CREATING KNOWLEDGE IN A SMALL BUSINESS:

A QUALITATIVE CASE STUDY

by

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Abstract

This study investigates how knowledge is created in a small business organization. Knowledge creation refers to organizational learning which results in innovation. The research design was a qualitative, single site case study of three firms in the point of sale industry. Data collection took place during a six month field study and employed multiple methods including participant observations, interviews, document reviews, and field journal entries.

The study was informed by a conceptual framework which focused on the importance of both tacit and explicit knowledge forms, multiple modes of knowledge conversion (socialization, externalization, combination, internalization), and a knowledge spiraling process. Six themes emerged from the data. The first theme, “the people are the business” indicated that individuals become a knowledge creating structure that transcends office boundaries. A second theme, “we just spend tons of time talking”, emphasized the importance of dialogue and informal communication structures to the sharing of tacit knowledge. A third theme, “there hasn’t been a new idea in a million years”, illustrated the predominance of incremental rather than radical innovation, the strategy of mimicking concept successes, and the importance of learning with other organizations through strategic alliances. A fourth theme, “you learn from your mistakes”, represented the experiential nature of learning within the firm. A fifth theme, “it’s one of those crystal ball kind of things” depicted the intuitive nature of personal knowledge and its limitations. Finally, the sixth theme, “a day late and a dollar short” explored how time and money pressures both enhance and hinder knowledge creation within a small business context.

By comparing the themes to the conceptual framework the study concluded that small business organizations create knowledge in accordance with the nature of interpersonal interactions as they occur in context. The theoretical knowledge spiral was reconceptualized as a web structure in order to accommodate more diversity of approaches to knowledge creation and the complex nature of innovations.
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CHAPTER ONE: INTRODUCTION

The one thing that we can be sure of is that the world that will emerge from the present rearrangement of values, beliefs, social and economic structures, of political concepts and systems, indeed, of worldviews, will be different from anything anyone today imagines....And it is certain also that its primary resource will be knowledge. (Drucker, 1993, p. 4)

Knowledge, our beliefs and ideas about what is true, is seen as an increasingly important resource for today's business organizations. As organizations struggle to compete in a global business environment, where information and knowledge are new corporate commodities, entrepreneurs and organizational theorists are increasingly requiring a more sophisticated understanding of the role of knowledge within firms. For small business entrepreneurs, whose organizations represent a growing component of the Canadian economy, an understanding of knowledge creation is especially relevant because traditional human resource strategies are often inadequate to address small business needs.

This study aims to explore a variety of perspectives related to organizational learning and knowledge creation, and to augment this growing body of literature by investigating how knowledge is created in a small business organization. While several studies have investigated knowledge in large firms, few studies have focused specifically on small business organizations. Additionally, while much of the literature has addressed knowledge acquisition or transfer, often discussed synonomously with information processing, only a few attempts have been made to examine how knowledge is actually created. Furthermore, organizational studies favour the perspectives of managers to the exclusion of other employees; this study is interested in all perspectives.

The purpose of this introductory chapter is to situate the study in its larger context and to provide an overview of this thesis. To do this, I will examine the background and context of the study, develop and define a list of terms and concepts central to this investigation, and identify the purpose and essential questions of the research.
Background and Context

The Shift to a Knowledge Age

Amid rapid environmental change resulting primarily from forces of technology and globalization, today’s business organizations are struggling to keep pace in an intensely competitive international environment. Traditional factors of production such as capital, natural resources, and labour continue to be important but only in an ancillary role to knowledge (Drucker, 1993). A firm’s competitive advantage relies on its ability to continuously innovate which, in turn, rests on its capacity to create new knowledge (Nonaka & Takeuchi, 1995). However, little is known about how knowledge is created and organizational theorists are calling for increased analyses of the knowledge creation process (Andersson, Batten, & Karlsson, 1989).

Increasingly, organizations are looking to their employees, and the knowledge of their employees, as a valuable and significantly untapped resource. No longer are individuals seen only as a goods-producing, labour resource; they are now an important knowledge resource, capable both of interpreting information and creating new ideas. Several business and socioeconomic theorists echo this point, suggesting that maximizing the potential of human resources will be key to future competitive advantage and ultimate organizational survival (Drucker, 1993; Nonaka, 1994; Senge, 1990; Toffler, 1990).

The Rise of Small Business

Until relatively recently, the image of stability in the business world has been associated with large, hierarchical organizations. Ironically, that very kind of structure now hinders many large firms who find themselves inflexible and slow to respond in a dynamic technological and global business environment (Galbraith, 1993). However, the same environment that has plagued large organizations has given rise to smaller, more flexible organizational forms. A recent report from the B.C. Labour Force Development board (Training For What, 1995) denotes a net decline of the number of employees in larger organizations while indicating that the largest net employment growth has occurred in firms of less than 20 employees.
“Small business” is variously defined and what may be categorized as “small” in one study may be “medium sized” in another. Both qualitative and quantitative criteria may be used to define small business including geographical scale of operations, degree of decision making independence, type of management, number of employees, and total annual sales (d’Amboise, 1991). For a Canadian context, d’Amboise (1991) suggests the following definition be used for small and medium sized business (SME):

- managers have decision-making independence; subsidiaries and franchises are excluded;
- the firm has an annual sales figure of less than $20 million and employs less than 500 people;
- it does not dominate its economic sector of activities; its turnover is less than that of market leaders. (p. 19)

While the above definition may address a variety of criteria, and distinguish SME’s from large businesses, it does not distinguish small from medium, nor does it account for differences in organizational structure likely to occur between a company of ten employees and a company of 450. The utility of a definition, therefore, lies in its ability to be clear about how the term will be used in a particular study rather than how the term might be used without reference to context. Hence, for the purposes of this study, a small business is any organization which employs less than 20 employees, and in which owner/managers have decision making independence from other organizations. Subsidiary or franchise status, sales volume and market position are not considered relevant in this case study and have, therefore, been excluded from the definition.

Human Resource Development

Traditional assumptions about learning and knowledge have heavily influenced human resource development efforts. That is, training and development programs have often relied on authorities to relay established expertise to individuals in organizational areas where knowledge deficiencies have been identified. However, for small business entrepreneurs, who often have limited financial resources and precious little time to
devote to formal training, a model of passive learning and static knowledge is inadequate. In some cases, such a model may even prove to be damaging as it promotes a dependency on experts at the expense of enhancing individual and organizational potential for knowledge creation.

While many organizations continue to emphasize and rely on traditional ideas, several studies suggest that knowledge is not a static entity to be transmitted from an instructor to a training participant. Rather, knowledge is a dynamic entity that exists in both tacit and explicit forms and whose creation is the result of learning that occurs at individual, group, organizational and inter-organizational levels (Nonaka & Takeuchi, 1995). In addition, although training efforts are often aimed at individuals, strong evidence suggests that learning occurs through interaction with other individuals in “communities of practice” (Brown, Collins & Duguid, 1989; Lave & Wenger, 1990). Therefore, organizational knowledge is best understood not simply a cumulative sum of individual knowledge, but as a synergistic evolution of ideas, experiences, and beliefs within and between individuals.

The Knowledge Creation Perspective

Knowledge is a central concept to this study. However, knowledge is frequently ill-defined and often equated with information or reduced to “facts”. Additionally, knowledge is frequently viewed as a commodity to be processed rather than a product to be generated. To fully understand how knowledge functions in organizations, both as a means and as an end, knowledge, and knowledge creation, must be clearly defined and delineated from such terms as information, learning, and innovation.

Knowledge

Knowledge has an abstract quality about it and may be broadly defined as “justified true belief”, a definition that dates back to Plato (Nonaka & Takeuchi, 1995). By this definition, knowledge entails a component of “justification”, inferring that knowledge has an evidentiary quality about it. However, what is justified as knowledge today, either through deductive reasoning or inductive experience, may be justified
differently tomorrow. The truthfulness of knowledge is thus based by some on its rational justification, and by others on its ability to fit with prior beliefs. The inherent subjectivity of this orientation suggests that knowledge is intrinsically connected to the knower; as individual knowers, we may have different beliefs because of who we are.

Furthermore, knowledge may be both tacit and explicit (Polyani, 1966). Tacit knowledge has a personal quality and results from a person’s own biography and experience and resides within the individual. While tacit knowledge is central to an individual’s existence, it is difficult to share with others because one cannot fully express through language all that is experienced nor demonstrate all that is known through action. Explicit knowledge, however, is that which is formalized through language and is thereby easily conveyed and shared. This study accepts the notion of “individually justified true beliefs”, as well as the conceptualization of knowledge as both tacit and explicit, and thus operationalizes an investigation of knowledge through the articulation of ideas, beliefs, conceptions, and skills.

Information

For the purposes of this study, information can be more easily identified as raw facts or data. In itself, information is not knowledge, for although organizations have access to a great deal of information, it is not the information that matters as much as what is done with it. In this study, information is understood to be transformed into knowledge by an individual, so that “knowing” is essentially an act of meaning making. Thus, information is “a flow of messages, while knowledge is created by that very flow of information, anchored in the beliefs and commitment of its holder” (Nonaka & Takeuchi, 1995, p. 58).

Learning

Learning is another term which has a multitude of definitions. Behaviourists, whose perspective dominates the training literature, suggest learning is evidenced by an observable change in behaviour (Nadler, 1982; Robinson & Robinson, 1989). Others posit that learning occurs as a result of a transformation of perspective (Jarvis, 1995;
Mezirow, 1991), regardless of whether behaviour ever changes. While several researchers suggest that learning is an individual activity, others contend that learning is socially situated and can best be understood by linking learning to the communities of practice in which it takes place (Brown, Collins & Duguid, 1989; Brown & Duguid, 1991; Lave & Wenger, 1990).

Learning that occurs in the context of an organization or for reasons associated with organizational development is referred to as “organizational learning”. Unlike learning theories which focus on individuals, organizational learning tends to focus on how organizations learn as a result of the interactions and intentions of their employees. Finally, it is noteworthy that within organizations, learning may result in new knowledge but, also, it may not.

Innovation

Innovation is herein understood as the introduction of a new product or service or a change in business process. Innovations often result from or are associated with some form of organizational learning or knowledge creating activities. Nonaka and Takeuchi (1995) suggest that continuous innovation is fueled by the process of knowledge creation while Engeström (1996) argues that new practices result from forms of “innovative” organizational learning. “Innovative organizational learning is collaborative learning in work organizations which produces new solutions, procedures, or systemic transformations in organizational practices” (Engeström, 1995, cited in Engeström, 1996).

Knowledge Creation

Finally, knowledge creation focuses on how new knowledge is created rather than how existing knowledge, information, learning, or innovations are processed by an organization. The knowledge creation perspective embraces both the tacit and explicit nature of knowledge as well as the cyclical character of innovations (Dixon, 1994, cited in Engeström, 1996). One theory which is, therefore, particularly pertinent to this study
is Nonaka & Takeuchi's (1995) "theory of organizational knowledge creation" in that it addresses all of the elements identified here as parts of organizational knowledge.

The Research Study

Purpose and Questions

If small business organizations are to implement successful human resource strategies, they must first understand the processes through which they create knowledge. Therefore, the purpose of this study is to examine, through description and analysis, how knowledge is created in a small business organization. Three questions guide this investigation:

- how is knowledge created in a small business?
- what, if anything, appears to enhance knowledge creation?
- what, if anything, appears to hinder knowledge creation?

Methodology

If research is a tool to enhance theory and inform practice, then its design must reflect the central purpose and questions of the study. Studying knowledge creation within a small business requires an approach that surfaces the details of daily business operations as well as the multiple perspectives of small business entrepreneurs and their employees. Statistical analyses, while helping to categorize firms by basic characteristics, do little to illuminate the inner workings of a particular organization.

To examine knowledge creation, this research therefore uses a case study approach which, according to Yin (1994), is "the preferred strategy when 'how' or 'why' questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context" (p. 1). The case study focuses on a single business site and, to strengthen findings, employs multiple and qualitative data collection tools including document analysis, observations, interviews, and field journal entries.
Organization of the Thesis

This thesis is divided into seven chapters. The first three chapters are intended to help the reader understand the background, literature, and methodology central to this study. The remaining four chapters present and analyze the findings of the case study, paying particular attention to the perceived fit with the study's conceptual framework.

This first chapter has attempted to introduce the study's background and context, to introduce relevant terminology, and to illustrate the purpose and central questions to be addressed. Chapter Two, reviews several bodies of literature in an attempt to survey important contributions which are pertinent to this work, and provides an overview of the conceptual framework used to inform this study. The framework adopts segments of Nonaka and Takeuchi's (1995) theory of organizational knowledge creation to further focus the study. The third chapter introduces and reviews the research design and methodology used. The overall research strategy is discussed as well as the particulars of data collection and analysis.

Chapter Four provides a description of the small business site which was the focal point of this study. The description presents a narrative format to help the reader access the essence of the field study. Chapter Five describes and examines six central themes found in the data and illustrates the themes with actual data examples. Chapter Six relates the themes to the study's conceptual framework, drawn from the literature reviewed in Chapter Two. A final chapter, Chapter Seven, suggests possible interpretations of the fit between themes and framework, discusses implications of the findings, makes recommendations for the participants of the study, and suggests areas for further research.
CHAPTER TWO: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

This chapter examines and critiques several bodies of literature which are pertinent to this study. The review attempts to situate the study within its broader theoretical context, as well as develop a synthesis of the multiple perspectives used to inform the research questions. A conceptual framework, which is based upon significant elements of Nonaka and Takeuchi's (1995) theory of organizational knowledge creation, is discussed in the second section of this chapter.

A Review of the Literature

A variety of literature is relevant to this study. A brief overview of organizational studies is necessary to develop an appreciation for the general nature of organizational research. In addition, literature concerning adult learning theories and philosophies is useful to sketch a foundation for the review of organizational learning. This is further explored through an examination of the literature of organizational innovation. Finally, a discussion of the literature of organizational knowledge creation, assists in comparing and interrelating other literatures in order to develop the specific elements of the conceptual framework.

Organizational Research

Organizational research involves inquiry into the complex nature of organizations and focuses at a variety of analysis levels including individual, group, organizational and inter-organizational processes. Frequently, studies are broken into organizational areas such as accounting, finance, marketing, operations research, organizational behaviour or industrial economics (Rinnooy Kan, 1985). Studies may take different forms (Chern, 1970, cited in Rothman, 1980; Easterby-Smith, Thorpe and Lowe, 1993), including ones which are more theoretically oriented and others which are more applied.

Despite the form of the studies however, organizational research is heavily dominated by a managerial perspective. Mumby (1988) suggests that "most organizational research implicitly adopts this managerial bias, not simply because it is
more interested in the managerial perspective, but largely because the so-called value-neutrality of scientific research is easily co-opted by dominant managerial interests” (p. 2). This bias means that organizational research is very much about management issues and especially those issues stemming from established management theories.

Organizational research is also characterized by a tendency to attempt measurement and observation of external phenomena. Organizations are seen as “rule structures” and as such are seen to shape, rather than be shaped, by individuals (Boden, 1994). Research intended to document rule systems in an effort to predict and control organizational behaviour is most closely associated with positivistic inquiry and a “functionalist” view of organizational activity. As described by Guba (1990), positivistic inquiry rests on a realist ontology, objectivist epistemology and experimental methodology. This paradigm presupposes a stable external world, a detached, objective researcher, and goals of generalized findings and developed universal laws (Le Compte & Preissle, 1993). Similarly, functionalism, presupposes an “objective” reality, reinforces dominant power relationships, and draws upon natural science models to study behaviour (Boshier, 1993).

Of the studies which investigate learning, knowledge, and innovation in business organizations, most have been conducted in large companies (Engeström, 1996; Nonaka & Takeuchi, 1995; Orr, 1990a, 1990b, 1987a, 1987b; Swords-Isherwood, 1984). However, several studies suggest that there are essential differences related to firm size which impact knowledge and innovation (Acs & Audretsch, 1991; Link & Rees, 1991; Scherer, 1991). Additionally, these same studies tend to focus on firms in the profit sector. Less emphasis has been placed on nonprofit organizations which may have similar organizational structures but significantly different goals.

While the traditional body of organizational research provides a number of insights into organizational processes, there is a bias toward studies of larger, profit organizations, and to the perspectives of those who hold power, namely managers, within them. Although studies of small Canadian organizations do exist (Baldwin, 1995; D’Amboise, 1991), there is a void regarding the study of learning and knowledge creation
in small business organizations. Additionally, organizational studies reflect a predominantly positivist worldview. It would seem useful to augment previous research by studies drawing upon qualitative research methods.

**Adult Learning Theories and Philosophies**

Perhaps the most notable feature of the literature concerning adult learning theory is its pluralism. Instead of a single, dominant theory, several theories attempt to describe and explain the concept of learning (Brown, Collins & Duguid, 1989; Candy, 1991; Freire, 1972b; Gagné, 1977; Jarvis, 1995; Kolb, 1984; Lave & Wenger, 1990; Mezirow, 1991; Rogers, 1969). The concept of learning varies with these theories and, although different theories share common elements such as personal reflection (Candy, 1991; Freire, 1972b; Gagné, 1977; Jarvis, 1995; Mezirow, 1991; Rogers, 1969), theories differ in their primary focus or approach.

Some theoretical perspectives focus primarily on the individual at a psychological level (Candy, 1991; Gagné, 1977; Rogers, 1969), while others attempt to address individuals as they act in their social contexts (Brown, Collins & Duguid, 1989; Freire, 1972b; Jarvis, 1995; Kolb, 1994; Lave & Wenger, 1990). Yet others focus on a change in perspective or consciousness (Mezirow, 1991). Jarvis (1995) argues that only Mezirow and Freire, and presumably himself, provide “comprehensive theoretical perspectives” (p. 100) and that Knowles’ work is not a theory at all but rather a group of ideas that relate to the management of adult learning and the body of knowledge broadly known as “andragogy”. Indeed, rich diversity seems to be the most consistent characteristic of the theories.

In addition to formal theories of how learning operates, a number of philosophical positions exist which provide a further framework for thinking about learning and teaching activities. Such perspectives include liberal, progressive, behaviorist, humanist, radical, and analytical conceptions (Elias and Merriam, 1980). “Liberal” perspectives focus on developing the intellect and one’s cultural background through liberal arts education. “Progressive” perspectives emphasize the link between education and society and the importance of the learner’s perspective. “Behaviourist” philosophies focus on
controlling and modifying behaviour through the use of behavioural objectives and accountability, while “humanist” perspectives value the autonomous individual striving for self-actualization. Proponents of humanism promote learning through cooperation rather than competition. Advocates of “radical” perspectives focus on education’s capacity to influence fundamental social change by empowering individual agency. Finally, “analytic” perspectives emphasize the need to critique and clarify other approaches in an attempt to create a strong philosophical tradition in adult education. Thus, while some chronological progression of philosophies is apparent, diversity continues to be a prominent feature in the field of adult education (Elias & Merriam, 1980).

