factors aim to answer the second question (Q2) of this research study. Whereas, the strategies associated with each of the factors endeavour to answer the third question (Q3) of this research study (Strauss & Corbin, 1998).

Table 4.1. The four core categories with the constituent KM factors

<table>
<thead>
<tr>
<th>Core categories</th>
<th>Constituent KM factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>(from selective coding phase)</td>
<td>(from open and axial coding phase)</td>
</tr>
<tr>
<td><strong>Business focus</strong></td>
<td>Knowledge dispersion (F1)</td>
</tr>
<tr>
<td></td>
<td>Employee turnover (F2)</td>
</tr>
<tr>
<td></td>
<td>Market environment (F3)</td>
</tr>
<tr>
<td></td>
<td>Virtual working (F4)</td>
</tr>
<tr>
<td></td>
<td>Innovation (F5)</td>
</tr>
<tr>
<td></td>
<td>Value addition (F6)</td>
</tr>
<tr>
<td><strong>Culture</strong></td>
<td>Leadership (F7)</td>
</tr>
<tr>
<td></td>
<td>Knowledge accessibility (F8)</td>
</tr>
<tr>
<td></td>
<td>Recruitment (F9)</td>
</tr>
<tr>
<td></td>
<td>Employee learning (F10)</td>
</tr>
<tr>
<td></td>
<td>Reward systems (F11)</td>
</tr>
<tr>
<td></td>
<td>Time allocation (F12)</td>
</tr>
<tr>
<td></td>
<td>Change management (F13)</td>
</tr>
<tr>
<td></td>
<td>Evangelisation (F14)</td>
</tr>
<tr>
<td></td>
<td>Communities of Practice (F15)</td>
</tr>
<tr>
<td></td>
<td>Events (F16)</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>KM strategy and alignment (F17)</td>
</tr>
<tr>
<td></td>
<td>Organisational structure (F18)</td>
</tr>
<tr>
<td></td>
<td>Piloting (F19)</td>
</tr>
<tr>
<td></td>
<td>Knowledge creation and quality control (F20)</td>
</tr>
<tr>
<td></td>
<td>Content management (F21)</td>
</tr>
<tr>
<td></td>
<td>Knowledge sharing and reuse (F22)</td>
</tr>
<tr>
<td></td>
<td>Business processes (F23)</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td>Technological infrastructure (F24)</td>
</tr>
<tr>
<td></td>
<td>Physical infrastructure (F25)</td>
</tr>
</tbody>
</table>
The 25 KM factors identified during the open and axial coding phases are grouped into core categories based on their similarities. These core categories or central categories are developed by looking at the interrelationships between all the KM factors. They are created using the selective coding techniques of the grounded theory approach (Strauss and Corbin, 1998). They represent precise and distinct organisational dimensions shaping the knowledge management in distributed organisations. The integration of the 25 KM factors has resulted in the development of four core categories; 1) Business focus 2) Culture 3) Process and 4) Infrastructure. Table 4.1 presents these four core categories or organisational dimensions with their constituent KM factors identified during this empirical study. The core categories aid in raising the level of abstraction of the study findings. The higher level of abstraction can help in seamless understanding of the findings and development of the proposed KM framework for distributed organisations.

Fig. 4.1 A thematic representation of the core KM categories or organisational dimensions and their interrelationships.

| Leadership, evangelisation, recruitment, Communities of Practice (CoPs), reward systems, knowledge access, etc. |
| Business processes, knowledge creation & quality control, piloting, organisational structure, etc. |
| Technological (ICT) infrastructure and physical infrastructure. |
Out of the four core categories, ‘Business Focus’ is predominantly related to the formulation of the business need, value, strategy and objectives for knowledge management in distributed organisations. ‘Culture’ core category is associated with the development of knowledge culture to enhance knowledge creation, sharing, and usage. ‘Process’ core category is connected to the business processes optimisation and the KM implementation process. ‘Infrastructure’ core category deals with the physical and technological infrastructure for facilitating KM in the organisations. Figure 4.1 depicts these four organisational KM dimensions and their interrelationships. Business focus is placed at the epicentre to denote its role in the KM. It drives the remaining three KM organisational dimensions thereby becoming the hub of knowledge management in distributed organisations. The following sections present, analyse, and discuss these core categories and their component factors in detail.

4.1.1 Business focus

This study reveals that the business focus serves as the driving force for the KM initiatives. This core category refers to the business need for KM, and the value it provides to the organisation. Much of the current KM literature suggests a generalised and compulsive approach for initiating KM (Hertog & Huizenga, 2000; Prusak, 2001; Rumizen, 2002; Skyrme 1999). However, the majority of the respondents have stated that all the KM initiatives, programs, projects or activities should serve a specific business need and provide value to the organisation in some form or other. They have suggested that each of the organisations should explicitly find its own specific business needs for initiating KM programs, and should not take a general and compulsive approach. This business focus paradigm is scarcely covered in the extant KM literature. This study clearly depicts that the lack of business focus as one of the major reasons for KM project failures in distributed organisations. The business focus core category encompassed several factors. Most of these factors (F1, F2, F3, F4, and F5) are related to the business need for KM and one factor (F6) is related to the business value provision from KM programs and initiatives. Table 4.3 depicts the constituent factors of this core category with some substantiating codes (interviewee responses). A unique number (e.g. 132a) is assigned to each of the codes displayed. This code number assists the author to identify code origins and context. The following sections provide detailed descriptions of various KM factors in business focus dimension.
"One of the things that were missing from most of the early KM initiatives is the business pain...where is the business pain...if you don't have a business issue to resolve or if you have other ways of resolving that issue...you will not turn to any of the KM concepts or KM practices...because if things are fine as is...if you don't have a pain or if you don't have a future pain that you can identify and you can feel as an organisation...you can't achieve it...If you don't have anything like that pressing (business problem)...KM, it would just be a good thing to have. But it wouldn't be that successful".(132a, 133cd***)

"...if you go into a company and say lets do KM...it doesn't work. You need a real need which is covered by KM...a business need or problem should be solved by KM. We are in that situation now...we are reducing our staff and loosing a lot of knowledge...how can we capture this knowledge to stay in the company or transfer to other people?...that gives a real need...and you could find a way to solve the problem". (2a)

"Lots of dynamics have been changed in the business and the challenges we face now are great...if not greater than what they have ever been...so knowledge management therefore will naturally rise as one of the areas where we can create further business value...and we acknowledge that...it will effect how people are compensated...it will be deeply ingrained in the culture of this business...it will be effective way we are organise...it will effect the way we interact with customers and also the way we develop our products". (111c)

"A successful KM project provides solution to a business problem". (61c)

"...these HR divisions were self inventing and reinventing things without innovating...without integration and collaboration...handling only their business divisions. These departments won't talk to each other. You are doing business...but not talking and thinking at meta level". (9d)

"We feel that it's important to have horizontal associations...because...if you are just in the vertical structure and you are the only department...you will have no external peers against which you compare yourselves". (P95c)

"People have to leave the company........people do not leave companies on their own today.........its rather the opposite. In the end........this is happening very quickly. We have our targets........we have to reduce head count........after so many years of restructuring........it(KM) gets more difficult........this is real life........this is not in favour of knowledge management........we lose a lot of knowledge, and organisation suffers a lot. But people are able to rebuild knowledge and live with it........my answer for this problem would be .............to explicitly manage knowledge". (14d)

"All the knowledge sharing that we do is based around some business purpose.....of achieving something new with a customer....or develop some thing". (120b)

"Going back to why our organisation has to do KM is......When I started at this organisation 11 years ago........we had like...a dozen products.....We now have 100s. In the past we used to go and tell our customers.......that we are a small organisation in that country (e.g. turkey). You can't expect us doing the same things now......that is not rue any more. Where ever you are.....as an employee you are expected to have the same knowledge.....same level of expertise and provide same level of service to the customers". (133c)

"There were some parts of the organisation who felt the pain (need for KM) a lot more than the others......especially within customer support, technical support, consulting, and some parts of our sales origination. They felt this pain more than the others because by nature they were geographically dispersed......by nature they needed or need to reuse the expertise and experiences of other people......and especially for customer support and consulting......reuse and repeatability is an important factor in terms of quality and efficiency of the work that we are performing......we being so geographically dispersed......felt the most pain. So that's why we have regional heads of KM, who work as a virtual team". (134b)

"I would see KM becoming an integral part of the business......specifically in our industry because of knowledge intensivity and amount. And it's the collaboration which makes the day going forward here. More importantly the customer is also getting more demanding. The expectations from the customer are increasing everyday........so it's imperative for any business to be on the leading edge or providing leading edge. I would see KM playing a significant role in that........interestingly I also run a Monthly news letter across our organisation..........called knowire and in every issue I write an article. Specifically my theme for this month's knowire is managing customer knowledge. Having said that I would see KM playing a significant role in driving business forward......as is say......its all about cost, quality, and schedule.........so all these are completely related and KM can help". (190c).

*** Note: A unique number (e.g. 132a, 133cd, 2a......) is assigned to each of the codes displayed. These code numbers assists the author to identify code origins and context (case organisations from which they were drawn).
4.1.1.1 Knowledge dispersion (F1)

The knowledge dispersion, in this context, refers to the scattered nature of knowledge in distributed organisations. It is identified as one of the major factors influencing the initiation of KM programmes, in the studied organisations, by providing a business case or need. It is a common factor observed in all the case organisations because of their characteristics such as large size, numerous business divisions, mergers, acquisitions, and global presence. Table 4.4 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Table 4.4 Knowledge dispersion (F1): Substantiating concepts and codes

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distributed organisations, large size, mergers, acquisitions, geographical distribution, dispersion of organisational knowledge, divisional heterogeneity, head quarters as power centre, divisional coordination, divisional knowledge flow, collaborations, divisional remoteness, and horizontal associations.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substantiating codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;it’s an interesting thing for you to know that…………our organisation has been a conglomerate of different companies worldwide……it has bought a lot of companies in last 100 years. We never were really grooved together. Imagine…………if we want to extend the markets we serve or the technology…………we usually buy a company representing these. So we have lots of companies (or divisions) within our conglomerate……with different cultures. What are we trying today is to grow together as a one company”. (P4a)</td>
</tr>
</tbody>
</table>

| "The business divisions didn’t really talk a lot to each other in a sense that…..Hay….if we could develop your product in this direction and my product in that direction we could offer the perfect solution to the customer. We have experienced this…..what you have experienced? And so on……” (8b). |

| "Our (KM team) job is to share knowledge within our world wide communication network…..this means we have market performance centres such as Italy, India etc. We have……general distributors……partners……press department…..customer relationship management. These are our target groups for KM…..our vision is to create the best international knowledge management in our industry”. (32a) |

| "We invite people to our meetings (from other divisions) they invite us for meetings. We share problems to come up with a common solution………………Because we feel that its important to have horizontal associations……...because, perhaps, if you are just in the vertical structure and you are the only department…..you have no external peers against which you compare yourselves . So yes……. we have (horizontal) structures”. (95b) |

| "Explicit measures taken to improve knowledge sharing between the global divisions………………There are a number of measures…….indeed……measures in terms of activity. We have created a new region……..which is a virtual region called REGION 6……………..which Doesn’t have any geography. But it’s the region for the customer operating in more than one country. That’s a very significant step…………organising our sales around the customers. For example…..if we have……in EMEA……may be 5 geographical blocks……now we have 6…which is a virtual group. That is a way of getting our people to collaborate and share customer knowledge……very powerful. Region 6 has a full team…..a Vice president…..it doesn’t have any geography……but the concept is beautiful and simple……..most of the major frictions between the territories have been resolved”. (109d) |

| "I would say…. the powerhouses of knowledge are becoming increasingly fragile…because its (knowledge) out there if you are willing to find it. R&D can access sales knowledge….and sales can access the development information and what they are working on”. (117c) |

| "Current KM initiatives…………….I (KM Head) have prioritised couple of things for this year….my priority is to……….cover larger spectrum of the organisation……what I mean by that is……the groups or divisions which are not included……covered earlier (in KM)……..largely these were support services. We are increasing the security levels……so that we could bring various groups into the KM portal….to bring every one”. (186b) |
Properties

1. Large size, self directivity, and geographical dispersion of the business divisions and functional departments, can complicate the knowledge flows in distributed organisations.

2. Mergers and acquisitions, a common phenomenon in distributed organisations, increase the knowledge diversity and dispersion.

3. Unification of the KM activities in various business units of a distributed organisation can be a complex task.

4. The business divisions of a distributed organisation can have different cultures and act as heterogeneous bodies, resulting in difficulties for organisation wide knowledge sharing.

5. ICT infrastructure plays a major role in improving the employee connectivity and knowledge sharing in distributed organisations.

Specific KM strategies

1. Continuous leadership and managerial efforts are needed to unify the business divisions and deploy one organisation philosophy in terms of knowledge creation, sharing, and usage.

2. Establishment of a combination of vertical and horizontal associations between the business divisions can significantly enhance the collaboration and knowledge flows in distributed organisations.

3. While the formal organisational structure can satisfy the vertical associations, developing Communities of Practice (CoPs) can be an effective strategy for establishing horizontal associations between the dispersed business units.

4. Distributed organisations can establish the technological infrastructure such as enterprise portals with collaboration tools, to enhance the connectivity and knowledge flow between the business divisions.
5. Standardisation of the business processes and systems, across the business divisions, helps in integrating the knowledge and people throughout the organisation.

Discussion

Knowledge dispersion is observed as one of the most common factors in all the organisations examined in this study. A majority of the studied organisations have a strong global presence while some had a wide national presence. In all the organisations the knowledge workers were spread across vast geographical regions complicating the knowledge flows. In some cases of this study, certain differences were observed in KM practices and cultures between the Head Quarters (HQ) and business units. For instance, in some of the organisations, the HQ has been regarded as the power centre for knowledge. The knowledge generated in the business units is often ignored and not valued. Variations are also observed between the HQ and regional units in terms of resource allocation for various KM related activities such as research and collaboration.

O’Leary (1998) supports the significance of this factor and claims that the “KM is difficult when participants are in the same location; geographical dispersion only makes it harder because many traditional knowledge flows (e.g. face to face communication) are simply not present”. Fisher et al. (1998) also notes the scattered nature of enterprise knowledge in distributed organisations. They suggest that the organisations should take explicit measures to improve collaboration between the employees spread across various business units. Most of their suggestions in this context align with the KM strategies and best practices identified in this study (listed above for this factor). For instance, they suggest establishing horizontal associations through the development of employee networks (CoPs), to enhance the knowledge flows between various business divisions of a distributed organisation.

4.1.1.2 Employee turnover (F2)

Employee turnover is mentioned by all the respondents, as an important factor influencing KM. This study depicts that enterprise knowledge can rapidly diminish because of employee turnovers. Little (2002) supports this notion and states that many BPR projects of the last decade have resulted in employee layoffs and simultaneous knowledge loss to some global organisations. Table 4.5
presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Table 4.5 Employee turnover (F2): Substantiating concepts and codes

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee turnover, lay-offs, outsourcing, structural changes, employee disappointment, knowledge loss, knowledge capturing, vanishing middle layers, and knowledge rebuilding.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substantiating codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>“We are reducing our staff and loosing a lot of knowledge how can we capture this knowledge to stay in the company or transfer to other people. That gives a real need and you could find a way to solve the problem through KM. There are always changes in the organisation and after a change there is always a break or interruption. People need to grow together again every time we change a team, there will be a team finding process”. (3a, 14a)</td>
</tr>
<tr>
<td>“5/6 years ago we centralised most of our business operations and back-office operations and removed a number of layers from the organisation in terms of geographical organisations. So the people were gone but the need in terms of different geographies talk to each other and connect to the central office was still there. And the only way we could do that was by building networks of people who share the same interests, who share the same expertise, who share the same concerns, and the same business issues. That required an infrastructure that will enable people in the organisation to connect to any part of that network. And I think this is true for a number of organisations and if you look at the root causes of why KM concepts is rising or picking up it is because the organisations are becoming increasingly networked shaped (middle layers of management vanishing)”. (132b)</td>
</tr>
<tr>
<td>“Long term thing would be to train our people to make them aware that it’s OK to finish things. That they shall open up themselves for things to come and also one of the keys to enable that is to reward people you have to tell them its great what you did. If you reward people they let lose (knowledge) they let go. But, if you don’t reward them they resist that’s one of the very psychological keys”. (15c)</td>
</tr>
<tr>
<td>“I think the basic strategy of KM at our organisation is to ensure that the talent that we have and the information we have is maximised when key people leave, the key information leaves the business capturing this key information and contextualising explicit and tacit knowledge is a key aspect contextualisation of knowledge is a major problem for us”. (105c)</td>
</tr>
<tr>
<td>“Measures to manage the knowledge loss explicitly take the time to get out to identify the knowledge you might lose and take the time to transfer it the problem is if a person leaves the company you have to take the knowledge to his successor and only that person can transfer the knowledge in practice, because of layoffs here there are lot of social problems and politics involved there are lot of politics involved. Usually, in practice, the people who will leave the company they don’t know 3 months before. And We don’t have a culture here it’s rare of sharing such information openly there wouldn’t be a problem, if I would know that I have to leave at the end of the year then I could really find a successor in time and share my knowledge usually that doesn’t happen and people are disappointed”. (14c)</td>
</tr>
<tr>
<td>“Layers removed and people networks being formed instead of hierarchical organisations people need to learn quickly on the go and react to the customers expectations. It created the need for the KM and learning origination and so on. In other words, it was a matter of survival no one said it was a matter of survival but if you look at the root of the problem it is easy to conclude. Unless we find a way to connect our people and get them to learn on the go we are not able to survive so I think that’s the gist of why KM at our organisation”. (133c)</td>
</tr>
<tr>
<td>“Preventing the loss of knowledge through employee turnovers We wouldn’t look at it at the time of an employee going out. What we are trying to do is we are trying to build it into the process in such a way that knowledge is getting captured at the time at which its is being generated one thing which I probably mention here is account closure meetings. That’s one occasion where we try to capture whatever knowledge is generated in the process of the project. Project closure meeting are the key for that. A person may leave the company or he or she might be moving out of that project or that particular role so project closure meeting are definitely a key. At the project closure it would be best practices it would be case studies expertise notes and share generic knowledge. Its mandatory to write a case study at the time of project closure it is mandatory to write expertise notes and share other generic stuff (knowledge) what ever is generated”. (160b)</td>
</tr>
</tbody>
</table>
Properties

1. Employee turnover and the resulting knowledge loss, are serving as an important motivating factor for initiating KM programs in many distributed organisations.

2. Layoffs tend to be the major reason, for knowledge loss rather than the voluntary resignations. Structural changes in the organisations such as mergers, acquisitions, reorganisation, and outsourcing can result in the large-scale employee layoffs. Such changes can have negative impact on knowledge creation and sharing attitude of the employees.

3. Middle layers of management are most prone to layoffs during the structural changes in distributed organisations. Removal of these layers cuts off the knowledge flows in the large distributed organisations.

4. Capturing and transferring the employee knowledge during layoffs is a challenging task.

5. Because of social, economic, and psychological factors, the employees can resist to share their knowledge during the layoffs, resulting in several organisational inefficiencies.

Specific KM strategies

1. Organisations need to take explicit long-term initiatives to identify and capture the core knowledge they might lose.

2. In the long-term, it would be beneficial to develop a culture where the information (even regarding turnovers) is openly shared beforehand. This would enable the organisations to build trust among the employees to a certain extent.

3. Some of the long-term initiatives to reduce the knowledge loss are, to improve the employee mobility, train them to share their knowledge, and make them ready for the possible structural changes in the organisation. Strategies such as job rotation, employee exchange, project rotation, and business divisional rotation can help the employees in preparing for such changes.
4. Developing the Communities of Practice (CoPs) can establish the vertical and horizontal associations in the organisations. To some extent, the CoPs can compensate the loss of the middle layers of management. CoPs are a natural choice for creating horizontal employee connections and enhancing the organisational knowledge flows.

5. The business processes and KM infrastructure should be optimised to facilitate knowledge capture in the day-to-day business activities. This long-term strategy can be more effective compared to the knowledge capturing methods during employee turnovers. For instance, the process maps, project closure documents, best practices, case studies, expertise notes, and sales closure documents can assist in constant building of the core organisational knowledge.

Discussion

The study shows that employee turnover is a major cause of knowledge loss, making it an important KM factor. This factor is making KM function as an immediate necessity, and increasingly relevant to distributed organisations. Several authors support this observation, and note that the organisations should consider the employee turnover in their KM initiatives (Drucker, 1998; Davenport & Prusak, 1998; Lesser & Prusak, 2001; Little, 2002). This study also depicts that the layoffs are far more complex than the voluntary resignations in terms of KM, because the knowledge capturing and sharing is extremely difficult during layoffs. The turbulent economic conditions in last few years have caused many distributed organisations to layoff people for cutting costs. This has resulted in the direct and heavy knowledge losses. Reinforcing this observation, Lesser and Prusak (2001) argue that “when employees walk out of the door, they take valuable organisational knowledge with them. In employee turnovers, often the most knowledgeable people leave first resulting in damage of critical social networks and trust decay”. The time necessary for knowledge transfer is also compressed and compromised in these situations.

Broadening the scenario, Drucker (1998) predicted that the future knowledge-based organisations will have half the number of management layers found in businesses today, and the number of managers will be cut by two thirds. He proposes that knowledge management will have a major impact on the structure of future organisations. In most of the organisations participated in this study,
this prediction is turning into reality now. However, there is a scarcity in extant literature for the specific KM measures that can be followed to control the knowledge loss during the employee turnovers. Many respondents in this study have suggested that preventing the knowledge loss in totality is an impossible task during employee turnovers. However, they advocated several systematic KM strategies (listed above for this factor) that can help in controlling knowledge loss to a certain extent. For instance, one of the suggested KM strategies is to introduce job rotation programmes to improve the employee mobility across the organisation. Moving the employees between the projects can enforce knowledge sharing and make them flexible towards the organisational changes. It can also help to foster the knowledge sharing between various business divisions as the employees are rotated between them. Another valuable strategy observed during this study is to embed the KM activities in the day-to-day business processes such as sales process. For instance, valuable customer and market knowledge can be regularly captured by introducing a sales closure document in the process.

4.1.1.3 Market environment (F3)

Market environment is another factor that is providing an important need and context for knowledge management in the studied organisations. Table 4.6 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the current KM literature.

Properties

1. The challenges of the market environment such as globalisation, knowledge economy, increasing customer demands, high levels of competition, need for business partner collaboration, etc., have created an immense need for KM in distributed organisations.

2. It is a complex and challenging task to manage the market knowledge because of its dynamic nature.
"In KM... context is every thing...what is it relevant to?...and the context you find at our organisation is a really interesting. We have historically enjoyed a very buoyant market...where almost the sales people were order takers....I am sort of exaggerating to make a point....But that's almost true...is that the sales force didn't need to do think much...people just wanted our product...but now......where do we go from here....the days of...how many do you want....have gone....we are wrestling and competing with the big application providers......So that means that this organisation can no longer act and behave the way we used to do......So we have to think very deeply and carefully about....how we work together, how we think much more smarter in our value propositions, How we build trust at board level, how we cooperate and organise as a team". (110d)

"In the early days....each business division had their own sales division which worked more or less independently. It could happen on one end....that a customer had to deal with several business divisions for buying a bunch of our products. That's disadvantageous for the customers. We want to put one face to the customer....we want to serve customer in a most comfortable way......In that way it didn't really happen......it's a very very important knowledge management thing". (8a)

"Now we have customer account teams (CAT).........which deals with customers. Behind them we have sales support from the different business divisions in giving the information they need about the products and technologies.........and also collecting information from these account teams.......to integrate back into the organisation.............to develop future products and solutions. Generally a Customer account is one big customer. This system has been deployed in all countries.............in CAT we have people dealing with special customers. If you deploy such system.........organisation really need time to live with it.........they try to keep up the old structure, channels and customs. Its not 100% in place that way........but formally and realistically, people are adopting this idea. This way you can market services better. That's pure knowledge management.....................because the information about the product, market, and customer flows into the company............and each business division are well coordination with internal information flows. There is a structure in each business division........each business division has head quarters.......and information flows into them........they are well coordinated to develop their products". (8d)

"The market research area..............this is really hot theme in the company........market research results are important knowledge........the markets tell us........what they want and what they need". (35d)

"We do have Customer knowledgebase.......we have worldwide customer database. We have database of worldwide sales and marketing divisions knowledge........containing customer information and competition information.............a part of that is CRM system.........consists..........the business opportunities to be exploited........which may not be exploited right now. If there is a customer.............might be an opportunity in future........so just put the information in there. It is web based and accessible worldwide easily". (12b)

"We have three targets (for KM team)........We want to increase the quality of marketing communications, We want to shorten the time to market, and We want to optimise the costs". (32c)

"Customer knowledge sharing events.............. We have Executive work shops........we have some preasles methodologies where we run work shops with our customers on a project basis........we run business evaluation workshops........next week we have an organisational event in London. Loads of customers are invited to these events. We interact with customers at these events.............dark side is we have a lots and lots of pockets of customer information. Because of knowledge management we are now able to connect these pockets of knowledge". (122d)

"In many organisations getting a single view of the customer (knowledge).......that is a huge challenge. We have multiple views but we have less multiple views then before". (114b)

"Do you involve customers in your KM activities? .................It's a good question....Its one area we are investing more and more. We are extending the use of some of our collaboration tools (KM infrastructure) and portal to our customers now.............by what we call the customer portal. We are trying to do more........we obviously have user groups called Special Interest Groups..............where customers can come, talk and know about our products and services. Beyond that........we are utilising our customers in our professional communities........I would say there is a still lot of room for improvement. If you talk about our industry knowledge, our product knowledge, our professional skills knowledge, and customer knowledge...............I would say customer knowledge is still an area where we need to do a lot more". (141cd)

"What we have now is some thing called international accounts and............especially those are the one's that require multiple countries and groups to share customer knowledge". (142c)

"What they (sales people) do is..............they pull out (from portal) what ever documents are interesting from their perspective........important from their perspective........case studies, analyst reports, and competition information.............which normally the marketing and sales people need". (183d)
3. Traditionally, the business divisions (e.g. sales teams) of a distributed organisation have worked independently resulting in divergent views of the customer and competition knowledge. This divergent market knowledge results in business inefficiencies in the areas such as sales, marketing, and product development.

4. Capturing the knowledge from sales force is also a difficult KM activity. Sales force generally lack time and interest to create and share customer knowledge artefacts such as best practices and case studies.

5. It is an immense and complex challenge for a globally distributed organisation to get a single, integrated, and 360° view of its customers and market knowledge.

6. Privacy, confidentiality, and security are some of the major concerns in disseminating customer and business partner knowledge throughout the organisation.

Specific KM strategies

1. The overall organisational KM strategy should encompass the management of market knowledge including the customers, business partners, and competition.

2. The KM strategy should explicitly address the divisional collaboration aspects regarding the collation and sharing of the market knowledge.

3. Establishing Special Interest Groups (SIG’s) for managing knowledge of specific market segments can serve as an effective mechanism.

4. Creating customer and business partner events can assist in capturing crucial market knowledge.

5. Because of highly tacit nature of customer knowledge, specialist KM roles may need to be created to develop the knowledge artefacts such as case studies, testimonials, sales best practices etc.

6. Effective usage of CRM systems is one of the proven measures to manage customer knowledge. However, such CRM systems should be integrated with
the overall organisational KM infrastructure (e.g. portal) in a controlled and secure manner.

7. Providing controlled and relevant access to the organisational KM infrastructure (portal) to the customers and business partners can enhance the collaborations, and flow of market knowledge into the organisation.

8. Developing unified market knowledgebase by integrating the customer, business partner, and competition knowledge, from all the business units, can help in achieving a collective view of the market knowledge. However, stringent access and security measures need to be established to protect such knowledge bases.

Discussion

This study shows that the external market environment is a major factor that imposes the need for the knowledge management in distributed organisations. Rapid changes in the customer needs, increasing competition, and rate of technological obsolescence are mentioned as some of the major issues necessitating KM programmes in the organisations under study. The major elements in this factor include the customers, competitors, and business partners. The macroeconomic issues such as recessions and globalisation were also mentioned frequently during the study. Several other authors acknowledge the importance of this factor and the challenges involved in managing the knowledge of the market environment (Gibbert et al., 2002; Osterle & Winter, 2000; Porter & Millar, 1985). However, most of the KM literature ignores the role of business partners in this context. This study shows that the business partners are also a crucial part of the KM function in this context.

Signifying the role of market environment in a knowledge intensive (IT services) industry, Pring et al. (2003) note that the “current levels of market demand are the result of long-term structural changes in buyer’s requirements, rather than simple cyclical trends. High price, long lead time, amorphous objectives and unquantifiable return style projects were wonderful for the industry — while they lasted — but they are now, and will remain, history”. In order to sustain these conditions, many organisations now need to continuously innovate, improve quality, deliver solutions on time, and at the same time reduce the prices. Several respondents have mentioned that the KM function can play a significant role in addressing these market challenges. For instance, the majority of the
studied organisations have explicit KM programs to capture the market knowledge and route it into the product development processes. Some of the organisations also have joint KM projects with their business partners to share market knowledge and to develop products and services collaboratively.

The majority of the respondents have expressed that it is difficult to capture market knowledge, especially from the sales professionals. Collating the customer knowledge of various business divisions into a single platform is another prominent problem in distributed organisations. The current KM literature lacks specific approaches for dealing with such challenges. In this context, most of the literature is directed towards the CRM technologies. For instance, Greenberg (2001) suggests using CRM systems for managing the customer and market knowledge. However, many respondents have stated that implementing CRM technologies is not the complete solution to this problem. In addition to the CRM, this study has identified several KM strategies (listed above for this factor) for addressing this issue. For example, organising customer and business partner events for capturing the market knowledge were proving successful in the organisations under study. Another prominent KM strategy is to establish Special Industry Groups (a type of CoPs) for building and sharing market knowledge in the organisation. Little (2002) also suggests that for today’s global organisations, the local business partners play a crucial role in capturing and exploiting the market knowledge.

4.1.1.4 Virtual working (F4)

Virtual working is a common phenomenon in all the organisations examined in this study. The growing complexity and dynamics of the knowledge work, in these organisations, require collaboration between the virtual teams. The need for virtual working is implicitly stimulating the establishment of KM infrastructure such as enterprise portals and intranets. Table 4.7 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties

1. Virtual work and remote work is one of the important factors that necessitated the establishment of KM infrastructure such as intranets, extranets or portals in many distributed organisations.
2. In many geographically (even global) distributed organisations there is a lack of funds and free time for physical employee meetings and knowledge sharing activities.

3. Technology enabled self service functions (e.g. training, purchasing, etc.) are common in distributed organisations.

4. Various business divisions of the globally distributed organisations need to collaborate virtually and share customer knowledge to cross sell the products to the multinational customers.

5. Most of the Communities of Practice (CoPs) are virtual in nature and need ICT infrastructure for their creation and functioning.

**Table 4.7 Virtual Working (F4): Substantiating concepts and codes**

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
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<tbody>
<tr>
<td>Virtual working, remote working, electronic processes, work flows, self services, virtual collaborations, technologies, and portals.</td>
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<th>Substantiating codes</th>
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<tr>
<td>“Because of performance targets..........and lack of time...............we are getting less and less attendance (in CoPs meetings). So.........we have to come with more and more interesting solutions........one of the solutions is..........another website........Which is one of our solutions to life........which is actually to have a virtual meeting place. So we can share our cross regional knowledge........people don't need to come to meeting this way.........we can cut down amount of time there. We also use this for training. There are various groups on the site......where cases are discussed. These are modern solutions for problems of information and knowledge”. (95d)</td>
</tr>
<tr>
<td>“Facilities we have on enterprise portal..........Some electronic processes or services. If I want to buy a computer......I do that online. I can create a purchase order........it is one of many self services. Other is......enrolling for courses at our organisational University”. (30b)</td>
</tr>
<tr>
<td>“We work virtually a lot...........and create communities that come and go a lot......that's the success model in this organisation or even for survival in this organisation. And people like my self........I regard my self as a fringe member of KM community........my work involve aspects of them........and much more as well. It's an important ingredient in many of the other aspects of the work that I do in the company”. (107c)</td>
</tr>
<tr>
<td>“We have mechanisms to capture this knowledge........we have website going........we have WIKI going........it’s an Individual name for collective Blogs”. (116d)</td>
</tr>
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<td>“.........people usually feel closer to the people who share the same expertise than their immediate boss or colleague who sit in the same room.............than the virtuality comes into picture.........some one who is 5000 miles away could be your best help as opposed to the person who is sitting next to you. So that need for interaction with others and understanding from their experiences is one thing...........and.....the second thing is this physical limitations in terms of achieving solution or finding information needs to go away”. (132d)</td>
</tr>
<tr>
<td>“We have...........War Rooms........it is actually a virtual work place where people can get together and do a particular task. It has a discussion board........but its time bound task oriented kind of application..............what it means is........you have a task...........lets say........you are preparing a proposal. You get together........you create a War Room.............only people who are working on that particular proposal will get together on this particular War Room. They finish the task and close it............In this........you have a discussion board and set of folders. You can put documents there and post your messages........So those are the two basic things a person can do in a War Room”. (177)</td>
</tr>
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</table>
Specific KM strategies

1. Virtual work and self service functions should become an integral part of the KM strategy and programs.

2. Developing virtual work processes such as self service functionalities can reduce administrative costs and show tangible results on KM investments.

3. Establishing KM technology infrastructure such as Enterprise Knowledge Portals can facilitate virtual working. The portals can also become a platform for the creation and functioning of virtual CoPs which can spread across the countries and functional divisions.

4. Virtual meetings between the employees can reduce the travelling time, resulting in direct cost savings. However, effective groupware technologies should be integrated with the portal to facilitate virtual meetings such as videoconferences.

5. The establishment of portals can also facilitate the virtual collaborations between the globally distributed divisions. Such collaborations can facilitate the customer knowledge sharing between distributed divisions resulting in direct business benefits.

Discussion

This study depicts an integral relationship between the virtual working phenomenon and the other KM issues such as CoPs, employee collaborations, and knowledge portals. Many elements are driving the employees in distributed organisations towards the virtual work. Some of the common observations during this study include global collaboration needs, cost saving measures, and lack of travel time for employees. The majority of the respondents have stated that a significant portion (from 30 to 50%) of their job is virtual work. Online conferences, virtual CoPs, and self service functions are observed in most of the studied organisations. Several other authors confirm the findings of this study and denote the association between the KM and virtual working in distributed organisations (Bitter-Rijpkema et al., 2002; Bradshaw et al., 2004; Warkentin et al., 1997). However, one of the important suggestions made by the respondents is to treat virtual work as a part of the organisational KM strategy. This can
enable the organisations to integrate the efforts of establishing the infrastructure for virtual work and KM. It will also enable the KM teams to show some tangible benefits such as cost savings through the self service functions and reduced employee travel.

4.1.1.5 Innovation (F5)

This study depicts the crucial role of innovation in knowledge management function. Many respondents in this study have stated that the KM initiatives in their organisations are creating significant business value by enabling and improving their innovation capabilities. Table 4.8 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A short analytical discussion is provided for this factor, based on a critical comparison of the findings with the extant KM literature.

Properties

1. Innovation is identified as one of the core objectives of the KM. It is considered as a major motive for several KM projects.

2. In distributed organisations, the HQ can act as the power centre for innovation and ignore the innovations from the regional divisions, which can hinder the overall innovation culture and capabilities.

3. Sometimes, the excessive organisational bureaucracy can hinder the innovation and knowledge creation.

4. Business partners are crucial in the innovation. Several organisations today need business partners’ knowledge at various stages of the new product development, and market delivery.

5. In market oriented innovations customers can also play a prominent role in bringing valuable knowledge into the organisation.
**Specific KM strategies**

1. The overall organisational KM strategy and teams should include innovation as an important element of their activities. They should closely coordinate with the R&D function of the organisation.

2. Pathways should be established for proper routing and treatment of the innovative ideas generated by the employees. These should be communicated and made visible throughout the organisation. This can enable the new knowledge created by the employees to get actualised into business benefits.

3. The unnecessary bureaucracy should be eliminated from the innovation process. Only the best and powerful people with the respective functional expertise should be involved in reviewing the new knowledge, ideas, and innovations of the employees. Establishing focus groups such as expert technical academies can help in such scenarios.

4. Establishment of the knowledge flow networks and mechanisms with the business partners or value chain partners is one of the key KM strategies that can help in improving the innovation. Creation and development of CoPs can serve as a valuable tool here.

5. Organising knowledge sharing and innovation events within organisation, with the business partners, and customers can also enhance the innovation capabilities.

6. Recognition and rewards are the essential elements to promote new knowledge generation and innovation. However, the appreciation and awards tend to be more powerful and effective in this area. Expert academies within the organisation can assist in reviewing innovations and employee recognition processes.
### Substantiating concepts

Innovation, product development, Research and Development (R&D), business partners, market knowledge, headquarters & divisions, and organisational bureaucracy.