While diversity is common amongst adult learning theories and philosophies, the conception of adult learning in an organizational context is dominated by an “organizational effectiveness” perspective (Darkenwald & Merriam, 1982). Organizational effectiveness is often the goal of learning strategies within organizations, and is closely linked with a traditional human resource development approach. In this approach, training activities target an individual’s ability to achieve organizational goals. Training programs rely heavily on a behaviourist perspective, including the perception that learning is evidenced by a change in behaviour. The specification of performance objectives, competency-based instruction, and criterion-referenced testing to evaluate performance against predefined standards exemplifies typical training programs in organizations. In addition to such behaviourist notions, humanism also plays a role in organizational training programs: “the concept of organizational development (OD) is an attempt on the part of organizations to match employee development with organizational growth” (Darkenwald & Merriam, 1982, p. 67).

The diversity of adult learning theories and philosophies is one of the many strengths of the field of adult education. However, in the context of a business organization, a relatively limited behavioural perspective, with some aspects of humanism, is frequently the norm. This perspective typically values a focus on the individual as an organizational “input” to be manipulated and leaves little room for exploration of learning in a social context or for an individual’s perspective
transformation. It would seem such a restricted view of learning within an organization might colour the efforts of human resource development and ultimately limit an organization's capacity for enhancing learning.

**Organizational Learning**

The literature on organizational learning does not negate the importance of adult learning theories oriented towards individuals, but addresses instead learning constructs which are relevant within organizations. Studies of organizational learning address individual learning in relation to learning between individuals and learning within and between organizations. Several constructs appear repeatedly in the literature: knowledge acquisition, information distribution, information interpretation, organizational memory, organizational skills, distinctive competencies, and organizational knowledge (Huber, 1991; Nordhaug 1995). Relatively few studies focus on knowledge creation.

This study is interested in learning that occurs at all levels (individual, group, and organizational), however, several studies suggest that the “community” is where innovative activity and learning occurs (Brown & Duguid, 1991; Daft & Weick, 1984; Orr, 1990a, 1990b, 1987a, 1987b). Communities consist of organizational groups which may be intentionally designed or naturally occurring. It is important to note that much of the organizational literature regarding groups has focused on how best to put groups together in organizations (Goodman & Associates, 1988) rather than how they exist in naturally occurring settings. This study is cognizant that both formal and informal communities may be sites for knowledge creation.

Literature concerning knowledge acquisition pertains to how knowledge is acquired by organizations and their members. One researcher classifies this literature as divided amongst five processes: congenital learning, experiential learning, vicarious learning, grafting, and searching and noticing (Huber, 1991). “Congenital learning” studies show that organizations are influenced by knowledge prior to their inception (Boeker, 1989; Stinchcombe, 1965), while “experiential learning” research examines how knowledge is acquired through either intentional or unintentional experience (Argyris, 1982; Mody 1989; Nonaka, 1988). “Vicarious learning” investigates how organizations
learn from other organizations. This includes studies of corporate intelligence (Fuld, 1988; Porter, 1980) and imitation (Argote, Beckman, & Epple, 1990). “Grafting” studies look at how organizations add knowledge by adding new members or by combining with other organizations (Lyles, 1988). Finally, studies related to “searching and noticing” explore how organizations and their members scan the environment (Dollinger, 1984; Hambrick, 1982), how they focus their search to solve problems (Cyert & March, 1963), and how they do and do not use information to improve performance (Mintzberg, 1975; Staw & Ross, 1987). While literature on knowledge acquisition is plentiful, there is a lack of integration amongst existing studies and a requirement for further investigation that augments and refines what is already known (Huber, 1991).

Organizational learning literature also examines “information distribution”, or how information flows between organizational members and their respective organizational structures such as departments or work groups. Several studies exist which describe the nature of information distribution and address issues of organizational communication (Huber, 1982; Krone, Jablin, & Putnam, 1987; O’Reilly & Pondy, 1980). However, the notion of how organizational units, as information sources, share and access nonroutine information is not sufficiently developed (Huber, 1991).

Because of its social, interpersonal nature, organizational learning must also address how knowledge is shared. “Information interpretation” explores the concept of how shared understandings develop within organizations. The literature in this area is relatively sparse, although some studies do exist (Isabella, 1990; Jablin, 1984, 1987; Sproull, 1981). These studies focus primarily on how information is given meaning within an organization. Related constructs include “prior cognitive maps”, “media richness”, “information overload” and “unlearning” (Huber, 1991). The literature on cognitive maps addresses how individual perspectives shape interpretation and how such interpretations are socially constructed (Sims & Gioia, 1986). Media richness studies explore how communication media impact the interpretation of information. By contrast, information overload studies examine how organizational units handle large quantities of information, particularly quantities that are beyond their capacity to manage. Finally,
unlearning studies focus on how knowledge is discarded by organizational members (Hedberg, 1981).

Organizational learning is necessarily concerned with effectiveness about how organizations store and retrieve both information and knowledge so that it may be used by various members of the organization. “Organizational memory” studies address learning and recall (Nisbett & Ross, 1980; Starbuck & Milliken, 1988), information storage (Feldman, 1989; Gioia & Poole, 1984), expert systems (Waterman, 1986), and perceived importance of organizational memory to managers (Yates, 1990). As with other aspects of knowledge acquisition noted above, studies which further explore these concepts are much needed.

Organizational skills literature investigates how individual skills and actions combine in synergistic ways to create skills at the organizational level. Studies in this area focus primarily on individual and organizational routines or systems of skill coordination (Nelson & Winter, 1982; Stinchcombe, 1990). Studies of distinctive competencies focus on how a particular organization’s knowledge, skill, and technology resources combine to create unique strategies for competitive advantage. Relevant literature examines the notion of core competencies (Prahalad & Hamel, 1990) and strategic skill pools (Naugle & Davies, 1987). The skills literature, however, ignores the notion of peripheral competencies and focuses primarily at a macro level (Nordhaug, 1995).

The largest portion of the literature on organizational knowledge is primarily concerned with knowledge as it exists in structural forms, as sets of facts or procedures that exist independently of individuals and become shared over time within organizational culture. Organizational knowledge is seen to be different from personal knowledge (Argyris & Schön, 1978; Lyles & Schwenk, 1992) and may exist in both core and peripheral forms (Lyles & Schwenk, 1992). “Whereas the core knowledge embraces information about the basic mission and goals of the organization, the peripheral knowledge is conceptualized as including information on subgoals and various means mobilized to promote those goals” (Nordhaug, 1995, p.172). Additionally, organizational
knowledge is rarely viewed as a product of learning, although notable exceptions do exist (Duncan & Weiss, 1979). Instead, knowledge is often conceptualized as external “input” in an “information processing” model of the organization resulting in some change in behaviour or performance (Argyris & Schön, 1978; Huber & Daft, 1987; Weick, 1991).

Just as the literature on adult learning is characterized by diversity, so too are studies of organizational learning informed by multiple perspectives and a plurality of ideas. Therefore, the strongest criticisms of the organizational learning literature stem from its lack of integration; these foster suggestions that further field studies are needed to verify and link the propositions that currently exist (Huber, 1991; Nordhaug, 1995; Weick, 1991). While most of the constructs associated with knowledge acquisition and information distribution have been studied extensively, information interpretation and organizational memory perspectives have received less attention. Additional criticism is leveled concerning the lack of guidelines for increasing the effectiveness of organizational learning as well as the poor distribution of the studies that do exist to those within organizations who could actually make use of them (Huber, 1991). Of particular relevance to this research is the apparent dearth of studies focusing on knowledge creation or studies informed by small business contexts. On a positive note, there is strong agreement that the current fragmentation within this body of research leads to a multitude of opportunities for further work in the area (Huber, 1991; Nordhaug, 1995).

Innovation

Innovation is seen as an increasingly important factor in the economic survival of organizations and international competitiveness (Economic Council of Canada, 1987; Swords-Isherwood, 1984). Indeed, for small and medium sized firms, Baldwin (1995) suggests that innovation is the key factor contributing to organizational success. Although innovation is commonly conceived of as “a process which consists of the technical, industrial, and commercial steps which lead to the marketing of new manufactured products or new services and the commercial use of new technical processes, products and services” (Swords-Isherwood, 1984, p. 9), innovation is more comprehensively understood as both product and process. The process aspect of
innovation relates to the creation or modification of existing organizational procedures, while product innovation results in a new product or service.

Although studies have traditionally assumed the source of innovation to be the manufacturer, Von Hippel (1988) suggests that the functional source of innovation can be predicted by identifying who is likely to benefit from an innovation. In this sense, sources of innovation vary according to context: in some industries, users are more active in the innovation process; in other areas, suppliers become innovators. Additionally, Lundvall (1993) advances the importance of user-producer relationships and the centrality of interactive learning to the innovation process. Accordingly, in some cases innovations occur as a result of informal “know-how trading” (Von Hippel, 1988) whereby firms, even rival firms, work together to share the costs of an innovation.

Innovation studies also suggest that innovations may vary according to size of firm and international location. Traditionally, large organizations have been regarded as arenas for innovative activity partly because of a traditional approach linking innovative activity with research and development (R & D). However, this may be misleading; it favours the perception that large firms innovate more than do small firms (Baldwin, 1995). Acs and Audretsch (1991) echo this by concluding that “there is no evidence that increasing returns to R & D expenditures in producing innovative output exist” (p. 57). Recent studies (Link & Rees, 1991; Scherer, 1991) note that small firms also contribute to innovative activity, and that their role is more significant in some countries than others (Scherer, 1991).

Finally, studies on innovation contend it may be categorized into different forms (West, 1992) and may occur radically or incrementally (Barley, 1988; Von Hippel, 1988). Some innovations are based on solutions to problems and vary according to their use; “solution” innovations are used for a particular case while “trajectory” innovations are used beyond their initial application on a repeated basis (Engeström, 1996). For the purposes of this study, it is assumed that innovation,

which is a key form of organizational knowledge creation, cannot be explained sufficiently in terms of information processing or problem solving. Innovation
can be better understood as a process in which the organization creates and defines problems and then actively develops new knowledge to solve them. (Nonaka, 1994, p. 14)

**Knowledge Creation**

Concepts from the organizational learning and knowledge literatures are broadened by Nonaka & Takeuchi's (1995) theory of organizational knowledge creation. Knowledge creation, defined as "the capability of a company as a whole to create new knowledge, disseminate it throughout the organization, and embody it in products, services, and systems" (Nonaka & Takeuchi, 1995, p. 3), focuses on the creation of new knowledge rather than the processing of information.

The concept of knowledge creation is powerful because it recognizes multiple forms of knowledge and multiple levels of knowledge creation. The theory builds on Polyan's (1966) notion of tacit and explicit forms of knowledge and acknowledges processes at individual, group, organizational, and inter-organizational levels. The resulting matrix (Figure 1) produces four modes of knowledge conversion and provides the foundation for the proposition that knowledge is created from a spiral interaction amongst modes.

![Figure 1. Nonaka and Takeuchi's (1995) theory of organizational knowledge creation.](image)

Tacit knowledge has a personal and subjective quality and is not easily shared because communication is primarily restricted to language conventions. Both individual, mental models and technical skills are forms of tacit knowledge. By contrast, explicit knowledge has an objective, rational quality and is easily communicated through

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Conversion”, the interaction between tacit and explicit knowledge, forms the foundation of the matrix for the knowledge spiral.

Converting tacit to tacit knowledge results in “socialization”, “a process of sharing experiences and thereby creating tacit knowledge such as shared mental models and technical skills” (Nonaka & Takeuchi, 1995, p. 62). “Combination” results from incorporating two or more instances of explicit knowledge. However, neither socialization nor combination are particularly helpful for creating new knowledge, although each represents an integral piece of the overall process. During socialization, only those individuals who are present at an exchange are able to add to their knowledge base; thus new knowledge remains somewhat inaccessible to the organization because it is not formalized. Similarly, when explicit knowledge is combined the result is more a sum of the existing parts than a synergistic creation of something novel. Consequently, the organization can, in theory, easily reproduce the resulting knowledge by recombining existing pieces.

According to this theory, the most powerful type of knowledge creation results from the interactions between tacit and explicit knowledge. “Internalization”, the conversion of explicit to tacit knowledge, and “externalization”, the conversion of tacit to explicit knowledge, are the processes which fuel continuous innovation. When individuals embody explicit knowledge, they make it part of their personal knowledge systems and thereby expand or reconstruct existing mental frameworks and perspectives. Externalization is perhaps the most difficult and powerful of all the knowledge conversion processes because it taps into personal knowledge. The difficulty with externalization lies in expressing personal understandings and images to others. Language, the primary vehicle for expressing tacit knowledge, necessarily limits expression. Consequently, the use of figurative styles of language, particularly metaphor and analogy, are helpful for trying to transform personal concepts into words.

Nonaka and Takeuchi (1995) also argue that, while the individual is the primary source of knowledge, individuals are situated within the context of the larger organizational network. Therefore, knowledge is also created as individuals interact in
groups and as groups interact with each other. At the highest level, knowledge is even created by the interaction between organizations. The process of creating knowledge is thus integrally linked to social interaction. "It should be noted that this conversion is a 'social' process between individuals and not confined within an individual" (Nonaka & Takeuchi, 1995, p. 61). "Thus, through this 'social conversion' process, tacit and explicit knowledge expand in both quality and quantity" (Nonaka, 1990b, cited in Nonaka & Takeuchi, 1995, p. 61). As an individual’s knowledge is shared and disseminated, a "knowledge spiral" (Figure 2) materializes, illustrating the cyclical nature of the conversion process and its movement to higher organizational levels.

![Knowledge Spiral Diagram](chart)

Figure 2. The knowledge spiral (Nonaka & Takeuchi, 1995).

The cyclical nature of the spiral is created by continuous shifts between modes of knowledge conversion. Shifts result from "triggers", conditions or actions which serve to initiate a transformation from one knowledge mode to the next. "Field building" triggers the socialization mode by creating an atmosphere and opportunity for individuals to share experiences. "Dialogue" triggers externalization by allowing individuals to attempt to capture their conceptual, tacit models in words, thereby making them explicit. The use of metaphor and analogy are the key tools of dialogue at this stage. Combination is triggered by "networking", which surfaces previously unconnected knowledge fragments. Finally, "learning by doing" triggers internalization by providing individuals with an opportunity to operationalize and experience explicit concepts within organizational contexts.
As each mode of knowledge conversion is unique and brought on by a different trigger, each results in a different type of new knowledge. Socialization produces "sympathized knowledge" in the form of shared mental models or technical skills. Externalization produces "conceptual knowledge" or concepts which have been made explicit through dialogue and reflection. "Systemic knowledge", in the form of a new product or service is produced by combination. Internalization creates "operational knowledge", a personal understanding of explicit processes, products, or services.

The knowledge spiral is promoted by five "enabling conditions": intention, autonomy, fluctuation and creative chaos, redundancy, and requisite variety (Nonaka & Takeuchi, 1995). Organizational "intention" or "an organization’s aspiration to its goals" (Nonaka & Takeuchi, 1995, p. 74) serves to outline what the organization stands for and also provides criteria for judging the value of new knowledge created. "Autonomy" encourages individual freedom to act and replaces hierarchy so that each member in a group may gain and share maximum knowledge. The autonomous group functions like a "rugby" rather than a "relay" team (Nonaka & Takeuchi, 1995), where each member works together in undefined patterns to move the task closer to the organization’s goals.

"Fluctuation and creative chaos" rests on the assumption that innovations result from an organization’s interactions with its external environment instead of relying solely on internal conditions. A lack of routine to this interaction forces a connection with the outside world. Fluctuation is a kind of disorder that provokes discontinuity between existing mental models and current experience so that existing frameworks are brought into question because they do not fit with what is happening. "Chaos" results from either a naturally occurring or artificially contrived crisis. "This intentional chaos, which is referred to as ‘creative chaos,’ increases tension within the organization and focuses the attention of the organizational members on defining the problem and resolving the crisis situation" (Nonaka & Takeuchi, 1995, p. 79). Creative chaos is only effective as an enabling condition if individuals can reflect on their actions; without the ability to reflect, the chaos can serve to destroy rather than build.
The fourth enabling condition, “redundancy”, occurs when information is shared beyond the scope of those who need it for their immediate tasks. While redundant information may not be used to generate new knowledge immediately, it encourages individuals to look beyond their immediate contexts and to understand their specific places in the larger network of the organization. Redundant information may also help provide cohesion between individuals and groups as they perceive their “loosely coupled” (Nonaka & Takeuchi, 1995, p. 81) association with each other and the overall organization.

The fifth enabling condition, “requisite variety”, is allied to these same aspects. “According to Ashby (1956), an organization’s internal diversity must match the variety and complexity of the environment in order to deal with challenges posed by the environment” (cited in Nonaka & Takeuchi, 1995, p. 82). Without variety, or without access to a variety of information, individuals are unable to confront the complexity in their environments in an efficient manner. It is possible to suppress an individual’s capacity for requisite variety by creating information differentials within an organization. By contrast, enhancing variety by making as much information available to all employees as possible broadens the possibilities for organizational knowledge to develop.

Thus, according to Nonaka and Takeuchi (1995), it is possible to somewhat “map” the spiral of knowledge creation or amplification, identifying both modes and enabling conditions. Indeed, they actually suggest an “ideal” model of knowledge creation within organizations which includes five phases: sharing tacit knowledge, creating concepts, justifying concepts, building an archetype and, cross-leveling knowledge (Nonaka & Takeuchi, 1995).

Because individuals are the primary source of knowledge, the first phase is a sharing of tacit knowledge. Following this, explicit concepts are created from shared understandings. In the third phase, concepts are justified as more or less valuable for the organization, based on both qualitative and intuitive judgments of worth and quantitative measures of feasibility and organizational fit. Once concepts have been justified, an archetype is built. The archetype, whether a new product, service, or process concept, is
built by combining new concepts with existing organizational knowledge. Finally, the process is completed by “cross-leveling of knowledge” in which new concepts are disseminated throughout the organization, thereby leading to the start of another knowledge spiral. The ideal knowledge creation process is unending and promotes continuous rather than one-time innovations.

An organization’s ability to continuously innovate, to promote social interactions within the organization between various organizational levels and, to interact externally is the key to competitive advantage (Nonaka & Takeuchi, 1995). When organizations innovate, they do not simply process information, from the outside in, in order to solve existing problems and adapt to a changing environment. They actually create new knowledge and information, from the inside out, in order to redefine both problems and solutions and, in the process, to re-create their environment. (Nonaka & Takeuchi, 1995, p. 56)

Within this ideal model, innovation is born from the knowledge conversion process between tacit and explicit knowledge. The knowledge spiral helps to capture individual tacit knowledge and convert it to explicit knowledge and vice versa, in a continuous process. As described above in “cross-leveling”, this in turn “organizationally’ amplifies the knowledge created by individuals and crystallizes it as part of the knowledge network of the organization” (Nonaka & Takeuchi, 1995, p. 59). In light of the literature cited above about learning in groups, it is worth noting that Nonaka and Takeuchi (1995) see this five phase process taking place within an “expanding community of interaction, which crosses intra- and inter-organizational levels and boundaries” (Nonaka & Takeuchi, 1995, p. 59).

Nonaka and Takeuchi’s (1995) theory of organizational knowledge creation thus broadens and consolidates existing organizational learning literature in several ways. Firstly, it recognizes the combined importance of tacit and explicit knowledge. Secondly, it recognizes the social context of learning and interactions at multiple organizational levels. Thirdly, it functions as a mechanism for integrating other learning and organizational theories. However, while the theory has these merits, it is based upon case evidence from large organizations and may not accurately reflect a small business perspective. Additionally, the model of knowledge conversion and the resulting spiral
appear relatively simplistic, perhaps too simplistic to be representative of actual organizational processes.

**Summary**

Existing studies have addressed issues of learning, knowledge and innovation in organizations in many important ways. However, there is still much ground to cover. The limited behavioural and information processing models of learning and knowledge require expansion. The treatment of organizations as holistic entities is underrepresented in research, which is biased instead towards the investigation of phenomena at only individual or organizational levels. What is needed is research that seeks to address both micro and macro processes and their interrelationships. New research should seek to synthesize theories and build on existing studies rather than pursue further fragmentation. Given the prevalence of small business in recent economic developments, the dominance of the large organization perspective and of the manager must be supplemented by the perspectives of small business entrepreneurs. As traditional hierarchical organizations give way to smaller, more flexible organizational forms, traditional approaches to training, organizational learning, and innovation will cease to be adequate. Instead, a broader repertoire of interpretations and interventions will become essential.

**Conceptual Framework**

In design, a conceptual framework is intended to focus a research study and to provide both a way of framing the relevant issues it raises and a means to link theory, practice and research. A useful framework integrates pieces of relevant literature, focuses the generation of research questions and provides a structure for subsequent data collection and analysis. The foundation of this study’s conceptual framework rests on three premises of Nonaka and Takeuchi’s (1995) theory of organizational knowledge creation: knowledge types, modes of knowledge conversion, and a knowledge spiral.

By emphasizing knowledge creation rather than organizational learning, Nonaka and Takeuchi (1995) focus on innovative learning processes in successful business organizations rather than information processing. An important assumption, however,
underlies their work; it is believed that knowledge creating processes lead to the ability for continuous innovation which in turn leads to competitive advantage.

These three premises in particular and, the intent of the full theory were chosen as a base for this study's conceptual framework for several reasons. Firstly, the theory is more comprehensive than any other offered from the adult learning or organizational learning literature for the purposes of this study. In essence “organizational knowledge creation” incorporates various adult and organizational learning theories while allowing each to find its own place within a larger framework. Further, the theory addresses micro (individual), meso (group) and macro (organizational and inter-organizational) processes. Secondly, the theory is derived from, and grounded in, case studies of real business organizations. This helps to ensure that the theory meaningfully links evidence of knowledge creation as it has been observed with a structure for explaining its existence and process. Thirdly, although the theory has been derived from business case studies, it is as yet, unexplored in either a small business, or Canadian small business context. Thus using it in this study provides the opportunity to add to the body of research knowledge by helping to extend an existing theory in another context. Finally, the theory as presented is neither overly complex nor too difficult to be understood by researcher and practitioner alike. This makes the framework accessible for both research interpretations and for prompting critical reflection in authentic case settings.

While the authors of the theory have sought to create a generic model for organizational knowledge creation, which they would argue has international implications, it should be noted that their case samples are drawn from large, predominantly Japanese business organizations (Honda, Canon, Matsushita, Sharp, Nissan, Kao, Shin Caterpillar Mitsubishi, NEC, Mazda, Fuji Xerox, Seven-Eleven Japan, Asahi Breweries, Fujitsu; notable exceptions include General Electric and 3M). Small business organizations have significantly different organizational structures than large firms. Furthermore, the case studies are from the profit sector exclusively and, while this is clearly the intended area of focus for both the theory and this study, the researcher is cognizant that the theory may need to be modified significantly for different
organizational contexts. Given this, it is useful to review the three principal premises which do seem appropriate as a conceptual framework for this study.

**Tacit and Explicit Knowledge**

Studies of organizational learning focus primarily on the explicit nature of knowledge and often underestimate the importance of tacit knowledge. Tacit, personal knowledge cannot be separated from the knower; the process of knowing is a continuous activity and therefore occurs as an individual interacts in context. Tacit knowledge is hard to observe and capture because it is frequently dismissed as less important, or because it is difficult to surface as individuals are limited to expression through language and action.

Nevertheless, the tacit dimension is important to this study because it counters traditionally held notions that favour explicit knowledge and because it helps to link individual learning theories to organizational learning theories. If an individual’s experience is central to the creation of new knowledge, then organizations, which are made up of people, cannot simply be seen as information processing entities. In other words, including the tacit dimension posits that, when individuals interact with organizational knowledge, they not only process existing information, but also create new knowledge.

This idea that knowledge is manipulated and changed by individuals challenges the dominance of training efforts which seek simply to transfer knowledge from one individual to another. Additionally, tacit knowledge is often subsumed under the notion of “routine” (Cohen, 1991; Nelson & Winter, 1982) in the organizational literature and, therefore, viewed as acquired through passive participation in a given organizational routine. Instead, the continuous and interactive nature of knowledge creation values individual perceptions and provides a method of explaining how knowledge grows and changes. Of particular interest to this study is the creation of new ideas, products, services, or processes that allow an organization to shape its future. In that light, tacit knowledge seems an element worthy of exploration.
Modes of Knowledge Conversion

Nonaka and Takeuchi (1995) propose four modes of knowledge conversion (socialization, externalization, combination, and internalization). Conversion is the process that results from tacit and explicit knowledge interaction. Tacit to tacit conversion produces sympathized knowledge through socialization, tacit to explicit creates conceptual knowledge through externalization, explicit to explicit results in systemic knowledge through combination, and finally, explicit to tacit renders operational knowledge through internalization.

While Nonaka and Takeuchi (1995) propose these four categories of knowledge, their illustration is more a matrix than a typology as they use the same descriptors on each axis. This leads to the consideration that perhaps the four modes are not mutually exclusive, that is both socialization/combination and internalization/externalization may be two subsets of a larger phenomenon. Despite this critique of the theoretical underpinnings of the model, the four modes serves to illustrate that there are different ways to conceive of knowledge and knowledge creating processes within an organization. Furthermore, these four modes can be used as a lens through which to view literature on learning theory which is otherwise disparate or too narrowly focused to serve as conceptually informative for this study.

Socialization, as a process of sharing tacit knowledge, can embrace literature which deals with organizational culture and context. Similarly, literature which addresses individual learning from the perspective of constructivist or transformative perspectives can “fit” within socialization. Likewise, the organizational learning literature which identifies the interactive nature of learning, or that of learning situated within communities of practice may also be seen as examples of socialization.

Externalization, the conversion of tacit perspectives into externalized concepts, is a relatively unexplored concept in the literature. This may relate to the relative absence of the tacit perspective in organizational learning literature. Orr’s (1990a, 1990b) study of photocopier technicians is an exception, and illustrates how employees may use
storytelling to share experiences which, in turn, helps them to learn how to troubleshoot and solve photocopier problems.

Combination, the conversion of explicit to explicit concepts, concerns the creation of new knowledge by combining previously unconnected pieces of information. This mode is closely associated with the literature which regards organizational learning as the processing of information. However, unlike Nonaka and Takeuchi's (1995) notion of combination, information processing literature has no regard for the tacit side of knowledge. Instead, it focuses primarily on social processes, such as communication, and social structures, such as meetings, to explain how knowledge is used within an organization.

Internalization, the conversion of explicit concepts into personal knowledge, includes those aspects of the literature which represent traditional notions of learning within organizations, including perspectives which favour behavioural learning approaches to training. In addition, organizational learning literature which is not connected to the notion of information processing can be subsumed and interpreted under internalization.

The Knowledge Spiral

The spiraling process has two dimensions: a cyclical rotation between modes of knowledge conversion and an evolutionary amplification of knowledge from individual to organizational levels. The spiral itself, therefore, serves to link two broad categories of organizational literature: the first includes studies of culture, social processes and structures, and traditional notions of learning; and the second combines adult learning and organizational learning literature by addressing the importance of individuals in all their many interactions within an organization.

Furthermore, the spiral also serves to integrate the literature on innovation, so that innovation is seen as both a process of converting knowledge and as a product of that knowledge conversion process. For the purposes of this study, it should be noted that the
spiral is useful to observe the continuous and incremental nature of innovation even though it was originally derived from data of rather large scale, radical innovations.

**Summary**

In summary, the framework proposed by Nonaka and Takeuchi's (1995) theory of organizational knowledge creation helps to integrate some of the diversity in the existing adult and organizational learning literatures. This enables a more comprehensive study of various aspects, both at individual and organizational levels, that may lead to knowledge creation within a small business. Research questions which emerge from this framework, as well as methods for data collection and data analysis, ideally will provide a systematic way of adding to the body of research about knowledge creation. Additionally, it is hoped that the use of this framework will prove accessible enough to small business entrepreneurs to use for reflection on their own existing practices. Finally, it is hoped that this framework will help to strengthen the connection between theory, research, and practice, and ultimately make all three more accessible to the researcher and the practitioner.
CHAPTER THREE: METHODOLOGY

There are a number of ways to set about investigating knowledge creation within a small business organization. The choices made in this study are as much a reflection of my own philosophy about research as they are about practical ways to answer the research questions. In a broader sense, I suppose that the questions themselves could be seen to be a reflection of my perspective; were they not, I might have chosen a different way in which to ask them. Undeniably, both my research philosophy and the study’s purpose influenced the design and methods of the study. This chapter will discuss my general research strategy, provide details about the research site, my role as a researcher, data collection and analysis procedures, criteria suitable to considering the value of my account, ethical considerations, and finally, limitations of the design.

Research Strategy

My research strategy integrated four important constructs: my own philosophy about what constitutes “good” research, the study’s purpose, the study’s research design and the methods of data collection. This strategy resulted in a qualitative case study design that incorporated a variety of data collection methods. While the methods were primarily ethnographic, there is considerable debate about what constitutes an ethnographic study. Ethnography is both process and product (Wolcott, 1988) and while I used traditional ethnographic methods, I feel the resulting product is best described as generally qualitative rather than specifically ethnographic.

“Good research” can be defined in many ways, but, ideally it should strengthen the relationship between theory and practice. While theory and research have traditionally informed practice, it has been suggested that the relationship between all three should be reconceptualized to favour a more equal distribution (Usher & Bryant, 1989). Accordingly, I chose a research design which enabled me to examine theory in the light of practice and practice in the light of theory. Additionally, all research is constructed and valued according to inquiry paradigms (Guba, 1990). From my perspective, “good” research acknowledges that multiple constructions of a phenomenon
may exist, values the researcher as research instrument, and recognizes that the researcher impacts and is impacted by the study’s context.

The purpose of the research was to examine through description and analysis, how knowledge is created in a small business organization. Consequently, I was concerned with providing an adequately descriptive account of what I observed in a “real world” context, analyzing what my data provided as it related to theory and, subsequently, re-examining both theory and practice in a complementary fashion.

A research design, “the logical sequence that connects the empirical data to a study’s initial research questions, and ultimately to its conclusions” (Yin, 1994), in keeping with the study’s purpose led me to choose a case study for several reasons. According to Yin (1994), a case study is suitable for investigating a contemporary phenomenon within a real life context when the effect of the context on the phenomenon is not clear and when multiple sources of data collection are used. Although case studies may be completely quantitative (Yin, 1994), I focused on qualitative methods because I sought a detailed understanding of knowledge creation in a single, particular context. Because my interest lay in discovering specific details of knowledge creation as they occurred in context, I decided that an in-depth examination of a single site was more conducive to answering my research questions than a less comprehensive study of several sites. A qualitative case study design valued my role as research instrument, allowed me to get close to the phenomenon I wished to study, and overtly permitted my interaction with the data and the findings.

In keeping with my desire to uncover detail, I sought methods that would allow me to observe daily business functions, and capture local meanings as they were expressed by the participants. Multiple methods of data collection were used for purposes of triangulation.

Data-source triangulation involves the comparison of data relating to the same phenomenon but deriving from different phases of the fieldwork, different points in the temporal cycles occurring in the setting, or, as in respondent validation, the accounts of different participants (including the ethnographer) involved in the setting. (Hammersley & Atkinson, 1983, p. 198)
The intent of data collection was not only to seek multiple perspectives but to validate those perspectives across multiple sources. The sources of data in this study included observations, documents, participant interviews and field journal notes.

Research Site

The study focused on a single office site in a suburb of Vancouver, British Columbia. This location was a contact point for three separate business entities who worked in conjunction to address market needs. The business entities included two point of sale (POS) hardware distributors, DataSystems Canada and DataSystems USA, and a POS software manufacturer, PC TechnoDev (all firm names are pseudonyms). Of the three firms, only two, DataSystems Canada and PC TechnoDev, conducted business directly from the Vancouver location. The third firm, DataSystems USA, was located in California but communicated regularly with the other businesses by phone and facsimile.

Although the individual businesses could have been considered separate cases, as each was a separate legal and financial entity, it seemed more appropriate to treat the firms as a homogenous unit for a number of reasons. Firstly, the ownership of each firm was equally divided amongst three partners; the resultant entity was a type of network with three branches. Haley managed the daily operations of DataSystems Canada, Thomas managed the California operation, and Kyle managed PC TechnoDev. Secondly, DataSystems Canada and PC TechnoDev conducted business in the same physical location, and at the beginning of the study, in the same 450 square feet of office space. Thirdly, although the study’s participants were hired to work primarily for one firm or another, they often worked together to complete tasks required by both firms. Finally, while the businesses offered different products and services, they worked closely together to create and address market opportunities within the POS industry. For the purposes of this study, the three firms will be referred to as a single business organization. Where it becomes important to report characteristics or activities of an individual firm, the particular business entity will be referred to by pseudonym.

The POS industry consists of companies who manufacture and market cash register technology and provide associated business services such as systems
development and end user support for POS applications. Although originally known as the “cash register industry”, due to the widespread use of personal computers in business and such advances as bar-code scanning and relational databases, the same industry is now known more commonly as the POS industry. Because of the growing predominance of computer technology in POS products, the POS industry is best thought of as a sub-segment of the computer industry.

The site was selected for several reasons. Firstly, and perhaps most importantly, I was granted liberal access to the site and its employees because one of the owners was a friend who consulted me for advice on how learning, knowledge, and innovation might be enhanced within the context of his organization. I had a strong desire to ground my research within the concerns and questions of the small business entrepreneur and to contribute where possible to a dialogue about the results of the study with those who participated. Consequently, I used this opportunity to pursue approval for my research.

Secondly, the site was local and provided me with easy geographic access. Thirdly, the site fit my “small business” criteria because it employed less than 20 people and the owners had decision making independence from external organizations. At the start of the study the Vancouver site employed only three people while another four worked for DataSystems USA in California. During the course of data collection, three additional employees were hired: two by DataSystems Canada, and one by PC TechnoDev.

Fourthly, I wanted a site which was closely, if not directly, linked to the computer technology industry. My reason for this preference included a belief that a site in an industry known for rapid technological change would be more likely to provide robust examples of knowledge creation during the course of my data collection than an industry which was considered more stable and less innovative. Finally, I required a site that would permit my access to business documents, allow my observation of business routines and, provide me with access to key informants who could talk to me about their perceptions of what went on in the firm. The research site provided me with liberal access to employees, their business activities, and written documentation. Participants
even went so far as to check with me periodically to ensure I was able to locate relevant information.

Researcher Role

My role in this study was one of participant-observer. “Participant observation refers to the process in which an investigator establishes and sustains a many-sided and relatively long-term relationship with a human association in its natural setting for the purpose of developing a scientific understanding of that association” (Lofland & Lofland, 1995, p. 18). This is considered to be an appropriate role for a researcher conducting a qualitative case study (Ely et al., 1991; Hammersley & Atkinson, 1983; Lofland & Lofland, 1995; Wolcott, 1988) although the nature of the balance between participant and observer will vary according to context.

When I first began my fieldwork, I expected to be more observer than participant partly because I was unfamiliar with the business and partly because I expected the participants to view me as a traditionally “detached” researcher. However, shortly after I began my observations I was encouraged by the owners and other employees to become involved in business activities. I answered phones, took messages, performed accounting duties and generally helped out when asked. My involvement in the daily activities of the firm blurred the distinction between observer and participant, researcher and employee. I received no compensation for my work because of my primary role as a researcher, although, in many ways I functioned as another employee. I believe my direct involvement produced more comprehensive and authentic data because I was privy to a greater variety of information and because as participants gradually saw me less as a researcher and more as a colleague, they appeared to relax and talk more openly to me about the business.

To make explicit the reflexive nature of my work and in keeping with Hammersley and Atkinson’s (1983) advice that “rather than engaging in futile attempts to eliminate the effects of the researcher, we should set about understanding them” (p. 17), I made every effort to carefully document, in written form, my observations of and interactions with the business. Because one of the owners was a friend, I made a special
effort to carefully record the nature of my relationship with each of the participants so as to make apparent my interaction with the individuals in the study. The record of interpersonal connections was documented primarily in my field journal and became part of the study’s larger data set. I also attempted to balance my exposure to and interactions with all participants, so as to avoid the perception that I was more interested in what my friend might say or do, which of course I was not.

The skill with which a researcher conducts a qualitative study is perhaps best judged by the written account that transpires. However, I believe that my background, which includes a familiarity with computer technology and concepts of data and sales management, contributed to my understanding of and access to the site. I have worked with computer software applications for several years, have taught computer courses and have provided occasional software support in previous jobs. Several years ago, I worked as a cashier and office manager in the retail clothing industry and became familiar with the concepts of cash and data management as they applied in a retail sales setting. I have some background in computer programming which helped me to understand the principal elements of code writing but I am unfamiliar with any particular programming language. I have had some exposure to small business operations from past personal experience but no direct nor prolonged experience in a small organization in the POS industry.

Data Collection

Data was collected from four sources: observations, interviews, documents, and my field journal. Additionally, I followed Hammersley and Atkinson’s (1983) advice to sample across the dimensions of time, people, and context. The data collection phase of the study spanned a six month period and resulted in 29 days worth of observation protocols, seven taped interviews, two additional informal interviews (not taped), more than a hundred pages of field journal entries, and approximately 20 documents. To attempt to capture a more complete picture of the business, observations were intentionally conducted at different times of the day and on varying days of the week. Additionally, since the number of total employees was small, all employees at the site were observed and interviewed. When employees from DataSystems USA came to
Vancouver, every attempt was made to interview them. This resulted in an additional interview, one of the total seven, and several pages of field notes. The primary site of data collection was the office; however, some interviews were conducted offsite.

Of the three business organizations that became a part of the data of this study, only two, DataSystems Canada and PC TechnoDev, were directly observed. While my initial strategy for observations included meetings and planning sessions, it quickly became apparent that these formal structures were less evident than I had originally thought. Consequently, instead of attempting to observe specific incidences of discussion, problem solving, or dialogue, I observed daily business operations by visiting the site and noting whatever took place. These site visits produced a volume of data which was recorded in observations protocols. My reflections about these observations, and all other aspects of the study, were captured in field journal entries.

Observations were supplemented by analysis of documents which seemed relevant to the planning and management of business activities. These documents included memos, documentation manuals, marketing literature both from the business and its suppliers and other documents provided by the study’s participants. Documents were checked for authenticity and analyzed for themes relating to knowledge creation.