### Substantiating codes

"New ideas ...questions....new solutions..........the essential core of KM to me is......it's not just about maintaining the status quo........its about creating some thing new that wasn't there before. The leading edge of KM is in..........innovation..........which adds amazing amount of value to the business. We have a big innovation program in our organisation........the KM is raising the profile of innovation in the business...its important, in addition to the traditional KM jobs such as storing and sharing knowledge for routine tasks". (129b)

"Historically the guys in development used to create these (develop products) things. And we were pushing these into the market place. But it is no longer the case........now there is increasingly strong feed back coming from customers back into our R & D...so that path is becoming very important........traditionally it used to be held within the base country (HQ). They now realised that they need to latch on with the collective wisdom around the world. The EMEA...for example, has now...good and improving relationships with R&D...so there are channels...particularly the industry groups feed back that knowledge.........so no longer do these incredibly talented people (R&D)sit in isolation and create amazing products.......they may get 70% right...but remaining 30% they get wrong". (117a)

"How new knowledge is created for product development and innovation? .................First....one of our core values is innovation. Every one at our organisation from time to time is briefed on these values. We try to keep up these values worldwide (business divisions) and motivate people to be innovative. Also...We spend a lot of money on research (R&D) – about 10% of our revenues. We have research centres worldwide...one of them is here in Stuttgart........this is again a worldwide organisation. In order to make it even better.........we have HR programs. One program, for example.........is our Technical Academy........which rewards people in case they have done very good. We have people who invented the fastest optical fibre in the world........you need to identify these people........we have people who got Nobel prizes. We have to identify these people........we have to network with them and bring them into the right projects worldwide". (16c)

"For innovation........people here, get rewards...like...they get members of club and academy awards". (16d)

"They (management bureaucracy) are trying every innovation to go through a business planning process and get risk assessed and all that.........which will stop innovation. At the moment we have hugely innovative organisation........ because we have many professionals who are empowered and most professionals are mostly medical. They are not trying to disempower.....they are trying to choral, they are trying to funnel.......I can see it from the management perspective........but the trouble is they just don’t know what’s going on [lack of domain knowledge or expertise]............they aren’t the core professionals........not at all........they are managers........none of them would be a core professional...........they don’t know about the knowledge objects...........they don’t know what you are talking about...........there is a strong feeling among the managers that knowledge objects you talk about or I do........are just a way of stopping them understanding what’s happening in the system...........they think they get in the way of good management". (71b)

"In our department we have guidelines list........we will take the knowledge we generate......as the guidelines and put them into practice. We needed a pathway........ for creating knowledge......and in order to get to that pathway we did a number of things. We did a number of secondary research projects. We also undertook primary research projects........you don't come up with these things instantly.......it takes a while to do those things". (74d, 75a)

"I access information (from the knowledge portal), as I do my job........and post solutions... which some body might need. We developed a database of FAQ’s........users can also post the innovative and effective ways of solving a problem on this knowledge base........to decrease response time". (57d)

"In innovation..........Our business partners are crucial ..........I mean, our organisation’s economy is wholly dependent on how strong our partnership networks are. We cant do it on our own...........I think ....to characterise what we do ................we obsess ourselves in doing things early........innovate new technologies and systems........once they are established........and then we involve our partners. Our organisation wants to do early leading edge implementations and technologies........once we establish these we can get our partners........this tends to be the operative model. How do we share knowledge with our partners? .................We have very strong network called Partnership Network...........this is supported by training and development. When we have meeting with our partners....some times they may have more knowledge about the technology and needs of customer.......which we can learn. There is a structure through which we connect with our partners........and share knowledge". (114d)
Discussion

This study reemphasises the role of innovation in distributed organisations and also depicts its relationship with the KM function. This study shows that the innovation factor influences KM in two ways. It creates the need for KM programs, and it also helps in achieving significant business value from KM. The need for innovation is well established in the current management literature (Balasubramanian & Tiwana, 1999; Cooper et al., 1998; Drucker, 1993; Premji, 2003; Sveiby, 1997). For example, Premji (2003) states that the rate of technological obsolescence in the IT industry is around 2% per month which makes innovation a necessity for the organisations in this industry. However, the innovation is a complex process which requires turning knowledge and creativity into business value (Hackett, 2000).

The majority of the respondents in this study have expressed that the KM has a great role in innovation. They have suggested many KM strategies and activities (listed in above sections) for addressing the challenges of innovation. Some of the prominent KM measures include establishing expert academies, rewarding the employees, establishment of portal infrastructure, CoPs, and virtual work processes. This study shows that the CoPs and virtual work procedures can control the negative impact of the organisational bureaucracy on the innovation process. The KM initiatives (e.g. CoPs) are providing a formal route for turning the employee ideas into real innovations thereby providing significant business value for the studied organisations. The KM teams can attribute such business value to their initiatives. For instance, increased number of patents can be attributed to the KM programs.

4.1.1.6 Value addition (F6)

The value addition is one of the most complex and significant factor influencing the KM function in the organisations under study. In many cases, the knowledge managers or KM heads have struggled to show the tangible business value from the KM programs. Table 4.9 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the properties and specific KM strategies observed during this research study, for addressing this factor. A brief analytical discussion is also provided for the factor, based on a critical comparison of the findings with the contemporary KM literature.
Properties

1. The inability of KM programs to show business value is one of the major criticisms against the KM. This drawback can sometimes result in dismantling the whole KM teams and programs.

2. Some KM programs are able to show the tangible short-term results. However, most of the KM benefits and impacts (e.g. improved innovation) are achieved in long-term. Therefore, the persistence from the top management to show regular short-term value can pressurise and disrupt the KM programs.

3. It is easy to calculate the cost of KM programs but difficult to show the returns. The KM efforts often result in widespread and ripple benefits in the organisation. It can be a challenging and sometimes impossible task for the KM team to show the tangible business benefits such as ROI.

4. Establishing huge, centralised, and exclusive teams for KM activities can be detrimental in the long-term. They can become massive corporate cost centres and are prone to layoffs during turbulent organisational conditions.

5. Although it is difficult to see the tangible short-term business value from the KM initiatives, the lack of a KM strategy and programs can leave organisations incompetent in the knowledge economy.

Specific KM strategies

1. KM teams should explicitly communicate the intangibility of the business value addition from the KM programs. It is essential for the top management and decision makers, sponsoring the KM programs, to understand the long-term nature of the KM business value provision.

2. KM programs should project their business value in terms of the long-term benefits such as improved organisational learning, employee collaboration, innovation, competitive advantage, and customer satisfaction. However, the KM projects should try (wherever possible) to show some short-term benefits and treat them as additional advantage. These may include employee cost savings, increased sales, and time savings.
"They (KM initiatives) really had to add value to the business...because we work on a quarterly basis our view of the world is zipped up...and...If the technology...or the KM strategy...or KM tools...are really not delivering value...it will be crushed and alienated...at our organisation KM and tools have developed and flourished because its adding value". (109a)

"Few months ago...I met Larry Prusak...he is one of the thought leaders in this KM area...they did a field research around...what are the different projects they are implementing...or interested in and what are the paybacks (ROI)...and where are the biggest gaps between expectations and results...Knowledge management came on the top of the list...having difference between the expectations and results". (130b)

"If our management discovered the cost of informal knowledge sharing...they would stop it...they would...because they consider this as cost at the value of nothing. Because...there is no easy way of putting a value on that...you can't put a monetary value on that. If you have a spreadsheet...you will know that 20 Minutes times 10 people in one day is the same as 3 hours of one person (man hours)...which the would say those meetings costs so much money and what would we get out of that?...So...if they (the management) could find them (the CoPs), they will get rid of them. The value of that to put is never easy...the cost is easily assessed...the value is difficult. I think and I am sure that...all knowledge managers will struggle with that. Actually, getting through the board...especially the CFO...the value of KM...is difficult. If I was a CFO...I think I had discovered that I was spending £200/ a day...in a department in knowledge sharing...with that money I could employ another person...or save £30K". (96c)

"You can't put those traditional financial measures (ROI) on KM. In these, you don't take into account the ripple benefits of collaboration........I think, this is an area which is completely under investigated...needs complete investigation". (125c, 126b)

"What I have discovered is......the risk management is very good tool to get people do what you want. That's what I have discovered......you actually say risk of not doing this(KM)...you put a value......you point out the risk of not doing it......we can quantify risk......that's a way of maintaining the balance. Because the risk of not doing this(KM)......they will do more errors...and actually it costs more money". (97b)

"Measure business value of KM activities?........Yes, I am a believer......I think you can find indicators......First of all you will find indicators if its happening........behavioural, cultural, activity based, or infrastructure based. So first of all we know that we have got some thing........once we know that we have got some thing......the job to say how is it going......will become easier. But there will be indicators of activity......you can identify......you can measure improved sales effectiveness......hit rates. So these will become surrogate measures after you have done it. I think the indicators are not direct......I think they are surrogate......they can be at organisational level........they can be at a group......or individual level. I think the amount of learning that takes place is a surrogate measure". (122c)

"Do you look into the ROI on KM investments?........We do and we don't......we do in a sense that we looked at....especially in the beginning...at the cost savings. From an efficiency perspective......ROI......cost savings are important. But........you cant count every thing that counts.....and everything that matters doesn't count.......So basically.......one of mistakes a lot of people did is......to put figures around certain things that will be achieved by working on KM or deploying KM solution, technologies, and processes. There is obviously a visible part......but also an intangible part. Usually......you concentrate on tangible part and show it to the organisation. But for the intangible.........get the management to say......we believe in it, you don't have to prove it'. That is needed.......otherwise.......you are going to fail. Because you can come up with most sophisticated indicators.......you can measure improved sales effectiveness.......hit rates. So these will become surrogate measures after you have done it. I think the indicators are not direct......I think they are surrogate......they can be at organisational level........they can be at a group......or individual level. I think the amount of learning that takes place is a surrogate measure". (122c)

"Largely......the way we work is....any (KM) activity we embark on......our proposal is well justified......both from benefits. I don't think there is too much of resistance in the company. The top management see the value of this.......it is well articulated". (187d)

"Investment Justification and ROI on KM........To me.......it's savings.......savings is a major thing. It's as simple as...........a dollar saved is a dollar earned. So that's precisely the whole principle of ROI is build around. As long as I am able to ensure......in any delivery situation, be it a simplistic thing like a proposal delivery, or a project delivery. If I am able to help these folks.......say......One man week per proposal written.......I am talking million dollars.......I don't make this claim.......this is largely claimed in conjunction with the people......employees who use the KM system and who are benefiting from the system. We did not have any problem with this ROI". (190d)
3. The KM strategies should deliberately avoid building large-scale, centralised, and exclusive KM teams or departments. Instead, small decentralised KM teams should be formed in conjunction with the respective business units.

4. It should be an effective strategy to define and explain the risks of not having the KM programs. These risks may include low levels of market competence, lack of innovation capabilities, and knowledge loss through employee turnovers. This strategy can act as a counterbalance for showing the short-term ROI on KM programs.

5. Conducting the employee and customer satisfaction surveys can serve as useful indicators for showing the business value of KM programs. It is observed that the presence of KM programs is one of the common features of the best employers.

Discussion

This study reveals that the determination of the business value from the KM investments is an intricate exercise as the benefits of such investments can be highly intangible. It is also observed that the KM benefits often spread across the organisation and are difficult to gauge. The majority of the respondents in this study have revealed that measuring the value (e.g. ROI) of KM implementations is difficult and needs further research. The costs of KM initiatives such as employee time, software, and additional hardware can be estimated easily. Whereas, quantifying the benefits from KM can be a highly complex job. Several other authors have reported that the managers in many organisations struggle to gain organisational resources and sponsorship for KM programs due to the ROI imperatives (Ellinger et al., 2002; Olson & Aase, 2002; Manville & Foote, 1996).

However, some of the respondents in the studied organisations have clearly demonstrated the business benefits such as ROI to justify the KM investments. They are also using the achieved benefits to build a business case for further KM initiatives. Some easily quantifiable benefits observed during this study include reduced service delivery time, reduced man hours in the project accomplishments, increased sales hit rates, reduced number of help desk employees, and the consecutive cost benefits. But other benefits such as better access to information, and improvements in the decision making process were
highly abstract and intangible. Even the quantifiable benefits discussed here are not always visible from the KM initiatives. Establishing a correlation between KM investments and business improvements is a challenging task. Summarising the distance between KM and ROI, Giacol (Gogus, 2003) says, “KM is like a growing tree, you cannot pull it out of the ground every once in a while to see how much it has grown”. Many of the organisations under study consider KM as a strategic necessity and are impassive towards ROI - although several business benefits were reported in them over the years.

Some respondents in this study have suggested that the knowledge managers need to adopt certain risk management approaches to win the organisational sponsorship and resources for the KM programs. These approaches project several risks, inefficiencies, or costs of not taking the KM initiatives: 1) Employee time wasted in finding enterprise information 2) costs related to information replication 3) delays in time-to-market due to the lack of collaboration 4) variance in knowledge levels of the employees within the organisation and in comparison with competitors and 5) the quality variance in products and service delivery. These approaches ascertain that the avoidance of conscious knowledge management efforts can cause damaging impact on enterprise competitiveness. Knowledge managers can look into such organisational inefficiencies which can be addressed through the KM programs. A research report from IDC (2001) supports these KM justification measures. It presented the costs in the form of knowledge deficit being accumulated at Fortune 500 companies because of inefficiencies with intellectual rework, substandard performance, and employees' inability to find knowledge resources. The according worldwide knowledge deficit was at $12 billion in 1999 and was projected to reach $31.5 billion in 2003. As the organisations become more diverse such knowledge deficits can increase substantially. Integrating the dispersed enterprise knowledge and providing effective access to all the employees across the organisation is crucial success factor for the distribute organisations.
4.1.2 Culture

This study demonstrates that the organisational culture is an important dimension shaping KM function in distributed organisations. Several other authors support this notion and advocate that organisational culture should be a focal point of the KM programmes (Bock, 1999; Krogh et al., 2000; Nonaka & Takeuchi, 1995; Rastogi, 2000). For instance, Davenport & Prusak (2000)

Table 4.10 Culture (Core category): Constituent factors and substantiating codes

<table>
<thead>
<tr>
<th>Constituent factors</th>
<th>Substantiating codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership (F7), knowledge accessibility (F8), recruitment(F9), employee learning(F10), reward systems(F11), time allocation(F12), change management(F13), evangelisation(F14), communities of practice (F15), and events (F16)</td>
<td>&quot;Main problems faced in KM.......I would say...culture....culture is primary thing. I am not saying that people will say...I don't want to share knowledge or I can't share knowledge...but it's like.......I have 'n' number of things to do.......where will I find time to sit and share knowledge&quot;. (173d)</td>
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<tr>
<td>&quot;Knowledge sharing culture in our organisation...........spontaneously, I would say.....it's different in every country. I don't see any global knowledge sharing culture yet in our organisation&quot;.</td>
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<td>&quot;One of the key which could change to a better situation is to have a culture of 'letting go' (giving away knowledge and power)......our people usually are not used to 'let go'. They are not used to 'finish some thing' which means that they stick to their job, they stick to their projects......they don't want to lose anything. They have never learnt that things end at some point and other (new) things come later - Its very psychological........things need to be more dynamic....and people should be made to know that the world is more dynamic....And if you have a culture like this you can go ahead and easily do knowledge management...because than you can say... Hey I know that you are leaving...you have told me that you are leaving...let's sit together. Every one is open and every one is okay with it...but without this it's hard&quot;. (16b)</td>
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<td>&quot;Informal knowledge sharing.....we are very open to such things...but it very much depends on department. As a whole organisation...I feel good about such culture here......personally...I would say the overall culture is rather open - but it really depends on the department. I am not sure about all the departments here&quot;. (20b)</td>
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<td>&quot;In medicine there is a very strong culture of using and developing knowledge. Most people subscribe to journals etc.....they will read them and get new knowledge in that way......the learning culture is absolutely inherent in the profession. We talk about life long learning. We teach them critical appraisal skills....tell them that their job is not to know every thing now...but to know where to find things out....that is inherent in their training. That's not the case within many other professions within the health service&quot;. (78c)</td>
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<tr>
<td>&quot;Its part of this department’s culture...........we actually give our middle grade professionals......time to do that ....to generate new knowledge and share&quot;. (81a)</td>
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<td>&quot;The culture of empowering the junior staff...........it varies from culture to culture........division to division.......I think some divisions are more empowered than others.......some specialities are more empowered than other specialities&quot;. (86b)</td>
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<tr>
<td>&quot;The people in authority need to develop a new culture.........to challenge themselves and........ to expect challenge from others&quot;. (87a)</td>
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<tr>
<td>&quot;The overarching culture at our organisation is.....get the deal done........that big tidal wave culture dominates all the subcultures........the propensity to share the knowledge is directly related to the ability to get the deal done&quot;. (109a)</td>
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<td>&quot;How do we change culture?........culture cannot be changed by telling people to change.....people change by habits and attitudes.....and technologies can help change habits. Having the tools doesn't solve the problem..... but having the tool gives people an incentive to explore it further......for example, if you are talking about that.....we needed to collaborate across the geographies......and that not necessarily requiring travelling all the time. It's a good thing ....but how do you do it?.......I think the role of the technology is really the enabling and habit forming aspect of it.......so........technology enables the culture change&quot;. (131d)</td>
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<td>&quot;The motivating factor for an employee to share knowledge.....I would say it's the Combination of self satisfaction combined with the culture of organisation.....The Rewards and recognition.....I would say it is an obvious and important factor......it would automatically fall in line once these two come together&quot;. (190b)</td>
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<tr>
<td>&quot;We generated a culture in our department....where you can say...I don't know, but I will find out&quot;. (104a)</td>
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</table>
suggest that the organisations should take a hard look at their culture before launching a knowledge initiative. This research study exposed various factors which are playing a significant role in the development of an effective knowledge culture in distributed organisations. These factors include leadership, evangelisation, reward systems, and CoPs. Here, the author refers to the ‘knowledge culture’ to represent “A way of organisational life that enables and motivates people to create, share and utilise knowledge for the benefit and enduring success of the organisation” (Oliver & Kandadi, 2006).

However, this study shows that the knowledge culture can vary significantly between various business divisions of a distributed organisation. The knowledge culture, in each of the business units or the whole organisation, can depend on several factors. Table 4.10 presents various factors influencing the knowledge culture with some substantiating codes. The following sections describe each of these factors in detail.

4.1.2.1 Leadership (F7)

This study illustrates the essential role of leadership, at various organisational levels, in KM. The study depicts that the provision of support, sponsorship commitment, flexibility, and empowerment is needed from the people at various levels of the formal and informal hierarchies of the organisation. Table 4.11 presents the substantiating concepts and codes for this cultural factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties

1. KM programs need continuous sponsorship and investment support from the organisational leadership or top management.

2. Rigid hierarchies, authoritative structures, top down approach, and lack of employee empowerment, are some of the detrimental characteristics to the overall knowledge culture of an organisation.
Table 4.11 Leadership (F7): Substantiating concepts and codes

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
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<tbody>
<tr>
<td>Leadership, executive sponsorship, empowerment, middle managers’ role in KM, time allocation, short-term orientation, long-term vision, questioning culture, hierarchical rigidity, professional authority, KM investments and resource allocation.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Substantiating codes</th>
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<tr>
<td>&quot;Informal discussions and knowledge sharing culture... it depends a lot on the business unit head. For example there can be an offshore development centre...with a person as business unit head...that person may avoid such discussions&quot;. (164a)</td>
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<td>&quot;.....the real leadership, caring, mentoring is not as strong as it should be&quot;. (116a)</td>
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<tr>
<td>&quot;The people in authority need to develop a new culture...to challenge themselves and to expect challenge from others...we spent a long time in this department...we spent eight years generating a culture of questioning...but we only managed to do it in our profession...we couldn't generate it in the other professions...we tried but they are not just open to it as a profession&quot;. (87a)</td>
</tr>
<tr>
<td>&quot;Here...you have lots of people who are empowered to do things on their own...not involving management in that at all. At the moment we have hugely innovative organisation... because we have many professionals who are empowered&quot;. (71b)</td>
</tr>
<tr>
<td>&quot;If you want to empower your professional workers... you have to give them a route where by they can go and do something...and come to you. And you say - you are absolutely right... let's change. But not that... I am the boss stuff ...Which happens in lot of organisations&quot;. (82a)</td>
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<td>&quot;Our Co-President sponsors the KM initiatives. We have executive VP...he established this KM program...we have executive sponsorship at all the different levels&quot;. (134d)</td>
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<td>&quot;The thing is...they (business leaders) need to invest money to make those (KM) things happen&quot;. (96b)</td>
</tr>
<tr>
<td>&quot;Time allocation for informal meetings and knowledge sharing...it’s very much dependent on the culture of the department manager or leader...he sets the culture in the department. I am aware of the departments where it is not that easy to talk. As a program director, I know middle grade professionals who come and say... we are not allowed to do that&quot;. (100a)</td>
</tr>
<tr>
<td>&quot;The middle management has a responsibility to use and implement the tools, strategy and frameworks that have been developed for KM. They should be using these tools and advising their staff to use these tools and helping them in using these to do their job properly...middle managers can be greatest supporters or its greatest critics of KM initiatives&quot; (108c)</td>
</tr>
<tr>
<td>&quot;In our organisation...just winning the deal or completing the project is not the only way to glory. You can be recognised by becoming a leader to a community of practice&quot;. (140b)</td>
</tr>
<tr>
<td>&quot;Crucial people for KM success...I think it depends on the phase. If it’s the initial phase...to trigger off the KM initiative... it has to be obviously come from the top management. After that...you come down to the activities and the hard core tasks... to make this happen...then it would be project managers, technical managers, and account managers...it would be these group or account managers along with the technical managers who would be really crucial...these are basically middle managers. (153d)</td>
</tr>
<tr>
<td>&quot;.....there is a very serious commitment towards KM area...top management including our chairman...they understand the need and importance of KM. Absolutely no problems.....we get all the necessary support&quot;. (187c)</td>
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3. One of the success factors of the KM programs is the existence of an organisational environment where employee questioning is appreciated and nourished at all organisational levels.

4. Middle level management play a crucial role in the implementation phase of the KM programs. In many organisations, the success and failure of the KM programs depend on the middle managers’ efforts to make KM activities happen.
5. It is a common phenomenon, in large distributed organisations, to have variances in KM program success. Because of the diverse leadership behaviours at business divisions, the knowledge sharing and creation attitudes of the employees can vary to a large degree within a given organisation.

*Specific KM strategies*

1. Top management or leadership should provide continuous sponsorship and investment support for the KM programs. Resource allocation from the top management is an essential element for sustainability of the KM programs.

2. Organisations should develop an environment where managers at various levels of hierarchy empower their teams to create and share knowledge, both formally and informally.

3. Managers at all levels of hierarchy should allocate time for employee knowledge creation, sharing, and usage.

4. Organisations should deliberately guide their managerial hierarchies to promote an employee questioning environment.

5. Managers should be explicitly made aware of the characteristics of the knowledge work such as, not knowing things beforehand, questioning, and continuous learning. These should be regarded and promoted as the integral parts of the knowledge work.

*Discussion*

Many respondents in this study believed that the expression of positive leadership characteristics at various levels of management is a vital aspect for KM in distributed organisations. These attributes include, empowering subordinates, allocation of resources, openness towards change & experimentation, developing trust, tolerance towards mistakes, and building long-term perspective of the organisational goals among the employees. They have emphasised that empowering employees with certain autonomy in task achievement and learning, can provide agility to the organisation's knowledge culture.
However, extant literature often emphasise Chief Executive Officers and Senior Directors in the context of the leadership and KM (Ribiere & Sitar, 2003; Bixler, 2002; Bonner, 2000; Ellis and Rumizen, 2002; Schien, 1996). Conversely, many interviewees expressed that, while leadership from senior management is important, it is essential that middle and front-end managers demonstrate the leadership attributes to develop and support KM activities throughout the organisation. This study revealed that the middle and front-end managers determine the success of KM programs and development of knowledge culture in a given team or division. At some of the organisations under study, despite good support from senior management, KM programs have not succeeded in certain divisions due to the lack of support from managers at lower levels of the organisational hierarchy. Whilst in some others, a few divisional managers initiated KM programs and created knowledge culture in their respective teams, with little support from the senior management.

This study highlights the essential role of middle and front level managers in developing knowledge culture through the manifestation of various leadership characteristics. The findings correlate with the view that effective management and leadership are integral to each other, and leadership at all managerial levels is required for effective KM practice in distributed organisations (Kluge et al., 2001; Marsh & Satyadas, 2003; Oliver & Kandadi, 2006; Welch & Welch, 2005).

4.1.2.2 Knowledge accessibility (F8)

The accessibility to enterprise knowledge is observed as one of the important cultural factors influencing the KM function in the organisations under study. In a few of the studied organisations knowledge hoarding or denial of knowledge access to the employees, is having detrimental effect on KM. For instance, some of the respondents have mentioned that the ability of the employees to innovate and create new knowledge is directly proportional to the knowledge access levels provided to them. Table 4.12 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.
Table 4.12 Knowledge accessibility (F8): Substantiating concepts and codes

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
<th>Substantiating codes</th>
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</thead>
<tbody>
<tr>
<td>Open access, information or knowledge hoarding, transparency, and secrecy.</td>
<td>&quot;We don’t have a culture here….of sharing information openly&quot;. (14c)</td>
</tr>
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<td></td>
<td>&quot;We want to get the information from the locker to the net… because if its here (in the locker) only you can see it……and that’s often with the people who are not that much attached to Intranet and internet&quot;. (21b)</td>
</tr>
<tr>
<td></td>
<td>&quot;Process knowledge…its web based….everybody can login on the intranet and access it. This is what the intention is..everybody should look at it and everybody should say…what we are doing is right….here it could be improved. Than we say…how could we improve the applications and architecture ….with the use of process management?” (49b)</td>
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<td></td>
<td>&quot;If people have access to networked resources…..more and more people will share knowledge and produce knowledge&quot;. (84b)</td>
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<td></td>
<td>&quot;One thing which is actually increasing knowledge generation and sharing is increasing access to internet resources….One of the things that actually stopping that is…..our premises are governed by very strict rules…..which means that they are to a large degree insulated from the internet….internet access is extremely guarded…..going from the open access to the web – we have gone to named website access – which is really quite difficult - because you actually don’t know where your information going to be. (P84da)</td>
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<td></td>
<td>&quot;….that’s one of the powers….its like having 1000 – 2000 text books available to you….and if you actually say you could only have four….than we are in a shell again”. (85b)</td>
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<td></td>
<td>&quot;I think there is a great deal of management anxious about open access to the web because they feel….I am sure they feel….that if staff could sit there in front of the screen and order their holiday tickets….there isn’t a great deal of trust really….between the staff and open access to the knowledge….and that is screened around pornography, playing games and chat rooms….but really its about control”. (85c)</td>
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<td></td>
<td>&quot;I would say…. the powerhouses of knowledge are becoming increasingly fragile…because its (knowledge) out there if you are willing to find it. R&amp;D can access sales knowledge….and sales can access the development information and what they are working on”. (117c)</td>
</tr>
<tr>
<td></td>
<td>&quot;…..the physical limitations in terms of achieving solution or finding information need to go away”. (133a)</td>
</tr>
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<td></td>
<td>&quot;...now we have opened that knowledge base to the customers through web interface….so the customers can actually resolve their issues and find the possible solutions through self service….that’s a direct impact….because we are turning previous customer experience to resolve the new customer problems” (137b)</td>
</tr>
<tr>
<td></td>
<td>&quot;Organisational knowledge access to business partners……..depending on the level of collaboration we give access levels&quot;. (143b)</td>
</tr>
<tr>
<td></td>
<td>&quot;Sales knowledge is accessible to only…. sales support folks, business development managers, and people who normally interact with customers…..but rest of the folks don’t really get an opportunity to see what’s in there…..only if we have separate initiative which is about integrating…we will actually get an opportunity to see there”. (156b)</td>
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Properties

1. Providing employees with an open access to the organisational knowledge is a primary necessity for any KM program. Existence of open information sharing policies and culture is an important attribute for the success and sustainability of KM.

2. The physical limitations such as geographical dispersion of business divisions can complicate the information access to the employees.
3. Providing knowledge access to the business partners and customers is also an important aspect for improving the business competence.

**Specific KM strategies**

1. The general business strategy should promote an open information access policies throughout the organisation. The open access protocols and procedures should be deliberately defined by the KM strategy.

2. Establishing the Information and Communication Technology (ICT) infrastructure can improve the knowledge access to the employees, business partners, and customers. Integrating various information systems in the organisation can also help in simplifying the employee access to the dispersed organisational knowledge.

3. Developing extranets or enterprise portals can address the physical limitations of information and knowledge sharing in distributed organisations. They can provide 24X7X365 access to the organisational knowledge from anywhere through the internet.

**Discussion**

This study supports an established notion in the KM literature that the provision of open knowledge access is an important ingredient of KM (Bate & Robert, 2002; Erridge & Greer, 2002; Sveiby & Simons, 2002). For instance, Bate and Robert (2002) observed an embedded culture of knowledge hoarding in some of the public sector organisations. They have noted that not having knowledge access may lead to difficulties in creation and maintenance of horizontal networks in these organisations. The properties and strategies (mentioned above) reemphasise the role of this factor. They suggest some ways for the elimination of knowledge hoarding, and promotion of knowledge sharing culture. However, this study reveals that the provision of an effective access to the enterprise knowledge is more complicated in distributed organisations. Many respondents have expressed that the lack of proper accessibility mechanisms, is forcing the people to reinvent the knowledge which already exists in the organisation.
The majority of the respondents have indicated that the KM infrastructure such as intranets, extranets, and knowledge portals can significantly enhance the knowledge accessibility across distributed organisations. Many other recent studies support these findings and suggest the organisations to develop KM infrastructure to provide knowledge accessibility to the employees (Detlor, 2004; Gottschalk & Khandelwal, 2004; Mack et al., 2001; Spies et al., 2005). This study also advocates that the KM strategy should explicitly influence and drive the information sharing policies of the organisation. The KM teams should consistently persuade the top management to enforce the open information sharing policies and knowledge access protocols across the organisation. These measures can help in controlling the knowledge hoarding and enhance the knowledge sharing culture.

4.1.2.3 Recruitment (F9)

This study reveals that employee recruitment can directly influence the knowledge culture of the organisations. Many respondents have suggested that the overall KM strategy of the organisation should encompass the employee recruitment factor. They noted that when new people join the organisation they slowly change and shape the organisational culture. Table 4.13 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties

1. Considering the knowledge creation abilities and knowledge sharing aptitudes of the potential employees, during the recruitment phase, is an important element in developing an effective knowledge culture in the organisations.

2. It can be difficult to measure the collaboration behaviour and knowledge sharing attitudes of the potential employees.
### Table 4.13 Recruitment (F9): Substantiating concepts and codes

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
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<tbody>
<tr>
<td>Employee recruitment strategy, weightage for knowledge attitudes, knowledge creation abilities, knowledge sharing aptitude and indicators.</td>
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<th>Substantiating codes</th>
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<tr>
<td>&quot;Indicators for knowledge sharing attitude...MBTI indicators, personal style indicators...which is basically running through a lot of questions and answers to find different attitudes...to find introvert, extrovert, innovator, completer etc...these are helping in the process...but I have never seen explicit knowledge sharing attitude testing measures&quot;. (20a)</td>
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<tr>
<td>&quot;In fact, at times, it had been difficult to become appointed as a consultant without a record of knowledge generation. If you do not have papers published on your CV at the point of consultant application - you may not get appointed. In my specialty it is not possible to become a fellow of faculty in emergency medicine unless you have a body of work you have published, or a thesis you have written for the purpose of that examination which is a synthesis of knowledge in an area of interest&quot;. (99a)</td>
</tr>
<tr>
<td>&quot;Weightage for knowledge generation and sharing activities in the recruitment......at junior level it will be about at least 10% of the short listing......on the knowledge issues such as research. At higher level...it will be 20%.....for example if you have PhD we will give 20 extra points in short listing ....Up to a fifth of total would be on research at that level&quot;. (103b)</td>
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<tr>
<td>&quot;Major indicators that a person is able or willing to share knowledge...curiosity and capacity to ask questions .....a notion of humbleness......capacity to connect and social networking&quot;. (118c)</td>
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<td>&quot;We take capacity to connect with individuals very seriously. I think it’s very important to see the knowledge sharing aptitude at recruitment. The focus for too long has been on what your explicit skills and capabilities, achievements are&quot;. (123d)</td>
</tr>
<tr>
<td>&quot;Measuring knowledge sharing aptitude of the candidates while recruitment......Questions such as: talk me through where you have you created renaissance through working in a group or team.....what are the benefits of doing that......how you did that.....and why did you that. Also there are social skills – the social skills I think are the ability to articulate clearly and with a degree of humility. The social interactions....looking at how people connect with people outside of their comfort zones – asking people such as......how did you stretch beyond your comfort levels........And these people have a record......a pattern of learning......what was their propensity to take more and more......that we have to work it out......may be is an area where further work is needed”. (124b)</td>
</tr>
<tr>
<td>&quot;Measuring knowledge sharing aptitude of the candidates while recruitment......I think that’s important - people are doing it intrinsically without necessarily thinking about it......I think we can put that.........and if you have psychometric test and so on which assesses this than you will have better shot at putting knowledge sharing into it..........I would say ability to learn quickly and effective communication are the two things..... The person’s ability to work in a team...... and so on......and obviously there are psychometric tests which take these into account.....but it might be an area where further work is needed”.</td>
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<td>&quot;............not much knowledge ability measurement while recruiting...... because of shortage of people&quot;. (60c)</td>
</tr>
<tr>
<td>&quot;Measuring knowledge sharing aptitude of the candidates while recruitment........ In fact I am suggesting that now. In the last three meetings that we had........I proposed that idea......I said......lets have a test which will assess the willingness and ability to share knowledge. I just proposed it...we have to work it out......may be its happening. Because its such a big organisation...there are teams recruiting in every corner of the organisation.....we don’t know what kind of processes are used.....may be a business unit head believes it so much that he established processes for that. (168c)</td>
</tr>
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<td>&quot;How to measure knowledge sharing aptitude of the candidates...... I would say that there are probably two ways by which we can do this......One is to look at history......if it’s a person who is coming with some experience.....look at What he has done.....or what she has done in terms of knowledge sharing. The second thing is......these days we have so many tests......to measure the attributes of a person......may be you can have questions which can lead to the knowledge sharing answers&quot;. (168d)</td>
</tr>
<tr>
<td>&quot;In recruitment......you have to consider......whether this person shares the knowledge......whether this person meld’s and gel’s with other persons......so those things are very very important&quot;. (206a)</td>
</tr>
</tbody>
</table>
Specific KM strategies

1. The organisational KM strategy should include mechanisms for an explicit measurement of the knowledge creation abilities and knowledge sharing aptitude of the potential employees. These mechanisms should form an integral part of the long-term recruitment activities such as graduate recruitments which are pre-planned. Such measurements may not be possible in the skills shortage scenarios and urgent recruitments.

2. Depending on the knowledge intensity of the job, certain weightage can be allotted to the knowledge creation and sharing abilities. Inclusion of these aspects in the overall recruitment weightage system helps in developing an effective and sustainable knowledge culture.

3. Based on the organisational and job specificities, various psychometric tests and questioning patterns can help in assessing the knowledge etiquette of the potential employees. For instance, the Myers-Briggs Type Indicators (MBTI) test can provide insights into collaboration, team working, and knowledge sharing behaviours of the people.

Discussion

This study illustrated that it is important to consider the knowledge sharing etiquette of the potential employees during the recruitment phase. An organisation can regulate its knowledge culture to a certain extent by recruiting employees with a positive attitude towards knowledge sharing and team dynamics. Hall (2001) also advocates that the employment of intrinsically motivated colleagues might be seen as an issue of recruitment and selection. Most of the current KM literature does not include this factor as an element of KM.

A majority of the respondents in this study agreed that this factor is worth considering in the KM. However, only one organisation has formalised recruitment practices to analyse the knowledge creation and sharing abilities of potential employees. Some of the interviewees expressed that this factor is often compromised, especially when certain skills are at shortage and need immediate fulfilment. However, most of the respondents stated that the organisations should consider analysing the knowledge attitudes of potential
employees in well-planned employment ventures such as graduate recruitments. An assessment of the past knowledge contributions, knowledge sharing motivations, team behaviour and learning patterns can reveal the knowledge etiquette of the potential employees. Interviewees have also expressed that numerous tests are in practice, to know the aptitude of potential employees in areas such as team working and customer orientation, but the methods to examine knowledge attitudes are not widely available. Some of the respondents have suggested using the psychometric tests such as MBTI indicators for this purpose. This study clearly demonstrates that further research work is needed in this domain to develop precise methods and theories for knowledge aptitude assessment.

4.1.2.4 Employee learning (F10)

This study reveals that the employee learning traditions in the organisations can also influence the knowledge culture. The majority of the respondents have stated that this factor has direct impact on the knowledge creation abilities of the employees. Table 4.14 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties

1. The dispersed business divisions of a distributed organisation can have different learning environments and knowledge levels.

2. Bringing all the business units and employees to the same knowledge levels can be a complex task.

3. Business partners and customers play an important role in organisational learning and aid in developing market oriented products.

Specific KM strategies

1. Employee exchange and job rotation programs can enhance learning and knowledge sharing across the business divisions of the organisation.
**Table 4.14 Employee learning (F10): Substantiating concepts and codes**

**Substantiating concepts**

Employee learning, training, corporate universities, talent management, job rotation, employee exchange, project rotation, employee mobility between the divisions, and e-learning.

**Substantiating codes**

"We have quite progressed HR personnel development procedures in place to develop next generation managers......which includes mobility program ....Mobility is travelling around the world doing long-term expatriations to other companies (other business division of our organisation)......work for 3 years in other company to transfer knowledge.....with the mobility programs we can come back and put in place what we have learned......it enables knowledge to flow through different part of the organisation". (4c & 23b)

"Our organisation has a worldwide virtual class room to learn......includes live presentations and other material to keep update.....here people can create a class room for interaction and share knowledge......so we have virtual classes.... e-learning modules.....learning management systems....and a separate talent management system where you can enter what you have learnt". (59b, 606, 61a)

"People learn medicine from the person who teaches them - that’s an obvious thing to say....but of course if you want to learn how to do emergency medicine.....it tends to be apprenticeship rather than looking at the knowledge". (64d)

"In medicine there is a very strong culture of using and developing knowledge. Most people subscribe to journals etc.....they will read them and get new knowledge in that way......the learning culture is absolutely inherent in the profession. We talk about life long learning. We teach them critical appraisal skills.....tell them that their job is not to know every thing now....but to know where to find things out....that is inherent in their training. That’s not the case within many other professions within the health service". (78c)

"Learning.....I think if you go out there....what most people do is....ask somebody who knows more.....that’s in real life practice....or look in the text book.....that’s what most people do most of the time.....but the key route in medicine is profession is to ask somebody who knows more than you.....At my level my colleagues will come in and discuss cases with me and I go and discuss the cases with them.....because two brains are better than one". (94a)

"I think that another thing about knowledge sharing is that you have to accept that....you don’t know everything.....other people know things you don’t. Then you can discuss things and perhaps come up with better answers....that’s a general rule". (94a)

"You are learning from the patient and that’s what the medicine is all about.....you are learning.....you are still learning.....you are never completely done with learning in medicine". (202a)

"I am a huge fan of apprenticeship.........we are taking a renaissance in apprenticeships....the basic construct and concept of apprenticeship....which is to sit by the side of somebody within a framework of learning and gain experience. The concepts and the frameworks are not complicated....its the question of implementation. We think of a quarter and what they can deliver in a quarter.....we don’t think of what happens when they go....we just don’t. It needs us to reframe.........hopefully....we will see the notion of apprenticeship will become increasingly valuable". (116a)

"When you talk about mentoring....it never really got off the ground....I don’t know why....I think you get lost in the day to day....its not supported....its not in profile.........but I think there is a real opportunity in apprenticeships". (116b).

"About 3 yrs ago.....one of the things that we did is to put KM alongside a number of other initiatives under the learning organisation umbrella. What we have under the learning organisation umbrella is......KM, Professional communities (Cop), Innovation, and Readiness......readiness is about how we actually develop skills and competencies of people and that needs to be split into different groups such as consulting skills, sales skills, management skills and.....how do we develop those competencies.....how do we equip people so that they can compete effectively". (138b)

"We also have our organisational University.....which is primarily the external and internal skills development and training for hard skills.....what we call them the product and technology skills. They do have some soft skills training". (138c)

"We have......Talent Management.....which is management and professional development...in which we have things like...succession management, director exchange......getting some of the high level managers going into different organisations for certain period of time on secondments and so on". (138d)

"We have Mentorship’s.....but not followed across the organisation. There are some groups which believe in it...so in such business units it is a formal process. In my vertical its there.....it happens in many of the business units.....but doesn’t happen across our organisation". (166b)

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| | "About 3 yrs ago.....one of the things that we did is to put KM alongside a number of other initiatives under the learning organisation umbrella. What we have under the learning organisation umbrella is......KM, Professional communities (Cop), Innovation, and Readiness......readiness is about how we actually develop skills and competencies of people and that needs to be split into different groups such as consulting skills, sales skills, management skills and.....how do we develop those competencies.....how do we equip people so that they can compete effectively". (138b)
| | "We also have our organisational University.....which is primarily the external and internal skills development and training for hard skills.....what we call them the product and technology skills. They do have some soft skills training". (138c) |
| | "We have......Talent Management.....which is management and professional development...in which we have things like...succession management, director exchange......getting some of the high level managers going into different organisations for certain period of time on secondments and so on". (138d) |
| | "We have Mentorship’s.....but not followed across the organisation. There are some groups which believe in it...so in such business units it is a formal process. In my vertical its there.....it happens in many of the business units.....but doesn’t happen across our organisation". (166b) |
2. KM programs should be integrated with the other organisational learning initiatives such as talent management projects. KM strategy and teams should have close association with Human Resources Development (HRD) functions in the organisation.

3. Mentoring and apprenticeship can serve as effective approaches to transfer the knowledge to the new employees.

4. Employees should be encouraged and allowed to attend intra-organisational events, and external learning events such as conferences, business partner events, and customer events.

5. Computer Based Training (CBT) and e-learning can play an important role in the employee learning. They can assist in bringing various business units of a distributed organisation to a uniform knowledge level.

Discussion

The findings of this study support a prevalent notion in the current literature that the employee learning is an important constituent of the KM function. The employees learning characteristics and the knowledge culture of the organisations are closely intertwined. Many authors use employee learning and Organisational Learning (OL) synonymously to denote this factor (Malhotra, 2001; Nonaka, 1995; McElroy, 2000; Prusak, 2001; Senge, 1990; Stacey, 1995). Some of the management literature tends to treat OL as a separate subject area. In this context, Prusak (2001) asserts that,

"The Organisational Learning people often fail to take the hard constraints against learning into account.................Also, there is very little economics or sociology in their work; they fail to specify how learning occurs and what business and economic outcomes we can expect from learning. Knowledge management has not yet completely mastered these issues, but it recognizes their importance and continues to work toward deeper understanding of them”.

In most of the studied organisations the KM teams are either totally undertaking the employee learning activities or closely associating with the people responsible for it. McElroy (2000) also signifies the close relationship between the organisational learning and KM. He notes that the first generation of KM initiatives were directed towards information management. Whereas, the second generation of KM initiatives increasingly concentrate on the employee learning, knowledge creation and sharing.
All organisations participated in this study have definitive programs for employee learning. Many of them have collaborations with the external Universities and training institutions. Some of the large distributed organisations have established their own corporate universities for enhancing the employee learning. They are also extending the educational services to their customers and value chain partners. These universities are offering extensive range of training programs in the areas such as leadership, management, and technology, which are relevant to the organisation’s business. This study shows that the Computer Based Training (CBT) programmes are also being increasingly used in employee learning, because of their inherent benefits such as low cost and flexibility.

In many of the studied organisations the KM teams are promoting and undertaking the employee learning initiatives such as job rotation, mentorship, and apprenticeship programmes. These KM teams are also actively involved in organising the knowledge sharing events to enhance the employee learning. The majority of the respondents viewed that such initiatives are highly useful for developing the new recruits, and can improve the knowledge culture of the organisations. They have also suggested that the mentorship programmes should become integral part of the KM activities. Interestingly, this study reveals that the employees learning initiatives are not implemented uniformly across the organisations. They tend to depend on the leadership of the specific functional divisions or business units. This finding reemphasises the role of leadership at various hierarchical levels, in the development of knowledge culture in distributed organisations.

4.1.2.5 Reward systems (F11)

The findings of this study show that the reward systems for the employees are one of the most significant factors influencing the knowledge culture in distributed organisations. Table 4.15 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.
Table 4.15 Reward systems (F11): Substantiating concepts and codes

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
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<tbody>
<tr>
<td>Reward systems, recognition, incentives, performance appraisals, awards, acknowledgement, direct incentives, and indirect incentives.</td>
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<tr>
<th>Substantiating codes</th>
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<tbody>
<tr>
<td>“One of the keys to enable knowledge sharing culture is...to reward people...you have to tell them - its great what you did. If you reward people they let lose (knowledge)...they let it go......If you don’t reward then they resist.........that’s one of the very very psychological keys”. (15c)</td>
</tr>
<tr>
<td>“We have management performance projects in place....like, people sit with their managers and agree on targets....personal and team targets. And it depends on your manager...whether a part of this is knowledge management or not....but we do not have formal established benefits for knowledge sharing”. (18c)</td>
</tr>
<tr>
<td>“KM is not built into performance appraisals formally.......absolutely not”. (19a)</td>
</tr>
<tr>
<td>“Incentives for knowledge sharing....we thought about this....but it’s really tricky. Just to give you an impression....the people....they don’t get money for that (knowledge sharing).......it’s just their passion”. (36d)</td>
</tr>
<tr>
<td>“A success factor from our KM system (program) is.......we have created Star award process.....we motivate our people”. (33b)</td>
</tr>
<tr>
<td>“No specific rewards....for knowledge creation or sharing....but a manager can suggest an associate for an organisational award........but some points get added to his pay or appraisal, when he adds knowledge to the base........its managers discretion........so no formal incentive structure........its mangers discretion”. (59c)</td>
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<tr>
<td>“I have made sure that there is some recognition.......for people creating new knowledge....it works.......it certainly worked in terms of making sure that there is no doubt whatsoever where it comes from”. (70c)</td>
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<td>“Because once we start giving money to people generating knowledge....they will see you buying off them....they may be more loath to get it. People are wide range of personalities....I think some people think....the joy of finding new knowledge is enough. On the other end there are loads of people....if you start giving money....they might want more. My approach to this is to totally avoid giving any money to anybody.......this is about your self actualisation. And there is no compulsion to do this.......if you don’t want to do it......you will always be an idiot. (97d)</td>
</tr>
<tr>
<td>“Considering knowledge generation and sharing activities in the performance appraisals............Absolutely.....I think it is one of the aspects of performance appraisals....I don’t think not doing it should be a negative thing....but I think doing it should be positive thing. I don’t think you can make people do things...you can acknowledge they have done things and say it’s good. Clearly there are some professions and some jobs where it’s part of their job.........if people fail to do part of their job....then there is something is very wrong. For example....chief scientist officer and his department are generating knowledge....then it should be acknowledged in the performance appraisal”. (98b)</td>
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<tr>
<td>“Yes....I think absolutely....if people produce new knowledge....if they have evidence that they have done that......even if it benefits just them.....it should be rewarded.....it should be acknowledged....it should be a part of the appraisal. But there should be no penalty for not doing it....except...there will be a failure to progress”. (98c)</td>
</tr>
<tr>
<td>“Acknowledgement of knowledge activities in performance appraisals....It’s interesting there is certainly a section (in appraisals) in my level, on knowledge generation and knowledge synthesis....its certainly expected that there will be a contribution towards knowledge. There are areas where you can record the publications you have done......I am talking as a consultant....all consultants are expected to record publications. There wont be any sanctions against them if they don’t generate knowledge....but If they do there is a potential for benefits”. (98d)</td>
</tr>
<tr>
<td>“Weightage for knowledge generation and sharing activities in the performance appraisals.......At senior level it is a very important part of the job - I would say 10-15 out of 100....some where around those....I think that’s a reasonable way. More junior you are the less important it is....its not about synthesis....its about acquisition at that level. So at junior level.....about 5-10 out of 100”. (99b)</td>
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<tr>
<td>“We have many many cases where we sub optimised the big deal because....a country (people in a business division) has not shared knowledge...that has been very parochial and is just not interested in taking a bigger view....because he is not paid to do that.......I don’t get paid....why should I share with you”. (109c)</td>
</tr>
<tr>
<td>“I think we tweaked with the incentive system.....to follow suit the knowledge sharing activity”. (110b)</td>
</tr>
<tr>
<td>“My view is that....you should regard the appraisal as the integral part of any knowledge management strategy”. (118b)</td>
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</table>
| “Major things we did to improve knowledge sharing culture here is....Recognition obviously.....but one of the things is....if rewards become an end rather than a mean....it usually backfired. I mean if you promote publication of reports in your repository or portal environment by saying....if you do that many you get this
and that......it becomes an end rather than a mean....and the people contribute junk. So......one of the other things is to recognise people in indirect ways – that is to tell them that......in this organisation just winning the deal or completing the project is not the only way to glory......you can become recognised by becoming a leader to a community of practice”. (140b)

“Incentives for Knowledge sharing...... we decided to do it......instead of having specific KM incentives......we decided to use existing incentives. In most of the countries we have recognition mechanisms. We have around 30 awards across EMEA......but not specifically for KM. You are given a same award if you did something great to a customer – or saved the life of your colleagues in a project......so what we are trying to do is get people rewarded with those awards based on some thing they have done around KM.

“Knowledge activities in performance appraisals......it is one of the things we have now put into the performance evaluations......but......its going to take some time to make it a natural part of the discussion”.

“Weightage for knowledge activities in performance appraisals......I think......it is the main skill......to me the main competency of a knowledge worker is......how well that person can learn quickly and how well that person can contribute to the organisation overall......all of those are around learning and KM skills. Product knowledge and others are important but they can become obsolete......the speed at which the employees can renew their skills is the key......from a perspective of a scale of 1 – 100......its very hard to say”. (144d)

“For overall organisation......we are in the process of conceptualising a reward scheme......But within verticals (business divisions) we already have some thing available. In my vertical, for example......I work on recognising and rewarding people who do a great job in terms of KM......people who are contributing......people who are sharing......people who are mentoring”. (159d)

“Incentives for knowledge activities......One thing is Recognition......that would happen through the news letters......that I prepare and send to the vertical. I would also Highlight the participants......I would also Highlight the contributor......so its basically the recognition, praise and......so on. (161b)

“Weightage for knowledge sharing in performance appraisals......Yes, its definitely part and parcel......For example in my vertical......I had a discussion with the TED (talent engagement and development) people and asked them to include it......in the typical goals of the goals. So I had discussion with HR people......in fact it was a pretty useful discussion......in terms of they telling me what is required......from their perspective......and I telling them what is required from my perspective......from KM perspective. For employees......typically there would be setting of four or five goals and objectives......one of them would be knowledge sharing and contribution to the KM system”. (161c)

“Weightage for knowledge sharing in performance appraisals......I think it would depend on the role and the designation basically. You might be talking about specialists......you might be talking about the Project managers, Project engineers, technical managers, business unit heads, service function heads......service function officers. I think its definitely some thing that has to be based on the role that the person is playing and the seniority of the person...........................................I would say......If its a specialist......who is an expert......a knowledge guy......than it would definitely should carry at least 60 – 70% Weightage. If it’s a Project engineer its 10 – 20%......and so on down the line. I think it should definitely depend on the roles and seniority of the person......So the senior it goes......more weightage”. (161d)

“KM issues to be considered in appraisals...... The existing rule is to look at......the number of knowledge objects or artefacts that the person has contributed......this could be a combination of he white papers that he has written......number of presentations and number of knowledge sharing sessions participated......whether he is registered as an expert......in the expert locator......number of questions answered or responded to......so it’s a combination of different things”. (163a)

“In every quarter......we (KM team) give reports......that this guy is an expert......who helped out a lot of people......so that their project managers recognise that. Managers can see the time spent by a given person......so we give reports to the project managers of knowledge sharing people – quarterly”. (171c)

“KM activities in performance appraisals at various levels........ The way I put it is......the entry level guys will carry the least......so I would say 10-15 is good. And then it should exponentially increase as the positions go up. Because the entry level guys would be young......and they do more of routine operational things as compared to more strategic and tactical. I would probably categorise as routine, tactical and strategic........people who do tactical and strategic should carry lot more weightage because they drive. Middle level......such as Project leader......incremental increase of 10 to 20%......as it goes up to the project manager its 25 out of 100......If its Senior manager it would be 40-50%......I definitely say so”. (188d, 189c)

“To kind of promote this (knowledge activities)......I am in the midst of developing a reward system......where my intention is to create a Knowledge market place......where there is a Credit / debit system......you cant keep always buying......you have to produce some thing......Depending on the vertical......whether you are positive or negative......it's very evident. What ever the case......if there are more transactions......it increases the collaboration. Very basically my emphasis is......create......exchange......collaborate......I am extending this whole concept into whole organisation......deployment of rewards and recognition schemes.

“KM consideration in Performance appraisals......It’s already there......but probably......what I would like to do it intensify it a little bit more objective and put specificities in place. But it is already there in place”. (189d)

“The motivating factor for an employee to share knowledge......I would say its the Combination of self satisfaction combined with the culture of organisation......The Rewards and recognition......I would say it is an obvious and important factor......it would automatically fall in line once these two come together”. (190b)
Properties

1. It is difficult to develop a knowledge creating and sharing culture in organisations without having an effective reward system in place. The employees may not get motivated to create and share knowledge if they are not rewarded appropriately.

2. Although financial rewards are important, indirect rewards such as recognition and praise also play a major role in the employee knowledge creation and sharing.

3. Effective leadership is needed from all levels of management to reward employees across the organisation for their knowledge activities. For instance, employee recognition from the top management can promote the knowledge sharing culture across the organisation.

Specific KM strategies

1. KM teams should develop and implement rewarding and recognition mechanisms, in collaboration with HR functions, for the knowledge activities of the employees.

2. Establishing the organisational awards for exemplary knowledge activities, can motivate the employees towards knowledge creation and sharing. In addition, various levels of management should explicitly identify and acclaim the people who share their knowledge for benefit of the organisation.

3. The knowledge creation and sharing activities of the employees have to be considered and appropriately weighted in the performance appraisals. However, the quality and value of the knowledge objects created and shared by the employees should be evaluated effectively.

4. The performance appraisal weightage system for knowledge activities can be developed based on the knowledge intensity of various jobs in the organisation. For instance, jobs such as analysts and consultants may have more weightage compared to some of the routine administrative jobs.
5. The Knowledge management strategy of the organisation should consider performance appraisals and general incentives such as Employee Share Options (ESOPS), as an integral part of the KM programs and activities.

Discussion

The findings of this study confirm a general view in the KM literature that the organisational rewards motivate employees towards knowledge sharing and foster a knowledge culture (APQC, 2002; Davenport & Prusak, 2000; Gupta & Govindarajan, 2000). However, in the context of knowledge contribution, many interviewees demarcated between direct and indirect rewards. The respondents suggested that the indirect rewards such as appreciation and recognition play a greater role than the temporary monetary incentives. Moreover, in promoting knowledge culture, the long-term rewards such as profit sharing and Employee Share Options (ESOPs) were observed as effective means when compared to the short-term incentives. There is also a prevalent view among respondents that irrespective of organisational rewards, some employees may involve in knowledge activities because of the intrinsic drive for learning, personal contentment, peer recognition, and self actualisation. Recent studies in the subject also confirm that these behavioural motives play a major role in knowledge creation and sharing (Ardichvilli et al., 2003; Darwin, 2004; Malhotra & Galletta, 2003, McLure & Faraj, 2000; Oliver & Kandadi, 2006).

The majority of the respondents experienced difficulties in ascertaining the economic value of knowledge activities of individual employees, to provide them with pertinent incentives. They have also emphasised that a qualitative evaluation of employees’ knowledge objects is needed while providing rewards. Otherwise, the quantity may dominate over the quality and can jeopardise the reward objectives. Professional groups and academies, consisting of domain experts, were established at three of the organisations under study. These groups appraise the knowledge objects such as, white papers, best practices, and innovative ideas developed by the employees. This study also shows that the existing human resource management practices need to be reviewed to recognise the knowledge contributions of the employees, and to develop knowledge culture in the organisations. Many respondents suggested making certain enhancements in the performance appraisals, pay reviews, incentive strategies and other long-term career issues. In most of the organisations, the acknowledgement of employee knowledge contributions was informal and
depended on the judgement of immediate managers. Whereas, the respondents expressed that this should be a standard and natural part of the performance appraisals. Only two organisations had formal processes in place to appraise knowledge contributions of the employees. In these two cases, the knowledge contribution issues carried up to 20% weightage in the overall performance appraisals.

### 4.1.2.6 Time allocation (F12)

This study demonstrates that the time allocation for the employee knowledge activities is another important factor determining the knowledge culture of the organisations. Table 4.16 presents some substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

**Properties**

1. Employees need time to learn, create, and share knowledge.

2. Existence of organisational environment, where the employees are provided with time for informal and formal knowledge sharing, is crucial for the success of the KM programs.

3. Employee time investment, from various business units of distributed organisations, is a crucial aspect in KM program implementations.

**Specific KM strategies**

1. Various business units and functional divisions of distributed organisations should make their own time investments for the KM programs. The central KM teams should play a strategic and coordinative role. If the business units do not make their own employee time investments for KM activities, they may perceive KM as not their need or job.
**Table 4.16 Time allocation (F12): Substantiating concepts and codes**

<table>
<thead>
<tr>
<th><strong>Substantiating concepts</strong></th>
<th>Time investments from business units for KM, time allocation for knowledge activities, lack of time, time availability, explicit time needs, and proportionate time for KM activities.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Substantiating codes</strong></td>
<td>“Measures to manage these types of tacit knowledge problems......Explicitly take the time to get out ...to identify the knowledge you might lose and take the time to transfer it. The problem is If a person leaves the company...you have to take the time to transfer the knowledge to his successor...and only that personal can transfer the knowledge”. (14b)</td>
</tr>
<tr>
<td></td>
<td>“At consultant level (senior manager), there is time set aside and funding set aside......to attend conferences.........every consultant has 10 working days per year to spend on such events.........Registrars (Middle grade professionals) have the same 10 days per year and have the budget of £820/year to pay for courses etc.”. (88b, 88d)</td>
</tr>
<tr>
<td></td>
<td>“I think in other professions of our organisation...because of their models of practice, it is difficult to find the time...for knowledge activities. They don’t have the leadership which can find the time to do that”. (P95a)</td>
</tr>
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<td></td>
<td>“Time allocation for informal knowledge sharing......it’s very much dependent on the culture of the consultant (department manager). The consultant sets the culture in the department. I am aware of the departments where it is not that easy to talk. As a program director, I know middle grade doctors and registrars come and say......we are not allowed to do that. Within this department it’s highly valued. But......In real life there is actually very little time to do that. Most departments are staffed so that there is down time...the emergency department at the moment is understaffed......which means there isn’t much time to do that. If there is down time......you will find doctors in groups talking about interesting patients they have seen which is very valuable......we are encouraging that to happen”. (100B)</td>
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<tr>
<td></td>
<td>“Knowledge creation......it all depends on the person and time availability”. (204c)</td>
</tr>
<tr>
<td></td>
<td>“Time spend on updating knowledge......I would say about 20-30%......in this profession we have to......because things are changing so rapidly......we have to keep abreast of things......about what is going on ......for example you have to know what are the new types of drugs are coming......so you have to keep abreast of the situation”. (205c)</td>
</tr>
<tr>
<td></td>
<td>“One of the other things we do is...to ask each of the business divisions to sponsor. If you are an industry sales group......if you are a product vertical segment......geography......they pay for the KM resources...........the real implementation is carried out by the KM communities or the networks of the people who have KM roles......and who are paid by the individual organisations or the business groups.......and since those organisations are paying for those people......they make sure that they get benefit out of it”. (136b)</td>
</tr>
<tr>
<td></td>
<td>“The KM investments by business division include the...people......time of the people......and their participation in some of the regional KM activities......we have meetings and so on......but basically time”. (136c)</td>
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<td></td>
<td>“The approach we (KM team) have taken from the beginning is......we will provide them (business divisions) the know-how and we will provide the infrastructure and rest is your problem. KM is not the job of KM organisation......KM is company’s problem......and it's your problem. If you don’t think it’s a priority for you......it's fine......KM team will not do your KM. If it’s a priority for you......then invest the resources and then make used of them. The investments the business divisions make are......time of the people and their participation in some of the regional KM activities......we have meetings and so on......but basically time”. (136d)</td>
</tr>
<tr>
<td></td>
<td>“The issue with Communities of Practice (CoPs) is......people need time to participate in it and also people need time to lead it. I think we solved the leadership part......we have leaders who are pretty much doing that......that time investments been made to enable the CoPs”. (140a)</td>
</tr>
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<td></td>
<td>“Employee knowledge activities (KM) time is built into core activities of business......we avoid differentiating KM time and core business time of the employee”. (163c)</td>
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<td></td>
<td>“In every quarter...we (KM team) give reports.......managers can see the time spent by a given person......on knowledge activities......so we give reports to the project managers......of knowledge sharing people......quarterly”. (171c)</td>
</tr>
<tr>
<td></td>
<td>“Main problems faced in KM......I would say culture......culture is primary thing. I am not saying that people will say......I don’t want to share knowledge or I can’t share knowledge......but it’s like......I have ‘n’ number of things to do......where will I find time to sit and share knowledge”. (173d)</td>
</tr>
<tr>
<td></td>
<td>“To allocate some time......It’s a definitely a good idea......if a project manager is ready to say that......look spend one hour every day on activities......that will definitely drive it......but despite that we should make sure that......it should be integrated into the processes......so that it becomes a habit......rather than being looked at KM as an additional activity”. (174a)</td>
</tr>
</tbody>
</table>
2. Various levels of managerial hierarchy should develop a sense of tolerance towards the informal knowledge sharing activities of the employees. Empowerment of juniors and provision of time flexibility in task achievement can also enhance the knowledge culture.

3. It can be beneficial to make explicit and proportionate time allotments, in the overall job time of the individual employees, for the knowledge activities. However, the KM programs should ensure, to a maximum extent possible, to include the knowledge activities in the core job roles.

Discussion

Nearly all the interviewees emphasised that to develop a knowledge culture, it is essential to allocate time for employee learning, collaborations, knowledge creation and sharing activities. Krogh et al., (2000) also reported the importance of time allocation exemplifying 3M and Sencorp, where employees are allotted between 15 to 20% of their job time for new knowledge creation. The respondents also suggested that the team leaders and middle managers play a significant role in allocating this crucial organisational resource to individual employees and directly affect the development of knowledge culture. While the senior management can facilitate knowledge culture by developing KM strategies and programmes, they may not wholly influence the time allocation for each employee.

The respondents have also noted that the expression of a long-term vision by managers is crucial to the development of knowledge culture. ‘Time allocation’ was stated as a key factor for the existence of differences in knowledge habits between various teams and divisions within a given organisation. They have reported that it is common to find managers who concentrate predominantly on achieving short-term goals and targets. These managers may not allow their team to spend time on knowledge creation and sharing, consequently hindering the knowledge culture. Therefore, in many cases, the KM program managers have chosen particular functional divisions for their pilot projects based on the positive attitudes such as the willingness to allocate time for KM activities.

4.1.2.7 Change management (F13)

Change management is identified as a complex and significant factor influencing KM in distributed organisations. The majority of the respondents have stated
that changing the employee attitudes and organisational culture towards an effective knowledge culture, is the most difficult task for the KM function. Table 4.17 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties
1. Changing the employee behaviours towards knowledge sharing and creation, is the most difficult and complex task in KM.

2. Employee resistance to change is a common phenomenon in the traditional distributed organisations.

3. Challenging market environments, such as increasing competition, customer demands, and rapid knowledge obsolescence, are driving the knowledge sharing behaviours of the people in distributed organisations.

4. KM failures in some organisations can be attributed to the short-term and mechanical approaches for changing the organisational knowledge culture.

5. Continuous KM efforts and some specialist roles are needed to change employee behaviours to create an organisation wide knowledge culture

Specific KM strategies

1. KM strategy and teams should adopt a psychological and behavioural approach for changing organisational culture towards knowledge creation and sharing.

2. Continuous KM evangelisation at all levels of the organisational hierarchy can help in changing the employees towards the knowledge culture.

3. Implementing KM technologies such as groupware systems and enterprise portals can enable knowledge cultural changes by modifying the employee attitudes and habits. For instance, if the sales people were made to record and share their customer proposals on the knowledge portal, it can directly improve knowledge access and sharing across the organisation.
“I basically rely on two things……One is oriented towards constant interaction and influencing people. I try to meet up with lot of people, have a lot of touch time with my customers, who are basically our employees and they have to be cognisant of these applying issues and problems…………………..therefore they have been forced……….not by the organisation……..but by market conditions to share and understand the knowledge……..so there is a natural extension. Many of them have risen to the challenge and some of them still wandering in the same thing”. (114a)

“How do we change culture?....culture cannot be changed by telling people to change……people change by creating and sharing knowledge….and technologies can help change habits. Having the tools doesn't solve the problem….. but having the tool gives people an incentive to explore it further………….for example, if you are talking about that…..we needed to collaborate across the geographies……and that not necessarily requiring travelling all the time. It’s a good thing …but how do you do it?....I think the role of the technology is really in implementing Global HR process modernization and knowledge sharing….what are the problems you have faced?……..One of the main problem is……the problem of change management. People are stuck where they are……..it’s resistance to change….it is problem number one. Within our organisation……..we talked about the psychological aspect of letting go (giving away or sharing knowledge and power)…..budget is the next problem……..but I feel and perceive that resistance is the main problem”. (25b)

“Actually…right now we are still in the state now ….where it creates a lot of additional efforts because people need to learn how to use these (new systems)……once they lean then it gets better……..but people often forget that its quite tough to learn……Its very tough…It take time for people to get into this electronically efficient mode of working”. (30b)

“Problems in implementing KM…..it’s changing peoples habits….because of the cultural aspects, articulating what KM is…..in the language people will understand……and express in their own words. Which boils down to……..what is in it for me? Finding that is not always easy. Finding that is half KM work done”. (147d)

“We are moving into an incredible phase of development……our organisation………is now been forced to change in a way it never been force to change before……not only just looking at its product but the very way we do business……..we need to think much smarter in……how we work with our customers……..how we connect with our customers…….how we learn together with our customers”. (111b)

“Actually…right now we are still in the state now ….where it creates a lot of additional efforts because people need to learn how to use these (new systems)……once they lean then it gets better……..but people often forget that its quite tough to learn……Its very tough…It take time for people to get into this electronically efficient mode of working”. (30b)

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4. Organisations can introduce and drive change towards knowledge culture by empowering the employees at central and local business unit levels.

5. Constant market orientation of the organisation can itself drive the change towards knowledge culture. Therefore, KM strategies should encompass the business partner and customer collaborations to enhance the market orientation of the organisation.

Discussion

This study reveals that change management is a challenging and complex factor in the knowledge management function. In most of the global organisations participated in this study, change management is mentioned as the most difficult task of the KM programs. Changing employee attitudes and behaviours, towards knowledge sharing and creation, has been a priority for the KM teams in many of these organisations. Several other authors note the significance of this factor in the KM function (Balthazard & Cooke, 2004; Chatman & Jehn, 1994; Malhotra, 2002; Robson et al., 2003; Wilson, 2002). However, the KM literature is still in need of the specific strategies or measures for changing the organisational environment towards an effective and sustainable knowledge culture. Much of the KM literature relies on the technology driven change for developing the knowledge cultures. For instance, Cabrera et al. (2001) suggest that organisations can change their culture by introducing information systems. The majority of the respondents in this study have also suggested that the knowledge culture can be changed to certain extent by implementing KM infrastructure such as groupware systems and enterprise portals.

This study also reveals many other KM strategies or avenues for developing the knowledge culture, in addition to the technology. In fact, the change management is an area where many other KM factors work in combination. These include the CoPs (F15), Evangelisation (F14), Leadership (F7), Market environment (F3), and Technological infrastructure (F24). One of the significant suggestions of the respondents in this context is to improve the market orientation of the employees. They suggested that the employees change their behaviours faster, when they are forced by the market environment rather than the internal organisation. The market orientation can be achieved by constant interactions and collaborations with customers and business partners. Establishing professional networks (CoPs) with the customers and business partners can assist in this area. Another common suggestion of the respondents
is constant evangelisation of the KM benefits to the people across the organisation. The change management strategies should be implemented across all the business divisions. Leaders of the individual business units should take prominent role here. Otherwise, only a few business units may take up the KM programs resulting in limited benefits for the organisation. The other KM strategies (listed above for this factor) identified in this study, can also assist KM teams in the change management efforts and building a sustainable knowledge culture in distributed organisations.

4.1.2.8 Evangelisation (F14)

The majority of the respondents have suggested that a constant KM evangelisation, by the managers across the organisation, is needed to develop an effective knowledge culture. Here, the KM evangelisation refers to the practice of educating the employees across the organisation about the KM need, benefits, processes, and facilities. This factor is significant in changing the employee attitudes and behaviours. Table 4.18 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties

1. Evangelisation of KM programs, concepts, and processes, is one of the core jobs of the KM teams in the organisations.

2. Employees need to understand the personal and organisational benefits from their knowledge activities.

Specific KM strategies

1. Organisations should take a long-term perspective of KM evangelisation because changing employee behaviours towards knowledge sharing and creation is a time consuming task.

2. KM Evangelisation through constant employee interaction and persuasion should be one of the core objectives and activities of the KM team.
### Substantiating concepts

KM evangelisation, KM activity communication, channels of communication, motivating people towards knowledge sharing and creation, stakeholder involvement, selling KM concept to employees, and KM promotion.

### Substantiating codes

“Some of our major KM activities are……. Bringing people together, both online and offline.……create meetings........promoting spirit of cooperation, we tell the people that it's its give and take (knowledge sharing)......We promote this in each and every workshop. Here within our business division........ we ask ourselves........how can we sell the idea of KM”.

“A KM specialist heads the initiatives at this division.....which is called Business Process Delivery. The KM team........consists of........total three KM roles........ Specialist, Champion, and Technical Writers. A total of 5 people. The champions are usually the team leaders, senior software associates etc..............who has a shared understanding with other people.........they........evangelise KM.........enlist best practices and motivate team to enter them in knowledge base”.

“Major activities of the KM team in your organisation........In My view, as a receiver of the KM services........They (the KM team) evangelise........very important. They become and practice as central points where people can come to and understand what it is, how it works and what it means for them. So they evangelise both internally and externally (to customer and business partners). They also put in place formal KM plans. They put in place and communicate the use of particular tools, methodologies, and processes for managing knowledge........think they also create momentum locally”.

“We do a lot of things strategically.....we bring some things in.....if it works we make a big noise about it when it doesn’t.....we don’t talk about it”.  

“Articulating what KM is.....in the language people will understand and express in their own words, Which boils down to......what is in it for me....finding that is snot always easy. Finding that is half KM work done”.

“........I (Knowledge manager) have to travel to each of these locations (business divisions)...........I keep going to them.......I would sit with them.......explain about KM.......evangelise”.

“The roles and responsibilities of a knowledge manager in your organisation? .........In broad base...........One is Evangelisation in cultural context......Change management, getting people to share knowledge, and getting people to be collaborative...........Two is looking at looking at processes......to capture more knowledge and disseminate more knowledge........... Three is the technology part of it.....we have a portal, we have applications, and we got to make sure that people make use of it and contribute to it. So very broadly...........these are the three threads”.

“Changing people towards knowledge culture........through........constant interaction, improvement orientation, persuasion, and rewards”.

“I basically rely on two things............One is oriented towards constant interaction and influencing people. I try to meet up with lot of people, have a lot of touch time with my customers, who are basically our employees in our vertical (business division). I conduct orientation programs when ever a batch (set of employees) gets into the vertical........a lateral batch gets into the vertical........or........a fresher batch gets into the vertical........ or........existing groups. I go and speak to project managers, technical managers and group heads..........and of course my news letters........through them I try to influence people”.

“Major KM problem is........changing human aspects........it’s largely the personality issue. One of the things I try to do is a different kind of evangelisation........evangelisation at all levels........with very targeted........clear focus on many things. One is Human Psyche part of it. Evangelise why sharing is important........how it is beneficial to both person and organisation. This kind of evangelisation is done at various levels in the origination........right from the presidents of various divisions to the last software engineer. The way we (the KM team) work is clearly a sort of hub and spoke........a combination........where I have a KM team. Each one of Knowledge Managers has responsibility to take care of all the KM activities ..........operational aspects of a particular vertical (business division). And they also take part of the strategic discussions and initiatives of the vertical from the KM perspective. These people ensure that the central KM strategy and the KM strategy of the vertical are closely related”.

“As part of evangelisation...that I (Head of KM) have been driving..........I am trying to see it (KM activities) mandated at the highest level. To put it simply.....if the VP or head of a particular business unit has a certain obligation in the KM area.....it automatically gets passed on. Because............as part of that.....he will have certain obligation towards to reuse........contributing to the KM from his vertical. So what they do is.....they in turn mandate their first line......second line......so on. What I do is.....having the overall organisational responsibility..........I have certain numbers in mind......depending on the size of the business unit......I kind of distribute that......and in a subtle way its pushed........and then it is a done thing”.

“Interestingly I also run a monthly news letter across our organisation.......called knowire. In every issue I write an article (on KM)........specifically my theme for this months knowire is managing customers knowledge”.

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Table 4.18 Evangelisation (F14): Substantiating concepts and codes

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
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<tbody>
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| “Interestingly I also run a monthly news letter across our organisation.......called knowire. In every issue I write an article (on KM)........specifically my theme for this months knowire is managing customers knowledge”.

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139
3. Consistent evangelisation of KM benefits to the employees in all functional divisions helps in developing an effective knowledge culture. KM team should make employees understand “what is in KM for them and for the organisation”.

4. Relevant channels of communication should be established to promote KM activities throughout the organisation. These channels can include internal journals, news letters, magazines, etc., which can be electronic and/or paper based.

5. KM evangelisation should be carried at all levels of the organisational hierarchy. Especially, the senior management or leaders of the organisation should explicitly evangelise KM as an important component of the business success.

Discussion

Evangelising the value of knowledge sharing and creation, to the employees, has been a significant element of KM programmes in the organisations under study. Many respondents have suggested that the KM programmes should constantly inform the employees about how KM can improve their performance and mutually benefit the organisation. Senior management should be actively involved in the evangelisation process and convey that knowledge creation and sharing are highly valued in the organisation. Otherwise it can be considered as a minor issue and may not be given due diligence by middle and front-end managers. In many cases the KM evangelisation also covered the establishment of various communication channels to convey the significance, processes, and achievements of KM. Most of the organisations have regular internal magazines, journals and newsletters to spread this information. The people who are actively contributing to the organisational knowledge, through communities of practice and other means, are made visible to the whole organisation through these channels.

Some respondents stated that their business leaders at CEO level were actively involved in the evangelisation process by conveying the value of KM programmes to the whole organisation. They regularly identify and reward the employees who make valuable knowledge contributions to the organisation. Other studies at Bristol-Myers Squib Company, and Russell Reynolds Associates (Paul, 2003), indicated a similar view that employee recognition from senior
management directly motivates people to participate in KM activities and enhance knowledge culture in the organisations.

4.1.2.9 Communities of Practice (F15)

The majority of the respondents have stated that the creation and development of the Communities of Practice (CoPs) can enhance knowledge culture in the organisations. This study depicts that the development of CoPs across the organisation has been a core part of the KM activities. Table 4.19 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties

1. Existence of informal employee networks, in parallel to the formal organisational structures, is an important requisite for knowledge sharing in distributed organisations.

2. CoPs can span across the nations, business divisions, functions, and professions thereby enabling knowledge flows in distributed organisations.

3. The nature of CoPs can be virtual, physical, and a combination of both. Therefore, an effective infrastructure support is essential for the development of CoPs.