Observations were further enhanced by interviews which attempted to clarify and illuminate issues of interest which had emerged as themes from other data sources. An interview schedule provided an initial framework for interview questions (Appendix A). Interviews were scheduled when convenient for participants and were tape recorded where possible. Taped interviews were transcribed into interview protocols.

As researcher, I kept a detailed field journal as an additional data source. The journal attempted to make explicit the reflexive nature of the study, that is, the assumption that I was part of the social reality I was attempting to study (Hammersley & Atkinson, 1983). The journal was started in the initial phases of the study, used extensively during data collection and analysis and continued as a tool until the study was in published format.
The majority of observational data was collected in the first three months of the study, February through April of 1996. The first interview was conducted in March and subsequent interviews took place in May, June, and July of 1996. Documents were provided and requested throughout the study either as deemed appropriate or interesting by the participants or by myself.

To ensure data was protected for confidentiality, written protocols were entered into password protected computer files. Hard copies of data protocols were used only for the researcher’s data analysis and then subsequently destroyed. Cassette tapes, used for recording interviews, were transcribed into secured protocol files and then erased. The anonymity of the firm and its employees was protected through the use of pseudonyms.

Data Analysis

Data was analyzed on an ongoing basis. This continual analysis made it possible to refine observations and interview questions as time passed. All data sources were analyzed individually and in reference to other sources in an effort to provide stronger evidence of robust phenomena. The analysis process refined and created more questions which in turn were explored in later interviews. The data analysis became more than a simple description of business activities which seemed to provide evidence of knowledge creation. Concepts that emerged were compared to the theoretical framework in an effort to discern similarities and differences. Comparison between the findings and the framework in turn led to a greater understanding of knowledge creation within this small business organization. Additionally, the data analysis and interpretation formed the basis of suggestions for implications, recommendations, and areas of further study.

The specifics of the data analysis process consisted of reading and re-reading protocols from all data sources. Data categories were initially established without direct reference to the conceptual framework. These categories were further refined through additional readings of the protocols and writing exercises designed to highlight important aspects of the data. Categories were then considered in light of the research questions and categories that did not appear to fit were removed. Definitions of each category were established and examples from the data were sought to triangulate the findings.
Categories were further refined during the writing of the first draft, but upon reflection, the categories appeared to be too simplistic and lifeless to adequately represent the concepts I was trying to express. After having read the data several more times, the categories were expanded to themes, which illustrated broader responses to how knowledge was created and which allowed the combination of categories to be subsumed under relevant themes. Drawn from actual data citations, the themes more adequately represented the essential phenomena found in the data.

Criteria for Evaluating the Study

All research is judged by criteria which help to establish the value of a particular study. Criteria seek to address issues relating to the truth value of the research, its applicability to other contexts, its ability to be replicated, and finally, its neutrality or ability to avoid biases of the researcher (Lincoln & Guba, 1985). Conventional criteria, which include internal validity, external validity, reliability and objectivity, are inappropriate for qualitative research because they are based on the assumptions of positivist science. Therefore, I have chosen to address Lincoln and Guba’s (1985) criteria of credibility, transferability, dependability, and confirmability as I find them to be more appropriate for the study I have conducted.

Credibility

The goal of credibility “is to demonstrate that the inquiry was conducted in such a manner as to ensure that the subject was accurately identified and described” (Marshall & Rossman, 1995, p. 143). In this study I have used Lincoln and Guba’s (1985) strategies of prolonged engagement, persistent observation, triangulation, and member checking to ensure credibility. I remained in the field until I felt I was no longer adding significantly diverse data, until I felt capable of fitting into the office culture and until I felt the participants trusted me. During my stay in the field I gradually focused my observations on what I analyzed to be important qualities relating to knowledge creation. Additionally, I collected and analyzed data from multiple sources to strengthen my findings. Finally, after having written an account of my experiences, I returned to the field to verify my account with participants and adjust it accordingly.
Transferability

Transferability addresses the issue of how transferable one’s findings might be to another context and “rests more with the investigator who would make that transfer than with the original investigator” (Marshall & Rossman, 1995, p. 143). To provide a substantively thick description of my experience, I followed several suggestions for writing up the data, including Lincoln and Guba’s (1985) suggestions for explicating the problem, describing the context, processes, important elements and outcomes of the study, and Wolcott’s (1994) strategy of description, analysis and interpretation.

Dependability

The notion of dependability is linked to the notion of credibility so that a study cannot be credible without first being dependable. Dependability is the process “in which the researcher attempts to account for changing conditions in the phenomenon chosen for study as well as changes in the design created by increasingly refined understanding of the setting” (Marshall & Rossman, 1995, p. 145). I have attempted to demonstrate dependability by using multiple methods to study the same phenomenon and by keeping detailed and regular notes in my field journal.

Confirmability

Confirmability addresses the traditional notion of objectivity, although objectivity is regarded as unattainable by advocates of the constructivist paradigm. Rather than focusing on the objectivity of the researcher, Lincoln and Guba (1985) suggest focusing on the data. Marshall and Rossman (1995) echo this by suggesting the appropriate qualitative question is “Do the data help confirm the general finding and lead to the implications?” (p. 145).

While I freely admit that my own perceptions have shaped the research, I have attempted to keep detailed notes of my observations and interactions with the study’s participants. Through these notes and in writing this thesis I have attempted to make explicit the reflexive nature of the research and to make clear my own assumptions. To balance my own perspective, I have sought alternative themes and undergone several
iterations of data analysis, searching for more complete ways to describe and label the phenomena I have found to be important.

Ethical Considerations

Ethical problems can occur both with the topic of a research study and with its methods or procedures (Anderson, 1990). While the subject of knowledge creation was not perceived, by either myself or the research participants, to be harmful or damaging, several precautions regarding methods and procedures were taken including informed consent, confidentiality, verifying accuracy and inclusion of data, respect for the participants’ time, and providing an optional debriefing.

Before the study’s data collection began, I requested the firm’s participation by way of an introductory letter which explained the details of my research project (Appendix B). I then discussed the nature of my study with the owners who managed DataSystems Canada and PC TechnoDev and reviewed the ethical guidelines I would follow. An agency consent form (Appendix C) was signed by an owner, and individual consent forms (Appendix D) were signed by each participant. Employees who were hired later in the study signed individual consent forms before participating in an interview.

Protecting the confidentiality of each business entity and its participants from outsiders was accomplished primarily through pseudonyms. However, to ensure that my portrait of the site was not overly revealing, I verified the site description with the owners, asking them to note anything they felt might reveal their identity. They had no concerns. Protecting the identities of individual participants from each other proved more challenging. The removal any identifying features resulted in a rather flat and incomplete account of the business. Finally, to resolve anonymity issues amongst participants, I asked participants whether they had concerns about others knowing what they had said or done. They did not. I also asked if they perceived harm could come from others being able to identify them through my account. They unanimously agreed this was not an issue for them. To ensure they were duly informed I submitted, to each individual, a list of quotations that I thought I might use and also asked them to read through my account.
of their business. Some participants asked for minor revisions to the document but none had concerns about others seeing what they had said or done.

I attempted to respect my participants' time in several ways. Firstly, when I observed at the office I tried to be relatively unobtrusive. Gradually, as I spent more time at the site, participants involved me more in conversations and work practices. I also attempted to schedule interviews at the convenience of the individual participants, although, as it became increasingly difficult to get participants to commit to a particular schedule, I started to be more direct in asking for interview time.

At the start of the study, I discussed with the owners managing DataSystems Canada and PC TechnoDev the possibility of providing a debriefing and review of my study's findings. Both individuals welcomed the idea of a debriefing and expressed an interest in understanding how the findings of the study might relate to their business. Results of the study were informally reviewed with these owners.

Limitations of the Design

This study has examined only one site among many. Additional cases would most certainly help to further enhance understanding of the conceptual framework and theories that inform this study. I do not claim the findings to be widely transferable to other settings, although it is possible that other settings which possess similar characteristics may prove to have similar themes. Data collection was confined to a six month period. While several relevant themes emerged from the data, it became abundantly clear that a central feature of the business site was rapid growth. Therefore, a longer timeframe may have produced additional themes.

Of the themes that did emerge from the data, only those apparently related to knowledge creation were discussed in the findings of this study. Further investigation through additional observations or another series of interviews may have linked apparently unrelated themes in new ways. Finally, the research site was clearly linked to the business of DataSystems USA, however limited time and funding prevented direct observation of the U.S. firm. A more complete investigation of DataSystems USA may
have produced additional themes relating to knowledge creation that were otherwise not captured by this study.
CHAPTER FOUR: THE STORY OF A SMALL BUSINESS

After having spent six months in the field, I have far more research data than I could ever use for this study. Sharing that data becomes difficult because, by necessity, I must limit what I present in these findings. It is equally challenging to transform what is now my own tacit knowledge about the case into an explicit form that I can offer to readers and the study’s participants. As a strategy for presenting what I have found, I have chosen to follow Wolcott’s (1994) framework of description, analysis, and interpretation.

This chapter, Chapter Four, attempts to convey the essence of my data by describing, in narrative form, what goes on in the small business I have studied. This story is at best a partial account of what I have experienced and reflects what I consider to be significant data evidence of knowledge creation. Data quotations, captured through observations, interviews, documents, and field journal entries, are referenced according to their source. Field journal and observational data is also referenced by date. The majority of interview data is referenced according to the participant’s pseudonym. Interview information which might be considered sensitive, or which does not clearly identify the participant, is referenced according to a randomly assigned interview number.

Analysis, “the identification of essential features and the systematic description of interrelationships among them” (Wolcott, 1994, p. 12), will be left to the following chapters. However, I wish to point out that my choice to include and exclude certain events in the story, and by extension, to have collected certain pieces of data rather than others, signifies that I have already sifted the data at a preliminary level.

Chapter Five, provides an analysis that is based both on this chapter’s story and the larger data set from which this story is drawn. That analysis is compared to the conceptual framework in the following chapter, and possible interpretations and discrepancies between themes and the framework are discussed in some length in Chapter Seven.
In the Beginning

Haley came to the realization that he wasn’t happy on his thirtieth birthday. It was true that a senior position with a securities firm in Toronto brought him financial success, but it was the kind of success that took its toll. The stress of the job was affecting his life; his fitness and health had declined and he lacked what he considered a meaningful personal relationship. He needed a change and wanted more out of life, but he was cautious; he didn’t want to give up everything he had worked so hard for without a plan.

Thomas’ POS business, DataSystems USA, was just starting to take off. The first couple of years had been a struggle. As one employee noted, “It’s hard, when you’re first going into business, you don’t know what to carry...and Thomas has made a lot of mistakes in the past” (Interview 4). But Thomas had learned from those mistakes and his California based business was growing rapidly. As the business grew, Thomas began to look for more financing.

Kyle, a businessman in his early forties, was back in the computer business. After giving up his shares in a software company because of a failed partnership, he had an opportunity to take back his business and give it another chance. There was much work to be done but he was confident he could do it and he knew he had a successful product. The trick would be to get financing in place so the product could be redeveloped and marketed properly.

It may have been coincidence that Thomas was looking for money at the same time his stepson was looking for a new career. Whatever the circumstances, Haley started to help Thomas finance some of the hardware deals for DataSystems USA and became increasingly confident in the viability of the business through repeated investments with Thomas. Haley felt that he and Thomas were a good team; they made money working together and they had fun doing it. Haley also felt a certain personal satisfaction working with his stepfather. When the time was right, Haley moved back to Vancouver and started a Canadian version of the US company.
Kyle and Thomas had been friends for a long time. They had worked together in
a previous business and had crossed paths throughout the years because of their
connections in the POS industry. Through a series of conversations, it appeared that there
might be a good fit between Thomas’ hardware company and Kyle’s software business.
DataSystems USA was now well established and PC TechnoDev had considerable
promise.

Haley had the money Thomas and Kyle were looking for. But more than that, the
three businessmen liked the idea of working together. Each possessed a variety of
experience and skills and all shared a vision of wanting to shape their own employment
futures. In an exchange of capital and shares, an equal partnership was born; each person
became a one third owner of the three business entities.

In their infancy, PC TechnoDev and DataSystems Canada were run out of Kyle’s
home. While the home based business cut down on overhead costs, it quickly became
apparent that the firms required space for hardware inventory and room for Haley and
Kyle to work. The hunt for suitable office space began.

Jake and Haley had been best friends for years. They had grown up in the same
town, and attended highschool together. Jake had suffered through a difficult business
year before joining DataSystems Canada. A previous restaurant business was failing and
a part time job in the sports industry was about to end for the winter. As Thomas and
Haley discussed their plans for the companies, Thomas, who had known Jake for years,
suggested involving him in a sales position. Jake welcomed the opportunity, “I was all
ears because I was hurting...I was laid off for the winter time and I wasn’t making much
money in that business” (Jake).

Together, Haley and Jake went looking for office space. It wasn’t long before
they found a suitable space to lease in “tech city” (Field Journal, 960225), a location in a
suburb of Vancouver well known for computer technology companies. A two level,
combined office and warehouse space became the new home of DataSystems Canada and
PC TechnoDev.
About the same time they were looking for office space, Haley and Jake decided to visit Thomas’ operation in California to see what it was all about.

When Haley and I first started...I went down to the office down in California, took notes of how they were set up down there, brought them back and then Haley and I went over the notes and said well we can do this, this and this. [We] took what was there and sort of tried to model up here and improve on it and that’s something that we did quite well. (Jake)

The Nature of the Business

The POS industry consisted of companies who manufactured or marketed either traditional electronic cash registers or more sophisticated computer based systems. While some still referred to it as the “cash register industry” (Interview 4), “point of sale” more accurately referred to computer based solutions to cash management functions. Chris, an employee of DataSystems USA, explained, “the point of sale industry never existed until computers got to the point where they were affordable for small business” (Chris). DataSystems and PC TechnoDev were an integral part of this POS industry.

The goals of the organizations related to their products; DataSystems Canada was a POS hardware distributor, like its US counterpart, while PC TechnoDev manufactured and marketed a POS software application. Although the two companies were legally and financially separate, they shared office space, several of the same customers, and their employees often worked together to accomplish tasks.

DataSystems was in the business of reselling products purchased from suppliers. DataSystems Canada serviced the Canadian market primarily through a network of dealers across the country. In an effort to reduce unit costs, DataSystems purchased and shipped product in bulk whenever possible. Product purchased and not yet sold was stocked as inventory in the office warehouse.

PC TechnoDev designed and developed POS software. Their main product consisted of three software modules: a transaction processing module for handling sales transactions, an inventory module for tracking inventory and generating bar codes, and a terminal manager module for system configuration and report generation. The firm also
marketed, installed and supported its software application. PC TechnoDev’s customers included POS software dealers as well as end users of the product. When a deal requiring hardware surfaced, PC TechnoDev would frequently work with DataSystems to provide the customer with a complete solution to their POS needs.

Haley managed the daily operations of DataSystems Canada, Thomas managed DataSystems USA and Kyle was left to manage PC TechnoDev. Routine business decisions were made by each individual although Haley and Kyle frequently talked over decisions face to face and consulted with Thomas over the phone on an almost daily basis. Large scale decisions, those that affected the structure or strategy of any one of the three organizations, were made together by the partners.

First Impressions

The phones ring frequently and the office is filled with conversations. There are no dividers between the desk areas and Kyle, Jake and Haley frequently talk back and forth to each other while they are on the phone...Nobody seems to be intimidated by my presence. (Observation, 960214)

I had known Kyle for several years and was excited about the possibility of doing research on his organization because I felt it would connect me to “real” issues. When I first met Haley and Jake I was surprised that they were my age and I was impressed that the business appeared to be so busy. The three worked well together, addressing issues and problems as they arose.

The office environment was always busy; phones rang frequently and conversation filled the air. I found the constant nature and volume of the dialogue to be somewhat disconcerting at first. However, the office atmosphere exuded a kind of energy, a sense of excitement and purpose that Jake, Kyle and Haley seemed to share. While the office dialogue was most often positive, there were stressful times too, when voices were raised and condescending words were muttered.

Office furniture was sparse, a desk unit for each individual, a couple of extra tables and a few chairs. A coffee maker and a microwave stood on a table in a room upstairs which would eventually become a boardroom. The amount of office technology
surprised me. Haley and Kyle each had 486 laptop computers with docking stations. The docking stations had built in CD ROM drives and ethernet connections to the office’s local area network (LAN). Jake had a pentium tower unit computer which was also connected to the LAN. Although the shared office area was only about 450 square feet, the LAN allowed the employees to share information between computers and connect to the same accounting and contact management files without having to share a computer.

In addition to computers, the office had a sophisticated phone system which allowed for multiple lines, call answer and call forward, hold features, an intercom, and call information such as length of call time. A plain paper fax machine, full page scanner, and laser printer completed the office automation products. When DataSystems Canada first started, Haley purchased an industry specific contact database. This became a source of customer contacts which Haley describes as being “75% valid” (Document 20). Haley used the office technology combined with the database to contact customers overnight by faxing information about product specials.

I spent my first few weeks at the office observing and helping out with work in whatever way I could. Kyle had approved my study in advance and Haley appeared willing to support the study but skeptical about whether the business could provide what I needed. “Haley says he doesn’t mind me hanging around and is always happy to have the extra help but is concerned that they are just a very basic operation and that I might not find what I am looking for” (Observation, 960214).

Although the leased office space had two levels, only the upper level was occupied. Kyle, Jake and Haley, the only employees, shared this second level floor space. They talked frequently about the growth potential of the business and I wondered if they had more office space than was occupied because they anticipated needing it in the future. While the companies were separate entities, daily business was conducted in the same physical space and office conversations included aspects of both company’s operations.

Haley spent a good deal of his time making phone calls to buy product. When he was not on the phone he worked at his laptop computer, usually performing a variety of
accounting functions. Accounting was very important to Haley and he focused both on reviewing reports from the financial accounting software as well as the more routine work of entering and paying outstanding bills.

Kyle was the only employee of PC TechnoDev. During the first few months of my study he worked with three major accounts: a franchised chain of sporting goods retailers, a provincial utility company, and parks and recreation departments of several municipal governments. Kyle designed, coded, installed, and supported the POS system that his company marketed. “He tells me that he is the only person who can do any programming right now and that they need to hire a programmer to free up some of his time” (Observation, 960214).

Jake was the salesperson and the shipper receiver. He spent a great deal of his time on the phone with customers and suppliers. To keep track of his contacts, he used a contact management software package which allowed him to keep a database of customer information.

A Day at the Office

It’s 7:30 am and Haley, Kyle and Jake are already at the office. The smell of freshly brewed coffee lingers in the air. Haley is busy at his desk working on his laptop, reviewing DataSystems’ sales and inventory figures. Kyle is writing code on his laptop. This morning he’s trying to fix a bug in his POS software that is preventing a customer from accessing the information they need. Kyle needs to have the problem solved in an hour because the customer will call for support at that time. Jake is sitting at his desk working on his computer. He’s reviewing his plan of action for the day and looking through customer records in his database.