4. A great deal of business is done through the CoPs including sales, customer service, and problem solving.

5. CoPs between the organisation and its business partners and customers can serve as an effective channel for capturing and exploiting crucial market knowledge. Such communities can facilitate innovation, reduces time to market, improve problem solving, and customer service.
Table 4.19 Communities of Practice (F15): Substantiating concepts and codes

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
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<tbody>
<tr>
<td>Communities of practice (CoPs), creation and development of CoPs, informal organisation, informal networks, employee connectivity, formalisation of CoPs, infrastructure support, global networks, physical and virtual meetings of CoP members, informal collaboration, and CoPs with business partners and customers.</td>
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<th>Substantiating codes</th>
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<tbody>
<tr>
<td>&quot;In simple terms..........we have two organisations. We have formal hierarchical classic structure around the matrix..........we are organised by country ...by industry...by product...by solutions...that's sort of formal sense. That helps in budgeting......that helps to know where people are. And then.................another type of organisation.........the informal one........where I believe the business actually gets done........which is the less structured business which is based on the communities of practice........some times which we may not know ever existed. These (CoPs) do span countries, disciplines........they do span different types of knowledge requirements..............they enable the business to get done&quot;. (106a)</td>
</tr>
<tr>
<td>&quot;If suddenly a customer comes to a Business development Manager (BDM) and says......can you do this for me......and if that BDM is not into that domain or that kind of work........then it would depend on the personal network of that particular BDM.......and he should know who are the key guys in the organisation........or he would get in touch with somebody in his domain and ask them to find out who is the right guy to route it&quot;. (175d)</td>
</tr>
<tr>
<td>&quot;At one level........we have our rigid (formal) organisation.............at another level, we have another layer of collaborating........which is the project layer, where we collect people from different parts of the world, and from different functions which work in..............what I call............communities of practice around certain topics such as mobility, HR information systems. These are formal. And I am quite sure that other functions also have their own......I have seen some examples&quot;. (17c)</td>
</tr>
<tr>
<td>&quot;Communities of practice........ we call them as Application Networks........across our organisation........we have 50 such networks........in my business division......I have 16 networks...........the CoPs span across the verticals&quot;. (168a, 160b)</td>
</tr>
<tr>
<td>&quot;Typically about 10-15 people in each CoP..........actually, they are world wide......they really collect people from worldwide........they are supported through the collaboration tools such as Lotus Quickplace&quot;. (17d)</td>
</tr>
<tr>
<td>&quot;We bring people together.......we manage and coordinate international committee.......we call it as Global Communication Forum (a CoP). We meet once in a year for example, in Frankfurt. There are about 120 marketing communications heads.......exchanging ideas, presenting ideas, and programs for the next year&quot;. (33a)</td>
</tr>
<tr>
<td>&quot;A success factor from our KM system (program) is...... things like CoPs. ........in these..............we have heads of communications from key markets. They talk about strategies about marketing communications.......about new models. This is other kind of knowledge sharing activity. We (KM team) at Head office coordinate the things&quot;. (33b)</td>
</tr>
<tr>
<td>&quot;Communities of Practice........Sure.......we have ....in our domain we have formal routes for CoPs.......we have consultants meetings once in a week in which we will take difficult areas of practice and discuss the decision guidelines........occasionally we take difficult cases. Three times a week on the shop floor........we have board rounds, where difficult cases are brought.......all consultants go.......and.....juniors come. In case if they don't understand something.....we discuss cases and trying build up the practice&quot;. (94b)</td>
</tr>
<tr>
<td>&quot;CoPs formed between people from different organisational divisions......We do have......We invite people to our meetings (from other divisions) they invite us for meetings. We share problems to come up with a common solution................Because we feel that its important to have horizontal associations........because, perhaps, if you are just in the vertical structure and you are the only department.......you have no external peers against which you compare yourselves . So yes.......we have (horizontal) structures&quot;. (95b)</td>
</tr>
<tr>
<td>&quot;Because of performance targets........and lack of time........we are getting less and less attendance (in CoPs meetings). So.......we have to come with more and more interesting solutions.......one of the solutions is........another website........Which is one of our solutions to life........which is actually to have a virtual meeting place. So we can share our cross regional knowledge........people don’t need to come to meeting this way........we can cut down amount of time there. We also use this for training. There are various groups on the site....... where cases are discussed. These are modern solutions for problems of information and knowledge&quot;. (95d)</td>
</tr>
<tr>
<td>&quot;The reason the knowledge communities work within our profession is because they are traditional&quot;. (96b)</td>
</tr>
<tr>
<td>&quot;we have this very successful creation of CoPs........which is a nice way of getting people together, physically and virtually........... in a way we really never done before........CoPs are very successful&quot;. (110b)</td>
</tr>
<tr>
<td>&quot;customer knowledge sharing..........networks (CoPs) work well in this case.......R&amp;D can access sales knowledge and sales can access the development information and what they are working on&quot;. (117c)</td>
</tr>
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</table>
"My job (a senior director).............is described not in terms of hierarchy but in terms of which social networks I should connect to..............and how we do that is key". (119a)

"Formalising informal knowledge networks (CoPs)...........is it effective? .............yes indeed.........on our portal there are various tags. There is an organisational tag which is the formal tag where you will find the HR, marketing, etc. Then you will find the informal tag......co communities tag........where there are communities specifically......by country........by division........etc.............where you can see all the communities we have........what they are........what they are doing". (123b)

"Creation and administration of CoPs............There is a formalised framework around this and we do have a person who will ask the right questions about why you want to do this (create a CoP)..................We always give them the chance..................provided its within the business priorities..............and provided there is some clarity around the objective of the group.............there will be a very short justification.............people can create their own online CoPs on our portal and there would be a person to look into these CoPs and tap into knowledge of business value". (123c)

"So as the layers are removed (layoffs)..............people networks (CoPs) are being formed instead of hierarchical organisations". (133c)

"The real (KM) implementation is carried out by the KM communities or the networks of the people who have KM roles............and who are paid by the individual the business groups..............and since those are paying for those people...........they make sure that they get benefit out of it".

"One aspect which I have leveraged a lot is to make it(KM) part of the day-to-day part of organisation.............we put lot of energy in developing the professional communities or CoPs. Basically these are the informal networks that connect all those people and they are the ones , in many cases, who trigger the usage of infrastructure.............because they establish discussion forums.............they are the ones who make things happen. If there is a customer problem.............customer issues they are the ones who collaborate to solve it........if there is a products issues then .......they are the ones who come together and identify the issue and go back to the product development........so it’s these professional communities". (136d)

"The issue with CoPs is..............people need time to participate in it...........and also people need time to lead it..............we have done things like..............if you work on a community lead project.............you are able to book your time against it..............but the reality is that the real contributors are the people who have an intrinsic drive.............what drives them is..............the recognition by peers.............their satisfaction to help others. Because they see it as an opportunity to develop.............they see it as a way to get help when they need it. So.............it’s a personal thing and more people you have in that category the more successful those communities will become". (142ac)

"It’s the duty of the owner (leader of CoP) of the network to ensure that the network is active. We would be looking into what’s happening in the network. If we find that there are no activities.............We actually go back to the owner of the network and say.............What’s happening.............ask about the discussions on the network. And if the person says that.............I don’t think I can sustain this network.............then we would delete it. Otherwise we would replace the owner If the owner is into other things. We can get somebody to work on it". (184c)

"In our organisation...............just winning the deal or completing the project is not the only way to glory.............you can become recognised by becoming a leader to a community of practice". (140b)

"If you provide infrastructure for communities.............they benefit immediately.............by connecting with organisational divisions in other countries". (143a)

"Our professional CoPs have regularly meetings.............where people present to their colleagues.............have physical meetings.............some of them once in a year.............some twice a year. We have around 80 communities in EMEA – not all of them have annual meetings. Some of them are grouped together.............a group of 10 – 15.............come together in a big summit. Some of them are smaller but they meet even more regularly.............to.............share their experiences.............work on specific issues. The sole purpose of these meetings is to increase the knowledge of the participants. They are Not just really training events.............its more learning from the peers.............these meetings are usually funded by their business units". (145b)

"What We have is communities.............and within the communities we have a set of tools where you can go and find out.............who are the members of the communities.............who are the core members.............and who are the leaders. So if you go to the community then.............if you go to the different knowledge areas than you will be able to know who is doing what".

"Formalisation of cops.............I try to formalise.............for example there is one particular community I am trying to work on right now. They need a lot of collaboration because of the kind of areas they are working on. Informally.............I am not sure.............all the people are in touch with all the people. So we will be formalising it and bringing the usage of infrastructure.............this an already exist informal community.............they are working for the customer.............may be there are ten technical managers.............only five of them have good network.............the remaining five don’t have a good network. Through Formalisation.............it may be easier for them to get together". (167c)

".............formalizing a natural CoP.............I don’t think it will actually bring down the collaboration or effectiveness of community. It will help.............or.............if people are not Ok with it.............in worst case.............they will not make use of the portal.............infrastructure we provide. I don’t think it will actually harm". (168b)
Specific KM strategies

1. Creation and development of CoPs should be a core activity of the KM team. The KM strategy should encompass the development of CoPs as a continuous and long-term objective.

2. As the employee communities often span across the countries, the overall KM strategy of a distributed organisation should set global objectives for the development of CoPs. These objectives should encompass the coordination between geographically dispersed business units.

3. The KM team should endeavour to create an environment to nourish both informal and formal CoPs. Many of the successful CoPs are informal in nature and wish to be autonomous of the organisational hierarchy. The KM team should be aware and value such characteristics while dealing with the CoPs.

4. Formalisation of informal CoPs can be taken aboard with the due diligence and acceptance from the respective communities. Such formalisation may be necessary and beneficial in circumstances where the knowledge activities of a given CoP can lead to a new product development, reduce time to market, or produce additional sales.

5. Organisations should establish necessary ICT infrastructure for the operation of CoPs. Developing groupware systems, message boards, chat engines, content management systems, extranets, and portals can facilitate CoPs by improving the employee connectivity.

6. Efforts should be made to develop CoPs between the employees, business partners, and customers. Such CoPs can enhance the sales and market oriented product development.

7. In collaboration with various business divisions, the KM teams should define and promote time allocation for the employee participation in the CoPs.

8. Efforts should be made by the KM team to organise the resources for physical meetings and events between the CoPs members. Such events may be necessary to actualise the knowledge activities of the CoPs into the tangible business benefits for the organisation.


Discussion

This study reemphasises the significance of CoPs in the knowledge management function. Lave and Wenger (1991) coined and described the term, Communities of Practice (CoPs) as, “an activity system that includes individuals who are united in action and in the meaning of action has for them and for a larger collective”. The majority of the interviewees believed that communities of practice have strengthened the knowledge culture in their organisations. The respondents suggested that encouraging the development of CoPs is an effective way to launch knowledge management programmes. In the organisations under study, CoPs are evidently playing a significant role in resolving product issues, solving customer problems and assisting in the generation of sales.

Formal and informal CoPs were observed in all of the studied organisations, overlapping various functional divisions and often deviating from the managerial hierarchies. Formal CoPs were generally based on projects while the informal ones were based on subject expertise, skill set, and professional competencies. Many of these communities surpassed organisational boundaries with active members from across the globe. However, there is a widespread view among the respondents that the major role of the organisations, in developing CoPs, lies in providing necessary KM infrastructure such as portals. The communities should be provided with facilities for virtual interactions and content management. Occasionally, some CoPs may need financial resources and time for possible physical conferences and meetings between the members. Two of the organisations under study, regularly sponsor such events for the members of CoPs. However, in one specific case, the members of a well-established professional community preferred to be unknown to the organisation, fearing that their managers would consider this as a time-consuming issue effecting target achievements. This particular instance resonates with a common theme in KM literature that formal management efforts can hinder the development of CoPs (Kandadi & Oliver, 2006; Preece, 2000; Stamps, 1997; Wenger et al., 2002).

The majority of the respondents inclined towards leaving the CoPs as self-governing entities. However, in some of the organisations, formalisation of CoPs was taken aboard when there was a specific business opportunity and request from a given community. For instance when the activities of a given community has the potential for a new product or service development, then a formal work group or project team is created by allocating the needed organisational
resources. Facilitating and promoting CoPs was seen as an important element of KM programmes in many of the organisations explored in this study. The senior managers regularly recognised and valued the employee participation in CoPs, wherever such participation has resulted in visible organisational benefits. Many interviewees have expressed that such organisational attention, support, and sponsorship for CoPs can directly promote the knowledge culture (Kandadi & Oliver, 2006).

4.1.2.10 Events (F16)

This study shows that the KM events across the business divisions can enhance the knowledge culture in distributed organisations by improving knowledge sharing and employee connectivity. Table 4.20 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties

1. Physical events such as conferences, seminars, and workshops are crucial for employee learning, knowledge creation, and sharing. Such events enable crisscrossing of knowledge between various business divisions and professions.

2. Virtual events are becoming a general phenomenon in distributed organisations. Challenges such as employee time, travel, and cost pressures are encouraging organisations towards virtual or online events.

3. Employee events also play a major role in the creation and development of the formal and informal CoPs. When people from dispersed business divisions meet, there is a high probability for triggering the creation of cross functional CoPs.

Specific KM strategies

1. KM team should develop and organise knowledge events in collaboration with various business divisions, professionals, partners, and customers.
Depending on the budget availability the events can be virtual, physical, or a combination of both. Employees should be constantly encouraged and allowed to attend these events.

Table 4.20 Events (F16): Substantiating concepts and codes

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
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<tbody>
<tr>
<td>Knowledge events, learning events, knowledge creation events, knowledge sharing events, knowledge events, learning events, knowledge creation events, knowledge sharing events, conferences, seminars, workshops, physical events, virtual events, organisational events, external events, business partner events, and customer events.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Substantiating codes</th>
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<tbody>
<tr>
<td>&quot;We also create events....we participate in lot of exhibitions...that's a standard (practice).....we have 3G reality centres....one of them is for demonstrating next generation technology&quot;. (11d)</td>
</tr>
<tr>
<td>&quot;We (KM team) bring people together....we manage and coordinate international committee....we call it as Global Communication Forum which meets once in a year....there are about 120 marketing communications heads exchanging ideas, presenting ideas, and programs for the next year&quot;. (33b)</td>
</tr>
<tr>
<td>&quot;We organise workshops etc......for knowledge sharing. This knowledge sharing is important&quot;. (55d)</td>
</tr>
<tr>
<td>&quot;We have....conferences all the time by specialties....there are events held to spread innovations and new knowledge.....its knowledge rich in that way. There is an expectation that everybody will have continuous professional development (CPD). The way they receive their CPD is through conferences, congresses, and meetings....numerous events. At consultant level (senior manager), there is time set aside and funding set aside to do that. In fact there is expectation that every consultant to do these. There is a portfolio....to keep record of where you have been....what you have done in these areas. My specialty has two major conferences in every year.....one in spring and one in winter.....one CPD conference and one scientific conference&quot;. (88b)</td>
</tr>
<tr>
<td>&quot;The conferences and other events spread knowledge.....may not be in a planned way.....may be in a haphazard way. I wouldn’t say it’s planned.....they do it by repetition....like....saying.....these are new knowledge and these are the best of the new knowledge selected for presentations&quot;. (88c)</td>
</tr>
<tr>
<td>&quot;....every consultant has 10 working days per year to spend on events.....registrars have the same 10 days per year and have the budget of £820/year to pay for courses etc&quot;. (88d)</td>
</tr>
<tr>
<td>&quot;We generally have duty seminars, meetings, at post meetings and also pharmaceutical industrial sponsored meetings in the evenings which we attend. Then second thing.....in the group practice we have meetings once a month, general club meetings, where the local GP's join&quot;. (195d)</td>
</tr>
<tr>
<td>&quot;Locally we have......meetings....we have these clinical governance meetings....in these meetings we share the knowledge and we tend to follow. We also have drug committee meetings.....if the new drugs are introduced..... how do we go about and they have their own guidelines which we follow and we share knowledge with all the practices. In our division everything is open, there is no secrecy.....there are no politics..... so it is very open&quot;. (196d)</td>
</tr>
<tr>
<td>&quot;We have physical incidence group meetings.......where, if there is anything interesting happening.....we share and discuss without naming the patient.....So that's sponsored by the organisation.....that is there&quot;. (199c)</td>
</tr>
<tr>
<td>&quot;We have Executive work shops.....we have some presales methodologies where we run work shops with our customers on a project basis.....we run business evaluation workshops.....next week we have an organisational event in London. Loads of customers are invited to these events. We interact with customers at these events.............dark side is we have a lots and lots of pockets of customer information. Because of knowledge management we are now able to connect these pockets of knowledge&quot;. (122d)</td>
</tr>
<tr>
<td>&quot;Our professional communities have regular meetings......where people present to their colleagues. They have physical meetings.....some of them once in a year.....some twice a year. We have around 80 communities in EMEA.....some meet even more regularly....to share their experiences...work on specific issues. The sole purpose of these meetings is to increase the knowledge of the participants. They are not just really training events....its more learning from the peers.......they are usually funded by business units&quot;. (145b)</td>
</tr>
<tr>
<td>&quot;There is one organisation wide event called Tech forum .....Its not labelled as a KM event.....It is actually Initiated by the CTO of our organisation. But we (KM team) have core role to play. This event is to invite ideas, thoughts, papers from across the organisation........so typically people from entire organisation come up with concepts, innovative things, papers, ideas, and thoughts. We would get about 900 – 1000 papers......we would be projecting big picture of KM to all people at these events&quot;. (152c)</td>
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</table>
2. External events such as industry conferences and internal events such as knowledge sharing workshops need time and financial support for the employees. It can be beneficial to allocate each employee, team, and business unit with a specified annual time and budget for such events.

3. KM programmes should build an effective infrastructure such as video conferencing and other groupware systems for virtual events and collaborations. Employees throughout the organisation, especially CoPs, should be explicitly communicated regarding the infrastructure support and other resources available in the organisation for various events.

Discussion

The majority of the studied organisations are encouraging their employees to attend various events of learning, knowledge creation and sharing. This factor includes both the internal and external events such as conferences, seminars, and workshops. All the organisations participated in this study have some form of regular events to promote knowledge creation and sharing. These range from large-scale organisation wide KM events to the small informal meetings of various CoPs. The respondents have mentioned that organising regular knowledge events is a common activity of the KM function. This study depicts the increasing role of the virtual events in KM arena, in addition to the traditional modes. Most of the organisations have established the technological infrastructure for virtual KM events such as web conferences or webinars. Earl and Scott (2001) also suggest that organising events and establishment of the supporting tools is an important activity of the KM teams and programmes. However, much of the current KM literature does not treat this factor as a distinct initiative.

Some of the organisations have annual funds and time allocations for the employees to attend the internal and external events. Interestingly, these organisations have decentralised the resource allocation to the respective divisions rather than creating central resources. This specific approach was adopted to spread KM costs across the organisation and to avoid creating a huge central KM cost centre. Therefore, the respective divisions have to provide the resources for KM events such as CoPs meetings. Many respondents have noted that the KM events are playing a positive role in the knowledge culture of the
organisation by improving the employee connectivity, knowledge creation, and sharing. However, the success of the KM events, in the organisations under study, mainly depended on the nature of professions and the business divisions. Certain professions, such as medicine and consultancy, tend to be more active than others in attending the knowledge events. The study also depicts that some pockets of the organisation tend to play a more active role in KM events because of the attitudes and interests of the business unit leader or manager. These issues signify the complexity of KM function in distributed organisations which encompass several professions and business units.

4.1.3 Process

The process dimension encompasses the core business processes and also the KM implementation process in distributed organisations. The core business processes are often the Knowledge Intensive Processes (KIPs) which need to be optimised for effective KM practice. The KM implementation process addresses the issues such as the formulation of KM strategy, establishment of KM organisational structure, and content management. This study illustrates that process is an important organisational dimension that needs to be leveraged effectively for KM success. Certain KM literature tends to address the process dimension by orienting the whole KM efforts towards the business processes (Nissen et al., 2000; Remus & Schub, 2003). Whereas, the majority of the respondents in this study have stated that the KM functions should consider the process as one of the organisational dimensions.

The process core category encompassed several factors. The first six factors (F17, F18, F19, F20, F21, and F22) are associated with the process of knowledge management itself. The last factor (F23) under this dimension focuses on the optimisation of the KIPs to embrace the KM activities. Table 4.21 depicts the constituent factors of this core category with some substantiating codes. The following sections describe each of these factors in detail.

4.1.3.1 KM strategy & alignment (F17)

The KM strategy of the organisation is a primary factor for implementing knowledge management programmes. A well formulated KM strategy differentiates the effective and organised KM programmes from the ad hoc and haphazard KM activities. Table 4.22 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial
"If we are talking about BPM... We are also talking about organisational structures. If you just document the processes... and leave the organisational structures... and the people are not integrated with the processes... then... it's a problem. In organisations people define organisation structure and then they define the process... and the process runs through too many interfaces... and that affects the problem. But we can do other way round... we say... we have process... and we base the organisational structure on that process... the Process should be identified first... and then you think about the organisation structure... but the reality differs... in a traditional company like ours... when people reach certain positions, levels... then they say... why should I (leave)... if a senior manager has 50 people... here its power... the senior manager or director... may not want to loose any". (53d)

"Tactically we are trying to deploy one organisation... in the past we have one local organisation and one whole organisation on top of that... now we are trying to unify... get to the down to the bottom of our organisation... we are trying to standardise processes worldwide. In HR - we are stopping to have difference HR processes in various countries differently... Like England doesn't have same HR as in Germany. We are trying to unify and have standard processes wherever possible. For example now we have one major stock option program worldwide... we do not have stock option program catered to each country... that's knowledge management again". (4b)

"Knowledge Management Process... We being a very pragmatic organisation by nature... instead of launching a 2/3 yrs program... what we usually do is... we establish a vision but we divide it into very small... achievable... chunks... projects... and show results". (139b)

"We established the system, we established processes, organisation, and things like that... now we go to the next step. We go step by step... development of information tools, working tools, content management tools". (36c)

"There is also a project called Map of Medicine... which aims to put the medical knowledge at the finger tips of doctors". (77cd)

"The roles and responsibilities of a knowledge manager in your organisation? ... In broad base... One is Evangelisation... Two is looking at looking at processes... to capture more knowledge and disseminate more knowledge... Three is the technology part of it... we have a portal, we have applications, and we got to make sure that people make use of it and contribute to it. So very broadly... these are the three threads". (153c)

"Project closure meetings are definitely a key. At the project closure... it would best practices... it would be case studies... expertise notes... and share generic knowledge. Its mandatory to write a case study at the time of project closure... it is mandatory to write expertise notes and share other generic stuff (knowledge) what ever is generated". (160b)

"The tacit knowledge... these are the behaviours and experiences beyond the products and applications. The explicit knowledge is very much around the products... functions and features, pretty well defined processes etc. The tacit knowledge is that... the day-to-day experiences of how the customer works, how to approach and how to interact with customers, how to interact with other people in the organisation... these are social skills, emotional intelligence skills... these are the types of tacit knowledge that is built up over the years... which makes you go into the presentation for a customer and be comfortable in how to deal with. You can't write this or it's very hard... you know it's hard to document... gosh!! how do you share that. Other than Role play or Simulation... they are the only two methods that can work. I don't see our organisation using role play or simulation that much. Story telling... is another one... We are becoming increasingly interested in story telling... but not sure how it works... I am not sure how it works". (115b)

"Sales and customer knowledge capturing... It's again one of the tricky areas. We cannot expect sales managers... account managers to write down their experiences. But the Communities and their discussions with their peers are... making their discussions more effective. The other one is providing them some support in making some of their experiences explicit. We have a few people for that... not many. We have different mechanisms to share success stories... but primarily what we have done is what we have consulting god news stories... sales people who have journalistic skills... go to account managers and project managers and do the write ups in an appealing way rather than forcing them to write some thing..." (142b)

"I still think that people think there is secret knowledge... there isn't... I don't think it's acceptable any more. That isn't to say there is no tacit knowledge... but I don't think it's acceptable. You have to think all the time explicitly... why am I doing this. Which is to say... you have to regularise your tacit knowledge... once you express some thing it's no longer tacit". (90d)
properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

**Properties**

1. Without an organisation wide KM strategy and it’s affirmation from the top management, the KM efforts may become adhoc and are extremely difficult to implement.

2. KM programs may get derailed if they are not aligned with the overall business vision and strategy.

3. Developing and implementing a KM strategy is a challenging task in distributed organisations because of the diverse stakeholders such as geographical divisions, business units, and professions.

**Specific KM strategies**

1. Organisations should develop a well defined KM strategy. This is a primary and crucial step for the successful KM programs. However, in the large distributed organisations it would be practical and essential to define a meta-level organisation wide KM strategy which can guide the detailed local KM programs of various business divisions.

2. The KM strategy must be supported and sponsored from the top management.

3. In distributed organisations, the development of KM strategy should deliberately consider several key stakeholders such as dispersed business divisions, functional units, and core professionals.

4. The KM strategy should be developed based on the overall business vision and strategy and should be firmly integrated with it. This strategic integration will ensure the KM team to understand and focus on core business issues. These issues can be customer orientation, employee
connectivity, divisional integration, quality improvements, cost reduction, innovation, etc.

5. The KM strategy should explicitly identify and describe the short-term and long-term business goals and issues it aims to accomplish.

Discussion

This study depicts the importance of an effective KM strategy in distributed organisations. The strategy formulation is highly relevant in distributed organisations because of diverse stakeholders and business issues. The majority of the respondents emphasised that the KM strategy should be closely integrated with the overall business vision and strategy. Sveiby (2001) and Allee (2000) also support the significance of the strategic integration of KM. This study also suggests that the KM strategy formulation should be definitive and descriptive. The KM strategy should explicitly include the elements such as the business need for the KM programs, objectives to be achieved, and the expectations regarding the value provision. A well formulated KM strategy provides clear direction to the KM teams and programs resulting in successful implementations.

Many respondents have suggested that the top management should be actively involved from the KM strategy formulation stage. This is crucial to win the sponsorship and organisational resources for KM programmes. Some of the respondents have emphasised that KM strategies should avoid building high expectations (e.g. ROI) from the KM activities. Instead the organisations should take a long-term view of the KM right from the strategy formulation stage. The strategy formulation process should also involve the key business divisions and stakeholders from across distributed organisation. Including the important stakeholders at these initial stages will enhance the take-up of the KM programs.
### Substantiating concepts

Business vision and strategy, KM vision and strategy, strategic KM integration, business focus, strategic support for KM, and strategic business targets.

### Substantiating codes

"Our vision....we want to connect to people....this is really important for us....Our main tasks are......Online based knowledge management with our common systems....with 121 countries....with excess to come in. 50%....nearly 61 countries....create and put their marketing communications and activities into the system....they give and take from the system(knowledge portal). 1800 communication specialists worldwide interact wit the system. We have three targets....We want to increase the quality of marketing communications, We want to shorten the time to market, and We want to optimise the costs". (32b)

"We (KM team in this business unit) have three targets........we want to increase the quality of marketing communications, We want to shorten the time to market, and we want to optimise the costs”. (32c)

"The KM department rolls out strategy and enlists what business objectives can be achieved through this................productivity analysis, metrics, customer query response, best practices.....so on. So.......the overall focus of the KM team here is........to help people to do their jobs better.......helps managers get information when needed........to improve productivity. (58a)

"They are beginning to have a whole organisation wide KM strategy........our central organisation is investing in a new computer based KM system.....it’s a project which is failing for ever........it completely failed to engage with core professionals of this organisation........they have not asked professionals.....the whole system is designed........currently to gather data..........it’s not designed to improve the field or advance the profession”. (74b)

"I think the basic strategy of KM at our organisation is..............to ensure that the talent that we have and the information that we have is maximised.............when key people leave, the key information leaves the business..........capturing this key information and contextualising explicit and tacit knowledge is a key aspect........contextualisation of knowledge is a major problem for us”. (105c)

"My view is that....you should regard the (employee performance) appraisal as the integral part of any knowledge management strategy". (118b)

"One of the things they (the KM team) need to do is............to understand the business issues and actually formulate solutions that are not there. Just to give an example..................let’s say.......we have a problem with the quality of customer proposals........what we expect the KM needs to do is....to understand that this is the systems issue, communications issue, skill sets of the people........and actually once they get to the bottom of the problem........then formulate a solution with tools and methods of approach....................the identification of those business issues and application of KM concepts is primarily their role”. (137d)

"Basically our business standards are.................productivity and customer satisfaction.............so through KM.......what we are trying to prompt is........is shorter time to market and innovation”. (150c)

"If you look at our KM vision.............it would basically focus on two things. One is the customer and the other is the employee. The customer.......we will be talking about delivering as quickly as possible.........in shortest time possible...........and in the most innovative way as possible. If it’s the employee.....we would be talking about........productivity improvement........and providing environment to create and share knowledge........so that’s the vision and obviously the strategy would flow from there. So......our business drivers would be...........competitive advantage, productivity improvement, innovation, capturing tacit knowledge and having a collaborative work environment. This would cover...........more or less......the KM strategy". (150d)

"The way we (the KM team) work is clearly a sort of hub and spoke..........a combination............where I have a KM team. Each one of the Knowledge Managers has responsibility to take care of all the KM activities..............operational aspects of a particular vertical (business division). And they also take part of the strategic discussions and initiatives of the vertical from the KM perspective. These people ensure that the central KM strategy and the KM strategy of the vertical are closely related”. (187a)

"Coming to the financial backup or related aspects from the top management......I (KM head) have not faced much of the problems because........part of the strategy is a kind of give back more than what we take". (187b)

"A part of my (KM Head) vision is (KM department) to become a profit centre.............so profit centre from a cost centre. To do that...............I just want to make sure that.....we get to a real position of practicing what we preach.........................and selling what we practice...............yes................this is one of the long term vision”. (191d)

"We are also a very pragmatic organisation by nature. So instead of launching a 2/3 yrs (KM) program..........what we usually do is........we establish a vision but we divide it into very small........achievable........chucks..... projects and show results and so on........it is some thing that influences how we approach". (191c)

"The strategy at our organisation is to embed things (KM) in the business...........we desperately try at all cost to avoid building big centralised organisation...........we have very lean, very small team”", (106)
4.1.3.2 Organisational structure (F18)

This study has revealed the significance of the organisational structures in the KM function and identified many practical and successful strategies to address it. Table 4.23 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties

1. Developing and implementing organisation wide KM strategy needs a combination of KM jobs and roles.

2. Several challenges exist in building an effective organisational structure for KM. These include the lack of expertise, immaturity of the KM subject, and associated complexities.

3. Because of wider implications and infinite activities, there is still a lot of complexity in understanding the rationale, purpose and functions of KM. In many distributed organisations, people don’t know whose job is KM and what it encompasses.

4. Exclusive and centralised KM teams can become massive corporate cost centres.

5. Large number of exclusive KM jobs can be detrimental in the long-term. During the turbulent organisational circumstances, these KM jobs can be highly prone to layoffs.

Specific KM strategies

1. Building very small KM teams (around 5 people in each) across the organisation, is an effective long-term strategy. Developing KM roles instead of full-time KM jobs is one of the most successful and sustainable KM approaches.
There are some people who are 100% dedicated (to KM)……………….but the majority are roles”. (141b)

organisations are paying for those people, they make sure that they get benefit out of it”.

have KM roles…and who are paid by the individual organisations or the business groups. And since those

ideas. But the real implementation is carried out by the KM communities or the networks of the people who

consultants who drive projects and who do research and who do talk to external people and bring in some

central KM budget…….but its just for my(KM Head) team…which basically…has senior project managers and

have four people……And imagine we managing the KM or content of 120 countries…it’s a big task…it’s just

possible only through decentralisation. We have to decentralise……otherwise it’s just not possible”. (33cb)

“Our KM (divisional) team…………consists of……total three KM roles……. Specialist, Champion, and

Technical Writers. A total of 5 people. The champions are usually the team leaders, senior software

associates etc……..who has a shared understanding with other people……..they……..evangelise

KM………..enlist best practices and motivate team to enter them in knowledge base”. (58b)

“People perceive that KM people don’t do any job…clear definition of job profiles is also a challenge”. (P61d)

“KM organisational structure……in this business division……………….KM director and his team (4 or 5

people)…..I think his team has grown slightly……but it is very small. The strategy at our organisation is to

embed things in the business. We desperately try at all cost to avoid building big centralised organisation.

Very lean, very small teams. Although KM Director will have a small team, he will have his communities and

he will have KM contacts in each country. But they will be a sort of dotted line. They will have a

functional responsibility plus KM responsibilities and then part-time in implementing whatever ever (KM)

strategies agreed …….what ever tools required, and management support required in each country. So he

has a virtual team……that’s a familiar model……very familiar model in our organisation”. (106b)

“We have a small (KM) team………………..who look after portal administration and things like that. Our

business model is that…..we are essentially a big sales machine………so……..in each of the

regions………….countries these are high powered sales satellites. In America is where the (core) development

takes place……and therefore…. If you are not in mainstream sales…………..which is a key goal of the

businesses….then you are slightly peripheral to the business……..unless you establish your value to the

business very quickly. So we don’t build big organisations (such as big KM team) that are not sales

oriented……therefore we work virtually a lot and create communities that come and go a lot…….that’s the

success model in this organisation or even for survival in this organisation”. (107cd)

“One of the things we have done is……..instead of creating KM jobs we have created KM roles. Part of

those are infrastructure and content related. Part of them are advocacy and connection to the business. We

have people called KM leads…………..and they are basically business people (from existing departments). They

could be the HR director, presales managers, consulting managers etc. A portion of their time is

dedicated to understanding KM concepts, looking at the business issues, setting up the priorities locally in

terms of what projects they need to do and what not . We have people called Portal managers………………and

they primarily look after KM infrastructure. They spend a lot more portion of their time in KM. Typically KM

people may spend any where from 25% to 100% of their time. KM leads spend around 30% - 50% or more

of their time on KM roles. While the Portal managers spend 50% to 100 % of time on KM roles…………but

they may have some additional roles”. (135b)

“Our experience is that…………….if we detach people from their day-to-day job they become very focussed on

KM (losing the core business sense) and then…..when there are changes in the organisation……………and

when there are changes on the market………..they cannot include these changes in KM…………….and when the

organisation changes shape, structure, reorganise, or do downsizing…………….they become first

targets……………because we cannot point them as part of the business…………….they are seen just as a

support function…………….a Cost centre…………….as opposed to the someone who is contributing to the business as

well as doing other things. It’s not just for KM……….for all the major initiatives. So instead of creating huge

organisations with jobs in them…………….what we tend to do is…..acknowledge the fact that these initiatives

needs to takes place and every one need to have multiple roles”. (135bc)

“We (KM team) ask each of the organisations (business units) to sponsor. If you are an industry sales

group…..if you are geography….they pay for the KM resources. There is no KM central budget. There is a

central KM budget …….but its just for my(KM Head) team……..which basically….has senior project managers and

consultants who drive projects and who do research and who do talk to external people and bring in some

ideas. But the real implementation is carried out by the KM communities or the networks of the people who

have KM roles… and who are paid by the individual organisations or the business groups. And since those

organisations are paying for those people, they make sure that they get benefit out of it”. (136a)

“There are some people who are 100% dedicated (to KM)……………….but the majority are roles”. (141b)
2. KM should be represented at the top management of the organisation for gaining access to various resources, and strategic inclusion of KM. The representation can be direct (CKO) or indirect (President, CIO or CQO).

3. The HQ or central KM team should play a strategic and coordinating role in KM. Most of the operational aspects should be leveraged by the respective business divisions. The KM functions and activities should be decentralised to the maximum extent possible and the business divisions should drive their own KM activities.

4. While the HQ may bare the cost of overall KM infrastructure and certain central strategic KM jobs, the majority cost of KM jobs and roles should be allocated to the respective business divisions.

5. One of the long-term tasks of the KM team is to ensure that various business units and functional divisions manage their knowledge themselves by taking the necessary support from the central organisation.

6. Embedding the KM roles in the existing functional jobs of various business divisions and functions is a proven strategy for the successful and sustainable KM.

7. KM infrastructure or portal management is one of the core KM activities which might require certain full time jobs such as content editors and portal administrators. These are the few needed full-time jobs in the KM team, especially in large distributed organisations because of the enormity of the content.

8. KM teams should effectively utilise the informal organisational structures such as CoPs for implementing the KM activities and programs. This approach can restrict the creation of many exclusive KM jobs.

Discussion

The majority of the respondents viewed that the conventional organisational structures need to be transformed to support the knowledge management function. There is a lack of proper understanding in the current KM literature regarding this factor. Previous studies in this area have proposed the creation of
several exclusive KM jobs, which include, Chief Knowledge Officer (CKO), Knowledge Managers, Portal Managers, Content managers and Knowledge Analysts (Davenport & Prusak, 2000; Gordon, 2002; Gray, 1998; Rastogi, 2000; Rumizen, 2002; Skyrme 1999). This study confirms the view that some specialist positions such as KM analysts and coordinators are necessary for KM. People with expertise in the areas of strategic management, process analysis & reengineering, change management, content development, human resource management and knowledge portal development, are considered crucial for performing KM functions. Several respondents in this study have noted that instituting an effective knowledge culture requires multidisciplinary expertise.

However, a significant number of the respondents were critical about establishing a comprehensive hierarchy for KM and suggested creating KM roles, as opposed to the KM jobs. Some of the studied organisations have KM positions with substantial functional role attached to their job profile. A very few exclusive KM jobs are created which include knowledge analysts, content editors, and knowledge portal administrators. In two of the organisations under study, the number of exclusive KM jobs has been reduced over the years albeit the continuous growth in the overall employee numbers. One organisation, in particular, has a strategy to avoid the exclusive KM jobs at senior or middle managerial levels. In these organisations, either the functional roles were attached to KM jobs or the KM roles were embedded in the jobs of core functional areas such as sales, product development, manufacturing, and customer service. Within each functional division, people with positive attitudes and skills towards knowledge management were awarded with KM responsibilities of their respective functional division. KM education, training and expertise are provided to these people to promote knowledge culture. Some of the respondents have expressed that the large number of exclusive KM jobs are not sustainable, as they often become vulnerable positions during the lay-offs (Oliver & Kandadi, 2006).

Figure 4.2 depicts a common theme of organisational structures observed during this study, with some positions consisting both the core functions and knowledge management responsibilities. In three of the cases, these mixed positions with varying degrees of KM and functional roles were observed. Depending on the requirement and extent of KM tasks, a given functional position was embedded with KM roles consuming up to 30% to 60% of overall job time.
A KM job title such as “Knowledge manager” is given if the job has more KM tasks. Conversely, a title such as “Customer Relations Manager” is given if the job is predominantly functional. The author refers these mixed organisational job structures as “Hybrid KM structures” or “Hybrid organisational structures”. These structures have been successful in developing knowledge culture and integrating KM activities with the core business functions at the organisations explored in this study. The structures are considered sustainable because the people in KM positions are also involved in core business activities. Moreover, each functional division undertakes a part of overall KM costs, by paying their functional jobs with embedded KM roles. The hybrid structures also enable the integration of KM programmes with functional divisions, as the people with the hybrid roles predominantly get involved in KM activities concerning their functional division. This study demonstrates that it is an effective way to make KM everybody’s concern and spread the knowledge activities throughout the organisation (Oliver & Kandadi, 2006).
4.1.3.3 Piloting (F19)

The majority of the respondents viewed that the pilot projects have a crucial role in the KM. This study shows that a high degree of variance can exist between the business divisions of a distributed organisation, in terms of knowledge levels and culture. Therefore, the initiation of formal KM programmes may need piloting through a selected business unit or functional division to show the benefits of KM. Table 4.24 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties

1. Initiating very large and ambitious projects is one of the major causes of the failures in the KM area.

2. Choosing an appropriate business division or functional department is a crucial aspect in launching the KM programs in distributed organisations.

3. Integration of KM projects with other organisational initiatives can be beneficial and achieve tangible results.

Specific KM strategies

1. Adopting the pilot project approach to launch the KM initiatives is a proven and successful KM strategy.

2. Phased expansion of KM can be beneficial in many ways such as achieving tangible results, winning managerial support and resources.

3. Business functions such as sales and customer services can serve as ideal targets for launching KM pilot projects. These areas can have fast impact and be able to show some tangible business results in both short-term and long-term. Increased sales and customer satisfaction are some of the visible business results observed from some successful pilot projects in these areas.
Table 4.24 Piloting (F19): Substantiating concepts and codes

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot KM projects, pilot project division or business function, integration of KM projects with other programs, KM initiation, KM expansion, phased KM approach, target oriented KM, short-term KM projects, long-term KM programs, and continuous development.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substantiating codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;The department or functional division I would select for a KM pilot project is......................Marketing and sales. I would see the immediate impact everywhere.............but I think that............in marketing and sales, you can see it sooner&quot;. (26a)</td>
</tr>
<tr>
<td>&quot;In a big company...........it’s not possible to collect and create a big (KM) solution system. To Start small...........we started a really easy information tool.............Where people can put and access information. Further we had another step in 2002............we have created a working tool ............online, exchange ideas, forums...........to exchange ideas online etc. Now we have on the way the planning tool and management tool. The planning tool is..............for example...........a country made their communication activities or new model or strategy.........they put their marketing communication details into the system via an entry form. Now we go one step further.................&quot; (33da)</td>
</tr>
<tr>
<td>&quot;We being a very pragmatic organisation by nature...........instead of launching a 2/3 yrs program...........what we usually do is..............we establish a vision but we divide it into very small ......achievable....chunks.... projects and show results&quot;. (139b)</td>
</tr>
<tr>
<td>&quot;There was a request from the Quality Assurance department...........they said OK...........another ISO certification is coming up. They wanted document processes (knowledge mapping)..................The documents that map...........people.............who provide knowledge to each process execution&quot; (52cd)</td>
</tr>
<tr>
<td>&quot;We really did it (a Knowledge creation project) for internal training issue within our department.........and we realised fairly quickly that we were doing something unique and it was taken up by others(regions).........I got some funding from educational sources to teach the methodology to multi professional groups..........And used some of that money to setup the website (portal)..............and rest as they say is the history&quot;. (66c)</td>
</tr>
<tr>
<td>&quot;This (process documentation) was really important for ISO certification..............we had all the processes and work instructions documented. Again KM comes here................we have Lotus Domino Doc integrated. All these documents are put into this KM system&quot;. (53a)</td>
</tr>
<tr>
<td>&quot;This project is the way of synthesizing information that’s available in the whole of the world. The idea is to implement..............what’s called Evidence Based Medicine. Particularly, it started from emergency medicine and spread from there’’. (63a)</td>
</tr>
<tr>
<td>&quot;They are beginning to have a whole organisation wide KM strategy...........our central organisation is investing in a new computer based KM system...........it’s a project which is failing for ever..............it completely failed to engage with core professionals of this organisation..............they have not asked professionals...........the whole system is designed...........currently to gather data..............it’s not designed to improve the field or advance the profession”. (74b)</td>
</tr>
<tr>
<td>&quot;I think it (success of KM initiatives) rests with Pilot programs..............it rests with testing ........in order become acceptable in the organisation”. (116bc)</td>
</tr>
<tr>
<td>&quot;All those initiatives are separate...........you could argue in an organisation these all (learning programs) could be branded as KM..............but instead of combining under one roof..............what we wanted to do is..............to do this in a distributed and coordinated approach” (138d)</td>
</tr>
<tr>
<td>&quot;One of the things we did ........which played a large part in success of the KM program is...........to focus on the positive people first rather than tackling everyone in the organisation. Following the initial promotion and visibility they bring..............if there are people..............who are interested, who are keen, who have ideas, who have business issues that you can solve..................work with them, spend your energy with them, and don’t do any thing with the rest. And once you prove it with them..............they are going to be better evangelisers than your self..............because they will speak from their experience..............and then people will do it even if I am not here”. (139cd)</td>
</tr>
<tr>
<td>&quot;An Ideal Pilot department to start a KM project..................I would say...........where you can have the visible impact..............there is a high visibility. Where people are excited and..............motivation. So motivation plus impact”. (146c)</td>
</tr>
<tr>
<td>&quot;For KM Pilot project..................If you ask me the business group..............and specific focus I would prefer..............the Pre-sales because of largely the way we conduct our own business. Pre sales and support groups..............these people have the responsibility to drive the whole process..............once the prospect (customer) is identified..............till the closure. And then I would probably focus the delivery teams”. (190ab)</td>
</tr>
</tbody>
</table>
4. A business division or function should be selected, as the KM pilot project area, based on the interest and motivation of the people towards knowledge sharing and creation. The people with most positive knowledge attitudes should be chosen for pilot projects. It is easy to achieve success through them, and they can serve as the best evangelisers of KM throughout the organisation.

5. Integration of KM projects with other organisational initiatives can provide some operational and tangible benefits. The possible integration targets can be six sigma programs, ISO, BPR, and IT development projects.

6. Since cultural change is a slow process, pilot projects and consequent expansion is the best KM strategy to develop a sustainable and organisation wide knowledge culture.

Discussion

This study emphasises the role of KM pilot projects in distributed organisations. There is a lack of specific strategies, procedures, and explicit discussion in the current literature about the role of this factor in KM. The majority of the respondents in this study have stated that onetime, large-scale and organisation wide KM programs often fail because of the enormity and complexity of the issues. Many respondents suggested a gradual approach for KM implementation, whereby the knowledge culture is slowly extended to the whole organisation through the pilot projects. Some of the recent studies in the area also indicated limitations in achieving organisation-wide knowledge culture in a single instance and suggested the pilot approach (Paul, 2003; Reinhardt, 2005; Rumizen, 2002).

The pilot KM zone can be a functional division, business unit, or a business process. However, the majority of the respondents preferred the sales and customer service functions for the KM pilot projects. In the organisations under study, the KM programs in these functions have resulted in tangible and quick business benefits such as increased sales revenue, decreased marketing costs, and improved customer satisfaction. Another rationale for identifying the KM pilot zone is the visibility of business pain. For instance, a KM pilot project can have a significant role and impact in a business division which is undergoing restructuring (e.g. Layoffs).
Some of the interviewees have suggested that the KM pilot programmes should also consider integration prospects with other organisational initiatives such as quality improvement, BPR, and IT projects. Such integration can reduce the project costs and enhance the business value provision. Once the KM pilot projects are accomplished, the business benefits achieved through them can motivate the whole organisation. The people impacted by the pilot programmes will become better evangelisers of the KM than the KM team. The pilot projects can also help in identifying the drawbacks of the KM programs at the initial stages thereby avoiding large scale failures. The KM strategies, programs, and activities can be fine-tuned based on the feedback from these pilot projects.

### 4.1.3.4 Knowledge creation and quality control (F20)

This study depicts a prevalent view in the KM literature that the knowledge creation is a significant factor in KM. In addition, this study also explored the importance of managing the quality of the knowledge created in the organisations. Table 4.25 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

**Properties**

1. An organisation’s capacity to innovate lies in its ability to create quality knowledge on a continual basis. This can include customer knowledge, product knowledge, competition knowledge, and industry sector knowledge.

2. Enabling and improving the knowledge creation activities is a core KM activity.

3. Managing the quality of the knowledge artefacts is essential for improving the usability of the organisational knowledge.

4. Both the quality and quantity of the knowledge artefacts are equally important in the knowledge creation process.
### Table 4.25 Knowledge creation and quality control (F20): Substantiating concepts and codes.

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge creation, knowledge synthesis, knowledge quality, knowledge objects, knowledge sources, explicit knowledge, tacit knowledge, Frequently Asked Questions (FAQ’s), best practices, guidelines, protocols, knowledge objects, routine tasks, knowledge intensive tasks, knowledge capturing, story telling, external knowledge acquisition, codification, and knowledge quality control.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substantiating codes</th>
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<tbody>
<tr>
<td>“If it is explicit………………proposals, whitepapers, tips and guide lines, training material, approach notes, methodologies,(models), best practices etc. If it is tacit…………………………again it would be… you know…trying to solve a particular technical problem…which calls for knowledge based on the programming language or an operating system…so on and so forth”. (154b)</td>
</tr>
<tr>
<td>“Tacit Knowledge at our organisation……mainly….customer knowledge…….what the customer likes, managing relationships with the customer……..its very important and it is very difficult to exchange”. (13cd)</td>
</tr>
<tr>
<td>“Here we have another separate department called Training and e-learning…..these guys look at getting knowledge from the outside world…………they have tie ups with plenty of Journals, Magazines, like HBR, G-gate and stuff like that”. (159c)</td>
</tr>
<tr>
<td>“Knowledge managers in verticals only guide and manage the codification process. What happens is……say…it is a Project engineer and feel that I have some knowledge to share…such as a white paper…or a knowledge object. I am supposed to send the draft to review. A senior would review it and add value to it…………………then it goes into the portal. I (Vertical Knowledge Manager) get into the picture in terms of adding value to it”. (166c)</td>
</tr>
<tr>
<td>“I access information (from the knowledge portal), as I do my job…………..and post solutions… which some body might need. We developed a database of FAQ’s…………..users can also post the innovative and effective ways of solving a problem on this knowledge base……………..to decrease response time”. (57d)</td>
</tr>
<tr>
<td>“There is another approach called story telling…..where the project people tell how the project went…….one person tracks it and puts the experiences on paper……and use good ideas in future. We use this formally…..we have this through practice…..many projects do some thing like this”. (21c)</td>
</tr>
<tr>
<td>“We build and provide knowledge…..that our customer needs……………..through our portal”. (13a)</td>
</tr>
<tr>
<td>“The idea is to synthesise the knowledge which is already there rather than to find new knowledge……………………based around particular clinical scenarios using the best evidence available, which ranges from not-very-good to excellent…………..what ever is the best…….to draw conclusions relevant to original questions from the evidence available”. (63a)</td>
</tr>
<tr>
<td>“If you want people to gain, generate, and synthesize knowledge you have to give them time. Its part of this department’s culture. We actually give…….time to do that”. (81a)</td>
</tr>
<tr>
<td>“Explicit and tacit types of knowledge………………..it’s quite interesting……..because I am not so sure that there is such a division. I think it is necessary in medicine to change much tacit knowledge into explicit knowledge now. Because there is an expectation that there will be a reason for all actions and defence of actions. In medicine very much it is expected if you do some thing you have a reason for it…..if you have a reason for it….you will have an explicit reason for it….you cant just say any more……because I am a consultant”. (89c)</td>
</tr>
<tr>
<td>“The quality process………….developed for this project(knowledge synthesis) ………..do avoid rubbish to get on the portal……………..that’s absolutely true. But sometimes there is only rubbish. We try to reflect in the comments section……..our worries of the level of evidence that we produce. We always try to score the evidence level 1 – 2 – 3 (1-bad to 3-good)………lot of it is level 3”. (101d)</td>
</tr>
<tr>
<td>“We have created over the last 2 years particularly…..our Industry Groups……..we not only organise by country/product/solution but also by industry now…………adding another dimension. Whereby, the primary value add by this dimension is to bring the customer knowledge of that particular industry to the heart of our business. So by definition if you are focussed on Aerospace, you are expected to have fairly deep knowledge of the industry segment….in and out. And likewise for many other industries. The knowledge will be changing all the time…………..they so should keep track of it…………..through industry reports, news papers etc., and share with the core organisation……..to modify and target products accordingly……………………that’s where the vast majority of our customer knowledge comes from”. (111d)</td>
</tr>
<tr>
<td>“New knowledge creation…………….One thing is Tech forum… it’s basically a KM event……..an annual event,physical event. That’s one event where new knowledge gets generated. We call white papers from across the organisation. May be 5-6 % of the organisation will be there on the event….people from across departments come there…it can be technical….customer relationships….so on. That’s one event where we generate lot of new knowledge”. (158a)</td>
</tr>
<tr>
<td>“Part of that (new knowledge creation)……..in my vertical……..what I am trying to do is……………..to generate new knowledge…is to promote communities…networks…online communities”. (158ab)</td>
</tr>
</tbody>
</table>
5. Large degree of variances can exist between the professions, within an organisation, in terms of the new knowledge requirements and consumption patterns. Certain professions may need new knowledge on a regular basis than others.

6. Organisational knowledge can be explicit or tacit. However, managing the tacit knowledge is far more complex and challenging than the explicit knowledge.

7. The explicit knowledge artefacts can be wide-ranging and include best practices, papers, process documents, FAQ’s, protocols, market reports, and product descriptions.

8. The tacit knowledge is fuzzy in nature and may include employee expertise in the areas of sales, project management, planning, communication, customer relationship management, team working, and social interactions.

9. Conversion of tacit knowledge into the explicit knowledge artefacts can be a complicated process. Motivating and persuading various professionals, throughout the organisation, to explicate their knowledge is a challenging task for the KM teams.

Specific KM strategies

1. One of the long-term KM strategies is to embed the knowledge creation mechanisms in the core business processes. For instance KM teams can introduce compulsory report writing at the sales closures or project accomplishments. Such reports should be developed to capture best practices, problems, relevant solutions, and other knowledge generated in the process. Embedding knowledge creation activities in the core business processes can also control severe knowledge loss during employee turnovers, project changes, and organisational restructuring.

2. People with good personal interaction, interviewing, and communication capabilities can be allotted with special KM roles to interact with professionals and convert the valuable tacit knowledge into explicit knowledge artefacts. Storytelling, interviewing, testimonials, etc., are some of the proven techniques for the knowledge conversion. KM programs should
focus and aggressively implement these techniques with the knowledge intensive professions of the organisation.

3. Explicit provision of time to various professionals is a key requisite for the knowledge creation.

4. Organising periodical events such as formal conferences and informal workshops within the organisation, with the business partners and customers can create valuable new knowledge.

5. Establishing industry groups, transition groups, product groups etc., with part-time KM roles, can enhance new knowledge creation in the large distributed organisations. For instance, the sales people operating in Aerospace industry can create their industry group and develop a specific knowledge base for that sector.

6. Providing open access to the organisational knowledge resources can directly enhance usage and further knowledge creation.

7. KM projects should establish measures and procedures to analyse and improve the quality of knowledge artefacts created throughout the organisation. For instance, technical academies or authoritative teams comprising of functional experts from the respective knowledge areas can be established. These experts should regularly analyse and refine the quality of the knowledge objects and add value to them.

8. Establishing feedback routes for the employees to comment and rate the accessed knowledge objects, can improve the overall knowledge quality in the organisation.

9. CoPs are a major source of knowledge creation. Because of the diversity of membership, they produce rich organisational knowledge. Therefore, developing the informal and formal CoPs is a crucial aspect in the knowledge creation and its quality control.

10. The knowledge creation and quality control process should be decentralised wherever possible. It can be impossible for a single central team to manage these tasks. HQ should play a coordinator’s role by providing strategic directions and infrastructure support.
11. Knowledge creation and quality management workflows can be automated and made web based. This approach can save time in generating and disseminating quality knowledge artefacts. Knowledge portals can play a major role in these aspects.

12. Establishing collaborations with external knowledge providers (universities, database providers, market intelligence providers, etc.) is also necessary in fast changing markets. The organisation may not be able to produce all the needed knowledge by itself.

Discussion

The majority of the respondents in this study have asserted that enabling the knowledge creation and quality control of the knowledge objects is a core part of the KM function in their organisations. The KM literature explicitly supports this notion and advocates that the organisations should continually create new knowledge for sustaining their business competence (Hertog & Huizenga, 2000; Krogh et al., 2000; Nonaka & Takeuchi, 1995). Several authors have developed theories and frameworks for the knowledge creation. The prominent theories include the knowledge creation spiral (Nonaka & Takeuchi, 1995), communities of practice (Wenger et al., 2002), and story telling (Snowden, 1999). However, most of the KM literature lacks focus and specific strategies on the quality control aspect of knowledge creation. This study revealed many properties and strategies (listed above for this factor) for enabling the knowledge creation and the quality control of the knowledge artefacts.

A prevalent strategy in the organisations, explored in this study, is to “capture knowledge when it is generated”. To achieve this agile strategy, the domain expert teams such as Special Interest Groups (SIGs) have been created to capture and reuse dynamic functional knowledge. These groups develop knowledge artefacts such as, templates, guidelines, best practices, case studies, expertise notes, knowledge maps, work flow charts etc., to assist in the effective execution of various business functions. For instance, if an industry group is responsible for the Telecom sector, it is expected to have deep knowledge of the customer segment and keep track of all the changes occurring in this industry sector. It is the group’s responsibility to update its knowledgebase through sales executives, distribution channels, industry reports, newspapers, journal
articles etc., and share this knowledge with the core organisation to develop, modify and target the products accordingly.

Some of the organisations under study, have made it mandatory to write case study reports, at the time of each sales accomplishment or project closure, to capture the knowledge generated in the business processes. The case studies covered many important topics including the customer issues, project problems, trouble shooting, lessons learned, decision rationale and best practices. To ensure quality and usability, the subject experts systematically review the knowledge objects before making them accessible to the wider organisation.

This study also depicts the role of professional communities (CoPs) in ensuring the quality of the knowledge artefacts created in the organisation. Several organisations, participated in this study, have developed expert roles and groups. They evaluate the authenticity and quality of the knowledge objects created by the employees in the respective subject domains. The evaluators are usually the senior managers, with vast experience in the domain, who can judge the knowledge artefacts and add value to them. They can also rate the business value of the knowledge objects to provide rewards for the employees creating them.

4.1.3.5 Content management (F21)

This study signifies the role of content management in the KM function. In distributed organisations, this factor is playing a prominent role because of the enormity of content generated by the employees across various business divisions. Table 4.26 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the properties and specific KM strategies observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties

1. Content management is a crucial KM element for creation and dissemination of organisational knowledge. KM teams are often responsible for overall organisational content management.
### Table 4.26 Content management (F21): Substantiating concepts and codes

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
</tr>
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<tbody>
<tr>
<td>Content management, knowledge maps, expert maps, documentation, codification, content publishing, content structure, taxonomies, navigation, document management, work flow, content updation and content collation.</td>
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<table>
<thead>
<tr>
<th>Substantiating codes</th>
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<tbody>
<tr>
<td>“I think……..Carl Linnaeus (father of taxonomy).............who first grouped....plants, animals and flowers....into genesis and groups.....he did this in 1650. I think that’s where we are with knowledge in medicine........we don’t know what is a flower and what’s an animal...........but lots of it running around. What we need to do is spend some time putting it together so that we can answer the questions that are relevant, we can see where there are no answers and we can take our research efforts forward from there”. (64d)</td>
</tr>
<tr>
<td>“Document management........is very different from project to project and organisation to organisation. No clearly shared approach...........it is very much dependent on the people...........in some places it is terrifying and in some places it is very formal and organised. Usually it is through meeting minutes...........share the documents in the meetings (ppt slides, other material) or before the meetings through the intranet. We are using now the Quick place...........where each member can access and publish the documents...........only very few modern thinking people use these things...........we leave it to people whether they use this or not. But we try to motivate them to use more and more...........because it’s more efficient way...........We want to get the information from the locker to the net... because if its here (in the locker) only you can see it...........and that’s often with the people who are not that much attached to Intranet and internet”. (21ab)</td>
</tr>
<tr>
<td>“Content management........we have an organisation for this............at Head office, the communication department............and in each country, we have small departments doing the same thing locally. And...it’s guided by head quarters. It’s just very explicit management. In this country...........the content manager does this. Actually he is just coordinating the content submitted by different departments...........you really have people who have a look at it...........they try to keep the quality up...........the content comes from the departments”. (22d).</td>
</tr>
<tr>
<td>“.............I (content manager) can also see how the content is viewed...monitoring...site statistics. I can see how this site is viewed...how many people have accessed the site...how many people downloaded the document. If there is an old content I have to renew it...........with relevant. We can compare the usage patterns on a time frame basis so that ...it can reviewed and improved. For example you can see...how the content is used between Jan 2003 to June 2003”. (43d)</td>
</tr>
<tr>
<td>“We have a people finder.............we can search by employee names.............gives contact details and place in organisation structure. People finder.............gets automatically updated with the changes in peoples profiles..............workflow is also automated”. (58d, 60a)</td>
</tr>
<tr>
<td>“It’s different here...........there is a hierarchy within a division and between. If you want to know something.............would go to Urology consultant...........they know where to go. They didn’t need to know a name. She has no idea who she talked to.............but she knew she went to that department and asked him that. It’s a little bit easier here I think...........there is a clear cut expertise division in medicine”. (101a)</td>
</tr>
<tr>
<td>“Through our portal.............we have access to.............global employee database (map).............Who is who, reports they do, what they do, their superiors, structural connections...so on”. (112c)</td>
</tr>
<tr>
<td>“On the portal.............we will be able to look for information in three ways. One...Search for information.............Basic search or Advanced search. Two...All information in the portal is categorised...........we don’t call it as map.............but people would be able to browse through different categories of information.............domains and sub-domains. Three is...........you can look for a specific kind of document.............it can be a white paper etc. We have a search...which will fetch the documents in that particular area.............the search is called KM 360.............the search is called KM 360.............it searches information from all the applications”. (165da)</td>
</tr>
<tr>
<td>“Registering in Expert Locator .............Its very...very simple form. You just put in your name, number of years of experience, and areas in which you would be able to answer the question. We made it very simple...........because people should not feel that.............we have to enter so much of information”. (170da)</td>
</tr>
<tr>
<td>“To contribute things (knowledge objects) is a very easy process. You just code.............have a document and you fill in taxonomy.............taxonomy would be.............title of the document, description, keywords, author’s name, categories to which it is mapped, business application area, industry Segment domain, reviewed by, copyright comments.............etc. So there are close to 20 fields to describe the document. So it differs...........if you are uploading a proposal then the taxonomy would be different. If you are uploading a white paper then the taxonomy would be different. It’s based on the type of knowledge objects.............so that’s about uploading”. (178bc)</td>
</tr>
<tr>
<td>“When a person uploads some thing.............that person enters.............name, email ID, vertical information.............etc. So.............if you open a document.............the document itself consists information.............the first page would carry the information about the author”. (180c)</td>
</tr>
</tbody>
</table>
2. Content editors and managers (for intranets, extranets, and knowledge portals) are some of the very few dedicated jobs observed in the KM function.

3. In distributed organisations, the content may be spread across different professions, information systems, functional divisions, and countries. Managing such diverse range of content is a complex KM task.

4. Lack of organisation-wide content management approach can be detrimental to KM. Because each of the business divisions may develop and organise content in their own way, resulting in a total chaos.

5. In large distributed organisations, employees can be unaware of where to place their content, where to find right content, and whom to contact for specific content. This is largely due to the wide dispersion of people and knowledge.

**Specific KM strategies**

1. The KM strategy should include and describe a content management approach for the whole organisation. This should include unification and standardisation of content management procedures throughout the business divisions, functions, and professions.

2. Knowledge artefacts or content such as protocols, FAQ's, guidelines, and best practices should be organised in an easily accessible and understandable way.

3. Enterprise portals play a major role in effective content management. They help in standardising and unifying the content management practices across the organisation. Web based uploading with proper document classification mechanisms are vital in this area.

4. KM team should deliberately address and communicate the planning, classification, and organisation of content. Developing standard taxonomies for the whole organisational content can help immensely in this area.

4. Developing an organisational knowledge map encompassing various professions, knowledge areas, and functional expertise can serve as a
valuable KM tool. Knowledge maps can help in simplifying aspects such as who knows what, and where to go for specific knowledge. They can range from a simple contact list to an expert database.

5. Web based knowledge maps and content taxonomies can also help the customers and business partners to find the needed knowledge about the organisation.

6. Content should be periodically reviewed and updated on various communication channels (e.g. enterprise portals). For instance, the content such as market reports, news, and events change very rapidly and need constant updation. Therefore, dedicated content editors may be needed for these tasks.

7. In the large distributed organisations there can be several portals or websites for each business division or country. In such scenarios, the look, feel, and organisation of content should be standardised on all the websites/modules of the organisation. This will help employees and external customers in the seamless accessing of the worldwide organisational knowledge.

8. A special attention should be given in managing content generated by CoPs. Both virtual and physical CoPs need effective content management systems and approaches for capturing, organising, and disseminating the knowledge generated from their collaborations.

Discussion

The majority of the respondents in this study have revealed that the content management is a crucial factor in knowledge management. This factor encompasses issues such as document management, development of taxonomies, knowledge maps, search mechanisms, content evaluation, updation, and dissemination. Several other authors also support the significance of the content management in the KM function (Mack et al., 2001; Marwick, 2001; Natarajan & Shekhar, 2000; Robson et al., 2003). This study also supports an established view in current KM literature that the technology has a predominant role in the content management. For instance, Marwick (2001) suggests organisations to use search engine technologies and document
management systems. The majority of the studied organisations have some form of content management system in place.

Many interviewees in this study have noted that content management is consuming a significant portion of the KM resources. The content editors, web editors, and technical writers are some of the very few KM jobs which are totally dedicated to the KM function. Most of the other KM jobs are embedded in the existing functional roles. In their organisations, the enterprise portals are proving very effective for managing the enormous content generated across various business divisions. Many respondents have suggested automating and integrating the work flows and content management activities with the enterprise portals. This approach can reduce the time span for creation and dissemination of knowledge across distributed organisations. Mack (2001) also suggests that the portals can significantly enhance the content management.

**4.1.3.6 Knowledge sharing and reuse (F22)**

Knowledge sharing and reuse is a complex KM factor because it converges with several other factors discussed before. However, this study has revealed many precise issues and strategies which specifically focus on enhancing the knowledge sharing and reuse in distributed organisations. Table 4.27 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

*Properties*

1. A significant part of the needed knowledge already exists across the business divisions in distributed organisations.

2. People may reinvent the knowledge in the absence of effective knowledge sharing and reuse practices. Knowledge reinvention may consume crucial resources and demote innovation.

3. The most shared and reused knowledge artefacts include best practices, sales proposals, white papers, stories, case studies, protocols, testimonials, and guidelines.
Table 4.27 Knowledge sharing and reuse (F22): Substantiating concepts and codes

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
</tr>
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<tbody>
<tr>
<td>Knowledge sharing, knowledge reuse, knowledge reinvention, formal knowledge sharing, informal knowledge sharing, knowledge reuse, informal contacts, previous project connections, knowledge flow and dissemination.</td>
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<tr>
<th>Substantiating codes</th>
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<tr>
<td>&quot;...these HR divisions were self inventing and reinventing things without innovating...without integration and collaboration...handling only their business divisions. These departments won't talk to each other. You are doing business...but not talking and thinking at meta level&quot;. (9d)</td>
</tr>
<tr>
<td>&quot;How do you make people...to create and share knowledge...an every day practice?...Here its very easy...in our department we can drive change. How do we do it nationally is a difficult question. In our department we have guidelines...we will take the knowledge we generate...as the guidelines and put them into practice. We needed a pathway...for creating knowledge...and in order to get to that pathway we did a number of things. We did a number of secondary research projects. We also undertook primary research projects. You don’t come up with these things instantly. It takes a while to do those things&quot;. (74da)</td>
</tr>
<tr>
<td>&quot;If people have access to networked resources...more and more people will share knowledge and produce knowledge&quot;. (84b)</td>
</tr>
<tr>
<td>&quot;On the knowledge portal...we can select a country...I can see what marketing communications they have done. For example in India...they have introduced 30 campaigns...they were very active in 2004........From this campaign any other division/country can get the theme or reuse the knowledge...it may fit perfectly to the markets...wholly or in part...such as theme, slogan, marketing agency details..........I am not in India...I am here...and I can see the marketing communications of any country. We can contact and collaborate with the people/division.........of any country......Can ask the agency who work for them.....I can contact and say...hey I like your marketing communication campaign...please send me high resolution picture...it will.............reduce costs, time to market, agency costs of course, briefing time, explaining themes, tests etc&quot;. (41a) (41b)</td>
</tr>
<tr>
<td>&quot;The conferences and other events spread knowledge....may not be in a planned way...may be in a haphazard way. I wouldn’t say it’s planned...they do it by repetition...like...saying...these are new knowledge and these are the best of the new knowledge selected for presentations&quot;. (88c)</td>
</tr>
<tr>
<td>&quot;In our division......because it is very nice and close.....we openly share the knowledge and have it openly, and again it’s up to you whether you follow it and again it depends on the practice and the people........we meet very often at least once in six weeks and again socially&quot;. (197bc)</td>
</tr>
<tr>
<td>&quot;If you have........particular complicated problem...........if you come across..........and you are dealing with it.......and if you have success with it........you feel happy about it.........and you discuss with others........saying that we had this case and this is how we dealt with it.......and have you come across it.......So cross questions.......cross knowledge......we always discuss it&quot; (198bc)</td>
</tr>
<tr>
<td>&quot;People always share...............they kind of gossip. Five years ago........I would have said........people spend........70 % time in the job he is doing and 30% in sharing knowledge. Today I would say that’s gone to...now its 50%...............tomorrow I would see that grow........that will make biggest difference........ where business values can be added. The processes (of sharing knowledge) are becoming standardised&quot;. (119b)</td>
</tr>
<tr>
<td>&quot;Each organisation and each line of business need to take a slightly different approach based on the nature of their work. Reuse may be very important in one group........not relevant at all for another group. For example........our support organisation has now actually built their entire organisation around competencies and skills, and their knowledge base is the most structured, strictly controlled, and managed one. Because for analyst........when an issue is important......the only way they can solve the problems is to go back to the knowledge base and analyse what happened before&quot;. (137a)</td>
</tr>
<tr>
<td>&quot;Now we have opened that knowledge base to the customers through web interface. So the customers can actually resolve their issues and find the possible solutions through self service. That’s a direct impact......because we are turning previous customer experience to resolve the new customer problems......In terms of analysts..........we have not increased the number of analysts......although the customer numbers have probably doubled.........and the issues numbers probably tripled. The only way to do it.................is basically by codifying some of that knowledge and presenting it to the customers for their consumption&quot;. (137c)</td>
</tr>
<tr>
<td>&quot;We have Project Data Bank (PDB). On PDB........we have information about the closed projects. If you look at them ......there are two things that people can do contribute or reuse........white papers, proposals, technical documents, case studies, expertise notes........so on&quot;” (178bc)</td>
</tr>
<tr>
<td>&quot;This is our Reusable Components Application.......and here.........Like I said........instead of documents........we have software components and tools. Here people can read the components........but one thing is sure that it’s not as open as document repository. Because tools need to be really...thoroughly checked before they are put into this. Because if you reuse the tool...in your software......then you have to be sure of its (quality etc.). What you are talking about there is document, but here it’s an actual component. So there are more mechanisms to ensure that the component which is being shared is thoroughly tested........quality checked&quot;. (179d)</td>
</tr>
</tbody>
</table>
4. Informal and formal employee connections within and outside the organisation can serve as the primary avenues for knowledge sharing.

5. CoPs play an important role in distributed organisations in the context of knowledge sharing and reuse. The global CoP members can serve as a great source for sharing and reusing the dispersed organisational knowledge.

Specific KM strategies

1. KM programs and teams should identify, synthesise, and organise the existing organisational knowledge and make it accessible to share and be reused throughout the organisation.

2. Development and dissemination of reusable knowledge artefacts is an effective KM approach. The reusable artefacts may include the best practices, FAQ’s, protocols, project databases, testimonials, and case studies.

3. Mentorship and apprenticeship programs are time proven strategies for knowledge sharing between the senior employees and newcomers.

4. Some of the useful approaches to promote knowledge sharing and reuse include the development of CoPs, explicit time allocation, organising knowledge sharing events, establishing enterprise portals, and promoting a questioning and learning environment.

5. Providing effective content management and knowledge accessibility mechanisms can reduce reinvention of knowledge, and improve knowledge creation. Enterprise portals can serve as valuable channels here.

Discussion

This study emphasises the significance of knowledge sharing and reuse in the KM function. The current literature provides an exhaustive coverage of the role of this factor in knowledge management arena (Cabrera & Cabrera, 2002; Hansen & Haas, 2002; Huysman & De Wit, 2002; Nonaka & Takeuchi, 1995, Wenger et al., 2002). For instance, Markus (2001) suggests that the knowledge
reuse process consists of four stages: (1) capturing or documenting knowledge (2) packaging knowledge for reuse (3) distributing or disseminating knowledge and (4) reusing knowledge. Whereas, Wenger et al., advocate the organisations to develop CoPs for enabling knowledge sharing and reuse. Some other authors concentrate on the issues such as technology and culture (Bansler & Havn, 2004; Stenmark & Lindgren, 2004). These views clearly imply the convergence of this factor with several other factors, discussed before in this dissertation, such as knowledge creation (F25), CoPs (F15), and content management (F21).

The majority of the respondents in this study have suggested that the knowledge sharing and reuse can provide many tangible benefits such as increased sales revenues, improved quality, reduced costs and time to market. For example, reuse of knowledge artefacts such as customer sales proposals, best practices, protocols, and software components can provide substantial cost and quality benefits. However, the organisations need to provide needed resources such as employee time, financial resources (e.g. funds for events), technological infrastructure to enable knowledge sharing and reuse.

4.1.3.7 Business Processes (F23)

The majority of the respondents have stated that the business processes are an important factor in the KM function. The KM programmes in their organisations are constantly enhancing the knowledge flows by identifying and optimising the Knowledge Intensive Processes (KIPs). Table 4.28 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies or best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties

1. A large proportion of the organisational knowledge lies in the business processes. In many organisations the sales, marketing, and product development are often regarded as the most Knowledge Intensive Processes (KIPs). Making the knowledge of such processes visible, and managing it effectively, is a tedious task.
“Now our organisation is really trying to get things done to do things in one way. Partly because...it is just totally inefficient... to not have one process.....to unable to use one information system. Small departments not seeing over the border of itself into another department (absence of collaboration)........That way we cannot be that lean, effective, and competitive.

“Process unification initiatives and measures..............Identifying main processes (KIPs) in our world wide divisions, analysing them, trying to find one process that covers all, and deploying. Not an easy thing. The projects for this includes Blue Planet supply chain processes, Ohin purchasing process, Galaxy, and Polaris global portal project. Polaris global portal project is front end of all processes..........one technology.....one structure.......for making e-business possible. These are all for standardising the company. You can say......all processes are been analysed and standardised”. (7d)

“Knowledge Transfer Group.............we are responsible for business process management........what we try to do here (Process KM team) is..........precision the business process management within the IT architecture........an idea to integrate business process management into IT architecture...into IT infrastructure. The idea is to start with the approach.................process management of business departments........documentation of work flow etc........that exists in the business departments. That is the basis step for this architecture. To find out what is there first........to find out what requirements we have......what we need..............our department is responsible for consolidating IT into the enterprise architecture”. (46ad)

"If you go into the business departments..............for example....logistics department....you will find out that they have lot of knowledge (about the processes)....But the problem is the knowledge is in the heads of the people. If you have some body...and ask how business is running...they will tell you...BUT if some one leaves the organisation......all the knowledge is gone....The link is no longer there................so the process documentation helps transparency”. (48b)

"Some how they(business divisions) are really interested in process documentation............because they say...aah.OK........I have a customer to deliver results...waiting for results..............he is waiting for this............the process is not running efficiently because of lack of information. But after documentation...........the problems and knowledge of the process are exposed  - and can be easily solved..............the complexities of processes are made explicit. If you talk about knowledge management..............we can document process with tools. For example......in a process...........we have an event and a then you have a function...than again an event and so on..............you can link to the function and link to the document. Then again......we go into the topic of knowledge management...because if people are involved in a process.....they can look at the process (document) and say..................may be we are right here and this is the information to fulfil this.............that could be a word document......that could be an excel sheet......or some thing like that......I don't know if you would agree on that...but this is some kind of knowledge management”. (48b)

"If a business department says OK..............we document our processes...we want to reach more transparency than what we have right now”. (43d)

"Process flow knowledge..............its web based.....everybody can login on the intranet..............we have to have admin access levels for that..............not everybody...but relevant and involved people. This is what the intention is......everybody should look at it and everybody should say......what we are doing is right...............here it could be improved..............than we say...How could we improve the applications and architecture.......with the use of process management. There must be some link between the process management and the improvements what we are doing here. So we take business process management..............analyse and optimise business processes..........and connect the IT systems”. (49b)

"We have a very heterogeneous IT systems landscape..................So nobody has an idea what it looks like..............of the whole of total thing. Even within the bigger departments...for example....logistics...has their own systems. The problem is.............you don't know which business processes are effected by a system. If we shut down a system...............we don't know which business departments will be effected. So That's another benefit of simple process documentation”. (49c)
“If you look at the processes...document them...analyse them...measure them. It should be much easier for IT department in requirement engineering and management...because lots of money is spent...for IT systems...may be 30-40% of IT projects fail...so you have to be more effective. One step that might help is this Process management and knowledge management”.