Haley asks Jake about a deal he has been working on. Jake explains the status of the deal and Haley reminds him about other products that might be a good fit with the customer. A technical question arises so Haley and Jake ask Kyle what he thinks. Kyle explains how the technology works. The three continue to discuss how they can best get the right product to their customer. Kyle remembers an update that needs to be made to
the software and enters the information in a “developer’s log” (Observation, 960217), a software package that helps him keep track of programming changes to be made.

The phone rings and Jake answers. It’s a customer who is having difficulty finding a printer that works for his application. Jake agrees to look into the problem and call the customer back. The phone rings again and Jake answers. It’s a call for Kyle from the customer who needs help with the software. Kyle takes the call and spends a few minutes talking through the steps needed to solve the problem. “I wish all my customers were like her!” he says as he hangs up the phone. Haley is on the phone with a custom’s broker trying to get a price quote for a shipment of goods. He seems shocked that the price quote is so high and attempts to negotiate on price. While Haley is negotiating, Jake phones their regular broker to ensure their price is cheaper.

A courier arrives with a shipment. Jake signs for and then opens the box of product. He turns the magnetic stripe reader over in his hands and examines it. Then he shows the “mag” stripe reader to Kyle and Haley. They examine the product around Kyle’s desk and talk about the technological advances it represents. Haley is on the phone again, this time with a representative from the National Research Council (NRC) trying to get information on available technology grant programs. “One of our challenges is finding the right people to support the technology we’re developing”, Haley explains.

Thomas calls from California. He talks with Jake first and then Haley. They discuss how they can buy a product at the best price. Haley calls a supplier named Bill to discuss “the price book”, a product catalogue that Haley is working to publish. Their discussion soon turns to buying product. “As you know,” Haley says to Bill, “this is a cash flow business...I’d have no problem ordering fifty but I’d like to get that hundred unit pricing for my cash management purposes” (Observation, 960227). Haley tells Bill he’ll send him a purchase order (PO) for fifty at the $213.00 price, then changes his mind and tells Bill he’ll send him a “PO” for twenty five and have Thomas send him a “PO” for twenty five, just to keep the books straight (Observation, 960227).

Kyle is on the phone with a supplier. A problem has plagued a particular POS keyboard that the company sells. Kyle is attempting to solve the problem by talking with
the supplier over the phone while taking apart a keyboard at his desk. The phone rings, Jake answers and it’s Penny for Kyle. Jake puts Penny on hold and tells Kyle that he’s tired of “deflecting” Penny’s calls. Kyle is still on the phone. He shakes his head at Jake indicating he can’t take the call. Jake looks frustrated and tells Penny that Kyle can’t make it to the phone right now but that he’ll return her call just as soon as he can. Jake jots down the information in a spiral message notebook he keeps at this desk. Haley is on the phone again with another supplier and Jake is on the phone with a customer. The phone rings again. Jake puts the customer on hold while he takes the incoming call.

It’s 2:00 p.m. Nobody has eaten lunch yet. Jake drives to a nearby restaurant to pick up lunch for himself and Haley. Kyle has brought his lunch and eats at his desk. When Jake returns he and Kyle eat lunch at their desks while reading through paperwork. A courier arrives with a cheque. Kyle agrees to deposit it at the bank on his way home.

Kyle is rushing to make software updates before a 3:30 p.m. courier pick up. The software must be shipped today in order for the customer to get it by tomorrow. Haley is having problems with his laptop so he asks Kyle for suggestions. Kyle stops what he is working on to help Haley, then returns to his desk and continues programming. Jake asks Kyle about printer interrupts. Kyle tries to explain how an interrupt works, then takes Jake over to a whiteboard where Kyle draws a diagram to explain the concept. Kyle gives Jake some examples of how a computer might be set up and how the various peripheral devices and interrupts might work. They return to their desks.

Jake is printing out purchase orders on the printer attached to the LAN. When he’s finished, he attempts to copy part of a product brochure to fax to a customer. Jake uses the office scanner to make a copy of the product brochure because there is no office photocopier. The scanning software is not working very well and Jake is getting frustrated. Finally Jake gets the program to work and sends a copy of the scanned image to the printer. The newly copied brochure page comes out of the printer and Jake faxes it off to the customer. Haley and I talk about the challenges of a small business. He tells me that one of the toughest things is trying to balance growth just at a point when you have no time (Observation, 960220).
It’s 3:30 p.m. A courier arrives. Kyle gets Jake’s help in putting the package together for shipping, gives it to the courier and the courier departs. Haley and Kyle talk about a current account that buys hardware and software from the company. They feel their pricing for installing a new system may be too high because they currently factor in travel costs. Haley and Kyle discuss how they might make the product more price competitive.

Haley is still at his laptop, working in the accounting system software, printing up cheques to pay some bills that are due. Kyle is attempting to return some calls from early in the day, and days gone past. Jake is updating his contact management database and preparing a list of things to do for tomorrow.

At 4:30 Kyle’s wife Ann arrives. Kyle and Ann share the car and today she is here to pick him up. Ann chats with Haley and Jake while Kyle is packing up. Haley puts the new Rolling Stones CD into the CD ROM drive of his laptop’s docking station and turns the volume up loud enough for everyone to hear. Kyle straightens the paper on his desk and puts his laptop into his briefcase to take it home with him. Ann and Kyle say goodbye and leave the office.

Haley and Jake talk casually about customer accounts, suppliers and where the sales figures are to date this month. Jake and Haley, who often socialize together, have a golf game scheduled this evening so they get ready to leave. Jake shuts off his computer and grabs his car keys. Haley closes down the program he is in, then shuts off his laptop. He leaves it in the docking station but grabs a couple of trade magazines to put in his bag. Haley and Jake turn off the office lights, check the warehouse door, set the alarm and leave. It is already 5:15 p.m.

The Price Book Project

The “price book”, a catalogue of products and pricing, was a marketing strategy for DataSystems. Major hardware competitors had price books; DataSystems employees decided if they were to be seen as a legitimate firm in the hardware business it was
important for them to do the same. When I asked Jake how the price book would help he replied,

it will make my job so much easier...number one, credibility, and that’s everything in this business...dealers don’t really know what’s out there in this market, the Canadian market specifically...I mean first there’s credibility, second is to show the variety of products. (Jake)

The price book was Haley’s responsibility, although he had never undertaken a project quite like this one. The project involved determining the products and prices to be included, creating lists of this relevant information, deciding on format and layout options, and finally publishing and distributing the book to customers. To complete the project, Haley enlisted the help of his cousin, an advertising specialist who also owned her own company and was able to help with design and publishing issues.

The price book was based on a concept that competitors used and Haley and Jake felt that the price book would make it easier for customers to buy from them. Jake noted that “it’s going to be a tool for them...it makes their job easier...and that’s what we’re trying to do...make it easy for them to order” (Jake). “Everyone’s time is pressed and if our clients know that they can just open our book, fill out a purchase order and slap it on the fax machine, they can save themselves time...I want it to be as easy as possible for people to deal with us” (Haley). While DataSystems had a “makeshift” price book when the business started, it became evident that they needed something better.

We had a makeshift price book and we thought...this is just very limited. Kyle had done one up and Thomas had a copy as well, he had US prices, we had Canadian prices and it just wasn’t acceptable especially when the competition’s got a nice price book...so we knew we had to improve on what we had out there. (Interview 3)

The price book was originally expected to be completed near the beginning of my study but was still not complete by the time I finished data collection six months later. The delay appeared to be related to several issues. Because Haley had never undertaken a project of this sort, he did not anticipate how long it might take. The day to day issues that arose appeared to need immediate attention and therefore took Haley’s time away from the project. Additionally, a new idea, to include advertising from suppliers, made
the publishing process more time consuming because there was more effort involved in gaining commitment.

However, Haley also noted,

the most successful thing was our idea to contact our suppliers to convince them that they should advertise in our catalogue....It was effectively direct mail marketing for them and...something that’s going to sit on someone’s desk for six months and be used presumably, almost daily....effectively what we’ve done is we’ve managed to...I suspect it will, we’ll actually be able to turn a profit on the book. And presumably it could increase our business by I think as much as fifty percent. (Haley)

I wondered if Haley had foreseen this additional benefit. He assured me, “I wasn’t trying to make money, I was just trying to cover costs and at the same time cover the costs of production”. He also felt that an additional benefit of the price book’s advertising was credibility.

I think it adds a sense of credibility that no one else has, because it shows that the manufacturers believe that we are worthy of their support. [This] again comes back to customer perception of the business and...the way we do business and I think that affects buying habits. (Haley)

Strategic Alliances

We’re under-resourced for what we’re trying to do...and that’s why we’re continuing to look at strategic alliances...when I say a strategic alliance I mean we’re actually talking about sharing technology now, as opposed to us setting them up as a dealer. We’re talking about a similar thing as what we did with Systex where we’re looking at sharing source code with them and they would share source code with us... both of us will integrate...and they’ll take their product into the market and we’ll take ours. (Kyle)

Strategic alliances provided an opportunity to maximize limited resources by working with other companies to address market opportunities. The most central alliance involved DataSystems and PC TechnoDev. The two hardware companies were able to cover the North American POS market while benefiting from economies of scale when purchasing product. PC TechnoDev brought the software dimension to the mix, which allowed all three companies to offer customers integrated solutions. Integration and standardization were described as future trends affecting the industry.
You can’t go out and get the hardware and the software that will fit your application and just plug and play...And that’s where this industry is going to go. And the company that can provide that will make life easier for the person buying it...Every installation has different specs. And I see it moving towards standardization. (Interview 4)

Kyle’s ideas for strategic alliances came from Ford, Mazda and Microsoft examples, “I could draw an analogy for you in the car business...if you look at Ford and Mazda...Microsoft is another example” (Kyle). However, while these companies were used as models of alliances, the idea was reinforced and operationalized from a current strategic alliance with Systex.

...the example with Systex, I mean that’s something that’s real, we’ve done it and it worked okay...And they feel the same way we do, they would much rather build where they have strength to build and buy where it makes sense for them to buy technology...So a strategic alliance makes a lot of sense. (Kyle)

New Employees

PC TechnoDev needed a programmer from the start. Kyle was technically capable of doing the job but it cost him valuable time that he could have spent marketing the product. Kyle explained “PC TechnoDev could double its sales if they just had another person to take care of the programming updates so that he could free up more of his time to sell” (Observation, 960214).

Hiring a programmer proved to be challenging. A first candidate, a young man who had worked part time for PC TechnoDev, expressed an interest in joining the company. Kyle and Haley felt Adam would be perfect for the job; he already knew the product because he had been working on it and he was eager and willing to join the firm. The problem was that Adam worked for Systex, a company that PC TechnoDev had a strategic alliance with. In an effort to follow “protocol” (Observation, 960308) Haley and Kyle suggested to Adam that they discuss the possibility of hiring him with senior level managers at Systex. Kyle explained that “protocol is really an ‘unwritten courtesy’ that you would extend to another business owner” (Observation, 960308). However, Adam felt that he should take care of it and asked Haley and Kyle to let him inform his employer before any other discussions took place.
When Adam did inform Systex of his intent to leave, senior managers at Systex became very upset. Kyle was called to meet with Adam's bosses at Systex and in a brief and apparently stressful meeting Kyle explained that he got "beat up" (Observation, 960308) by Systex's senior management and that they felt "that the way in which the whole situation had been handled was really poor and...they questioned Kyle's business ethics" (Observation, 960308). In the end Adam opted to stay with Systex; Kyle felt the motivator was a combination of money and guilt. After his meeting with Systex, Kyle phoned Adam to clarify that PC TechnoDev, not wanting to further damage any individual nor any relationship with Systex, would no longer require Adam's services. He told Adam to invoice him for any hours worked and to drop off a copy of the "source code" and then their relationship would be over. When Kyle and I spoke about how the situation with Adam was handled, he explained that "their worst fears were realized and that they 'blew up the relationship' with Systex and they didn't get the person they were after" (Observation, 960308).

After placing an advertisement for a programming position in a local newspaper, Kyle located another candidate. The candidate was interviewed and determined to be suitable in terms of technical skills, experience, and attitude. He was offered the job but refused PC TechnoDev's offer for another, more lucrative offer.

Frustrated, Kyle continued to look for a programming candidate. My husband, who is a friend of Kyle's, happened to mention a job line that was available from a local technical institute. Kyle used the job line to post the programmer position and shortly thereafter received a faxed resume from Tim. Tim was just finishing a computer programming degree and was looking for a job in a small business. He later explained,

And so I had, right then, I had already decided before I had even finished my second year that I didn’t want to get into a big company. Even though the money’s good to start with...I don’t think it’s worth it, they’re just kind of paying you off to be one of them. (Tim)

Tim describes this experience as the best job search he ever had.

One day I phoned the job line and got the number for these guys, called them up and faxed my resume over and I had a message on my answering machine the
next morning and I called them and basically I went in for an interview the very next day. So I think I faxed here in the middle of the night and twenty four hours later I was in here for an interview and that took two hours and when I walked out everything was looking great and by the time I got home from driving here I had the job. And that was the only interview I had. And the only reason...I took the job seeing as I was offered it, it was the only job I applied for that I wanted, out of all those twenty, twenty five...places I probably applied for, I actually wanted to work here. (Tim)

Accounting work was a major part of Haley’s job. Haley held a Certified Financial Accountant’s degree and was good with finances. But the accounting work was time consuming and left little time for Haley to work on more important projects. Consequently, projects, like the price book, were delayed because there wasn’t enough time in a day to address both immediate issues and longer term project work. When I was able to help at the office, much of my time was spent entering accounting transactions, entering and paying bills and writing cheques to cover bill payments. Haley and Kyle were grateful for my help but I was a short term solution at best and the need to have a regular bookkeeper and accountant remained.

Ian had worked in the POS and cash register industries for several years. He knew both Thomas and Kyle from a company that all three had worked for. Ian found himself looking for another job at the same time that Haley and Thomas were searching for an accountant. Although the original intent was to hire Ian only part time, he began working full time almost immediately. He was hired primarily for his accounting skills but it quickly became apparent to Haley that he had other skills to offer as well. Haley recalls,

I figured it was important to hire some more people and that included Ian...who was originally expected to be a part time employee. We were thinking of sharing him, with his bookkeeping experience, we were going to share him between Washington State and here...Some pleasant surprises about him is that he’s got some accounting ability and bookkeeping ability but he’s also quite experienced in the business, he knows a number of people,...he’s...well liked and respected and also well connected and he’s brought a lot more to the party than I expected. (Haley)

Steve had worked in the computer industry for about 10 years and in sales since he was 15 years old. His previous employer sold hard drive systems and was just two
doors down from the DataSystems and PC TechnoDev office. Steve had visited the office just a week before his employer’s business closed down. Steve found himself unemployed at the same time that DataSystems Canada was searching for a salesperson. Because of his previous contacts with the company, Steve was hired as a new salesperson. This freed more of Jake’s time for sales and Steve was given both shipper receiver and sales responsibilities.

When I asked Steve how he learned to do his job, he replied, “Well one source is...asking these people, another thing is...really just paying attention, listening to what is going down...the hard part is getting it started and baptism by fire is probably the best way...you know sink or swim”. After two and a half months, Steve was let go for performance issues.

Kyle had this to say about the timing of hiring the new employees.

We really wanted to have some of those people here last fall and there was a combination of things, events I guess, that triggered it. Number one we were late getting into the building, there was no point in hiring the Tims and the Steves and the Ians of the world and even Jake, we didn’t have any place for him because we were operating out of my house. We didn’t move in here until late November. By the time late November came, I was blown out of the water,...I was gone most of December on the road, I was gone most of January on the road so by the time I got through that blur...we started to put some ads in the paper. (Kyle)

We started to funnel some interviews...that’s about the time that Adam was working with us and of course then that whole Adam issue came up. We focused pretty heavily on hiring Adam and thought we had and of course that blew up in our face. So by the time we went through that loop and...started to put out another set of feelers...for new resumes and stuff and finally found some people that looked like they were going to fit the bill we were into late April and then, boom, it just happened. (Kyle)

Challenges and Opportunities

Several challenges arose as the business began to grow.

The biggest challenge right now is probably to follow through on all the things that we’ve put in place. That’s the number one challenge, to carry out our vision of what we think...are the right things to do and to carry them out properly. The honeymoon period is over, the novelty of dealing with us is over, I want to prove
to people that they would be making a mistake to not deal with us...that’s aside from the financial aspects...that would be very difficult if I wasn’t...backing the company. (Haley)

I guess the big thing is that we follow through on most of our...ideas. We’ve actually gone and done it, a couple of things haven’t happened as quickly as we’d have liked but...it’s going to happen...on one hand we should be happy with where we are right now but you know looking back hindsight is twenty twenty, you can say well we should have done that, should have done that....I think for any business starting up, making a profit in a short period of time, having the overhead that we had...is pretty substantial...but you can’t be content with that. (Jake)

Structure and organization also proved challenging.

As you know, I think it is really important to have an organized and clean working environment. I feel very strongly about this particularly because of the effect that it has on the people that work for us. It is my belief that an organized environment promotes organized thinking, pride and commitment. I certainly understand how a mess can build up and get overlooked, especially with the inadequate office and warehouse space, and the amazing amount of business that is going on, it’s hard to find the time. But, if you’re too busy, you have to delegate. (Document 5)

As the business continued to grow, Haley became especially concerned about structure. It was important to control the inventory and to make sure the accounting records were accurate. Although most conversations and meetings were held informally, there came a time when a weekly conference call was introduced to link Haley, Kyle and Thomas together and to allow them an opportunity to dialogue about current business issues. In particular, the ideas that came up during informal communication sessions were difficult to implement.

I find that one of the biggest problems that we’ve repeatedly dealt with is the fact that we, in our brainstorming sessions, have lots of good ideas and we follow through on ten percent of them, we drag fifty percent on and we forget about the balance, the remaining forty percent are lost in space. (Haley)

There were many specific challenges to be overcome and the original trio, Haley, Kyle and Jake, spent a good deal of their time focused on resolving problems and meeting challenges. This occurred in a predominantly reactive mode; a situation needing attention would arise and someone would be required to deal with it.
Kyle has asked for my help today to put together a project plan for the development of the next version of software. I tell him I thought he was already part way through this development process and he says he is but needs a ‘plan’ to be able to show Systex what kind of development time they would be billed for when a new version of software is released. (Field Journal, 960318)

As new employees were hired, Haley and Kyle had more time to focus on their project work and the “sell side” of the business. Jake was able to pass along his shipper receiver duties temporarily to Steve but when Steve was let go, Jake was back in the shipper receiver business.

Despite all the challenges, everyone felt good about the opportunities for growth that the business hoped to capitalize on. “There’s so much potential here it’s scary” said Jake, “we’d really have to screw up for it to fail...we’d really have to do something drastic to stop the momentum” (Jake).

Leaving the Field

During the last six months, from February to July of 1996, DataSystem’s sales have more than doubled. Already the firm shows a profit. At a recent North American trade show, the company won an industry award as a preferred supplier of POS hardware. The company has hired new employees, taken over the entire second floor of the shared office space, and the warehouse is full of new product. In the last month, DataSystems has incorporated and the US arm of the company, DataSystems USA, has moved its central operations from California to Washington State.

PC TechnoDev has installed a new POS system for a major provincial utility provider. A large retail department store chain is close to signing a deal to purchase a similar version of POS software. The owners are working hard to finalize a proposal for a National Research Council grant. A new technology project is in the works, a new programmer is on staff, and new customers are actively being recruited. Recently, a US company made overtures to buy PC TechnoDev.
DataSystems Canada and PC TechnoDev have been in a predominantly tactical mode since their inception and particularly since moving to the office they currently occupy.

If we go back a year, ninety-five percent of my time has been spent on purely tactical things, developing supporting, installing,...very little time has been spent on trying to keep an eye on where we need to be big picture wise. (Kyle)

But several business issues are currently forcing the firms to re-examine their strategic directions. “We’re really at a point where we need to have a hard look at how the companies fit together”, Kyle explained, “and an obvious path is to have vertical integration” (Field Journal, 960801). The concept of vertical integration suggests that the companies may become even closer than they already are; in effect DataSystems might begin to distribute PC TechnoDev’s product just as they do hardware. Whatever the immediate future holds, it is sure to include a discussion of future strategies. “It’s just amazing what we’ve done in such a short period of time but there’s some things that have to be addressed and have to be addressed soon” (Jake).
CHAPTER FIVE: AN ANALYSIS OF THEMES

Several themes emerge from the data. This chapter reviews each of six dominant themes as they relate to the study's most basic research question: how is knowledge created in a small business? The content of each theme will seek also to address what appears to enhance or hinder knowledge creation. Each theme emerged from several iterations of data analysis. Initially, data was sorted by category but the categories failed to provide a thick enough description to adequately capture the essence of the data. Gradually, after several drafts of written analysis, themes, which are expressed in quotations from data sources, were chosen to reflect the significant aspects of this study's findings. Evidence which illustrates each theme is provided to clarify the nature of the theme and to link the thematic concept to actual data examples. Themes include:

- The People are the Business
- We Just Spend Tons of Time Talking
- There Hasn’t Been a New Idea in a Million Years
- You Learn from Your Mistakes
- It’s One of Those Crystal Ball Kind of Things
- A Day Late and a Dollar Short

The following chapter, Chapter Six, reviews the relationship between significant themes and the study's conceptual framework. By comparing the themes with the framework, this study seeks to link the data to the larger constructs represented by the framework and to foster a more complete understanding of the framework as it might apply in a Canadian small business context.
The People are the Business

Within this study, it was evident that individual employees provided the foundation for the creation of the firm’s organizational knowledge. Their technical skills, perceptions and experiences played a central role in business problem solving, decision making, and continuous improvement activities. The interaction with the firm was reciprocal so that individuals broadened their own knowledge base as a result of acting in context.

Individuals became even more valuable resources when leveraged in group situations. By working together, employees increased the diversity of skills, perceptions and experiences that were shared, thereby enhancing the knowledge creating process. Because individuals interacted in both work and social settings, the potential for new knowledge expanded beyond the work site. In essence, individuals and the groups to which they belonged, become a kind of organizational structure which transcended the boundaries of the office and which both defined and constrained the knowledge creating activities of the firm.

Individual Knowledge

Each employee represented both a knowledge unit and a dynamic mechanism by which to generate knowledge. Personal knowledge was constantly evolving and was shaped through past experiences and present interactions. Both the individual’s background, and his ability to share his experiences, became important to the firm’s ability to generate new ideas. Each employee was recognized as being unique and as having expertise which was important for developing business ideas; “...everybody is responsible for coming up with new ideas” (Interview 3).

While each employee brought a unique perspective to the business, he was also valued for specific areas of expertise which linked to employee roles and responsibilities. “They [the owners] try to tap into the talents that a person has” (Interview 4). Kyle, who had a computer systems background and who was well versed in software applications, was primarily responsible for activities pertaining to the daily operation of PC
TechnoDev’s software development. Thomas’ thirty to forty years experience in the cash register industry positioned him as the leader of DataSystems USA and his primary responsibilities of buying and selling hardware permitted him to draw on his many contacts within the industry. With a degree in financial accounting and a strong business background, Haley’s strength lay in developing and implementing systems, managing the daily operation of DataSystems Canada, planning strategically, and buying and, sometimes, selling hardware products. One employee noted, “everybody’s doing something they like to do and the job’s getting done” (Interview 4).

New employees further broadened the knowledge base by adding to the foundation which already existed. Their perceptions and experiences brought as much to the business as the technical skills they were originally hired for. Through the hiring of additional employees the company could increase its knowledge base exponentially; not only did new employees add their own knowledge but they greatly expanded the number of knowledge creating interactions possible between individuals. Tim, the new programmer, brought computer programming skills to PC TechnoDev but also served as a discussion partner for Kyle, who was previously unable to share ideas with others because his advanced technical expertise left him isolated.

Knowledge appeared to be developed by individuals in several ways. To develop product knowledge, employees reported reading trade magazines and consumer reports, using internet resources, and talking with other employees, customers, dealers, and suppliers. Business knowledge thus accumulated gradually over time and was added to existing knowledge. In describing the link between previous sales knowledge and knowledge required to sell POS equipment, one salesperson noted, “it’s just that I have to be able to put the knowledge about general sales towards this particular thing” (Interview 6). Additionally, increased knowledge was seen to correlate with improved customer service. “The more I know the better I’ll be able to service my customer” (Interview 3).

Project work, usually completed by a single project leader, provided a good example of how individuals helped to create knowledge for the firm. Several projects were undertaken during the course of the study but there were two especially significant
ones, because they were perceived to have high payoff for the firm: the price book and the National Research Council (NRC) grant application.

The price book project was led by Haley, who had the responsibility of developing, publishing and distributing this price and product catalogue. Although Haley consulted periodically with others, his decisions essentially reflected his own understanding and ideas about the project. The reliance on a single person to complete a complex and important project both enhanced and hindered organizational knowledge creation. Haley appeared to capitalize on his extensive knowledge of products and prices and his own marketing experience. However, input from other employees was limited and therefore the completed product was more a reflection of Haley’s knowledge base than a synergistic combination of ideas from others.

The NRC proposal was Kyle’s project. Because the grant proposal required that the specifics of the new technology project be documented, Kyle, who was the only technical expert at the time, relied on his own knowledge to create the proposal. While Kyle detailed several significant components of the new technology project in the grant proposal, the representative from the NRC critiqued the proposal for not being specific enough about how the project would actually be implemented. Kyle seemed to have a number of ideas about implementation but had difficulty expressing them and initially had no other technical experts with which to share and explore his ideas.

**Working Together**

While participants worked individually to complete tasks, they frequently worked together to solve business problems, to share information, expertise or experience, to plan projects, to review new products and, to interview potential employees. The process of working together helped to surface personal knowledge and to build shared understandings of systemized business knowledge.

Working together was accomplished on a relatively informal basis. Little, if any, preparation occurred before individuals sought each other out. Individuals who had information to share appeared to come together as needed, then disband and regroup for
other purposes. Individual roles and interpersonal relationships appeared to influence who worked together so that owners worked together on strategic planning issues because of their role as leaders of the company while participants who were friends discussed problem issues over lunch or during a golf game after work.

Working together was often precipitated by the presence of an unresolved business problem. Although formal authority was linked to ownership, all employees were encouraged to become involved with finding solutions to problems. In most cases, an employee who was unsure about how to accomplish a task would ask another employee with expertise or experience to help determine how best to complete the required work. In other cases the problem situation had not been faced before and a completely novel solution needed to be found. Gathering information and completing the proposal form for the NRC grant was one example of trying to solve a new type of problem. In this case, Haley gathered information about the grant requirements and Kyle created the proposal. They then came together to review the information and make decisions about how best to proceed.

Sharing information, like problem solving, was frequently preceded by an immediate need. It appeared that a single employee would usually initiate an information sharing session by seeking out another employee whom they felt might have the needed information. In response to the initial employee’s request, the “expert” would usually agree to share information immediately. On a few occasions I observed a participant decline to share information but usually because they said they felt pressured by immediate time constraints.

The Importance of the Social World

There were two distinct “worlds” in this study. The first, the world of work, was a world of activities which existed primarily within the confines of the office. Customer site visits for purposes of product installation and support were also considered part of the work world as were trade shows and meetings which occurred offsite but during business hours. The world of work was typically present during set office hours of approximately
7:30 am to 6:00 p.m., Monday to Friday, although there were incidents of individuals working at the office outside of these hours.

The second world consisted of those activities which occurred outside the scope of the work world and which typically occurred before or after business hours or away from the office site. The principal purpose of such activities was not the doing of work although this second world appeared to be a rich source of discussion regarding work issues. This social world consisted of interpersonal social relationships and places where social interactions occurred more frequently than work activities, such as individual’s homes.

Work activities occurred in the social world and social activities occurred in the work world. Although I did not observe the social world as completely as I did the world of work, what observations I did indicated the presence of work activities in both. The two worlds seemed so intricately bound together that the participants in the world of work were primarily members of previously existing social networks. The two worlds were interwoven through the interactions of people. The individual and not the organizational unit became the organizing structure for knowledge creation. As one participant reflected, “companies come and go and people stay the same for the most part” (Interview 6).

Relationships were one mechanism which spanned work and social boundaries. Several examples exist. For instance, the partner ownership of the three companies consisted of three individuals: two related through family ties and two linked through previous employment in the same company and a longtime friendship. Jake and Haley had been best friends since highschool. Steve, an employee hired to do sales, was recruited because he had worked with two of the employees in a previous job. The social world appeared so influential that even some suppliers and competitors had social links. For example, a representative from a POS hardware supplier went to school with Kyle.

Social events were another source of interaction connecting work and social worlds. Formal social events resulted from planning while informal social events seemed to occur on the spur of the moment. Haley and Kyle skied and golfed together on a
According to these individuals, these formal social events offered an opportunity to discuss business issues and to plan and problem solve. The social world seemed to allow opportunities for strategic planning in particular which rarely occurred within the confines of daily business operations. Jake explained, “We do most of our planning out of the office...in the office we do mostly executing ...doing the day to day chores but outside we start talking the overall picture and how we can figure it out” (Jake).

Informal social events, such as having drinks at the office on Friday afternoons, appeared to encourage more casual conversation. Such conversation focused on general topics of discussion, both work related and otherwise, rather than specific work problems to be solved. Discussions around the coffee machine, or over coffee in the morning, may be started by a social agenda but then turn into a discussion session about particular business problems. Going out for lunch seemed to be another venue for discussing ideas away from the office while relaxing with social acquaintances.

Even some business decisions had a strong link with a social rather than work agenda. Late in my study, DataSystems USA moved from California to Washington State. When I asked Haley about the reasons for the move, he told me, “frankly it wasn’t much to do with business...it’s a lifestyle decision” (Haley).

The social world thus seemed important to knowledge creation because it allowed for a greater focus on proactive rather than reactive activities. “You only have a certain amount of time to generate business and to do the immediate things because of the tools you have in the office and...the fact that you’re somewhat confined by hours of operation of your clients” (Interview 7). Time constraints in the office appeared to promote a greater emphasis on immediate, tactical issues in the work world, while the less hectic social world encouraged reflection on past actions and a focus on strategic planning. “I mean Haley and I talk about it [business strategy] a lot after hours” (Jake).
We Just Spend Tons of Time Talking

The communication structures of the business heavily influenced how knowledge was created. Communication tended to occur informally, and most frequently in the form of office dialogue and phone conversations. Some written communication was evident in office documentation and fax transmissions, although one participant estimated that as much as 95% of all communication was verbal and the other 5% took place through the fax machine (Interview 4). Formal communication structures such as meetings, interviews and planning sessions occurred only infrequently.

Dialogue

Office dialogue was the most central feature of the firm’s communication structure. Dialogue occurred on an almost non-stop basis from the start of the business day until the office closed in the late afternoon or evening. Often several conversations transpired at once. When discussions became more focused or prolonged or when interpersonal conflicts erupted, voices typically became louder.

Most office dialogue occurred across the room. Although the central office space was only about 450 square feet, participants mostly talked back and forth from their desks or wherever else they might be in the room. Rarely did participants go to another employee’s desk to have a semi-private conversation. This open communication was partially made possible by the open, physical office environment which lacked dividers between desk areas.

Phone conversations were almost as frequent as office dialogue. Only once was a salesperson absent from the office because he was visiting a customer (Observation, 960803). Participants used the phones to contact customers, suppliers, business contacts and personal acquaintances although the majority of phone conversations were focused around discussions of business issues. The phone rang frequently and there were more incoming calls to be answered than outgoing calls made. Occasionally, so many calls came in at once that callers were put on hold. Phone conversations connected employees with knowledge sources outside of the firm.
Office dialogue and phone conversations were frequently intermixed so that a participant would have a conversation with a phone caller and at the same time be trying to give or receive information from another employee in the office. In some cases this seemed to benefit the employee and in other cases it was considered an interruption causing frustration because the individual could neither attend adequately to the phone conversation nor the office dialogue. Once in a while, a three way conversation was initiated so that two individuals in the office were able to speak with a caller at the same time. This happened most often when the three owners discussed an issue together.

The predominance of office dialogue allowed for the sharing of experiences between individuals. Because everyone participated in dialogue sessions, a great variety of knowledge was shared. While sharing through dialogue was generally perceived to be helpful, unwanted interruptions caused participants to lose focus, thereby limiting their abilities to contribute to discussions in a meaningful way.

Informal Communication

Communication was primarily verbal and informal in nature. There appeared to be no formal hierarchy for communicating, although information was directed to those who appeared to need or want it. Occasionally, a memo or plan of action was written down but this was not the norm. Even phone messages, which were often written in a phone message book, were relayed verbally as though the message details needed to be communicated in an informal way. Where information was not documented in written form, it often needed to be retrieved from the original source again.

Privacy appeared to be absent in office communication. For the most part, office dialogue and phone conversations had a public nature about them. Even personal issues were often discussed in the office without apparent need for privacy. Haley would regularly check stock reports over the phone and made no attempt to hide the fact that he was involved in the stock market and regularly invested in large financial transactions. Other participants had personal phone conversations with friends and relatives without attempting to lower their voices or use a private phone location.
Privacy did seem to be an issue when the owners had a meeting, although it was unclear whether this was for purposes of concealing information or simply to avoid disrupting others. Rather than discuss business matters in the open office environment, a meeting would take place in the boardroom behind closed doors. The extent to which this communication was private is debatable because it was possible to vaguely hear the conversation through the walls of the boardroom and the boardroom had a large window which provided a clear view of the occupants and their gestures and actions at all times. Occasionally, when a meeting was scheduled to last for some time, Haley’s home would be used as a meeting site.

The general lack of privacy ensured that participants could listen in on office conversations. One employee suggested that he learned “really just by paying attention, listening to what is going down” (Interview 6). It was unclear why owner’s meetings had a more private appearance or what issues were discussed at the meetings that were not discussed in a public manner, if in fact there was any difference. If, however, owners dealt with more strategic type issues in their meetings, this information may not adequately have been communicated to other employees.

While the informal nature of communication seemed to encourage participants to become involved in conversations, it appeared that at times too much talk and not enough action caused new ideas to be lost.

I find that one of the biggest problems that we’ve repeatedly dealt with is the fact that we, in our brainstorming sessions, have lots of good ideas and we follow through on ten percent of them, we drag fifty percent on and we forget about the balance, the remaining forty percent are lost in space. (Haley)

Haley, Kyle and Thomas attempted to address the issue of lost ideas by formalizing a weekly conference call. The conference call added structure to the communication process and, while still relying on dialogue as a primary method of sharing ideas, meant that the dialogue was scheduled to occur more frequently and with a more formal agenda.
There Hasn’t Been a New Idea in a Million Years

Of all the new ideas, products, services, and processes in this study, none seemed so revolutionary as to make a vast difference to how the company did business. Nevertheless, taken together, these incremental innovations appeared to lead the company towards growth and prosperity and to foster an environment of continuous innovation. New ideas were frequently drawn from other companies and were “mimicked” and adapted to fit the firm’s particular requirements. Strategic alliances helped to create knowledge by offering a mechanism for tapping into another company’s knowledge base.

Incremental Innovation

Most new ideas appeared to evolve in a somewhat incremental and often haphazard manner. A culture of continuous rather than radical improvement encouraged participants to focus on making small enhancements rather than having to alter structures radically or get it “right” the first time. When DataSystems Canada was created, an employee noted, “we had an idea of what we wanted and then we just sort of improvised along the way...making any necessary adjustments” (Interview 3).

Better ways of completing activities seemed to evolve out of solutions to previous problems or as reactions to previously problematic activities. The sophisticated office phone system was installed because of a requirement to handle multiple incoming calls and to be able to put customers on hold or to contact other employees in distant parts of the office via intercom. A simple phone system would have worked but participants felt the advanced phone system enhanced the customer’s perception of the business as a capable and service oriented company. Likewise, office technology could have been simpler but the addition of a computer network increased each employee’s ability to access information quickly and efficiently. New software releases tended to be updates from previous versions with a few new features, added at the request of the customer.

According to the participants, there were no formal processes for developing an idea, product, service or process. In most cases, employees identified a problem and worked to resolve it using whatever means were at their disposal. Any processes that
were followed appeared to be generated in response to problem situations, and were left to the imagination of the individuals involved.

Mimicking

Mimicking involved taking an existing idea from another organization or product and modifying it to fit the particular requirements of the business situation. The firm mimicked products and processes by identifying successful concepts, then utilizing those aspects of the concepts that appeared to have applicability to the firm’s requirements. The price book, the PC TechnoDev technology project, and the startup structure of DataSystems Canada provided good examples of mimicking.

The price book was an idea that came from other POS hardware suppliers. The biggest industry competitors had product and price catalogues and it was important to DataSystem’s image to follow this lead. A “makeshift price book...wasn’t acceptable, especially when the competition’s got a nice price book...so we knew we had to improve on what we had out there” (Interview 3). Competitors’ catalogues served as templates for the creation of the DataSystems’ price book and were reviewed before the formatting of the price book was finalized. When the cover of the new price book was ready, Haley showed it to me and held up a competitor’s cover to illustrate the superiority of the DataSystems’ format.

PC TechnoDev’s new technology project was a second example of mimicking. While Kyle asked that the details of the technology project remain confidential, he did comment that the idea for the concept of a new generation of software was based partially on the operation of existing Microsoft Windows based software packages. When asked how this project would compare with “starting from scratch”, Kyle explained,

that it would be much harder to start from scratch because the functionality of the product is already there...the development of the new product requires mostly the translation of information into a new form rather than the generation of completely new ideas. (Observation, 960401)

A final example of mimicking arose during discussions I had with Haley and Jake, participants who had been around at the start of DataSystems Canada. The
hardware business in California, Data Systems USA, was well established and had apparently struggled during its first years to gain credibility in the business and learn how best to design its operation and market its products and services. When the Canadian hardware company was formed, it was based on many of the successes of the US company.

One participant mentioned that the Canadian company had been able to learn from the mistakes of the US company, particularly in regard to buying equipment. The US company had apparently learned over the years what product sold well and what did not, and was able to make better buying and selling decisions based on this hindsight. The Canadian company basically bought what the US company did, thereby ensuring that its core products had been market tested.