“We have some preconditions the business department has to agree to achieve the process transparency...they have to say...Yes...we want to see how the processes are running...I would say...Its an option...because...think about political issues. Some business departments just don’t want to. They say...even if you are talking about measuring processes...if you say...this process is not efficient...lets say they have too many people...we may tell they have too many people...you are doing something wrong. Then they say...we don’t want to know about that...this is the problem...they can say it would be helpful...on the other hand they can say...its none of your business”.

“The idea with the BPM approach is...start modelling and designing the processes...then we have to get them more detailed (documenting)...for example...software engineering...KM...and so on...have to add technical terms...move on to UML ER diagrams...we have internal guidelines, methods and so on...on how to model processes...we use UML for process modelling”.

“If we are talking about IT implementation - that’s starts here (BPM)...because if we don’t know which business processes you want to support with the IT systems...its not efficient. And then If a business department agrees. So we have processes...they are documented...what shall we do next...the next step would be...to measure each processes...Key performance indicators. To implement a performance cockpit for the managers...analyse which processes are running well...which are not...the crucial questions...some how...are lying in the processes”.

“At the moment we go to them (business departments)...recommend them...that it (process analysis) would be helpful. You need to find the right arguments for that...They focus on their daily business...The business departments...this is an extra work...they don’t have the resources to document processes. If they don’t see the benefits which are really important in implementing this approach. And also budgets...money...the business departments bears the expenses”.

“The benefit would be that...if the business departments are modelling their processes...then if we talking to implement new technology...implementation of SAP...and we have process models ready...we put these process models into SAP. If we have the work flow...then the system runs according to new plan. This is ideal and future...very ideal...we are talking about future”.

“We are talking about measurements...might be another argument for them...for business unit...to say OK (for process analysis)...Identify processes which can be enhanced or improved...because business is not running well”.

“This (process documentation) was really important for ISO certification...we had all the processes and work instructions documented. Again KM comes here...we have Lotus Domino Doc integrated. All these documents are put into this KM system”.

“Business partners and value chain process knowledge sharing...there is no standard for this...there is a research project going on at the moment...called Partner integration. We are talking about the suppliers...developing products for us...services for us...and so on. Its not clear...how these processes are running here...the research project is to define such methods to map the process...for partner integration...suppliers other value chain partners. If some thing changes here...the suppliers are affected...and also other way round. This is a very difficult thing”.

“The explicit knowledge is very much around the products functions and features...pretty well defined processes...etc”.

“Top three knowledge intensive business processes at our organisation...Sales process...Business planning...Marketing”.

“KM...its an interesting field as I say...and the debate going around all the time...on whether you should start KM at the technology end...or you should start at the process...or culture end. I think that everyone agrees that...it is a combination of all. But which comes first...where you put your emphasis...it is some thing dependent up on the organisation itself...how the things work...how the people perceive certain things. From our perspective...showing tangible results are usually around some of technology...technology being part of our day-to-day life.”

“Knowledge Intensive Processes...all customer facing processes...they are hardest...but they have the biggest impact...they are the most visible”.

“Documenting process knowledge...there is a separate portal...which has...everything about the processes we have...in the form of documents. There is a team called Software engineering group...they document all the process knowledge and develop...templates, guidelines, work flow, flow chart...everything is documented. In fact...one thing we are trying to do is to integrate that with portals”.

“It is all related to what KM can do...Process redesign include KM aspects and functions...reengineering processes, integration services, legacy systems management, migrating the systems...”.
2. Business process optimisation is a major avenue to enhance enterprise knowledge management. However, process improvement projects across the business divisions are complex, expensive, and time consuming.

3. Effective management of the process knowledge can provide immediate, tangible, and sustainable business benefits.

4. In distributed organisations, especially the global corporations, there can be divergent business processes in various business divisions for achieving a common business task. These process variances result in inefficiencies and hinder knowledge flows.

5. Various business divisions in distributed organisations can be rigid, and may not expose their process knowledge because of the fears such as change, loss of power, and layoffs.

6. The value chains such as product development and service delivery may encompass the processes of the external business partners. Such scenarios result in the difficulties in managing the process knowledge, because of the privacy and security agreements.

Specific KM strategies

1. Managing knowledge of the business processes should be an integral part of the KM programs. However, the primary focus of the KM team should be on the most Knowledge Intensive Processes (KIPs) in the organisation.

2. Business process analysis and documentation can help in the identification of the KIPs, and capturing the crucial process knowledge.

3. Explicit management of the process knowledge can draw best practices from various business divisions and control knowledge hoarding. It can also help in identifying and filling the knowledge gaps in various business processes and trigger many process improvements.

4. Process optimisations for KM can include enhancement, alignment, automation, optimisation, and standardisation of business processes across distributed organisation.
5. The process KM initiatives often result in tangible business benefits such as direct cost savings. The KM teams can show these benefits as the business value or ROI generated from the KM investments.

6. The KM activities related to the business process changes should adopt optimisation strategy rather than total change. The KM teams should avoid full fledged BPR projects on their own, as they can derail the KM programs. One of the effective KM strategies is to collaborate with the existing process improvement projects (if any) and related people in the organisation.

7. KM programmes should give special attention to value chain business partners and include them in the KM initiatives.

8. Making the process knowledge accessible through the intranets, extranets, or knowledge portals can improve the visibility, and trigger improvements throughout distributed organisations.

9. Process KM may involve some important changes in business functions and operations. To make these changes happen, a high level of commitment, sponsorship, and pressure should be exercised from the top management.

10. Process documents from the quality programs and IT projects can be used for the KM initiatives and vice versa. Most of the IT and quality projects analyse the business processes in detail. Therefore, KM teams need to closely coordinate and associate with the other project initiatives.

Discussion

This study demonstrates that the effective management of the business processes is an important building block of the KM function in distributed organisations. Many respondents have suggested that certain process changes may be needed for the success and sustainability of the KM programs. Davenport (1998) also supports this notion and advocates that the crucial enterprise knowledge is generated, used, and shared intensively in a few business processes. These Knowledge Intensive Processes (KIPs) may vary depending on the organisation and the industry sector, but generally include, market research, product development, sales, and service delivery. They are
considered as the core processes along the value chain and primarily use knowledge in order to create process outputs (Eppler, et al., 1999; Remus & Schub, 2003).

The importance of managing the business processes in KM function is well articulated in the contemporary KM literature. However, there is a lack of specific and sufficient theories and concepts to address this factor. This study has revealed many KM strategies (listed above for this factor) for addressing the issues in this area. For instance, the KM programs in some organisations have analysed and documented the business processes to find KIPs and inherent knowledge flows. The respondents considered most of the customer facing processes as the KIPs. They suggested optimising the KIPs to capture vital customer knowledge from various market segments. The current literature, in the business management, also emphasises that gaining customer knowledge is a competitive advantage. Several authors advocate utilising it in product development and service delivery (Drucker, 1999; Gebert, et al., 2002; Hammer, 1990; Österle, 2001; Porter & Millar, 1985). Most of the studied organisations have created industry focus groups to gather and shove market knowledge into the product and service development processes.

Many respondents have also asserted that it is essential to integrate KM activities with the core business processes to enable seamless flow of knowledge in the day-to-day business life. This requires continuous analysis and improvement of KIPs to assess and resolve the knowledge needs, resources and gaps. These process initiatives standardise and spread KM activities from a few knowledge active teams and divisions to the whole organisation (Nissen & Levitt, 2004; Wenger, 2004). However, to accommodate KM activities in the KIPs, many respondents suggested making incremental process changes rather than complete reengineering. Total process reengineering, for KM, is viewed as a time consuming and complex task that can derail the KM efforts. Therefore, a continuous and incremental approach is favoured, whereby the KM activities are gradually planted in the core business processes.

4.1.4 Infrastructure

The infrastructure dimension encompasses two important organisational KM factors: Technological infrastructure (F24) and Physical infrastructure (F25). This study highlighted a prevalent notion in the KM literature that the organisational infrastructure is an essential dimension of KM. However, most of
the current KM literature concentrate on the Information Communication Technology (ICT) infrastructure and ignore the physical infrastructure factor (Mack et al., 2001; Marwick, 2001; Hansen et al, 1999; Prusak, 2001; Roberts et al., 2000; Walsham, 2001).

Table 4.29 Infrastructure (Core category): Constituent factors and substantiating codes

<table>
<thead>
<tr>
<th>Constituent factors</th>
<th>Substantiating codes</th>
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<tr>
<td>Technological infrastructure (F24) and Physical infrastructure (F25)</td>
<td>&quot;KM........its an interesting field as I say.............. and the debate going around all the time.....on whether you should start KM at the technology end...........or you should start at the process...........or culture end. I think that everyone agrees that it is a combination of all. But which comes first...........where you put your emphasis........it is some thing dependent up on the organisation itself........how the things work........how the people perceive certain things. From our perspective...............showing tangible results are usually around some of the technology...............technology being part of our day-to-day life&quot;. (131b)</td>
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<td></td>
<td>&quot;Clearly Information infrastructure is important..............if people have access for more and more........through broadband..............to networked resources..............more and more people..............will share knowledge and produce knowledge..............&quot; (84bc)</td>
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<td></td>
<td>&quot;Because of internet we have home work..............remote work..............in campus we have 5 big restaurants..............people are down there all the time. We don't micro manage people..............(we manage) more on what they should achieve. We will say go and figure out how to achieve it. We will provide KM training, and other infrastructures in helping achieving things..............to get the things done..............go and do networking. They primarily may go to portal..............then informal networks..............formal hierarchy. They first talk to peers..............and so on..............first informal and then formal&quot;. (119bc)</td>
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<td></td>
<td>&quot;We established the system, we established processes, organisation, and things like that..............now we go to the next step. We go step by step..............development of information tools, working tools, content management tools&quot;. (36c)</td>
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<td></td>
<td>&quot;In HR..............you find a lot of knowledge about Benefits, Personnel Law, and so on..............etc. Our internal customers (Business unit managers) have their needs..............we try to handle their needs in the most efficient way..............70% through intranet and self service..............20% through people in here (HR)..............10% by experts. This is a common model in industry as well. This explains very well..............why intranets and portals become so important..............it will be main channel for communications in future to the customers (employees). It's not always as simple as that..............but this is the model we are kind of pursuing&quot;. (10c)</td>
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<td></td>
<td>&quot;Some Business Units have their own (KM) portals..............which are accessible to their customers..............Offshore Development Centres (ODC's: customer project specific units)..............which has around 3000-400 people..............these guys have their own KM systems and portals in place..............which is accessible to customers, consultants, partners etc..............related to the project&quot;. (172a)</td>
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<td></td>
<td>&quot;We have ..............extranet..............because it's really important for us..............so that our partner, who is not the member of our intranet system, can have access to the system..............also general distributors and other partners far away from us&quot;. (33a)</td>
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<td></td>
<td>&quot;How do we change culture?..............culture cannot be changed by telling people to change..............people change by habits and attitudes..............and technologies can help change habits. Having the tools doesn't solve the problem..............but having the tool gives people an incentive to explore it further..............for example, if you are talking about that..............we needed to collaborate across the geographies..............and that not necessarily requiring travelling all the time. It's a good thing..............but how do you do it? ..............I think the role of the technology is really the enabling and habit forming aspect of it..............so..............technology enables the culture change&quot;. (131d)</td>
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<td></td>
<td>&quot;We are extending the use of some of our collaboration tools (KM infrastructure) and portal to our customers now..............by what we call the customer portal. We are trying to do more&quot;. (141b)</td>
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<td></td>
<td>&quot;I (Head of KM) have prioritised couple of things for this year..............my priority is to take this entire KM system into new platform in terms of..............upgrading the technology thereby..............the users, at large, get all the benefits in terms of..............superior content management, providing the rich content, personalisation to the extent possible. My priority is to..............cover larger spectrum of the organisation..............what I mean by that is..............the groups or divisions which are not included..............covered earlier (in KM)..............Largely these were (customer) support services. We are increasing the security levels..............so that we could bring various groups into the KM portal..............to bring every one&quot;. (186ab)</td>
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However, this study shows that the physical infrastructure also plays an important role in KM by influencing the knowledge sharing and collaboration aspects of the employees. Table 4.29 depicts the constituent factors of this core category with some substantiating codes. The following sections describe each of these factors in detail.

4.1.4.1 Technological infrastructure (F24)

All the respondents regarded technological infrastructure as an essential factor of KM in their organisations. Information and Communication Technologies (ICT) such as groupware, content management systems, and enterprise portals are the commonly observed elements in the study. This study demonstrates that it is difficult to implement KM programs and carry KM activities in distributed organisations without proper technological infrastructure. Table 4.30 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM best practices observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties

1. Establishment of the ICT infrastructure is a core and essential factor of the KM programs. It plays a major role in all KM activities, especially in knowledge accessibility, CoPs, virtual collaborations, and content management.

2. Intranets, extranets, and portals are the commonly used technology platforms for KM. They can dramatically improve the employee collaboration and cut down the communication costs.

3. In distributed organisations, especially the global corporations, the enterprise portals play an effective and essential role in creation and dissemination of the knowledge to all the business divisions and professions.

4. Various business divisions and functional departments in distributed organisations can have disparate technologies making it difficult to bring together the whole organisational knowledge.
<table>
<thead>
<tr>
<th>Substantiating concepts</th>
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<tbody>
<tr>
<td>Technological infrastructure, Information and Communication Technologies (ICTs),</td>
</tr>
<tr>
<td>information systems, groupware systems, collaboration tools, search technologies, user</td>
</tr>
<tr>
<td>access management, disparate IT systems, legacy systems, need for integration, technology</td>
</tr>
<tr>
<td>as change enabler, intranets, extranets, knowledge portals, and enterprise portals.</td>
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<th>Substantiating codes</th>
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<tr>
<td>&quot;We have intranet...quite evolved and progressed...but not evolved into a full portal stage. For outside and customers we have a portal. But inside for employees...the intranet...it is still a passive collection of information. It's not yet a living website/ portal with lot of interaction and self service functions...its evolving towards that.........but not there yet&quot;. (3c)</td>
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<tr>
<td>&quot;We have video conferencing on the portal......since we are heavily cutting costs severely since couple of years........we have to avoid travelling if possible. We are using products such as Net meeting......very often we leave away the video of meeting on the portal. We share online......the documents......we do it very often&quot;. (29d)</td>
</tr>
<tr>
<td>&quot;How do we change culture?.........culture cannot be changed by telling people to change......people change by habits and attitudes....and technologies can help change habits. Having the tools doesn't solve the problem......but having the tool gives people an incentive to explore it further........for example, if you are talking about that....we needed to collaborate across the geographies.....and that not necessarily requiring travelling all the time. It's a good thing ...but how do you do it? ..............I think the role of the technology is really the enabling and habit forming aspect of it........so......technology enables the culture change&quot;. (131d)</td>
</tr>
<tr>
<td>&quot;The countries who are really far way from us (Head quarters)........its (KM portal) much more important for them......they say...its so faraway, we are there once a year........so its really important for them to have a knowledge sharing channel&quot;. (37d)</td>
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<td>&quot;We have monitoring systems..............we can see the page views, downloads, and other statistics of(portal) access, downloads&quot; (37b)</td>
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<td>&quot;We have an interactive calendar (on the portal)............we can go into detail scheduling. We have whole features you can choose. We want to develop and have the calendar information........not only for one country......but all over the world.&quot; (44bc)</td>
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<tr>
<td>&quot;We have a very heterogeneous IT systems landscape....................So nobody has an idea what it looks like........of the whole...of total thing. Even within the bigger departments...for example ...logistics...has their own systems. The problem is...you don't know which business processes are affected by a system. If we shut down a system........we don't know which business departments will be effected. So That's another benefit of simple process documentation&quot;. (49c)</td>
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<td>&quot;In terms of synthesis of knowledge and propagation of knowledge...............going on to the web is definitely the right thing to do. We harnessed the power of the worldwide web. We have designed and developed a nice website and..............it does for us what we wanted it to do&quot;. (67ab)</td>
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<tr>
<td>&quot;You (employees) are expected to use many of the frameworks and tools ...such as central portals (Global knowledge portal)........it's a very rich and important source of information and also has an external face........it has developed quite nicely.....it's a smart tool..................through global portal............we have access to........customer information, presentations, files, white papers...............we got access to global employee database, who is who, reports they do, what they do, their superiors, structural connections..............so on&quot; &quot;. (108bc, 112c)</td>
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<td>&quot;On the portal.........we will be able to look for information in three ways. One...Search for information..............Basic search or Advanced search. Two...All information in the portal is categorised......we don't call it as map..............but people would be able to browse through different categories of information........domains and sub-domains. Three is...you can look for a specific kind of document...it can be a white paper etc. We have a search...which will fetch the documents in that particular area......the experts in that particular area........the search is called KM 360...it searches information from all the applications&quot;. (165da)</td>
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<td>&quot;On our portal...........we have........Expert locator, Networks for online CoPs, Virtual workspace, Project data bank, Teleconferencing, Message boards, Chat engines............search engines............etc&quot;. (170b)</td>
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<td>&quot;The use access levels are............different...............if you take the repository for example, there are some folders which are accessible to only certain managers that are involved . Likewise, we have a proposal folder........which is not accessible to everybody in the organisation........it is for the people who work on those proposals. Technical repositories....any one can access. Just proposals and key customer information have restricted access&quot;. (171da)</td>
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<tr>
<td>&quot;We do have and use CRM systems...........we do have CRM suite of applications......sales force use it....its called Sales Online........It is Integrated with knowledge portal&quot;. (114b)</td>
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5. Establishing KM infrastructure and making it accessible to the business partners and customers, is an important but challenging task because of the privacy, security, and business agreements between various stakeholders.

6. Self service applications and online work flows are some common features which can enable virtual working in distributed organisations.

7. Effective search technologies and mechanisms are needed for the employees to fast find the needed knowledge from the vast resources available within and outside the organisation.

8. Technologies such as emails, message boards, blogs, chat engines, video conferencing tools, and other groupware systems are the most used applications in the knowledge work.

Specific KM strategies

1. The KM strategy should address the ICT infrastructure element as a core factor. The technological infrastructure can help in changing employee habits and promote knowledge culture throughout the organisation.

2. Establishment of the enterprise knowledge portals is an effective KM strategy for distributed organisations, especially the large and global corporations. The portals provide several important systems such as groupware technologies and content management tools on a single platform. Therefore, portals can serve as a single window for various business divisions to access the enterprise knowledge.

3. Establishing KM roles such as content editors can be useful and sometimes essential in managing the enormous knowledge generated in distributed organisations. However, most of the operational aspects of the KM infrastructure should be allocated to the respective business divisions. This approach ensures constant updation of knowledge.

4. Incorporating KM infrastructure with the core business processes to enable knowledge creation, sharing, access, and reuse is an important approach which helps in the sustainability of the KM programmes.
5. Implementing an effective and secure user access management system can make it possible to open the organisational knowledgebase to the business partners and customers. Organisations can cut down costs in the areas of product development, sales, and customer service by opening the knowledge base in a controlled way.

6. Developing a separate module in the organisation’s portal or a separate portal altogether, can be essential in certain collaborative projects with the business partners and customers. Projects such as joint product development with business partners may need such KM initiatives to leverage on the knowledge of the both sides. Separate portals may be necessary because of knowledge privacy agreements of various organisations.

7. Integrating various existing IT systems can help in bringing together the dispersed organisational knowledge. The integration includes building technology bridges between disparate IT systems such as ERP systems, CRM systems, and legacy systems of various business units and functional divisions. Integrating diverse systems and providing single window for organisational knowledge should be a long-term and essential part of the KM strategy.

8. Building effective search engines and mechanisms can assist the employees in fast finding the relevant organisational knowledge. Content taxonomies and classification mechanisms can help immensely in this context. Effective search technologies promote the usage of the KM infrastructure as they provide accurate information based on the search terms and queries.

9. Incorporating collaboration tools such as videoconferencing, blogs, and message boards in the portal can also help in enabling the virtual working environment.

10. Employees throughout the organisation should be explicitly made aware of the available KM infrastructure. This should form an integral part of KM evangelisation.

11. Appropriate levels of autonomy and security should be provided for the collaborations and content of the CoPs. These issues will be crucial in the development of CoPs as they provide trust for the members to participate in
the virtual collaborations for creating, accessing, sharing, and using knowledge.

12. Developing certain monitoring mechanisms on the usage of the KM infrastructure can help in its continuous improvement. For example, statistics such as site feedback, usage patterns of knowledge objects, and most visited pages, can help in modifying, orchestrating, redesigning, and development of content and infrastructure.

Discussion

Majority of the respondents in this study viewed that it is fundamental to establish the Information & Communication Technology (ICT) infrastructure to facilitate the knowledge management functions. Knowledge portals, in the form of intranets and extranets, are the most common type of infrastructure observed in the organisations explored in this study. Such technological infrastructure is far more important in distributed organisations because of their global dispersion. Other recent studies (Detlor, 2004; Gottschalk & Khandelwal, 2004; Spies et al., 2005) have also found that knowledge portals play an important role in KM. All of the organisations explored in this study, have been making considerable investments in an array of technologies for providing KM infrastructure. The observed technology components include groupware, search engines, virtual conferencing tools, data mining technologies, content management systems, decision support systems, and Artificial Intelligence (AI) tools. These technologies are often integrated into knowledge portals to provide a single gateway for accessing the organisational knowledge resources. Through these portals, people can access, create, organise, share, and utilise enterprise knowledge via seamless collaborations. Figure 4.3 depicts a conceptual view of the ICT architecture observed during this study.

The majority of the respondents have asserted that knowledge portals are an effective way to provide open access to all relevant information to the employees. This organisation-wide access can prevent information hoarding and directly enhance the knowledge culture. This study has also revealed another evident trend, wherein organisations extend the knowledge base access to the business partners and customers. Though such access is restricted to certain areas, it is playing an important role in collaborative product development, service delivery, and project accomplishments (Oliver & Kandadi, 2006).
Very few respondents supported a persistent criticism in KM literature that the technology takes superfluous lead role in KM programs (Malhotra, 2004; Wilson, 2002; Ruggles, 1998). There is a pervasive view among the respondents that technology can significantly promote knowledge culture by changing employee habits in terms of communication, collaboration, information sharing, learning, and decision-making. The portal infrastructure can also serve as the essential ‘Ba’ component (an interaction platform, a place and context in time-space nexus) of the KM theory developed by Nonaka & Konno (1998). Many respondents asserted that the infrastructure is central for virtual communities (CoPs) and an essential part of all KM programmes, making it a vital factor for managing enterprise knowledge in distributed organisations (Oliver & Kandadi, 2006).

### 4.1.4.2 Physical infrastructure (F25)

This study shows that the physical infrastructure such as the work place design and the availability of informal meeting amenities can also influence the KM. In some cases the respondents have mentioned that the physical work environment has heavily influenced the KM activities in their respective
organisations. Table 4.31 presents the substantiating concepts and codes for this factor. The following sub-sections enumerate the factorial properties and specific KM strategies observed during this research study. A brief analytical discussion is provided for this factor, based on a critical comparison of the findings with the contemporary KM literature.

Properties

1. The physical infrastructure in the organisations can have significant impact on the employee collaboration and knowledge sharing.

2. The important elements of physical infrastructure, which can influence the knowledge culture, may include the office design, cubicle layouts, meeting amenities, and internet accessibility.

3. Differences in physical infrastructure, across the dispersed business units of a distributed organisation, can result in the variances in knowledge culture.

Specific KM strategies

1. The KM strategy and teams should try to influence and shape the physical infrastructure of the organisation towards a knowledge sharing mode.

2. Policies such as open-door offices, open access cubicles, and effective internet access can significantly improve the knowledge sharing culture. Adopting a standard workplace design and policies throughout the business locations can unify the knowledge culture of the organisation.

3. Physical amenities such as meeting rooms, in-house cafés, discussion tables, open presentation rooms, campus wide internet nodes, etc., can significantly improve the probability of informal collaborations and knowledge sharing. These can also help in the development of an effective knowledge culture in the long run.
Discussion

Most of the extant KM literature ignores the role of physical infrastructure in the enterprise knowledge management. This study explicitly shows that the physical configuration of the work environment can significantly influence the knowledge activities in distributed organisations. Structural characteristics such as, shared areas, cubicles with low dividers, open spaces, and other informal meeting amenities can help people in the process of social networking. These physical characteristics can facilitate the flow of knowledge across the organisation. Research studies at Alcoa, British Telecom, f/X Networks (Cohen & Prusak, 2001), BP (Chiem, 2001), TBWA CHIAT DAY (Gladwell, 2000) and SAP (Czarnecki, 2001) emphasised the role of physical work environment in employee collaborations and innovation.

Table 4.31 Physical infrastructure (F25): Substantiating concepts and codes

<table>
<thead>
<tr>
<th>Substantiating concepts</th>
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<tbody>
<tr>
<td>Physical infrastructure, office design, closed-door offices, open-door offices, internet nodes &amp; connectivity, meeting rooms, presentation equipment, cafés and in-house restaurants.</td>
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<tr>
<th>Substantiating codes</th>
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<tr>
<td>&quot;Because of internet we have home work........remote work........in campus we have 5 big restaurants........people are down there all the time. We don't micro manage people.......(we manage) more on what they should achieve. We will say go and figure out how to achieve it. We will provide KM training, and other infrastructures in helping achieving things......to get the things done.....go and do networking. They primarily may go to portal........then informal networks........formal hierarchy. They first talk to peers.....and so on.......fist informal and then formal!&quot; (119bc)</td>
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| "Knowledge sharing culture in our organisation............spontaneously, I would say.....it's different in every country. I don't see any global knowledge sharing culture yet in our organisation. But.......for example............in our head quarters (HQ).......I saw for first time that there can be a totally different culture in knowledge and information sharing. Practical example............our HQ is designed for easy information and knowledge sharing. There, we do not have cubicles........we have........lot of offices side by side........with glass walls. The doors are usually open.......you can drop in when ever you want........you meet people everywhere.......you have coffee corners........where you meet every one. Usually if you want to exchange information or meet people.....you can go into the coffee room........meet other people, discuss ideas....great ideas are born/created in the coffee rooms. It's really a totally different information sharing culture. The office structure was built to share knowledge/information. It really works.......it really convinced me that it works. Its informal way of making sure that information flows seamlessly........................Where as here (in this local business division)...........It's a partly determined culture. Where the office structure is usually closed...where every thing is cut. And also here.......the culture is usually do not share information if its sensitive, politically sensitive, too early, not public...............very difficult to gain information here....do not get strategic signals and information informally. I do not have clear strategic informal signals - to go forward as an employee. In which direction shall I go.......In HQ there was no such problem as it exists here". (6a) |

| "We don't have............video conferencing (globally)...........because not in every country there is technology............internet speed............infrastructure. We try to reduce the size of the documents to a minimum............we make the TV spots(marketing knowledge objects)............divide into files.....to optimise for downloads". (45cd) |

| "This division has always been very internet savvy...........because we had massive MB (bandwidth)............before people were on 28k(bandwidth)...........we were on 12 Mb............we have been very lucky. Many other divisions............you find that's not the case". (104d) |

| "Physical infrastructure............we have............meeting rooms............internet nodes............presentation equipment in the meeting kiosks............and phones............so on. The room doesn't have to be booked............if it's empty............you can just walk-in for a meeting". (176d) |
For example, one of the interviewees of this study has worked at his organisation’s global Head Quarters (HQ) for two years as part of the employee development program. The interviewee had experienced phenomenal differences, in physical office environment between the HQ and his divisional office, which directly affected employee collaboration and knowledge sharing. In this case, unlike the divisional office, the HQ has adopted an open door policy and does not have conventional cubicles. The office cabins at the HQ were built using glass walls and doors so that everybody can see whether someone is busy or available to talk. People can walk into any of the offices without prior appointment. These characteristics have explicitly promoted the development of a culture of openness and knowledge sharing among the employees at HQ. When the interviewee returned to his own regional division at the end of the program, he noticed that the physical work environment at his division is rather enclosed which deterred the social networking and flow of knowledge (Oliver & Kandadi, 2006).

During this research study, in many of the organisations, the author has observed provision of physical amenities such as discussion rooms, internet café’s, common dining halls, open door offices, and informal meeting tables. These common shared spaces have contributed to the development of knowledge culture by facilitating informal collaboration between the employees. They provide a high probability for interaction between the people from various functional departments and aid in the crisscrossing of organisational knowledge. Positioning the presentation equipment, couches, whiteboards, internet nodes, notepaper and pens in these shared spaces assist and encourage employees to do useful organisational work during the informal gatherings. Based on the author’s observations and the annotations from respondents, it can be asserted that physical structure and design of the work environment play an important role in the development of knowledge culture. Extant literature in social behaviour and architecture also suggest that the organisations should consider these workspace characteristics to promote employee collaboration and knowledge sharing culture (Anderson et al., 2001; Cohen & Prusak, 2001; Chiem, 2001; Girard, 2004; Kolleeny, 2003; Oliver & Kandadi, 2006).
4.2 A meta-level KM framework (BCPI Matrix)

A meta-level framework is developed for practicing knowledge management in distributed organisations. The framework is based on the empirical findings of this research study. This KM framework is termed as the ‘BCPI Matrix’ to resonate with the four core organisational dimensions explored in this research study: Business focus, Culture, Process, and Infrastructure (BCPI). The proven principles in the current KM literature are also integrated in this framework, based on the critical discussions made in the previous sections for each of the KM factors (F1-F25). The process coding techniques of the grounded theory approach are used extensively for building the BCPI Matrix (Strauss & Corbin, 1998). The framework aims to address the research problem (P) and achieve the goal (G) of this study.

Figure 4.3 presents the BCPI matrix encompassing several fluid phases. Phases A and B focus on developing the Cultural dimension for KM in distributed organisations. Phases I to IX concentrate on the remaining three KM dimensions: Business focus, Process, and Infrastructure. These phases provide a sense of direction and sequence for practicing KM in distributed organisations. The organisations need to consider the BCPI matrix as a meta-level KM template, and customise it according to their business needs. Each of these phases can change their positions depending on the specific KM requirements and organisational circumstances. However, the KM factors (F1-F25) described before in this chapter, can assist in customising the BCPI matrix accordingly.

This BCPI Matrix deliberately avoids meticulous details or descriptions for each phase. It aims to provide a swift and comprehensive view of KM, and avoids repetition of the descriptions that have already been made for various factors involved. However, precise cues are built into the framework in the form of various factors (F1 – F25). These cues provide directions to the detailed KM strategies, initiatives, and measures pertaining to each of the KM factors. The following paragraphs provide a brief overview for each of these phases and provide directions to various factors for a more detailed level of understanding.

4.2.1 Phase-A: Developing knowledge culture with soft factors

Phase-A in the BCPI Matrix attempts to address the soft part of the cultural dimension. This phase aims to develop an effective knowledge culture in distributed organisations by developing the leadership attributes in the
### Business focus - Need
Knowledge dispersion (F1), Employee turnover (F2), Market environment (F3), Virtual working (F4), and Innovation (F5)

### Process and Infrastructure

#### Phase-wise KM implementation route with various factors

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase - I</td>
<td>Identification of the business need &amp; Formulation of the KM vision &amp; strategy (F17)</td>
</tr>
<tr>
<td>Phase - II</td>
<td>Establishment of the organisational structure for KM (F18)</td>
</tr>
<tr>
<td>Phase - III</td>
<td>Initiation of formal KM programme with a pilot project (F19)</td>
</tr>
<tr>
<td>Phase - IV</td>
<td>Optimisation of the Knowledge Intensive Business Processes (KIPs) (F23)</td>
</tr>
<tr>
<td>Phase - V</td>
<td>Establishment of the technological infrastructure for KM &amp; optimising the physical infrastructure (F24 and F25)</td>
</tr>
<tr>
<td>Phase - VI</td>
<td>Establishment of content management systems and approaches. (F21)</td>
</tr>
<tr>
<td>Phase - VII</td>
<td>Creation and developing of the Communities of Practice (CoPs) across the organisation (F15)</td>
</tr>
<tr>
<td>Phase - VIII</td>
<td>Developing knowledge creation, quality control and sharing mechanisms (F20)</td>
</tr>
<tr>
<td>Phase - IX</td>
<td>Evaluation of the KM project success and business value provision. (F6)</td>
</tr>
</tbody>
</table>

### Business focus - Value
Value addition (F6)
managers (F7); providing knowledge accessibility (F8); enabling employee learning (F10); evangelising KM (F14); and change management to embrace KM (F13). The KM factors involved in this phase are abstract and non-sequential in nature. Therefore, the organisations need to take a continuous development approach regarding this phase. For instance developing leadership attributes and KM evangelisations are long-term initiatives which need to be instigated on a continual basis.

4.2.2 Phase-B: Developing knowledge culture with tangible factors

Phase-B in the developed KM framework is also associated with the cultural dimension. It involves optimising the recruitment practices to measure knowledge aptitude of the employees (F9); developing the reward systems to encourage knowledge activities (F11); time allocation for KM activities (F12); and organising various events to promote KM in the organisation (F16). However, the core difference between Phase-A and Phase-B lies in their tangibility. The factors involved in Phase-B are easier in terms of their implementation. Concrete strategies and procedures can be adopted for implementing the aspects of phase-B when compared to those in phase A. For example, factors in Phase-B, such as reward systems and recruitment, can be easily optimised to promote the knowledge culture. Whereas, the factors in Phase-A, such as leadership and change management, involve higher complexity.

4.2.3 Phase-I: KM strategy formulation

The Phase-I in the BCPI framework involves formulation of KM strategy for the organisation. The strategy should be based on the business need for knowledge management in the organisations. The business need may arise from various factors (F1 to F5) described in the Business focus dimension. For example, for one distributed organisation the business need for KM can be the dispersion of knowledge across the business divisions (F1). For another organisation, it can be the necessity to manage market knowledge to enhance the sales and customer service functions (F3). Therefore, every organisation needs to identify a business problem or need which can be resolved by KM. The KM strategy should also be closely aligned with the overall business strategy of the organisation. The strategic integration of the KM can provide several benefits such as the commitment from the management, resource allocation, and take-up of the KM activities in the organisation. However, the KM strategy should avoid building
high short-term expectations (e.g. ROI) from the KM programmes. It is essential that people, at various levels of organisational hierarchy, understand the intangibility and long-term nature of business value provision from KM.

4.2.4 Phase-II: Establishment of an organisational structure for KM

This phase involves establishing an effective organisational structure (F18) for the KM function. It includes creation of KM jobs and roles throughout the organisation for implementing the KM strategy. The organisations need to avoid building large and centralised KM teams. Instead, small and agile KM teams, with around 5 people, should be developed across the business divisions. The hybrid-organisational structures (F18) discussed before can serve as a valuable approach in this phase.

4.2.5 Phase-III: Initiation of formal KM programme with a pilot project

This phase involves launching formal KM programme with a pilot project approach (F19). The organisations need to identify a pilot area for launching the KM programme. The pilot area can be a KIP, functional division, or a dispersed business unit. The business need described in the KM strategy can also guide the organisations in the pilot area identification. For instance, if an organisation envisages innovation as a key aspect, then the R & D division or product development process can serve as a pilot area for KM. However, this study shows that the sales and customer service functions can serve as the best areas of KM pilot projects. The KM pilot projects in these areas tend to be successful and show quick results because of the immediate impact of KM initiatives on them. In the pilot area identification for KM programmes, it is also crucial to select organisational vicinity where the people are positive towards knowledge creation, sharing, and usage. Once the KM pilot project exposes the benefits through these people, it is easy to convince the rest of the organisation about the KM value.

4.2.6 Phase-IV: Optimisation of Knowledge Intensive Processes (KIPs)

This phase involves identification and optimisation of the knowledge intensive business processes (F23). It includes conducting a swift and precise analysis of business processes in the pilot area. The process analysis and documentation can assist in identifying the KIPs, their knowledge flows, needs and gaps. Various KM activities should then be integrated with the KIPs which may need
some process modifications or optimisations. For example, KM activities such as story telling, best practice capturing, and case study writing, can be included in the sales process to enable knowledge creation and sharing. However, the KM teams should avoid comprehensive BPR projects in this context. This study shows that the monumental process changes can derail the KM programs because of the complexity and enormity of the work involved in such projects. Therefore, the KM team should instigate precise, incremental, and continuous business process improvements to include the KM activities in the KIPs.

4.2.7 Phase-V: Establishment of technological and physical infrastructure

This phase involves establishing technological and physical infrastructure to support KM in distributed organisations (F24 & F25). The technological infrastructure may include implementing groupware systems, document management systems, intranets, extranets, and/or enterprise portals. This study shows that the enterprise portals can serve as valuable platforms for creation, sharing, and dissemination of knowledge in distributed organisations. The portals facilitate integration and accessibility of the dispersed enterprise knowledge. This phase also involves optimisation of physical infrastructure. This may include adopting open workplace design, providing informal meeting amenities and effective internet infrastructure.

4.2.8 Phase-VI: Establishment of content management systems

This phase encompasses establishing content management mechanisms and systems for KM (F21). In distributed organisations, enormous amount of content is generated by the knowledge workers across the business divisions. The organisations need effective systems and approaches to organise this knowledge into meaningful and accessible forms. Developing the content Taxonomies, knowledge maps, search tools, and expert locators, can assist in effective content management. This study depicts that distributed organisations need to define uniform content management approaches for whole organisation to improve the knowledge creation and accessibility.

4.2.9 Phase-VII: Development of Communities of Practice (CoPs)

This phase involves creation and development of the professional Communities of Practice encircling the pilot KM area (F15). However, the CoPs essentially involve knowledge workers from across the organisation. These CoPs may touch
several other areas beyond the pilot KM area. This characteristic feature of CoPs enables spreading of the KM activities throughout the organisation. KM programmes should provide necessary resources (e.g. financing for events) and infrastructure support for the development of CoPs. This study shows that CoPs can be both formal and informal. Many of them may also involve employees from various dispersed business units or locations. Therefore, provision of technological infrastructure, for virtual collaborations between the CoPs members, is a necessary KM initiative in distributed organisations.

4.2.10 Phase-VIII: Development of knowledge creation, quality control, and sharing mechanisms

This is a complex phase which involves several KM initiatives for enabling knowledge creation, quality control, sharing and reuse (F20 & F22). The knowledge creation initiatives may include establishing CoPs, industry groups, knowledge synthesis approaches, and explicit-tacit knowledge conversion mechanisms. This study shows that the quality control of the knowledge artefacts is also equally important as the knowledge creation. Therefore, KM programs need to develop specialist roles (e.g. domain experts) to analyse and improve the quality of the knowledge artefacts created by employees across the organisation. The knowledge sharing and reuse approaches include developing the reusable knowledge artefacts such as best practices, protocols, process documents, FAQ’s, and software components. Enterprise portals can serve as effective channels for knowledge sharing, and provide open accessibility to the organisational knowledge.

4.2.11 Phase-IX: Evaluation of business value provision from KM

This phase involves evaluating the effectiveness of the KM programs and business value provided by them. This phase can help in identifying the tangible and intangible benefits from KM initiatives. It can also help in reviewing and enhancing the KM strategy and programmes. The drawbacks identified in the pilot KM programmes can also be addressed before an organisation wide expansion. However, this study depicts that the organisations need to take a cautious approach in the evaluation of KM benefits. The impact of KM programs is often intangible and spans several areas of the organisation. For instance, the financial value, of improved collaborations between the employees, is difficult to measure. Therefore, the traditional qualitative measures (e.g. ROI) can prove detrimental in this context. The KM initiatives should be viewed in a long-term perspective in terms of business value provision.
Based on the evaluation results, the KM strategy and programs need to be enhanced accordingly. The enhancements may include adjusting the strategy, modification of the KM activities, changing the KM organisational structure, and identification of additional business needs for KM. The enhanced KM strategy and programs should then be implemented across the organisation by repeating various phases of the BCPI matrix.

**Summary**

This chapter presented the empirical findings of this research study. An application of various analytical techniques of grounded theory approach has resulted in identification and description of a comprehensive list of factors (F1 to F25) influencing KM in distributed organisations. For each of the identified KM factor a set of properties, and strategies or best practices were provided. Based on these factors, a meta-level framework, termed as BCPI Matrix, was developed for practicing KM in distributed organisations.
5  CONCLUSIONS

“The possession of knowledge does not kill the sense of wonder and mystery. There is always more mystery”. – Anais Nin

Introduction
This chapter aims to provide conclusive remarks on this dissertation. These research conclusions are discussed under five headings: 1) Research problem, goal, and objectives 2) Theoretical and Practical contributions 3) Research methodology and validity 4) Limitations and 5) Further research. The first section provides a brief description on addressing the research problem, and the achievement of research goal and objectives. The second section provides an overview of the theoretical and practical contributions to KM subject arena from this dissertation. The third section discusses the validity of the findings of this research study. The fourth section looks at the limitations of the findings of this research study. Finally, the fifth section attempts to explore further research opportunities to extend this study to add value to the KM discipline.

5.1 Research problem, goal, and objectives
The research problem of this study was to explore and describe “How to manage enterprise knowledge in distributed organisations while encompassing the fundamental organisational elements?”. To address this research problem, a goal (G) was formulated i.e. “To develop a holistic framework for practicing knowledge management in distributed organisations”.

Development of BCPI Matrix, a knowledge management practice framework for distributed organisations, has addressed the research problem (P) and achieved the goal (G) formulated for this dissertation. The BCPI matrix was constructed based on 25 KM factors identified from the empirical data. The substantiating data was collected from six in-depth case studies conducted at some large
distributed organisations. The following paragraphs provide a brief overview of how the objectives charted for this dissertation were accomplished.

**Objective 1:** To provide a critical literature review of various concepts, theories and frameworks of knowledge management.

An in-depth critical review of KM literature was provided in the second chapter of this dissertation. This literature review encompassed several subject domains influencing the KM subject arena. These subject domains include Epistemology, Philosophy, Knowledge Management, Organisational Learning, Intellectual Capital, Change management, Business process management, and Information Systems. This multidisciplinary review has provided some useful insights to several aspects of KM such as the definitions of knowledge, diversity of the subject area, theoretical limitations, and practical problems. This critical review has also provided an opportunity to describe the research problem in detail and assisted in formulation of questions (Q1, Q2, and Q3) for this study. (Chapter 2)

**Objective 2:** To develop a group (based on literature review) of organisational elements which can influence knowledge management.

Based on a literature review in KM and other related subjects, a broad set of organisational elements were identified as possible KM issues (Table 2.1). These issues have been taken as guiding elements while conducting the case studies. However, the case studies were conducted with an open-minded approach to explore the KM factors beyond these guiding elements. (Chapter 2)

**Objective 3:** To conduct empirical studies at selected organisations with successful knowledge management programmes for understanding how various principal organisational elements can be managed in order to effectively manage the enterprise knowledge.

Based on an evaluative discussion in chapter 3, this dissertation has adopted interpretivist research paradigm and case study methodology for conducting this research study. The data was then analysed using grounded theory approach. Six in-depth case studies were conducted at some large distributed organisations with established KM programmes. A total of 25 KM factors (F1 to F25) were identified through this research study. These factors were then grouped into four core organisational dimensions of knowledge management; Business focus, Culture, Process, and Infrastructure. (Chapter 3)
Objective 4: To evaluate and discuss the study findings against the contemporary KM literature.

The KM factors (F1-F25) identified in this study, are critically evaluated against the contemporary KM literature. Each of these factors is provided with various properties and strategies. The properties assist in understating the factor while the strategies provide the best practices, measures, and initiatives which need to be adopted for managing the respective KM factor. (Chapter 4)

Objective 5: To develop a knowledge management framework based on the empirical study and the expertise gained from the current KM literature.

A Meta-level knowledge management framework was developed for distributed organisations, based on 25 KM factors which were developed from the empirical findings of this research study. These KM factors were grouped further into four core organisational dimensions; Business focus (B), Culture(C), Process (P), and Infrastructure (I). The framework is accordingly termed as the BCPI Matrix for KM. It provides a holistic view for practicing KM in distributed organisations. (Chapter 4)

5.2 Theoretical and practical contributions

One of the primary motivations for this dissertation was to contribute towards bridging the gap between KM theory and practice. The goal of this research study was to develop a KM practice framework for distributed organisations. Therefore, it can be a difficult task to differentiate between the theoretical and practical contributions from this dissertation. The following sub-sections aim to provide the contributions of this dissertation to the KM subject arena in both theoretical and practical perspectives. However, these two perspectives are discussed in an intertwined manner.

5.2.1 A comprehensive list of KM factors

A major contribution of this dissertation is the identification and description of a comprehensive list of factors (F1 to F25) influencing KM functions in distributed organisations. A total of 25 KM factors were identified during this study. A descriptive rationale was provided in the form of properties to explain how each of these factors influences KM practice. In addition, a set of strategies,
measures, or best practices were provided for each KM factor. These strategies guide practitioners in implementing KM. The KM factors with the associated properties and strategies can also enhance theoretical understanding of knowledge management. For example, there is a lack of understanding in KM literature on how to develop effective organisational structures for KM function. This study has identified several properties for this factor (F18) which include the ineffectiveness of large and centralised KM structures in distributed organisations. Based on the KM best practices observed in this study, a set of strategies were formulated for this factor. These strategies include establishment of small and agile KM teams, decentralisation of KM tasks, and development of KM roles rather than full time KM jobs. A thematic organisational structure, termed as ‘Hybrid organisational structure’, has been developed to provide an effective understanding of this factor (fig. 4.2). Similarly, the properties and strategies provided for other factors can help in the theoretical understanding and practice of KM in distributed organisations.

Some findings of this study have deviated from certain contemporary notions in the KM literature, especially in issues related to the value addition from KM (F6), leadership (F7), reward systems (F11), time allocation (F12), organisational structures for KM (F18), knowledge creation & quality control (F20), and technological infrastructure (F24). For instance, the findings of this research study have deviated from a persistent criticism in KM literature that technology takes superfluous lead role in KM programs (Malhotra, 2004; Wilson, 2002; Ruggles, 1998). There is a pervasive view among the respondents that technology can significantly promote knowledge culture by changing employee habits in terms of communication, collaboration, information sharing, learning and decision-making (F24). The technological infrastructure can also serve as the essential ‘Ba’ component (an interaction platform, a place and context in time-space nexus) of the KM theory developed by Nonaka & Konno (1998). Many respondents asserted that the infrastructure is central for virtual communities and an essential part of all KM programmes, making it a crucial factor for developing knowledge culture.

5.2.2 Integration of KM factors and interrelationships

Some of the current literature in KM tends to orient towards a particular track or an organisational element. These tracks include the process orientation, people orientation and technology orientation (Lewis, 2002; Natarajan & Shekhar, 2000; Nissen et al., 2000; Remus & Schub, 2003; Sveiby, 2001). Conversely,
this study demonstrates that KM practitioners need to adopt a composite view of organisational factors for practicing KM. Various factors (F1 to F25) identified in this study are integrated into four core organisational KM dimensions: Business focus, Culture, Process, and Infrastructure. Figure 4.1 and table 4.1 depict the constituent factors and integrity of these organisational dimensions in KM function.

Figure 4.5 exemplifies the interrelationships between various factors constituted in the four KM dimensions. It depicts the role of several KM factors, identified during this study, for developing knowledge culture in distributed organisations. Presence of certain factors (highlighted petals) from other KM dimensions denotes the integrity between them.

The floral portrait shows each factor with characteristic strategies identified during the study. Nurturing knowledge culture, positioned at the nucleus, requires effective management of each centripetal factor. This study has evidently emphasised that all these factors should be prudently managed in
order to foster an effective knowledge culture. The supporting illustrations and rationale, provided for each of the factors, offer some realistic strategies for the development of knowledge culture (Oliver & Kandadi, 2006).

5.2.3 BCPI Matrix for KM

This dissertation has identified a prominent gap in KM literature i.e. the need for a meta-level and comprehensive framework for practicing knowledge management in distributed organisations. The BCPI Matrix developed in this dissertation aims to fill this gap. This framework takes a holistic approach, rather than a single dimensional view of KM such as process orientation or technology orientation (Nissen et al., 2000; Natarajan & Shekhar, 2000).

BCPI matrix encompasses several organisational factors (F1 to F25) impacting KM function in distributed organisations. It adopts a phased approach and attempts to implement KM across four organisational dimensions: Business focus, Culture, Process, and Infrastructure. Each of these dimensions is based on several KM factors and encompasses proven strategies and measures for effective enterprise knowledge management in distributed organisations. Organisations can use the BCPI framework as a broad based KM roadmap. Because of its meta-level nature, this framework can be customised according to the specific business contexts through deduction. Various KM factors (F1 to F25) can guide the organisations in customising the framework to their business needs and contexts. Croasdell et al. (2002) and Malhotra (2004) view that the knowledge management research community is in infancy. The 25 KM factors and BCPI Matrix, developed in this empirical study, can contribute towards KM discipline by providing a sound understanding of the subject.

5.3 Research methodology and validity of findings

Several measures were adopted at various stages, in this research study, to ensure the validity of the findings. Adoption of multiple case study approach has helped in gathering a rich set of qualitative data. As suggested by Hussey and Hussey (1997), the interview data of each case was verified and evaluated by constant comparisons with the data collected from other sources within the respective case organisation. As part of the investigator triangulation, the data was analysed and compared by different researchers independently. This triangulation helped in achieving the accuracy and consistency in the research
findings. Several other researchers in social sciences suggest using triangulation techniques at the data collection and analysis phases to improve the validity and reliability of the empirical findings (Denzin, 1970; Jick, 1979; Miles & Huberman, 1984; Easterby-Smith et al., 1991).

Cross case analysis has also helped in identifying the common patterns in KM practice between various organisations under study. Multiple occurrences of various factors across the cases have improved their validity. Rigorous usage of analytical techniques of the grounded theory approach has also enhanced the validity of the findings in this dissertation. Exhaustive display of interview codes for each of the KM factors provides rigorous evidence and rationale for the derived conclusions.

The BCPI Matrix and various KM factors developed in this study are based on the best practices at some organisations with well-established KM programmes. For instance, two of the organisations that were selected for the case studies have won the Most Admired Knowledge Enterprise (MAKE) awards in the past few years (Teleos, 2003; 2004). The best practices explored from these organisations can serve as the pragmatic guidelines for both KM practitioners and theorists. To further improve the validity of the findings, the following five qualifying criteria (T1 to T5) or protocols were adopted during the data analysis stage to determine the factors influencing KM. The factors meeting these criteria are presented with selected codes of data to support the arguments and conclusions.

T6. Each factor should be mentioned and supported by the respondents from two or more organisations under study.
T7. Each factor should have played significant role in shaping the KM practice in two or more organisations under study.
T8. Respondents should have provided instances of how a particular factor has influenced the knowledge management and the way it has been managed in their respective organisations.
T9. Each factor should be clearly identified by two or more researchers during the discrete analysis of the gathered data.
T10. The interview data supporting each factor should be eligible for triangulation with the verifiable data from the internal documents of the respective organisations.
5.4 Limitations

Perhaps, the major limitation of this dissertation is associated with the sample selection strategy. All of the cases in this research study are large-scale distributed organisations with more than 40,000 employees. A majority of them are global business organisations. Therefore, the findings may not be generalised for small and medium enterprises (SMEs). Most of the factors identified during this study (F1 to F25) explicitly consider distributed nature of organisations which is a predominant feature of large organisations. For instance, the development of a comprehensive technological infrastructure (F24), in the form of an enterprise knowledge portal, may not be feasible for an SME because of the financial and operational constraints.

Another limitation is related to the data analysis phase of this dissertation. The results of this empirical study were presented in this thesis by deliberately detaching the organisational identities from the data. This disassociation of organisational information may not permit the readers to construct specific assumptions and derivations. However, such a strict code of ethics was needed to preserve the identity of the respondents and protect the image of the organisations participated in this research study. Stake (2000) also advocates this research practice and asserts that the value of the best research is not likely to outweigh injury to a person exposed. He says, “Qualitative researchers are guests in the private spaces of the world. Their manners should be good and their code of ethics strict”. Several respondents have given valuable contributions to this research project by providing sensitive organisational information during these case studies. Revealing the respondents and organisational specifics can affect the respondents and organisational image. For instance, some of the respondents have mentioned large scale lay-offs and lack of positive leadership in their business divisions. Associating such information with the organisational details can jeopardise the image of the organisation and interests of the respondents. However, this limitation was addressed to a certain extent by providing extensive code displays for each of the KM factors to substantiate the derived conclusions.

The sample size in this research study is also an area where certain limitations are exposed. Yin (1994; 2003) argues that the relative size of the sample does not transform a multiple case into a macroscopic study. He suggests that even a single case could be considered acceptable, provided it met the study objective. However, this research study depicted that a larger sample size can enhance the
theory development process and resulting product. Because of the enormity of the KM subject area, every new case in this dissertation has presented certain new concepts and understanding. This is evident from the fact that the categories (or KM factors) were not fully saturated during the grounded theory analysis of this dissertation (Strauss & Corbin, 1998). This limitation gives rise to an important opportunity and direction for further research. There is a scope for conducting further case studies, extending this research, to find additional factors and the related KM properties and strategies.

5.5 Further research

The need and opportunity for further research to this dissertation exists in three directions. Firstly, the findings of this study can be applied and tested on a distributed organisation through a collaborative research project. Secondly, the findings can be expanded and enriched by conducting additional case studies in various industry segments. Thirdly, the generalisability of the identified factors, derived conclusions, and the BCPI matrix can be improved through a consecutive research survey. The following sub-sections describe these three further research scenarios in detail.

5.5.1 Application of the findings

An immediate and logical extension to this dissertation would be to test the usefulness and limitations of the KM factors and framework developed in this study. The author intends to apply and evaluate the BCPI Matrix through a further research project in collaboration with a distributed organisation. However, such a project may be limited to a business unit or functional division of the selected organisation. This proposed research project can add value to the BCPI Matrix by evaluating its real-time validity and implications.

5.5.2 Expansion and enrichment of the findings

Another important opportunity for further research is to expand the findings of this study by conducting an additional set of case studies. These studies can be conducted in the organisations from other industry sectors such as Aerospace, Pharmaceuticals, and Steel, which were not covered during this dissertation. They can also be in the organisations from the industry segments which were already covered. These may include IT services, Healthcare, and Automobile industries. Yin (1994) also advocates that replication can be claimed if multiple
cases support the same theory. Therefore, certain number of additional case studies would enhance the analytic generalisations made in this dissertation.

The proposed additional case studies can also help in acquiring and qualifying more data for triangulation, thereby improving the validity and scope of the findings of this study. If substantial number (three or more) of case studies are conducted in a given industry sector, the resulting data can be analysed for that particular industry sector. This in turn can help in identifying and developing specific KM patterns and theories to the respective industry sector. Whereas, a number of supplementary case studies from diverse industry sectors can help in identifying additional KM patterns, and enrichment of the findings of this research study. These research extensions can add value to the KM factors and the BCPI matrix developed in this dissertation.

5.5.3 Consecutive research survey

The BCPI matrix and the associated KM factors (F1 to F25) described in this dissertation may be applied to a universe of large-scale distributed organisations. The rationale of generalisation is supported by the diversity of the cases, depth of the interviews, and the evaluation criteria adopted for this study. However, the assertiveness and generalisability, of KM framework and factors, may be improved through a consecutive research survey. The author intends to further examine the validity of the findings of this study through a quantitative research study. This may involve taking a large sample size (100 to 300) and conducting a survey. The proposed quantitative research study would encompass developing and testing a number of hypothetical propositions based on the findings of this dissertation. The following propositions give certain indications about this further research direction. The propositions $P1, P2, P3, P4, P5,$ and $P6$ are related to various aforementioned KM factors, $F7, F18, F11, F12, F9,$ and $F25$ respectively. These would be among several other propositions which can be examined through a quantitative research study.

$P1.$ In the context of knowledge culture, the expression of leadership attributes by the middle and front level managers is equally essential, as it is from the top management.

$P2.$ Hybrid organisational structures are effective in facilitating sustainable knowledge culture.
In the context of employees’ knowledge contribution to the organisation, the recognition and long-term incentives (e.g. ESOPs) act as better motivators than the short-term monetary incentives.

Time allocation for employee knowledge activities, is a crucial element in developing knowledge culture and a determining factor for the success or failure of KM programmes.

Analysing the knowledge etiquette of the potential employees, during the recruitment process, helps the organisations in regulating and developing the knowledge culture.

The structure and design of the physical work environment plays a significant role in knowledge sharing attitudes of employees.

Summary

The current chapter concluded this dissertation by providing an overview of how the research problem of this study was addressed. A brief description is provided on how the research goal and objectives charted for this study were achieved. It also encompassed concluding discussions on this dissertation’s research methodology, validity of the findings, contributions to the KM subject, and further research directions.
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Appendix – A: Semi-structured questionnaire

Knowledge Management Research Questionnaire

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Bolton, Greater Manchester, BL3 5AB UK
Email: krk1bns@bolton.ac.uk
Tel: 0044 – (0) 1204903607
Mobile: 0044 – (0) 7900894329

© 2003.
| Q1 | **Contact person/interviewee and company information**  
(*Business Card*) |
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Interviewee details</strong></td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td>.................................................................</td>
</tr>
<tr>
<td>First Name</td>
<td>..................................................................</td>
</tr>
<tr>
<td>Surname</td>
<td>..................................................................</td>
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<tr>
<td>Contact details (Business Card)</td>
<td></td>
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<tr>
<td>Email</td>
<td>..................................................................</td>
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<tr>
<td>Phone</td>
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<td>Mobile</td>
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<td>Address</td>
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<tr>
<td></td>
<td>..................................................................</td>
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<tr>
<td><strong>Company Information</strong></td>
<td></td>
</tr>
<tr>
<td>Designation</td>
<td>..................................................................</td>
</tr>
<tr>
<td>Company Name</td>
<td>..................................................................</td>
</tr>
<tr>
<td>Department &amp; Business division</td>
<td>..................................................................</td>
</tr>
<tr>
<td>Location and office contact details</td>
<td>..................................................................</td>
</tr>
<tr>
<td>Number of employees (business division)</td>
<td>..................................................................</td>
</tr>
<tr>
<td>Annual Business Revenues</td>
<td>..................................................................</td>
</tr>
<tr>
<td>Industry Type</td>
<td>..................................................................</td>
</tr>
<tr>
<td><strong>Company Global Information</strong></td>
<td></td>
</tr>
<tr>
<td>Total number of employees</td>
<td>..................................................................</td>
</tr>
<tr>
<td>Annual Business Revenues</td>
<td>..................................................................</td>
</tr>
<tr>
<td>Number of countries operating in</td>
<td>..................................................................</td>
</tr>
<tr>
<td>Head quarters</td>
<td>..................................................................</td>
</tr>
<tr>
<td>Q2</td>
<td>Knowledge Management Strategy</td>
</tr>
<tr>
<td>----</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>A.</td>
<td>Does your organisation have a written Knowledge Management strategy?</td>
</tr>
<tr>
<td></td>
<td>• Yes (Please provide us a copy)</td>
</tr>
<tr>
<td></td>
<td>• No</td>
</tr>
<tr>
<td>B.</td>
<td>What is the strategy on sharing knowledge of/with in globally distributed business divisions &amp; partner organisations</td>
</tr>
<tr>
<td>C.</td>
<td>What major areas KM function encompasses in your organisation (KM objectives)</td>
</tr>
<tr>
<td></td>
<td>• Employee Job related training</td>
</tr>
<tr>
<td></td>
<td>• Organising events</td>
</tr>
<tr>
<td></td>
<td>• Personal development</td>
</tr>
<tr>
<td></td>
<td>• Professional development</td>
</tr>
<tr>
<td></td>
<td>• Extranet/Intranet/ Portal management</td>
</tr>
<tr>
<td></td>
<td>• Intra-departmental collaboration</td>
</tr>
<tr>
<td></td>
<td>• Global collaboration</td>
</tr>
<tr>
<td></td>
<td>• Others (please specify)……………….</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q3</th>
<th>KM Leadership and Organisational Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Who leads overall Knowledge Management in your organisation and to whom this person reports to?</td>
</tr>
<tr>
<td></td>
<td>• Chief Executive Officer</td>
</tr>
<tr>
<td></td>
<td>• President</td>
</tr>
<tr>
<td></td>
<td>• Chief Knowledge Officer</td>
</tr>
<tr>
<td></td>
<td>• Chief Technology Officer/Chief Information Officer</td>
</tr>
<tr>
<td></td>
<td>• If other please specify designation..........................................................</td>
</tr>
<tr>
<td>B.</td>
<td>Who leads Knowledge Management in your business/functional division</td>
</tr>
<tr>
<td></td>
<td>• Please specify designation &amp; KM Roles.........................................................</td>
</tr>
<tr>
<td>C.</td>
<td>Does your organisation has a formal organisational/ Management structure for KM</td>
</tr>
<tr>
<td></td>
<td>• Yes (a copy of the KM roles – structure &amp; overall organisational structure)</td>
</tr>
<tr>
<td></td>
<td>• No</td>
</tr>
</tbody>
</table>
D. Who heads KM in each of the functional divisions (e.g.: Production, Marketing etc)
  - A dedicated KM leader/manager for each functional division
  - Head of functional division acts as the KM leader
  - Others
  - Please specify designation

    KM Roles of the person (please provide us a copy)

E. Total number of KM roles (people/Head count in your organisation)
  - With in your division
  - Global count

F. Role of Middle managers and front-end executives in KM
   Middle managers (please provide us a copy/explain)
   Front-end executives (please provide us a copy/explain)

G. In your view who are the crucial people in KM.
   - Senior managers
   - Middle managers
   - Front level employees

Q4

A. How your organisations culture influences KM in your organisation?

B. What measures you have taken to create/ improve this knowledge sharing culture?
Marketing/Sales/Customer Knowledge Management

A. Does your organisation has a strategy for managing customer/Sales/Marketing Knowledge in particular?
   - Yes (a copy of strategy document)
   - No

B. Who leads Customer Knowledge Management
   - A dedicated Customer Knowledge Officer
     Please specify designation.................................................................
     Role.................................................................
   - Marketing Head
     Please specify designation.................................................................
     Role.................................................................
   - Sales Head
     Please specify designation.................................................................
     Role (a copy).................................................................
   - Others
     Please specify designation.................................................................
     Role (a copy).................................................................

C. How customer knowledge is shared between various functional divisions such as sales, marketing, product/service development etc.
   - ☐ Inter-departmental events
   - ☐ Through Intranet
   - ☐ Through Extranet
   - ☐ Through Web-based Knowledge Portal
   - ☐ Others - Pls Specify..............................

D. Do you involve customers in KM activities directly? Please specify the ways how customers get involved in your organisations KM activities.
   - Events for exclusively for existing customers
   - Events for all potential customers
   - Events open for customers and other interested people
   - Others please specify..........................
E. Do you have a centralised customer database (knowledge base) which has total information of organisations customers?
   - Yes
   - No

F. Is this customer knowledge base/database web accessible?
   - Yes
   - No

G. How does your sales people contribute to the knowledge base

H. Does sales and customer service have a CRM system?

I. If yes, is the CRM system integrated with Knowledge portal?

Q6  Suppliers/ Business partners knowledge
   A. How do you share knowledge with your business partners/suppliers/value chain service providers
      - Organise events (please specify)
      - Have access to each others knowledge bases/portals
      - Employee exchange programs
      - Others please specify
## Knowledge creation/sharing

### A. Types of knowledge existing/stored/shared in your organisation
- Explicit knowledge
- Tacit Knowledge

### B. How the following types of new knowledge is created/generated
- Market knowledge
- Technological knowledge
- Customer knowledge
- Product/service knowledge
- Process knowledge

### C. How do you identify important new knowledge in your organisation?

### D. How innovation occurs/new ideas are generated

### E. How do you acquire new Knowledge, which is not there in your organisation?
- Buy from external partners (eg. IDC)
- Encouraging the knowledge acquisition by employees
- By recruiting the people
- Consultants - Rental
- Universities and other research institutions

### F. Knowledge generation groups (CoP’s) with in the enterprise – Please give names
- ..............................................................
- ..............................................................
- ..............................................................

### G. How R & D contributes to new knowledge creation (only/major/minor...?)

### H. What steps you have taken in creating atmosphere for knowledge creation and exchange
- i. Monetary incentives
• Monthly (Please specify)...........................................
• Annual (Please specify).........................................
• Other regular (Please specify)..............................
• Other irregular (Please specify)..........................

ii. Performance Appraisal

▪ How much weight your organisation gives to employees for sharing knowledge and participation in KM activities. Please specify in % weight points (out of total performance appraisal points).

.................................................................

▪ How do you measure employee knowledge sharing activities

▪ Do you use any systematic methods to measure knowledge sharing activities of your sales people

▪ How much time do you allocate for your employees to share knowledge and generate new knowledge

  Percentage time for KM out of total job time......................

▪ What are the major indicators of knowledge sharing from employee?

iii. Continuous learning and employee development

I. How do you encourage knowledge generation activities?

▪ Unstructured spontaneous exchanges
▪ Water cooler socialising – tea discussions
▪ Balance – encouraging informal networks and also formalising them
▪ Knowledge fairs - to know who knows what
▪ Trust, Tolerance for mistakes, rewards etc.
▪ Corporate dictionary/ Index - to establish common language and terminology
▪ workshops
▪ best practice transfer events
▪ Other events... Please specify...........................................

J. How the employees in your organisation decide where to go for a specific information or knowledge

▪ Through Knowledge Maps/ other document stating where to go
K. Time allocation for learning and knowledge exchange

- Specific no. Of hours allocated (please specify % of total working hrs)
- On project basis according to the requirements
- Other ways... Please specify

L. How does knowledge transfer generally occur in your organisation

Q8 Codification, storage and retention

A. How does your organisation retains acquired knowledge – steps

B. How do you document knowledge - OR convert tacit knowledge to explicit knowledge

- Interaction
- Apprenticeship
- Knowledge map – who knows what - span across departments
- Modelling knowledge – process knowledge – how things happen
- Knowledge maps - complexity – politics
- Dynamic modelling knowledge – operations - business processes
- Narratives – story telling
- Knowledge embedded in products – service – processes

C. Who does the codification/ knowledge documentation role

- Portal / KM administrators
- Knowledge generating person
- Others Pls specify.............

D. How do you ensure control the quality of knowledge objects/artefacts

E. Can you please explain the knowledge objects review process and the people involved?

Q9 Can you please explain a total knowledge cycle with an example from knowledge object generation to sharing through storage? (where knowledge portal plays a role)
**Q10**

**Business processes and functions**

A. What are the knowledge intensive business processes and functions in your organisation

B. Comparative Knowledge intensiveness of the following business processes in your organisation

<table>
<thead>
<tr>
<th>Activity</th>
<th>Knowledge involved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Marketing research</td>
<td>1</td>
</tr>
<tr>
<td>Product development</td>
<td>3</td>
</tr>
<tr>
<td>Services development</td>
<td>5</td>
</tr>
<tr>
<td>Research &amp; Development</td>
<td></td>
</tr>
<tr>
<td>Pricing</td>
<td></td>
</tr>
<tr>
<td>Product promotion (Incl. Advertising)</td>
<td></td>
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<tr>
<td>Product distribution</td>
<td></td>
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<tr>
<td>Sell side logistics</td>
<td></td>
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<tr>
<td>Pre-sales</td>
<td></td>
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<tr>
<td>Sales process</td>
<td></td>
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<tr>
<td>Customer service</td>
<td></td>
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<tr>
<td>Employee recruitment</td>
<td></td>
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<tr>
<td>Training and development</td>
<td></td>
</tr>
<tr>
<td>Performance appraisal</td>
<td></td>
</tr>
<tr>
<td>Others – 1 : Please specify</td>
<td></td>
</tr>
</tbody>
</table>

C. How do you integrate KM activities with core business processes – please give an example of a core business process with KM activities embedded at various stages. Please explain in terms of a Knowledge cycle

D. Do you think constant analysis and change of business processes is needed for an effective KM?

E. How often you formally analyse business processes for improvement

   a. If not continuous (eg. SME) how frequently you think the business processes should be analysed thoroughly for improvement in terms of KM?
Q1
Communities of Practice - CoP

A. Does your organisation have CoPs
   • Yes
   • No

B. Are they formal/Informal - Number of Cops – Are the majority formal/Informal?
   • No of Formal...............
   • No of Informal ............

C. Do you formalise CoPs or do you think its better to leave them informal

D. Does CoPs in your organisation span across departmental & organisational boundaries

E. What do you think are the major factors influencing formation of successful CoPs
   What do you do to enhance/develop CoPs
<table>
<thead>
<tr>
<th>Q1 2</th>
<th><strong>Employee Recruitment and KM</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A. Does your organisation consider knowledge sharing aptitude of candidates while recruitment. (Graduate &amp; Overall recruitment)</td>
</tr>
</tbody>
</table>
|      | • Yes  
|      | • No |
|      | B. Level of importance given for knowledge sharing attitude of candidates at the time of recruitment |
|      | • Very important  
|      | • Important  
|      | • Consider to some extent  
|      | • Not that important  
|      | • Don’t consider |
|      | C. Do you have specific policies and rules built to analyse candidates knowledge sharing Aptitude in the selection process (**Can you suggest some ways for measuring this Aptitude) |
|      | D. Do you think its necessary to see/measure knowledge sharing aptitude of the candidates while recruiting |
### KM Technologies & Enterprise Portal

<table>
<thead>
<tr>
<th>Technology</th>
<th>Don’t have</th>
<th>Usage (2 Most -2 least)</th>
<th>Don’t Use</th>
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<tbody>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>-2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Enterprise Portal/Extranet
- Portal Name:
- Technology:
- Web accessible:

#### Corporate Intranet
- Portal Name:
- Technology:

#### Database DBMS
- Technology:

#### E-mail
- Technology:

#### Data Warehouse
- Name:
- Technology:

#### Knowledge repositories
1. Thesaurus
2. Others......

#### Other Help Desk Applications
1. Name:
   - Technology:
2. Name:
   - Technology:
3. Name:
   - Technology:

#### Document Management Systems
- Name:
  - Technology:

#### Work Flow Tracking Systems
<table>
<thead>
<tr>
<th>Name:</th>
<th>Technology:</th>
</tr>
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<tbody>
<tr>
<td><strong>Teleconferencing (White boards)</strong></td>
<td></td>
</tr>
<tr>
<td>Name:</td>
<td>Technology:</td>
</tr>
<tr>
<td><strong>Message boards</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Chat engines</strong></td>
<td></td>
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<tr>
<td><strong>Discussion forums</strong></td>
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<tr>
<td><strong>Videoconferencing</strong></td>
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<tr>
<td>Name:</td>
<td>Technology:</td>
</tr>
<tr>
<td><strong>Other Collaboration tools</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Corporate Yellow Pages / Knowledge Maps</strong></td>
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<tr>
<td>Name:</td>
<td>Technology:</td>
</tr>
<tr>
<td><strong>Search technologies</strong></td>
<td></td>
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<tr>
<td><strong>Expert systems and AI</strong></td>
<td></td>
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<tr>
<td><strong>Other online learning tools</strong></td>
<td></td>
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<tr>
<td><strong>Other technologies and tools</strong></td>
<td></td>
</tr>
</tbody>
</table>

A. Is your knowledge portal compatible to mobile devices (eg. PDA)?

B. What is the KM portal architecture
   - Is it connected all databases
   - What information does the portal hold
   - Does it have total customer information
• Including financial information of previous projects

C. What information about the people inside the organisation does it hold
• CVs
• Skill base
• Experts in the field
• Search ability
• How to contact - online – on phone
• How people justify that they are providing knowledge for other project and how do you measure
• How they (other projects) justify the time used for knowledge sharing on other projects

D. Who and when can access these Knowledge base/portal – What is the best strategy in you view regarding knowledge access? Total/ Limited??
• All employees have total access
• All employees have access to all data – Except financial data
• All employees have access - related to their project/job roles

E. Does external partners/ consultants have access to your knowledge portal? To what level and extent

F. What access levels sales people have to the customer knowledge base
• All sales people have total access to data of every customer
• Limited access (Please specify)......................................................
Q1 4

**Knowledge Management projects**

A. How do you implement a KM project
   - Start with a pilot project and extending it
   - Implementing in total at once

B. External assistance/Partnerships
   - Seek service from external KM consultancies and professionals
   - Seek only professional service
   - Seek only technology service
   - Totally in-house

C. How much did your organisation invested on Knowledge Management projects in the
   - last 5 years..............................
   - Last one year..............................
   - This year.................................

D. Do you calculate ROI on your KM investments
   - Yes
   - No

E. What are techniques/ways/methods used to calculate ROI on KM investments?

F. What was the ROI (savings and income) on your KM investments
   - last 5 years..............................
   - Last one year..............................

G. What are the key success factors or performance indicators of a KM projects/initiative.

H. Does your organisation measure Knowledge/Intellectual capital? Please explain methodology and results.
A. Impact of KM initiatives

<table>
<thead>
<tr>
<th>Impact on</th>
<th>+ Positive impact level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low----------------------</td>
</tr>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Can’t say 0 1 2 3 4 5</td>
</tr>
<tr>
<td>1 Product development cycle</td>
<td></td>
</tr>
<tr>
<td>2 Innovation</td>
<td></td>
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<tr>
<td>3 Product / service quality</td>
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<td>4 Direct time savings</td>
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<td>5 Direct cost savings</td>
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<tr>
<td>6 Increased revenues/profits</td>
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<td>7 Customer service</td>
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<tr>
<td>8 Product/service delivery</td>
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<tr>
<td>9 Employee job satisfaction</td>
<td></td>
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<td>10 Employee retention</td>
<td></td>
</tr>
<tr>
<td>11 Growth in intellectual assets</td>
<td></td>
</tr>
<tr>
<td>12 Employee empowerment</td>
<td></td>
</tr>
</tbody>
</table>

B. Impact of KM initiatives on other areas.....Please specify

Interviewees Role and Experiences

- What are your roles as a “Knowledge Manager” in your organisation
  - i. Overview
  - ii. Knowledge creation
  - iii. Knowledge Exchange
  - iv. Knowledge storage

- What are the main problems you face in Knowledge Management

- How you are (Or want to) addressing these problems

- What are the current new KM initiatives and projects at your organisation

- Can you explain a Knowledge cycle at your organisation? An example of how a piece of new knowledge is created stored & exchanged?

- How motivated are the people in your organisation towards knowledge sharing (on the scale of 1-10 with 1 being least motivated and 10 being most motivated)

- What measures you are (organisation) taking at present to motivate employees to share knowledge.

- What are the major/ key series of steps an organisation new to formal KM should take while starting KM (an SME)
  - i. Where to start
  - ii. How to continue/ improve
  - iii. Review etc.
Appendix – B: Selected journal paper

How to develop knowledge culture in organisations? A multiple case study of large distributed organisations

How to develop knowledge culture in organisations? A multiple case study of large distributed organisations

Purpose
This paper identifies various factors affecting knowledge culture in some of the large organisations and suggests realistic strategies for developing knowledge culture.

Design/methodology/approach
In-depth case studies were conducted at six large distributed organisations to investigate and assess Knowledge Management (KM) practices and associated organisational culture. The core data collection is based on semi-structured interviews with senior managers who play a significant role in KM programs at their respective organisations. A range of internal documents of these organisations has also provided some important inputs for the empirical analysis.

Findings
The study identified ten major factors affecting knowledge culture in organisations. These include leadership, organisational structure, and evangelisation, communities of practice, reward systems, time allocation, business processes, recruitment, infrastructure and physical attributes.