**Strategic Alliances**

Strategic alliances were important because they provided a mechanism for tapping into another company’s knowledge base. A strategic alliance consisted of working together with another firm to address market opportunities. One such alliance was already in progress when the study started; PC TechnoDev worked with Systex, a larger POS company, to develop and market software. This alliance gave PC TechnoDev and its software product exposure to a vertical market in municipal governments. In exchange for exposure and possible added business for the hardware company, Systex received “source code”, the framework for the POS application, which it then modified for its particular application.

In essence, Systex and PC TechnoDev were indirect competitors; they competed in the same industry but with slightly different products and significantly different customer bases. Had PC TechnoDev worked on its own to create a product similar to that it created with Systex, the project would have required far more resources and would have taken a much longer time. Because product development time was directly associated with availability of resources, PC TechnoDev would have had great difficulty competing directly with a larger organization due to insufficient resources. As a result of the alliance, both companies benefited and were able to exchange ideas and create new...
knowledge through the process of their interaction. “If it’s done right you both win because you both come to the market quicker with more features, more product, more solutions for the customer” (Interview 1).

Strategic alliances can, of course, have a negative side, although it does not appear that the business encountered serious problems with an alliance relationship. The political problems concerning the attempted hiring of a Systex programmer, while initially uncomfortable, failed to result in permanent damage to the Systex alliance. “In theory, the big disadvantage...is if you consider what you’re selling as highly proprietary, you’re giving that away...so people can see what you’ve done and how you’ve done it” (Interview 1). The risk with a strategic alliance comes from providing ideas without a reciprocal sharing of information.

You Learn From Your Mistakes

Past experiences, particularly those which were negative, provided a wealth of knowledge for participants. Individuals used this knowledge to make decisions and avoid mistakes already made. Employees also learned by involving themselves in the completion of actual work tasks, thereby experiencing the “sink or swim” (Interview 6) nature of task performance in the real work environment. This “learning by doing” (Interview 7) approach was a preferred strategy for introducing new employees to their roles within the organization.

Learning from Experience

Learning from experience emphasized the backgrounds of the employees. Individuals reported learning from prior jobs, projects, and interactions with others. One participant noted, “I’ve been managed at a high level...by good managers and by bad and...I recognize that I’ve learned from that” (Interview 7). Likewise, another participant reported learning from past business experiences (Interview 3) and yet another credited school experience with providing a foundation for decisions he made in the organization (Interview 5).
While employees recalled that they were influenced by experiences prior to their working with DataSystems or PC TechnoDev, they also noted many important experiences had occurred during their current employment. A sales seminar helped Jake focus on some basic selling techniques, “it was very good for me because it was...a refresher course on...the basics” (Jake). A “pilot project” (Kyle) with a large customer helped Kyle understand how that customer preferred to purchase POS software.

Each employee’s experience was assumed to be valuable because it gave an individual the advantage of a unique viewpoint. The firm strengthened its abilities to create knowledge by encouraging employees to draw on a sense of what could be improved. “Sometimes it takes a new perspective”, explained Haley, when he was trying to convey how new employees could contribute to continuous innovation by evaluating existing organizational processes. “When they are new to an environment they can recognize things that people who have been there for a long time can’t recognize as being inefficient or...unproductive” (Haley).

Individual experience was harnessed by the company but also served to help individuals make decisions. Several employees explained that they relied on past experience to help them make decisions and come up with new ways of doing business.

...you’re looking for where do these ideas come from. They come from everywhere. There is what is this person doing right, well let’s mimic them...what is this person doing wrong in our eyes, well let’s never do that, learn by their mistakes. (Interview 6)

Experience, perceived to be negative, seemed to have a particularly profound effect on individuals. This may reflect the rather costly nature of mistakes; such negative experiences usually had direct or immediate impact on the company in terms of lost business or decreased credibility. Learning from mistakes was a way of correcting perceived failures and using past negative experience for positive ends. One employee suggested that in a particular case “we’re not going to be learning from our own mistakes, we’ll be learning from other people’s mistakes” (Interview 5). Another employee mentioned that he reflected on an unsuccessful project in order to create a new idea. “So I’ve been rethinking that and I’ve got to come up with a new plan” (Interview 4).
Learning by Doing

Participating in business activities was a way of learning by doing. This phenomenon appeared to be both an integral part of how the business operated, as well as a strategy for introducing new employees to their work within the organization. Learning by doing allowed for both successes and failures to occur, although mistakes tended to be regarded as learning opportunities, and were added to the repertoire of individual and company knowledge.

Employees regularly attempted novel activities. Often there was no time for practice except as it occurred in the real setting. When DataSystems Canada and PC TechnoDev started their combined office operation, Haley, Jake and Kyle had to learn as they went, “I mean we didn’t have a road map” (Interview 3). Similarly, when Tim was first introduced to PC TechnoDev’s software applications, he acted like a user both to learn about the product and to identify areas for improvement. “When I first came in you could have treated me like a user except for the fact that I know how to make things work the way they do” (Tim).

New employees received minimal orientation to the organization. Kyle described providing Tim with basic information and then encouraging him to work with the software.

The first step I went through...was to try and get him...familiar with what our business is, what the nature of the business is, where the priorities are...what it is we do from a day to day basis to make customers happy...now it’s to the point when I turn a module over to him...he...can take his technical expertise and...say to me this is how he wants to implement it. (Kyle)

Haley echoed the need to get employees involved with the business, “I really want people to learn by absorbing their environment, learn by doing” (Haley). “So for the first little while I really want to see what someone does on their own and...what they’re all about...I think it’s...better to give them a bunch of rope and see what they do with it” (Haley).

Employees were encouraged to treat the business like their own and learn by involving themselves in the many aspects of business operation. In describing the way a
new employee would be encouraged to think about the business, one participant remarked, “I don’t want him to think that the doors are going to open the next day. I want him to be desperate about getting new business and treating it like his own company, like we did when we first started” (Interview 7).

A focus on continuous improvement seemed to undergird both learning by experience and learning by doing. Continuous improvement appeared to be a strategy for bringing together experience and learning by doing; in this way individuals were encouraged to keep improving by drawing on their experience, and trying out new ideas rather than being expected to provide an optimal solution the first time.

It’s One of Those Crystal Ball Kind of Things

Personal, tacit knowledge was central to the activities of the business. Employees reported acting on “gut feels” and guesses. In several cases, important knowledge about business operations was inaccessible to others because it was not formally documented. In particular, employees reported that some information was kept in their heads and therefore was not readily accessible to others.

The Tacit Dimension

While individual knowledge and experience shaped the business and its activities, only knowledge which was somehow externalized could be accessed by other employees. Therefore knowledge was limited to the extent that it was held internally. Kyle put it best when he said “if I got hit by a bus tomorrow, we’d be out of the software business” (Kyle). A similar comment was made by another employee who suggested that the majority of the business activities of DataSystems USA were “in Thomas’ head” (Interview 4).

When I asked Kyle what kind of market changes were impacting his decision to develop a new generation of software product, he was able to convey that several corporate clients were capitalizing on new Microsoft Windows technology but couldn’t explain his intuition about needing to follow that trend.
'It's just one of those crystal ball kind of things' he said, 'those gut feels...I think it's going to be driven by the corporate players, they're going to put it on all their machines and then people are going to start taking it home'. (Kyle)

Another employee described the gut feel as "what they call the X factor...something you really can't put your finger on" (Interview 6). This gut feel or tacit knowledge is central to many of the business decisions made. The firm counted on its people to make good decisions and the people appeared to count on their own personal knowledge to establish the criteria for what would result in a "good" decision.

**Surfacing Tacit Knowledge**

Several attempts to formalize or document knowledge were made. The software “User’s Guide” documentation that accompanied PC TechnoDev’s POS software was a good example. The purpose of the documentation was to detail how the POS application worked should a user of the application require assistance. While this documentation helped to make explicit the nature of the product’s operation and its various components, it was written for an audience external to the business. Its primary purpose was to allow users to understand the software rather than other employees of the business.

One mechanism for helping to externalize knowledge was the asking of questions. When an employee was uncertain about how something should work or what to do given a particular problem, they often asked the appropriate “expert” for the information. This seemed to force the knowledge that a person held internally to the surface. “If you don’t ask, you’re not going to learn” (Interview 3), noted one participant. According to another participant, asking questions was a primary way in which he learned about the business and how to do his job (Interview 6). However, once the knowledge had been shared it was rarely formalized or written down so that when a similar problem arose again, the process of searching for knowledge would be repeated.

The addition of structure and process helped to make explicit that which was previously only in the mind of an individual. Tim’s documentation of software code clarified previously implicit programming logic. Tim felt this would alleviate rework when he went back to modify or add code sequences. He seemed motivated to document
the knowledge because it helped him to learn more about the product and because he felt it would be useful to other employees in the future.

Another example of attempting to externalize knowledge came through the implementation of the weekly conference call. Although the three owners spoke on a regular, sometimes daily basis, there seemed to be a need to create a communication device that would allow continuous and regularly scheduled sharing of information. The conference call was created in response to Haley’s need to feel current on the business issues facing the firm. Although the conference call was added later in my data collection, I asked for feedback on how it was working and the response was overwhelmingly positive.

A Day Late and a Dollar Short

Two contextual factors of this study are of primary importance in showing the conditions under which knowledge creation occurs: time and money. Time and money pressures caused frustration and stress for the employees and impacted knowledge creation by imposing constraints on business activities. Time pressures resulted from having too many work activities to be completed within the timeframe of a day or week at the office. Money pressures came from various sources but focused primarily around the issue of cash flow. Managing cash flow was essential to ensure bills were paid on time and bank balances remained in a positive position to cover operating costs. Granting credit to customers made the process of managing cash even more challenging and important.

Time Pressures

Time pressures affected everyone at the office. Project work fell victim to time pressures because it was often postponed in order to deal with immediate business issues. Almost every project encountered a delay of some kind and this delay caused pressure on the project leader and on other employees who relied on the completion of the project for the commencement of related tasks. Delays to the price book meant that participants promised the price book to customers for several months. In an industry where reputation
was extremely important, delays were dangerous; they could make employees look bad when they were unable to deliver what they originally promised.

Time pressures also occurred on a daily basis outside of project work. Products were delivered and shipped primarily by courier, so courier pick up times had to be met and couriers had to meet company deadlines for having shipments arrive on time. Delays to shipments of products, either incoming or outgoing, usually meant eventual delays to the customer. The extra cost to get a product to a customer quickly meant a loss of margin for the company and possible future loss of business. There was also pressure to respond to customers’ requests in a timely manner. This may have been as simple as ensuring that phones were answered when they rang or as complex as ensuring quotes were in on time and fax requests had been returned.

There was a sense in the office that there was always much to do and never quite enough time to do it in. Rarely did participants comment that it had been a slow day or a slow week. More often participants commented that they were behind in their workload. Frequently, employees delayed eating lunch until late in the afternoon, and when they did stop for lunch they usually ate at their desks while working on another business task. The owners in particular seemed to have a sense that there was always more to do than could be done in the time they had. Perhaps this was one of the reasons that Kyle and Haley worked over weekends and at home in the evenings.

Time pressures may also have related to market opportunities. PC TechnoDev’s new software product needed to arrive on the market before other competitors produced a similar application. Even if the concept were sound, the product still had to hit the market in a timely manner. While discussing the options for developing the product, Kyle explained that “we’ll be in trouble if we wait that long” (Kyle), inferring that the product had to reach the market at a certain time.

Several attempts were made to “add time” to the workday. These attempts focused primarily on the efficient completion of work and involved adding structures to the business in the form of processes or additional employees. Several systems were revised and added throughout the study. The accounting system was initially used for
financial purposes, but was later combined with an inventory system to allow inventory and financial results to be updated whenever products were received or sold. To help keep track of physical inventory, the warehouse space was reorganized on several occasions and a shipping desk and racking were added to help separate inventory products and promote organization. To help customers access product specials quickly and efficiently, a word processed “hotsheet” was created and updated daily or weekly with available special products and their prices.

One of the most significant changes to time pressures occurred when new employees were hired. Kyle’s responsibilities for software development were partially shifted to Tim, Haley’s accounting responsibilities shifted to Ian, and Jake’s duties as a shipper receiver shifted to Steve. Kyle commented that shifting work to Tim “means that I’ve got extra time because I don’t have to worry about those issues” (Kyle). Haley noted a similar effect, “in terms of freeing up my time, he’s [Ian] taken a lot of pressure off me in the sense that I’ve been able to refocus and try to do some of the things to build rather than feeling bogged down” (Haley).

Although adequate time continued to be a challenge for the business, the implementation of processes and the addition of more employees helped to ease some of the pressure. The business still struggled to get project work completed in a timely manner but there was a sense that the daily pace could be matched. At the completion of the study, there were enough people to answer phones and to handle customer requests and support calls. In particular, certain individuals who had carried a heavy workload before were able to distribute or delegate some of their tasks to others.

Time pressures impacted knowledge creation in several ways. Firstly, time pressures appeared to impact the quality of dialogue. Dialogue quality tended to decrease when there was insufficient time to discuss ideas fully. Interruptions tended to occur more frequently when several business issues had to be dealt with simultaneously, thereby decreasing the time available for any one topic. Secondly, although lack of time may have adversely impacted the quality of dialogue, the fast paced office environment appeared to make dialogue rather than written vehicles a more appropriate choice for
communication. Thirdly, limited time and limited resources sometimes required that a single person had to focus on a complex task, such as project work. This forced a reliance on an individual’s knowledge to the exclusion of other employees’ knowledge.

Money Pressures

Money pressures seemed to be constant although the business continued to increase its monthly sales figures. The essence of the money pressure revolved around cash flow, having enough money available when needed. Cash flow determined which tasks and projects would be completed at certain times and was one of the many factors that went into prioritizing projects.

Thomas and Haley and I have to look at those things [projects and timelines] and make sure we're okay with that. Because, if for whatever reason we get caught in a vacuum for the next few months and we don't seem to be able to ship any products, we need to be able to get through it, cash flow wise. (Kyle)

Capital was used to purchase product, supplies and equipment, and to pay employee salaries. It flowed into the business from products or services sold. The trick was to balance the money coming in with the money going out so that ideally suppliers were paid on schedule and customers paid in an expedient manner.

At several stages throughout the study, the business was in a position where it could not afford to pay all of its outstanding bills. In some cases, this meant refinancing deals so that money could be made available. In other cases, Haley, who had heavily invested in the business already, had to consider putting in more of his own money. Sometimes cheques would be written to companies and held before mailing to ensure that there were sufficient funds in the bank accounts to cover transactions. Several purchases were made by Visa and Haley had a separate Visa card to cover business purchases.

Kyle and Haley were attempting to find additional funds through a NRC grant. While this grant would not apply to the hardware company, it would be applicable to the new products planned for the software company. In addition to their interest in receiving government assistance in the form of grant money, they were interested in further
exploring government programs which supported small business and, in particular, programs which subsidized the cost of new employees.

It is uncertain what the cash flow status will be as the company grows. If profits increase and subsequent funds are put back into the business, the cash flow position may improve. However, cash flow is a critical aspect to be managed in this business at all times. If cash is not available when needed, deals are lost or, even worse, creditors may become agitated and pressure the business to find the funds that are owing.

Cash flow appeared to present a significant aspect of risk to the company. While the company had some control over its purchases, it relied on incoming funds from products and services sold. While some debtors paid on time, others required longer credit terms. There were several incidents where money did not arrive as anticipated. In one such case, Jake and Haley had to consider going to get the product they had sold the company in lieu of the money that was owed, and Haley also had to consider court action against the delinquent company in order to ensure funds owing would be fully recovered.

Money pressures impacted knowledge creation by limiting the availability of resources, particularly new employees. Although the company was initially in a position where it needed additional staff, it was not able to afford them. This limited the knowledge creating capacity by restricting the knowledge base to existing employees. This fixed number of existing employees meant that the interactions between individuals were limited. For example, at one point Kyle had nobody with which to discuss his software ideas because he was the only employee of PC TechnoDev and, more importantly, the only employee with sufficient programming knowledge to be able to discuss the ideas. A lack of resources also limited the number of individuals working on projects. Typically, a single individual was responsible for a project, thereby contradicting the importance of sharing knowledge.

Summary

This chapter detailed important knowledge creation themes which emerged from the analysis of data collected during a six month field study. Data sources were coded to
reflect categories which appeared frequently or which seemed to be particularly important even though frequency was not high. Data sources included site observations, participant interviews, the researcher's field journal, and business documents.

The first theme focused on the centrality of the individual to the firm’s knowledge creating capacity. Individuals not only brought skills and experience to the business but worked together to create knowledge in both work and social settings. A second theme reflected the important role that communication structures played, particularly the emphasis on informal dialogue as a way of sharing tacit knowledge. “There Hasn’t Been a New Idea in a Million Years” considered the idea that innovation appeared to be incremental and that new ideas were generated both by mimicking existing concepts and by sharing knowledge through strategic alliances.

The fourth theme addressed learning from experience that was both personal and observed. Negative experience or “mistakes” seemed to provide particularly important opportunities for learning. This theme also explored the nature of learning by doing and the firm’s focus on continuous improvement. A fifth theme examined the phenomenon of tacit knowledge and the limited ability of the firm to capitalize on the knowledge of its people when it resided “in the head” of the individual. A final theme, “A Day Late and a Dollar Short” examined how time and money pressures constrained organizational learning and knowledge creation by affecting the quality of dialogue and by limiting human resource availability.
CHAPTER SIX: A COMPARISON OF THEMES TO CONCEPTUAL FRAMEWORK

Themes covered in Chapter Five address the central research questions of this study. Knowledge was created by people, individually and in groups, and in work and social settings. Knowledge was both generated and shared primarily through informal communication and through dialogue in particular. New ideas evolved over time and may have occurred as a result of copying other ideas or by partnering with organizations through strategic alliances. Knowledge was created experientially; the importance of tacit knowledge was central to the activities of the firm although surfacing tacit knowledge was a relatively inefficient process. Finally, knowledge was created within the context of time and money pressures.

The processes of knowledge creation thus appeared to be enhanced by the diversity of individual employee backgrounds and by the numerous opportunities that employees had for working together. The open office environment and lack of privacy probably provided more opportunities for employees to accumulate knowledge than if they were otherwise isolated. The focus on incremental rather than radical innovation allowed employees the flexibility of learning by doing and appeared to encourage the sharing of personal knowledge.

Conversely, knowledge creation was hindered by time pressures which served to restrict dialogue primarily to immediate problems. Furthermore, interruptions caused individuals to become distracted and frustrated, thereby diverting their attention from the tasks at hand. The discussion of strategic issues in the social context, while helpful for addressing larger business issues, confined the knowledge sharing process to those individuals present at the exchange. Finally, money pressures, although present in most profit based businesses, in this study curtailed hiring activities and therefore restricted the addition of new employees who could augment organizational knowledge by increasing the skill base.

This chapter explores the themes as they relate to the study's conceptual framework. Three areas will be discussed: the recognized importance of both tacit and
explicit knowledge, the four modes of knowledge conversion (socialization, externalization, combination, internalization), and the concept of a knowledge spiral.