Research limitations/implications
Perhaps, the major limitation of this research study is associated with the sample selection. All of the companies participated in this research project, were large-scale distributed organisations. Therefore, the findings may not be applicable for Small
and Medium Enterprises (SMEs). Furthermore, the derived conclusions would be more assertive if they were tested as hypothetical propositions through a consecutive research survey.

**Practical implications**

This study provides illustrations and rationale for a diverse range of factors influencing the knowledge culture. Some of the findings deviated from established notions in contemporary KM literature, especially in the issues such as organisational structure, leadership and reward systems. The organisational dimensions explored in this study provide some original thoughts for building sustainable knowledge cultures.

**Originality/value**

The factors described in this paper are based on the existing KM practices at organisations with well-established KM programmes. These can serve as pragmatic guidelines for KM practitioners in developing knowledge culture.

*Key Words:* Knowledge Management, Organisational culture, Knowledge culture, Cultural factors, Ten-factor framework and Large distributed organisations

**Type of the paper:** Research Paper
INTRODUCTION

The emergence of the knowledge economy necessitated many organisations to recognise knowledge as a crucial resource to achieve sustainable competitive advantage (Davenport, 2000; Drucker, 1988; Hertog & Huizenga, 2000; Skyrme 1999, Teece, 1998). This recognition resulted in imparting strategic importance to the Knowledge Management (KM) and triggered the commencement of formal KM programs in many organisations. In the last few years, several theories have been put forward for practicing KM. However, given the abstract nature of the subject area, there is little consensus on the components and ways of knowledge management. Davenport & Prusak (2000) suggest that organisations should take a hard look at their culture before launching a knowledge initiative. Several other authors support this notion and advocate that organisational culture should be the focal point of KM programmes (Bock, 1999; Krogh et al., 2000; Nonaka & Takeuchi, 1995; Rastogi, 2000). Despite this widespread recognition of organisational culture as a core factor in the KM arena, very little is known about creating an effective culture for knowledge management. Many unanswered questions remain regarding the meaning and content of organisational culture itself (Gupta & Govindarajan, 2000; De Long & Fahey, 2000; Louis, 1983; Martin & Siehl, 1983). Pacanowsky & O’Donnell-Trujillo (1983) argued that, “organizational culture is not just another piece of the puzzle, it is the puzzle. From our point of view, a culture is not something an organization has; a culture is something an organization is”. The problem of defining culture is not new and arises from age-old arguments in anthropology, sociology and archaeology. Given the backdrop of continuing deliberations over the definition of culture, addressing the cultural factors towards effective knowledge management, becomes a complex problem for organisations.
However, some organisations have proved more successful than others have, in their KM efforts, often citing their inherent culture as the central aspect behind their success (Hackett, 2000). Thus, the goal of this paper is to contribute to the understanding of the KM subject area, by exploring and describing various organisational factors that determine knowledge culture. This paper commences with a discussion about culture and knowledge management, to devise a broad set of research questions to explore the factors affecting the knowledge culture in organisations. The discussion and formulation of the research questions was based on a review of literature in Organisational Behaviour, Human Resource Management, Information Systems, Business Process Management and Knowledge Management. Secondly, the paper presents the research methodology and design adopted for this study to address the specified research questions. Thirdly, the findings of this study are analysed, discussed and evaluated with the insights gained from the existing KM literature. The concluding section of the paper presents the implications of the findings of this study on KM research and practice. The section also discusses the limitations of this study and provides some directions for further research.

CULTURE AND KNOWLEDGE MANAGEMENT

Organisational culture

Tyler (1871) was first to provide a formal description of the term “culture”. He defined the term as, “…that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society”. This definition emphasises individuals, knowledge, groups and society as integral constituents of a culture. Several other definitions and
descriptions of culture followed in anthropology, sociology and archaeology. In their classic study, Kroeber & Kluckhohn (1952) found 164 different definitions of culture in the anthropological and sociological literature. Though closely related, these definitions present an array of meanings. The key definitional features include; 1) the group or the collectiveness 2) a way of life and 3) the learned behaviours, values, knowledge and perceptions of the people. These themes give us certain direction and indication regarding the fundamentals of organisational culture.

Steven (1989) notes that the organisational culture is something akin to the culture of the society in which the organisation operates. This view considers the organisational culture as a micro culture within the culture of a given society or nation. However, today’s large organisations distributed across the world have developed their own specific cultures embedding various cultural features of the societies and nations in which they operate. These organisations continuously strive to develop their own and unique cultures with a sense of unanimity throughout their distributed divisions. Lemken et al. (2000), describe organisational culture as the sum of shared philosophies, assumptions, values, expectations, attitudes, and norms that bind the organisation together. These cultural features of an organisation may deviate from cultures of their respective societies. Authors take this view of uniqueness of organisational culture rather than treating it as a part of a given societal culture. This view helps us in the context of knowledge management, as many business organisations at large, influence the cultural factors within them rather than the society as a whole.
Knowledge culture

The existing literature in knowledge management constantly accentuates the inseparable relationship between organisational culture and knowledge management (Davenport & Prusak, 2000; Krogh et al., 2000; Nonaka & Takeuchi, 1995). Despite this emphasis on the crucial role of organisational culture in knowledge management, there is a lack of clarity on how to influence and develop knowledge culture in organisations. Authors refer to the knowledge culture in this paper to represent, “A way of organisational life that enables and motivates people to create, share and utilise knowledge for the benefit and enduring success of the organisation”. In KM literature, a wide array of factors and concepts are cited as influencing elements for the creation and development of knowledge culture. These include organisational structure, people, rewarding systems, leadership, business processes and information systems (Drucker, 1999; Delong & Fahey, 2000; Gupta and Govindarajan, 2000; Harper 2000; Wenger, et al., 2002). However, there are limited descriptions about how various individual elements influence knowledge culture. Moreover, certain literature in the subject tends to orient the KM programmes, theories and frameworks towards a particular track or an organisational element. These tracks include, process orientation, people orientation and technology orientation (Lewis, 2002; Natarajan & Shekhar, 2000; Nissen et al., 2000; Remus & Schub, 2003; Sveiby, 2001). As the development of a knowledge culture needs consideration of multiple organisational elements, such orientation mystifies the KM practitioners. There is also a dearth of empirical evidence about how various organisational factors can be managed for developing the knowledge culture. For instance, it is difficult to find proven concepts and theories in the current literature demonstrating effective organisational structures for KM.
Research questions

Based on a literature review, three major questions were derived to address the empirical inadequacies regarding the development of knowledge culture. The following are the three meta-level research questions formulated for this study to identify and describe the factors influencing the knowledge culture in organisations.

Q4. What are the factors that enable knowledge culture in organisations?

Q5. How do various cultural factors influence knowledge management in organisations?

Q6. What strategies, initiatives and measures organisations should take to create and develop knowledge culture?

Several organisational factors, listed in table I, were considered to guide this research study. These factors were taken on a hypothetical basis during the research study that was designed to be both explorative and descriptive. Contradicting the prominent view in KM literature, authors have not taken the “people” element as a distinct factor during the study. Discussing the “people” element as a discrete subject within the organisational culture gives rise to a logical confusion to the theorists and practitioners. Culture is normally defined by anthropologists in such a way that, even if ‘human’ is not explicitly specified, the possibility of any non-human possessing culture is made impossible in practice (Kroeber & Kluckhohn, 1952; Pacanowsky & O’Donnell-Trujillo, 1983). Therefore, in the subject of knowledge culture, the people or employees of an organisation are the subject. In this context, the aspects such as, organisational structure (of people), reward strategies (for people), leadership (by people), trust (in people) and infrastructure (for people) may be discussed as disparate factors influencing knowledge culture. The authors adopt this
people-centric approach for achieving clarity and precision in studying the role of organisational culture in KM.

| Table I Organisational issues (affecting knowledge culture) considered in the study |
|---------------------------------|---------------------------------|---------------------------------|
| Agility in organisations        | Innovation                      | Organisational functions       |
| Business process management     | Intranet                         | Organisational structure       |
| Change management               | KM evangelisation                | Performance appraisal          |
| Collaboration                   | KM events                        | Physical work environment      |
| Communities of Practice(CoPs)   | KM infrastructure                | Pilot projects                  |
| Competitiveness                 | KM jobs and roles                | Problem solving                |
| Customer orientation            | Knowledge maps                   | Professional development       |
| Decision making                 | KM organisational structure      | Recognition                    |
| Empowerment                     | Knowledge worker                 | Recruitment                     |
| Enterprise Information Portal Expert systems | Lay-offs | Resource allocation |
| Extranet                        | Knowledge worker                 | Reward systems                 |
| Flexibility                     | Leadership                       | Risk taking                    |
| Front-end managers              | Learning                         | Search engines                 |
| Group motivations               | Long-term vision                 | Senior management              |
| Groupware                       | loyalty                          | Short-term focus               |
| Human Resource Management       | Market orientation               | Sponsorship                    |
| Incentives                      | Middle level managers            | Team behaviour                 |
| Individual behaviour            | Neural networks                  | Team leaders                   |
| Individual motivations          | Openness to change               | Tolerance to failures          |
| Informal employee relationships | Openness to experimentation       | Training and development       |

(Source: Authors)

RESEARCH METHODOLOGY AND DESIGN

Case study method

Many researchers in social sciences argue that only certain dimensions of culture may be studied using quantitative research methods. They propose that the assessment of cultural factors require thorough investigation, which include, learning about the history of an organisation, visiting the place, talking to the employees and observing their behaviour (Rousseau, 1990; Schein, 1999). Qualitative research methods such as case studies, ethnography and action research provide many avenues to learn about these aspects. The case study approach, in specific, is often used and suggested in conditions where several elements and multiple dimensions of a subject need to be studied exhaustively (Alavi & Carlson, 1992; Benbasat, 1987; Eisenhardt, 1989; Yin, 2002). As it can be observed from the formulated research questions, the multiple dimensions of organisational factors are to be studied and
analysed in this research study. The crucial factors affecting knowledge culture need to be explored and their rationale described. Therefore, the case study approach has been chosen to address the derived research questions. Yin (2002) defines case study method as, “an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”. The perplexity in the relationship between the organisational factors and knowledge culture illustrates the appropriateness of case study enquiry in this research project. The case study methodology also supports the explorative and descriptive nature of this study. Other qualitative methods such as ethnography and action research were not considered practical for this study because of the constraints such as time span, organisational access and other resources.

**Sample selection for case studies**

An effective understanding of the critical cultural phenomenon depends on choosing appropriate cases (Stake, 2000; Miles & Huberman, 1994). The case organisations for this empirical study were selected through a purposive sampling. The intention was to achieve a fine diversity of responses and to qualify the collected data for generalisation of the observed phenomena. In purposive sampling, researchers need to select the units for research, based on characteristics or attributes that are important to the evaluation (Smith, 1983; Patton, 1990; Yin, 2002). A mixed sample of six large organisations were chosen for this study, on the basis of several characteristics including the size, industry sector, operational distribution, knowledge intensivity and the maturity of KM practices. Five of the organisations are globally distributed businesses while one organisation is a UK National Health Service provider. Most of these organisations have definitive knowledge management strategies and implementation programmes. To achieve a rich mixture
of responses, interviews were conducted in distinctive geographical locations and industry segments. Details of the organisations and interview locations are provided in Table II. KM programs at many of these organisations have been widely acknowledged and some have won Most Admired Knowledge Enterprise (MAKE) awards over the last few years: HP in 2004 (Teleos, 2004) and Wipro in 2003 (Teleos, 2003). These base factors in case selection have strengthened the evidence by giving an opportunity to identify and generalise the factors influencing knowledge culture.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Location of research study</th>
<th>Total no. of employees</th>
<th>Distribution of operations</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle Corporation</td>
<td>Oracle EMEA, London, United Kingdom(UK)</td>
<td>41,000</td>
<td>100 countries</td>
<td>Software products &amp; services</td>
</tr>
<tr>
<td>National Health Service (NHS)</td>
<td>Manchester Royal Infirmary, UK.</td>
<td>1,300,000</td>
<td>Multiple locations in UK.</td>
<td>Health services</td>
</tr>
<tr>
<td>Hewlett Packard(HP)</td>
<td>e-Business division, Bangalore, India</td>
<td>140,000</td>
<td>178 countries</td>
<td>IT Hardware Products &amp; services</td>
</tr>
<tr>
<td>Wipro Technologies</td>
<td>Global Head Quarters, Bangalore, India</td>
<td>41,000</td>
<td>35 countries</td>
<td>Software products and services</td>
</tr>
<tr>
<td>Alcatel</td>
<td>Alcatel SEL, Stuttgart, Germany</td>
<td>151,000</td>
<td>130 countries</td>
<td>Telecom products and services</td>
</tr>
<tr>
<td>Daimler Chrysler</td>
<td>Global Head Quarters, Stuttgart, Germany</td>
<td>384,000</td>
<td>200 countries</td>
<td>Automobile</td>
</tr>
</tbody>
</table>

**Data collection**

The core method of data collection was based on a semi-structured interview instrument developed through a literature review. Interview method was preferred in this project to achieve our objective of exploring various factors influencing knowledge culture in organisations. Silverman (1985) notes that the interview data display cultural realities, which are neither biased nor accurate, but simply ‘real’. Kvale (1996) also advocates the interview method to seek and describe the meanings
of central themes, in the life world of the subjects such as organisational culture. The questionnaire was designed to allow respondents to drive and describe the content within the boundaries of formulated meta-level questions. The interviewees were predominantly the directors, senior managers, knowledge managers and functional heads, who played a significant role in the development and implementation of KM strategies in their respective organisations. In each of the organisations, upto three managers were interviewed to get a varied and comprehensive account of organisational culture and KM practice. The time span of each interview ranged from three to eight hours, and in some cases was spread across two weeks to suit the busy schedules of the respondents. All Interviews were conducted at the respective organisations and were recorded with prior permission of the respondents. To provide a thorough analysis, the authors have studied various internal KM strategy and practice documents of the case organisations. These included best practice documents, white papers, customer case studies, internal journals, presentations and previous research papers. The authors have also explored the intranets, extranets and technology components of the organisations under study, to analyse the KM infrastructure and their usage patterns. During and after each interview, notes were made to describe important observations that are relevant to the research questions.

Data Analysis

The data collected through the interviews and additional documents were examined to remove incomplete and ambiguous information. A thorough review of interview records and a series of post-interview communications with the respondents helped the authors in achieving data accuracy. The content is analysed through a series of readings and specific codes were assigned to the pieces of text that represented important concepts and distinct responses from the interviewees. Two researchers
have independently analysed the data to avoid bias and ambiguity. As suggested by Miles & Huberman (1994), the data is conceptualised through a mapping process whereby themes are identified, appropriately weighted, and then related. The concepts formed through this process were categorised and analysed for common patterns between the organisations explored in this study. The extracted patterns are presented as a range of factors shaping knowledge culture in organisations. The following five qualifying criteria have been adopted during the data analysis stage to determine each of the factors. The factors meeting these criteria are presented with selective examples of data to support the arguments and conclusions.

C1. Each factor should be mentioned and supported by multiple respondents from two or more of the organisations under study.

C2. Each factor should have played significant role in shaping the knowledge culture in two or more of the organisations under study.

C3. Respondents should have provided instances of how a particular factor has influenced the knowledge culture in their respective organisation and the way it has been managed.

C4. Each factor should be clearly identified by two or more researchers during the discrete analysis of the gathered data.

C5. The interview data supporting each factor should be eligible for triangulation with the verifiable data from internal documents of the respective organisations.

Ethics

The details of the respondents and their organisations were deliberately separated from the analysis and conclusions presented in this paper, because of the ethical issues and privacy agreements charted for this research project. Stake (2000)
advocates this research practice and asserts that the value of the best research is not likely to outweigh injury to a person exposed. He says, “Qualitative researchers are guests in the private spaces of the world. Their manners should be good and their code of ethics strict”.

**FINDINGS, DISCUSSION & EVALUATION**

Based on the empirical analysis, ten factors ($F1$ to $F10$) have been derived that have influenced the development of knowledge culture in the organisations under study. Although many of these factors are interrelated, they are still deliberated as discrete factors because of their individual importance and manageability characteristics. The following sections describe each of these factors in detail with substantiating illustrations. The derived factors and the associated study findings are evaluated with the pertinent theories in the existing KM literature.

**F1. Leadership**

Many respondents believed that the expression of positive leadership characteristics at various levels of management is a vital aspect for developing knowledge culture in organisations. These attributes include, empowering subordinates, allocation of resources, openness towards change & experimentation, developing trust, tolerance to mistakes and building long-term perspective of the organisational goals among employees. They have emphasised that empowering employees with certain autonomy in task achievement and learning, can provide agility to the organisations knowledge culture. However, extant literature often emphasise Chief Executive Officers and Senior Directors in the context of the leadership and development of organisational culture (Ribiere & Sitar, 2003; Bixler, 2002; Bonner, 2000; Ellis and Rumizen, 2002; Schien, 1996). Conversely, many interviewees expressed that, while
leadership from senior management is important, it is essential that middle and front-end managers demonstrate these leadership attributes to develop and support knowledge culture throughout the organisation. This study revealed that the middle and front-end managers determine the success of KM programs and development of knowledge culture in a given team or division. At some of the organisations under study, despite good support from senior management, KM programs have not succeeded in certain divisions due to the lack of support from managers at lower levels of the organisational hierarchy. Whilst in some others, a few divisional managers initiated KM programs and created knowledge culture in their respective teams, with little support from the senior management. This study highlights the essential role of middle and front level managers in developing knowledge culture through the manifestation of various leadership characteristics. The findings correlate with the view that effective management and leadership are integral to each other and leadership at all managerial levels is required to develop a desired culture (Kluge et al., 2001; Marsh & Satyadas, 2003; Welch & Welch, 2005)

F2. Organisational structure

The majority of the respondents viewed that the conventional organisational structures need to be transformed to support the development of a knowledge culture. Previous studies in this area have proposed the creation of several exclusive KM jobs, which include, Chief Knowledge Officer (CKO), Knowledge Managers, Portal Managers, Content managers and Knowledge Analysts (Davenport & Prusak, 2000; Gordon, 2002; Gray, 1998; Rastogi, 2000; Rumizen, 2002; Skyrme 1999). This study confirms the view that some specialist positions such as KM analysts and coordinators are necessary for developing knowledge culture. People with expertise in the areas of strategic management, process analysis & reengineering, change
management, content development, human resource management and knowledge portal development, are considered crucial in instituting a knowledge culture at the organisations explored in this study.

However, a significant number of the respondents were critical about establishing a comprehensive hierarchy for KM and suggested to create KM roles, as opposed to the KM jobs. Some of the organisations understudy have KM positions with substantial functional role attached to their job profile. A very few exclusive KM jobs are created which include knowledge analysts, content editors and knowledge portal administrators. In two of the organisations under study, the number of exclusive KM jobs has been reduced over the years albeit the continuous growth in the overall employee numbers. One organisation, in particular, has a strategy to avoid the exclusive KM jobs at senior or middle managerial levels. In these organisations, either the functional roles were attached to KM jobs or the KM roles were embedded in the jobs of core functional areas such as sales, product development, manufacturing and customer service. Within each functional division, people with positive attitudes and skills towards knowledge management were awarded with KM responsibilities of their respective functional division. KM education, training and expertise are provided to these people to promote knowledge culture. Some respondents expressed that the large number of exclusive KM jobs are not sustainable, as they often become vulnerable positions during the lay-offs.

Figure 1 A thematic representation of Hybrid organisational structure for KM
Figure 1 depicts a common theme of organisational structures observed during this study, with some positions consisting both the core functions and knowledge management responsibilities. In three of the cases, these mixed positions with varying degrees of KM and functional roles were observed. Depending on the requirement and extent of KM tasks, a given functional position was embedded with KM roles consuming up to 30% to 60% of overall job time. A KM job title such as “Knowledge manager” is given if the job has more KM tasks. Conversely, a title such as “Customer Relations Manager” is given if the job is predominantly functional. The authors name these mixed organisational job structures as “Hybrid KM structures” or “Hybrid organisational structures”. These structures have been successful in developing knowledge culture and integrating KM activities with the core business functions at the organisations explored in this study. The structures are considered sustainable because the people in KM positions are also involved in core
business activities. Moreover, each functional division undertakes a part of overall KM costs, by paying their functional jobs with embedded KM roles. The hybrid structures also enable the integration of KM programmes with functional divisions, as the people with the hybrid roles predominantly get involved in KM activities concerning their functional division. This study demonstrates that it is a key way to make KM everybody’s business and spread the knowledge culture throughout the organisation.

**F3. Evangelisation**

Evangelisation of the value of KM activities to the employees, has been a significant aspect of KM programmes in the organisations under study. Respondents suggested that the KM programmes should consistently inform the employees about how KM can improve their performance and mutually benefit the organisation. Senior management should be actively involved in the evangelisation process and convey that knowledge creation and sharing is highly valued in the organisation. Otherwise it can be considered as a minor issue and may not be given due diligence by middle and front-end managers. KM evangelisation also covered the establishment of various communication channels to convey the significance, processes and achievements of KM. Most of the organisations had regular internal magazines, journals and newsletters to spread this information. People who are actively contributing to the organisational knowledge, through communities of practice and other means, are made visible to the whole organisation through these channels. Some respondents stated that the business leaders at CEO level were actively involved in the evangelisation process by conveying the value of KM programmes to the whole organisation. They regularly identify and reward the employees who make valuable knowledge contributions to the organisation. Other studies at Bristol-
Myers Squib Company, and Russell Reynolds Associates (Paul, 2003), indicated a similar view that employee recognition from senior management directly motivates people to participate in KM activities and enhance knowledge culture in organisations.

**F4. Communities of Practice**

Lave and Wenger (1991) coined and described the term, Communities of Practice (CoPs) as, “an activity system that includes individuals who are united in action and in the meaning of action has for them and for a larger collective”. The majority of the interviewees believed that the communities of practice have strengthened the knowledge culture in their organisations. The respondents suggested that encouraging the development of CoPs is an effective way to launch knowledge management programmes. In the organisations understudy, CoPs are evidently playing a significant role in resolving product issues, solving customer problems and assisting in the generation of sales. Formal and informal CoPs were observed in all of the organisations, overlapping various functional divisions and often deviating from the managerial hierarchies. Formal CoPs were generally based on projects while the informal ones were based on subject expertise, skill set and professional competencies. Many of these communities surpassed organisational boundaries with active members from across the globe. However, there is a widespread view among the respondents that the major role of the organisations, in developing CoPs, lies in providing necessary communication infrastructure such as Knowledge Portals. The communities should be provided with facilities for virtual interaction and content management. Occasionally, some CoPs may need financial resources and time for possible physical conferences and meetings between the members. Two of the organisations under study, regularly sponsor such events for the members of CoPs.
However, in one specific case, the members of a well-established professional community preferred to be unknown to the organisation, fearing that their managers would consider this as a time-consuming issue effecting target achievements. This particular instance resonate with a common theme in KM literature that formal management efforts can hinder the development of CoPs (Preece, 2000; Stamps, 1997; Wenger et al., 2002).

The majority of the respondents inclined towards leaving the CoPs as self-governing entities. However, in some of the organisations, formalisation of CoPs was taken aboard when there was a specific business opportunity and request from a given community. For instance when the activities of a given community has the potential for a new product or service development, then a formal work group or project team is created by allocating the needed organisational resources. Facilitating and promoting CoPs was seen as an important element of KM programmes in many of the organisations explored in this study. The senior managers regularly recognised and valued the employee participation in CoPs, wherever such participation has resulted in visible organisational benefits. Interviewees expressed that such organisational attention, support and sponsorship for CoPs directly promote the knowledge culture.

**F5. Reward systems**

The findings of this study confirm a general view in KM literature (APQC, 2002; Davenport & Prusak, 2000; Gupta & Govindarajan, 2000), that organisational rewards motivate employees towards knowledge sharing and foster a knowledge culture. However, in the context of knowledge contribution, many interviewees
demarcated between direct and indirect rewards. The respondents suggested that the indirect rewards such as appreciation and recognition play a greater role than the monetary incentives. Moreover, in promoting knowledge culture, long-term rewards such as profit sharing and Employee Share Options (ESOPs) were observed as effective means when compared to the short-term incentives. There is also a prevalent view among respondents that irrespective of organisational rewards, some employees may involve in knowledge activities because of the intrinsic drive for learning, personal contentment, peer recognition and self actualisation. Recent studies in the subject also confirm that these behavioural motives play a major role in knowledge creation and sharing (Ardichvilli et al., 2003; Darwin, 2004; Malhotra & Galletta, 2003, McLure & Faraj, 2000).

The majority of the respondents experienced difficulties in ascertaining the economic value of knowledge activities of individual employees, to provide them with pertinent incentives. They also emphasised that a qualitative evaluation of employees’ knowledge objects is needed while providing rewards. Otherwise, the quantity may dominate over the quality and can jeopardise the reward objectives. Professional groups and academies, consisting of domain experts, were established at three of the organisations under study. These groups appraise the knowledge objects such as, white papers, best practices and innovative ideas developed by the employees. This study also shows that the existing human resource management practices need to be reviewed to recognise the knowledge contributions of employees and to develop knowledge culture in modern organisations. Many respondents suggested making certain enhancements in the performance appraisals, pay reviews, incentive strategies and other long-term career issues. In most of the organisations, the acknowledgement of employee knowledge contributions was
informal and depended on the judgement of immediate managers. Whereas, the respondents expressed that this should be a standard and natural part of the performance appraisals. Only two organisations had formal processes in place to appraise knowledge contributions of the employees. In these two cases, the knowledge contribution issues carried up to 20% weightage in the overall performance appraisals.

**F6. Time allocation**

Nearly all the interviewees emphasised that, to develop a knowledge culture, it is essential to allocate time for employee learning, collaborations, knowledge creation and sharing activities. Krogh *et al.*, (2000) also reported the importance of time allocation exemplifying 3M and Sencorp, where employees are allotted between 15 to 20% of their job time for new knowledge creation. The respondents also suggested that the team leaders and middle managers play a significant role in allocating this crucial organisational resource to individual employees and directly affect the development of knowledge culture. While the senior management can facilitate knowledge culture by developing KM strategies and programmes, they may not wholly influence the time allocation for each employee. The respondents have also noted that the expression of a long-term vision by managers is crucial to the development of knowledge culture. ‘Time allocation’ was stated as a key factor for the existence of differences in knowledge habits between various teams and divisions within an organisation. They have reported that it is common to find managers who concentrate predominantly on achieving short-term goals and targets. These managers may not allow their team to spend time on knowledge creation and sharing, consequently hindering the knowledge culture. Therefore, in many cases, the KM program managers have chosen particular functional divisions for their pilot
projects based on the positive attitudes such as the willingness to allocate time for KM activities. Many respondents also suggested a gradual approach of improvement, whereby the knowledge culture is slowly extended to the whole organisation through such pilot projects. Recent studies in the area also indicated limitations in achieving organisation-wide knowledge culture in a single instance and suggested the pilot project approach (Paul, 2003; Reinhardt, 2005; Rumizen, 2002).

**F7. Business processes**

This study demonstrates that the effective management of business processes is an important building block for developing sustainable knowledge culture. Davenport (1998) advocates that knowledge is generated, used, and shared intensively in a few specific processes. These Knowledge Intensive Processes (KIPs) may vary depending on the organisation and the industry sector, but generally include, market research, product development, sales and service delivery. They are considered as the core processes along the value chain and primarily use knowledge in order to create process outputs (Eppler, *et al*., 1999; Remus & Schub, 2003). Many respondents asserted that it is essential to integrate KM activities with the core business processes to enable seamless flow of knowledge in the day-to-day business life. This requires continuous analysis and improvement of KIPs to assess and resolve knowledge needs, resources and gaps. These process initiatives standardise and spread KM activities from a few knowledge active teams and divisions to the whole organisation (Nissen & Levitt, 2004; Wenger, 2004).

A prevalent strategy in the organisations explored in this study, is to “capture knowledge when it is generated”. To achieve this agile strategy, the domain expert
teams such as Special Interest Groups (SIGs) have been created to capture and reuse
dynamic functional knowledge in the KIPs. These groups develop knowledge artefacts such as, templates, guidelines, best practices, case studies, expertise notes, knowledge maps, work flow charts etc., to assist in the effective execution of the KIPs. Some of the organisations under study, have made it mandatory to write case study reports, at the time of each sales accomplishment or project closure, to capture the knowledge generated in the processes. The case studies covered many important topics including the customer issues, project problems, trouble shooting, lessons learned, decision rationale and best practices. To ensure quality and usability, the subject experts systematically review the knowledge objects before making them accessible to the wider organisation.

In many cases, the KIPs were also optimised to capture vital customer knowledge from various market segments. Literature in the business studies area, emphasise that gaining customer knowledge is a competitive advantage, and advocate to utilise it in product development and service delivery (Drucker, 1999; Gebert, et al., 2002; Hammer, 1990; Österle, 2001; Porter, 1985). This notion is evident in many of the case organisations, which have created industry focus groups to gather and shove market knowledge into product and service development processes. For instance, if an industry group is responsible for the aerospace sector, it is expected to have a deep knowledge of the customer segment and keep track of all the changes occurring in the industry sector. It is the group’s responsibility to update its knowledgebase through sales executives, distribution channels, industry reports, newspapers, journal articles etc., and share this knowledge with the core organisation to develop, modify and target the products accordingly. However, to accommodate KM activities in the KIPs, many respondents suggested to make incremental process changes rather than
complete reengineering. Total process reengineering, for KM, is viewed as a time consuming and complex task that can derail the KM efforts. Therefore, a continuous and incremental approach is favoured, whereby the KM activities are gradually planted in the core business processes to institute knowledge culture throughout the organisation.

**F8. Recruitment**

This study illustrated that it is important to consider the knowledge sharing etiquette of the potential employees during the recruitment phase. An organisation can regulate its knowledge culture to a certain extent by recruiting employees with a positive attitude towards knowledge sharing and team dynamics. Hall (2001) also advocates that the employment of intrinsically motivated colleagues might be seen as an issue of recruitment and selection. While a majority of the respondents in this study agreed that this factor is worth considering, only one organisation has formalised recruitment practices to analyse the knowledge creation abilities of potential employees. Some of the interviewees expressed that this factor is often compromised, especially when certain skills are at shortage and need immediate fulfilment. However, nearly all the respondents stated that, organisations should consider analysing the knowledge attitudes of potential employees in well-planned employment ventures such as graduate recruitments. For instance, assessment of past knowledge contributions, knowledge sharing motivations, team behaviour and learning patterns can reveal the knowledge etiquette of potential employees. Interviewees expressed that numerous tests are in practice, to know the aptitude of potential employees in areas such as team working and customer orientation, but methods to examine knowledge attitudes are not widely available. This study
demonstrates that further research work is needed in this domain to develop some precise methods and theories for knowledge aptitude assessment.

**F9. Infrastructure**

The majority of the respondents viewed that it is fundamental to establish the information & communication infrastructure to facilitate the knowledge culture. Knowledge portals, in the form of intranets and extranets, are the most common type of infrastructure observed in the organisations explored in this study. Other recent studies (Detlor, 2004; Gottschalk & Khandelwal, 2004; Spies et al., 2005) have also found that knowledge portals play an important role in KM. All of the organisations explored in this study, have been making considerable investments in an array of technologies for providing KM infrastructure. The observed technology components include groupware, search engines, virtual conferencing tools, and data mining technologies, content management systems, decision support systems and Artificial Intelligence (AI) tools. These technologies were integrated into knowledge portals to provide a single gateway for accessing the organisational knowledge base. Figure 2 depicts the conceptual architecture of knowledge portals observed in this study. Through these portals, people can access, create, organise, share and utilise enterprise knowledge via seamless collaborations. The majority of the respondents asserted that the knowledge portals are an effective way to provide open access to all relevant information to the employees. This organisation-wide access can prevent information hoarding and directly enhance knowledge culture. This study has also revealed another evident trend, wherein organisations extend their knowledge base access to the business partners and customers. Though such access is restricted to certain areas, it is playing an important role in collaborative product development, service delivery and project accomplishments.
Very few respondents supported a persistent criticism in KM literature that the technology takes superfluous lead role in KM programs (Malhotra, 2004; Wilson, 2002; Ruggles, 1998). There is a pervasive view among the respondents that technology can significantly promote knowledge culture by changing employee habits in terms of communication, collaboration, information sharing, learning and decision-making. The portal infrastructure can also serve as the essential ‘Ba’ component (an interaction platform, a place and context in time-space nexus) of the KM theory developed by Nonaka & Konno (1998). Many respondents asserted that the infrastructure is central for virtual communities and an essential part of all KM programmes, making it a crucial factor for developing knowledge culture.

**F10. Physical attributes**
This study shows that the physical configuration of the work environment also influences the knowledge culture in organisations. Structural characteristics such as, shared areas, cubicles with low dividers, open spaces and other informal meeting amenities can help people in the process of social networking. These physical characteristics can facilitate the flow of knowledge across the organisation. Research studies at Alcoa, British Telecom, f/X Networks (Cohen & Prusak, 2001), BP (Chiem, 2001), TBWA CHIAT DAY (Gladwell, 2000) and SAP (Czarnecki, 2001) emphasised the role of physical work environment in employee collaborations and innovation. For example, one of the interviewees of this study has worked at his organisation’s global Head Quarters (HQ) for two years as part of the employee development program. The interviewee had experienced phenomenal differences, in physical office environment between the HQ and his divisional office, which directly affected employee collaboration and knowledge sharing. Unlike the divisional office, the HQ has adopted an open door policy and does not have conventional cubicles. The office cabins at the HQ were built using glass walls and doors so that everybody can see whether some one is busy or available to talk. People can walk into any of the offices with out prior appointment. These characteristics have explicitly promoted the development of a culture of openness and knowledge sharing among the employees. When the interviewee returned to his own regional division at the end of the program, he noticed that the physical work environment at his division is rather enclosed which deterred the social networking and flow of knowledge.

In many of the case organisations, authors have observed provision of physical amenities such as discussion rooms, internet café’s, common dining halls, open door offices and informal meeting tables. These common shared spaces have contributed to the development of knowledge culture by facilitating informal collaboration.
between employees. They provide a high probability for interaction between the people from various functional departments and aid in the crisscrossing of organisational knowledge. Positioning the presentation equipment, couches, whiteboards, internet nodes, notepaper & pens in these shared spaces assist and encourage employees to do useful organisational work during the informal gatherings. Based on our observations and the annotations from respondents, it can be asserted that physical structure and design of the work environment play an important role in the development of knowledge culture. Extant literature in social behaviour, architecture and knowledge management also suggest that, organisations should consider these workspace characteristics to promote employee collaboration and knowledge sharing culture (Anderson et al., 2001; Cohen & Prusak, 2001; Chiem, 2001; Girard, 2004; Kolleeny, 2003).

CONCLUSIONS

There is a widespread view in KM literature that organisational culture plays a key role in developing knowledge culture. This study has explored, analysed and presented some major factors affecting the development of knowledge culture in large organisations. Based on an empirical research conducted at six large distributed organisations, this study has identified ten organisational elements influencing the creation and development of knowledge culture. These factors include leadership, organisational structure, evangelisation, communities of practice, reward systems, time allocation, business processes, recruitment, infrastructure and physical attributes.

Figure 3 summarises the study findings while depicting the explored factors as a collective and presents a ten-factor framework for developing knowledge culture. The floral portrait shows each factor with characteristic strategies identified during
the study. Nurturing the knowledge culture, positioned at the nucleus, requires effective management of each centripetal factor. The study has evidently emphasised that all these factors should be prudently managed in order to foster an effective knowledge culture. The supporting illustrations and rationale, provided for each of the factors, offer some realistic strategies for the development of knowledge culture. Some findings of this study have deviated from established notions in the contemporary KM literature, especially in the issues related to the organisational structures, leadership, reward systems and other human resource management practices. The organisational dimensions explored in this research, present some original thoughts for developing sustainable knowledge cultures.

The factors described in this paper are based on KM practices at the organisations with well-established KM programmes. These can serve as the pragmatic guidelines for the KM practitioners and researchers. Some of the current literature in KM tends to orient towards a particular track or an organisational element, such as, the process orientation, people orientation and technology orientation. Conversely, this study demonstrates that the KM practitioners need to adopt a composite view (figure 3) of organisational factors for developing the knowledge culture. Perhaps, the major limitation of this research study is associated with the sample selection strategy. All of the cases in this research study are large-scale distributed organisations with more than 40,000 employees. Therefore, the findings may not be generalised for small and medium enterprises (SMEs). The disassociation of organisational details from various findings presented in this paper may not permit the readers to construct specific assumptions and derivations. However, such a strict code of ethics was needed to preserve the identity of the participants who provided valuable contributions to this research project.
The organisational factors and the correlated characteristics described in this paper may be applied for a universe of large-scale distributed organisations. The rationale of generalisation is supported by the diversity of the cases, depth of the interviews and the evaluation criteria adopted for this study. However, the assertiveness and generalisability of some of the explored factors and the derived conclusions maybe improved through a consecutive research survey. The authors intend to further examine the following findings as the hypothetical propositions, $P1, P2, P3, P4, P5, P6$, derived from various aforementioned factors, $F1, F2, F5, F6, F8 & F10$, respectively.

$P7$. In the context of knowledge culture, the expression of leadership attributes by the middle and front level managers is equally essential, as it is from the top management.
P8. Hybrid organisational structures are effective in facilitating sustainable knowledge culture.

P9. In the context of employees’ contribution of knowledge to the organisation, recognition and long-term incentives (e.g. ESOPs) act as better motivators than the short-term monetary incentives.

P10. Time allocation for employee knowledge activities, is a crucial element in developing knowledge culture and a detrimental factor for the success or failure of KM programmes.

P11. Analysing the knowledge etiquette of the potential employees, during the recruitment process, helps the organisations in regulating and developing the knowledge culture.

P12. The structure and design of the physical work environment plays a significant role in knowledge sharing attitudes of employees.

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