- Tacit and Explicit Knowledge

The conceptual framework is based on the notion that both tacit and explicit forms of knowledge are important to knowledge creation processes. It has been argued that while explicit knowledge is more common to western philosophy and tacit more central to eastern philosophy, both must exist in order for new knowledge to be generated. More specifically it is the interaction between tacit and explicit that is most important because it is this interaction which fuels continuous innovation (Nonaka, 1994).

Both tacit and explicit forms of knowledge were evident in the data of this study. What participants “knew” was a reflection of both their past experience and present practice, and their shared understandings of acceptable business practices. Although tacit knowledge can never be fully understood through observation, participants appeared to act and talk in ways that led me to believe they were drawing on tacit knowledge. “I think we’ll be in trouble if we wait that long”, “It’s just one of those gut feels that you have to do”, and “It makes a lot of sense” (Interview 1). “It has a different feel to it, doesn’t it?” (Interview 7).

Tacit knowledge appeared to be more dominant in business activities than explicit knowledge so that experience or what had worked in the past appeared to play a more central part in daily decision making than theories or plans of what might work in the future. Tacit knowledge appeared to be important in both the form of mental models and technical skill. Participants reported learning certain tasks by doing them and appeared to problem solve based on their own perspective of what should happen rather than a specified or standardized company process. In response to being asked how he learned to do his job, Jake said “I don’t know, just by doing it. By winging it and educating yourself...and just by interacting with the dealers” (Jake).

When asked about processes they might follow during project work, participants reported a notable absence of formal process and instead mentioned a heavy reliance on
making decisions based on individual perspectives and experience of what would be the best solution. “You like to deal with, draw on people’s experiences to try and make the company better” (Interview 7).

Explicit knowledge appeared in this study primarily in the form of documentation. Several documents, including software user’s guides, memos, government proposals and the price book catalogue provided examples of explicit knowledge. This “language codified” knowledge appeared to be generated initially by the individual or individuals in charge of the project associated with the documentation. Once knowledge was formalized in a document, it was usually offered to other participants for comments and additions.

Technology, like documentation, appeared to be a source of explicit knowledge; examples included company contacts, sales documents and accounting records. Because the business provided computer technology to all employees and improved upon the personal computer technology through a local area network, individuals could access explicit company knowledge stored through technology easily and efficiently.

There was an apparent lack of explicit knowledge in some surprising areas. Although both Kyle and Haley talked about their vision of the company’s future, a formal, written business plan was non-existent. Documentation related to programming decisions seemed to be similarly absent. As a way of learning about PC TechnoDev’s software applications, Tim documented the logic behind the programming code, thereby creating explicit knowledge.

I tried to do this so...when we come to the point when someone else is here...someone can look back at what I did because I don’t really have anything to look back on and I think you can learn a lot more from what’s been done beforehand and to see how things have been changed than to try and weed through the code and figure it out for yourself. (Tim)

Adding structure to the business appeared to be a way of helping to formalize the tacit knowledge brought forth by dialogue. When participants discussed ideas they would sometimes make notes or attempt to write down a process for dealing with a problem should it occur again. I suspect that when more structure is added to the business in the
form of documented systems and processes, more balance between examples of tacit and explicit knowledge will emerge.

When individuals worked together on tasks they drew repeatedly on aspects of individual, tacit knowledge to help them problem solve and make business related decisions. This networking tended to occur on a relatively informal basis in the office environment and there appeared to be a greater reliance on tacit knowledge within the business. When individuals and groups of individuals interacted through strategic alliances, there appeared to be a greater demand for explicit knowledge or at least for the formalization of tacit perspectives into explicit concepts. Perhaps this was an indication of the more formalized nature of inter-firm alliances.

Mimicking required knowledge of another company or concept. In this case, it appeared that participants relied both on explicit and tacit forms of knowledge. When individuals mimicked an idea from another company they appeared to rely primarily on an explicit concept which they then shaped to fit their situation. Individuals drew on past experience to modify the mimicked concept, thereby relying on their own tacit understanding.

Internalized knowledge or knowledge 'in the head' of participants was a prime example of the tacit dimension. Participants often reported “thinking” or “feeling” that something was so, a reflection of their own perspective. Internalized knowledge frustrated other participants only when it was perceived as difficult to access; harnessing the knowledge of individuals, which is not readily available, continues to challenge the business.

Communication structures both supported and inhibited the sharing of tacit knowledge. The open office dialogue that occurred allowed employees to access each other’s personal knowledge simply by listening. Additionally, employees were encouraged to ask questions and participate in office conversations. However, various interruptions in communication seemed to limit the amount of tacit knowledge which was accessed.
Although Nonaka’s theoretical concern seems to be primarily with making tacit knowledge explicit through dialogue, this did not appear to be a substantial problem for the participants in my study. Participants regularly shared tacit knowledge through dialogue without any apparent prompting. What appeared to cause problems was that tacit knowledge was only formalized through language at the moment it became explicit and therefore was not repeatedly accessible without going back to the original source of the tacit knowledge. This resulted in inefficiency accessing knowledge; tacit knowledge was usually only available to those present during the dialogue exchange.

This leads me to question whether there is some intermediary form of knowledge which exists between the notion of tacit and explicit or whether there are perhaps multiple versions of externalized or conceptual knowledge. While there is clear evidence of tacit and explicit knowledge, there appears to be a kind of gray area which exists between these two knowledge types. Tacit knowledge may be shared through dialogue, and therefore made explicit through language, but remain unusable unless it can be formalized for easy repeated access. Explicit knowledge is only accessible if participants are part of the dialogue which helps to surface tacit assumptions or if they can somehow make use of the explicit knowledge because it exists in documentation, either written or computer based.

Modes of Knowledge Conversion

All modes of knowledge conversion (Figure 3) can been seen in the data of this study. However not all modes are equally represented, nor do they appear to have an equal impact on how knowledge was created within the business. Additionally, the most important aspect of Nonaka and Takeuchi’s (1995) model is the interaction between tacit and explicit knowledge, or more specifically, making explicit tacit assumptions. Efficiently accessing knowledge that has previously been made explicit through dialogue appears to be a difficult process for the participants of the study and seems to be an area worthy of further examination.
Tacit knowledge to Explicit knowledge

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<th>Tacit knowledge</th>
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Figure 3. Modes of knowledge conversion (Nonaka & Takeuchi, 1995).

Socialization

Of the four modes of knowledge conversion, socialization appeared most frequently in the data. Socialization is the process of sharing experiences so that individuals acquire tacit knowledge by coming into contact with others. Although much of the sharing of experience in this study occurred through dialogue, socialization also occurred without language when one participant observed another.

Participants were encouraged to draw on their experience and background and in turn encouraged others to do so as well. It appeared that the various roles and responsibilities associated with the business were occupied by those who not only had adequate experience but also interest in doing the job. Common goals appeared to keep the talents of individuals focused in the same direction and on the requirements of the organization.

The strong presence of social interaction both at work and in social settings allowed participants many forums for sharing work and personal experiences. This strengthened the work team by allowing individuals to get to know each other on levels other than those of employment. Work pressures also helped to force individuals together to share experience as problems in the work environment often required solutions which
had to be tailor made. Lack of time and money put additional pressures on participants to achieve goals within the constraints of existing resources.

Project work appeared to contradict the notion of socialization because projects were most frequently assigned to a single person. However, this appeared to be partly connected with time and money pressures; because the firm had more work than current resources, it was not always possible to assign additional individuals to work on projects. When project leaders had the time to share with others they appeared to do so and when they had questions or concerns about the projects, they sought out others who might have been able to help them.

Structural additions to the business, in the form of new systems or process improvements, appeared to be primarily in response to work pressures, however, such additions as weekly meetings started to provide formal environments for socialization. As the company grew, it appeared that employees desired greater structuralization although the informal networks which connected individuals continued to be a rich source of sharing tacit knowledge and were not sacrificed for exclusively formal arrangements.

Socialization was triggered by field building or creating a space where individuals were encouraged to feel comfortable sharing personal experience. While minor power struggles and interpersonal conflicts did arise from time to time, participants generally perceived the office environment as a safe and comfortable venue for sharing. The physical arrangement of the upstairs office, where desks were located in the same room allowed individuals to be physically present during conversations. Participants were therefore able to enter or observe conversations or observe others' work simply by being in the same physical space.

When individuals worked together for any of several reasons they also created a field for sharing. They worked together focused on a common goal which allowed them to share their tacit knowledge. Strategic alliances helped to broaden the field to an inter-organizational level.
Communication structures also promoted the sharing of tacit knowledge. Private conversations were rare in the business context and most often individuals freely expressed opinions and feelings. Frequently, mini-brainstorming sessions took place when several employees in a common physical location talked about how to solve a particular business problem.

Externalization

"Externalization is a process of articulating tacit knowledge into explicit concepts" (Nonaka & Takeuchi, 1995, p. 64). While socialization is a process that might or might not include the use of language, articulation through language is central to externalization. Dialogue is the primary trigger which causes tacit personal knowledge to become externalized.

Once again, the business context provided numerous opportunities for dialogue. Employees communicated primarily face to face with other individuals and over the phone with customers and suppliers. The bulk of this communication was verbal. Social interaction away from the office extended the opportunities for dialogue in other physical spaces and formal structural additions such as weekly meetings extended the opportunity for dialogue within the office setting. Technology, particularly in the form of an advanced phone system allowed for dialogue between parties that were not physically proximate.

Several of the projects undertaken appeared to require making tacit knowledge explicit although this did not always occur through dialogue. For projects such as the NRC grant, the software user’s guide documentation, and the price book, tacit knowledge was made explicit primarily in written form. The written forms were subsequently used as objects of discussion and dialogue as improvements were sought and revisions made.

Work pressures to get things done quickly because “time is money” had a dual effect on the externalization process. When problems or issues needed to be addressed immediately, dialogue appeared to be the preferred choice of locating information. If direct dialogue with an “expert” (someone who knew how to do something) was not
possible or practical, then other sources of information, such as documentation, were resorted to. While work pressures promoted dialogue of a sort, limited time meant that dialogue was usually restricted to short discussion periods on a single topic. Because of the hectic pace and large number of tasks that needed attention, dialogue on one topic was frequently interrupted by dialogue on another topic. Interruptions maintained the dialogue process but may have decreased the quality of dialogue by cutting short some conversations which were not yet complete.

Working together appeared to be another forum which supported the conversion of tacit to explicit knowledge. Working together on a task often required participants to dialogue with one another thereby helping to surface personal knowledge about the task at hand. Strategic alliances appeared to be examples of externalization as well, although the evidence was less perceptible in the data because the study did not collect detailed information on the nature of inter-firm activity.

Combination

Networking is Nonaka and Takeuchi's (1995) trigger for combination. Combination is a process of blending explicit concepts such as those attempted through strategic alliances. Combination was also evident both in communication structures and technology systems within the organization.

Communication structures which promoted the sharing of explicit knowledge included phone conversations where, for example, product and price information was communicated to the customer. When the customer responded to product or price information a negotiation took place which in turn may have created an effort to purchase a new product or change a product’s list price. Written documents also showed evidence of combination. When documentation from the NRC proposal was included in existing marketing brochures, a new, more comprehensive information package was created.

In general, computer technology stores information and has the ability to generate reports easily and flexibly. In this study, computer software such as the accounting package was used to produce a variety of reports by combining separate explicit pieces of
information. For example, to see who owed the company money, the accounting software could be queried to run a report which listed customers along with their account status. Information from the contact management database could be combined with accounting information to see who had purchased the greatest amount from the company. The contact management database could be combined with the fax and word processing software to send all customers in a particular geographic area the hotsheet listing of the week’s special buys.

Mimicking appeared to be another form of combination. When individuals and the company mimicked ideas they first located an explicit idea or concept which seemed to fit with what they wanted to do. It appeared that this copied concept was then combined with explicit existing knowledge within the company to create an idea which was transferred from one application or context to another.

Nonaka and Takeuchi (1995) argue that the most important types of knowledge conversion are those where tacit and explicit intersect, and that modes such as socialization and combination are limited because they do not create something which is radically new or innovative. As combination is not a radically new form of knowledge conversion, ideas that result from combination are better thought of as incremental innovations or continuous but minor improvements to existing business processes.

Internalization

"Internalization is the process of embodying explicit knowledge into tacit knowledge. It is closely related to ‘learning by doing’" (Nonaka & Takeuchi, 1995, p. 69). Internalization is best exemplified in this study as individuals attempted to learn how to do their jobs. In order to learn how, individuals talked to other, more experienced individuals. By sharing their expertise through dialogue, expert participants helped to coach new employees into their roles. Individuals also attempted to learn about their jobs through trial and error or learning by doing and by reading about various aspects of the business in trade publications or organizational documents.
Generally, the business context appeared to support learning by doing so that individuals were encouraged to experience their new jobs by actually performing them. New employees reported that orientation procedures were minimal or non-existent and that training consisted primarily of self-directed attempts to find out how to do something.

Summary

The way in which Nonaka and Takeuchi (1995) create their tacit and explicit matrix allows only for the modes of knowledge conversion discussed thus far. While this study generally supports the notion that different modes exist and that evidence of each mode may be found in the data, some examples appear to fit in more than one mode. Other examples fail to fit neatly in a single mode and appear instead to straddle the line between modes. This is particularly relevant with the conversion of tacit to explicit knowledge where tacit knowledge is sometimes offered through dialogue and other times must be sought through observation.

An important theme in the data revolves around the notion of internalized and externalized knowledge. If the process of internalizing and externalizing is fundamentally different from the tacit and explicit dichotomy, a more comprehensive framework may be required. This is further discussed in the following section on the knowledge spiral.

The Knowledge Spiral

The conceptual framework for this study posits that a knowledge spiral (Figure 4) is created when modes of knowledge conversion interact with each other and as knowledge is organizationally amplified from individuals to groups, and then to the organization and even to other organizations. The spiral occurs as knowledge is generated through the various modes and as knowledge repeats the cycle of modes at higher levels of the organization.
Figure 4. The knowledge spiral (Nonaka & Takeuchi, 1995).

The framework illustrates a spiral which starts with socialization and revolves in a clockwise, circular pattern to externalization, combination, internalization and then back to socialization again. Innovation is said to occur as a result of the spiraling process.

While all modes of knowledge conversion specified in this model can be seen in this study, a continuous knowledge spiral is more difficult to find. The business context favoured a socialization mode and, while attempts were made to externalize knowledge, they were frequently time delimited due to interruptions or inability to capture information in a formal, documented way. This in turn hampered combination, which relied on formalized sources of knowledge for its existence. Finally internalization, while also evident, seemed to be a somewhat inefficient process as participants were limited by available sources from which to draw explicit knowledge into their own experience.

The concepts theoretically identified as triggers for knowledge conversion (field building, dialogue, networking and learning by doing) were all present in the study but did not always appear to trigger the same mode as described in the framework. For example, the process of networking with others appeared to have as much significance for sharing tacit experience as it did for promoting combination. According to the framework, dialogue triggers externalization; however, my data showed dialogue as a trigger for internalization as well. Participants talked about their personal experiences both as a way of sharing with others, but also as a way of learning how to do a task.
If a spiral pattern does occur, it is a roughly sketched one (Figure 5). Rather than an easy and continuous circling from socialization to externalization and so on, any spiral pattern in my data appears to require several attempts at one mode before another mode occurs. Additionally, the concepts that the framework posits as triggers (i.e. events or contexts that shift knowledge from one mode to another) may require some fine tuning to ensure that they are the best descriptors of what actually triggers the shift.

![Figure 5. A "roughly sketched" knowledge spiral.](image)

The theoretical framework also depicts a spiral which moves upward and outward from the individual. As the individual is the lowest common denominator for knowledge creation, knowledge is said to occur first at an individual level and then move to group, organization and inter-organization levels. In my data, this too, appears to be a rough rather than smooth spiral. Although knowledge clearly starts with the individual, in my study, it appears it may move to the group and then back to the individual before spiraling further upward to the organization.

One way of attempting to compare the framework with the data is to examine the notion of a project. Project work within the organization was certainly not the only type of work that occurred at the site. However, in many ways, project work attempted to improve the organization by providing new ideas, products or services that did not previously exist. Additionally, the examination of a project fits closely with the way in which Nonaka and Takeuchi's (1995) framework was constructed.
Several projects were in evidence during the course of this study. Two of the most significant ones, because they were worked on frequently and were described as having a profound effect on the future growth and success of the organization, were the price book and the new generation of software. Neither of these projects was complete when this study finished; however, they were far enough along to provide some helpful insight into the processes of knowledge creation and the presence or absence of a spiral phenomenon.

The Price Book Project

The idea for the price book came from other competitors who had similar product catalogues. The project was jointly funded by the DataSystems firms, although, Haley, the project leader, was from DataSystems Canada. The price book was a high priority project and it was conservatively estimated it would double sales volume once published and distributed. The project was due to be completed near the beginning of my study but, due to a number of delays, was still ongoing at the end of my research.

Haley worked with an external consultant, hired to format and publish the final copy of the book. Ideas about the layout and content of the price book were discussed with other employees periodically throughout the development process. Although DataSystems USA had a makeshift price book, the publishing of a product catalogue of this magnitude had never before been attempted. The novelty of the task may have accounted for some of the delays to the project as unanticipated activities required additional completion time.

If the idea of a knowledge spiral holds, then the project should have proceeded through various modes of knowledge conversion in a cyclical manner. Experience should have been shared through socialization, knowledge should have been converted to explicit concepts in a process of externalization, then combined with existing organizational knowledge in combination and finally internalized through a process of learning by doing.
The price book project started with identifiable concepts from other organizations. Haley examined the competitors' price books in an effort to identify ideas that could be used in the DataSystems' catalogue and to make note of features he did not find helpful. At some point early in the project a discussion between partners took place over the general content of the price book. At this point, the idea to include supplier advertising was raised, thereby creating a combined concept that resulted from external and internal ideas. Through discussion and Haley's efforts to map out a sample of the catalogue, the price book concept began to take shape for DataSystems.

The price book project was then left largely to Haley. Rather than continuing to amplify the price book concepts to the rest of the organization, it appeared that any spiraling that occurred moved from group discussions back to an individual task level. An advertising consultant was brought in to handle the layout, design, and publishing work of the price book. In this way, the concept was shared, this time with an outsider to the organization who was brought into the project because of technical expertise.

Throughout the project, Haley identified required steps and assembled various components of the book as they were finished. Periodically, Haley had discussions about the catalogue with other employees but continued to be primarily responsible for completing the associated tasks. When I completed my fieldwork, the price book's cover and general layout was complete. The details regarding edits and last minute decisions regarding layout specifics still needed to be finalized.

If one were to compare the development of the price book to the framework, it would appear that the process began with the examination of explicit competitor concepts. These concepts were then discussed between partners who shared tacit assumptions about how the DataSystems' catalogue should be created. During the process of creating the price book, Haley learned about publishing such a catalogue by doing the work himself. It is somewhat unclear whether the concept of the price book was shared beyond the three partners, although it is clear that once shared the concept was then "deamplified" to the individual level. The spiral is not clearly evident although
movement between knowledge modes and concept transition within and between organizational levels does appear.

The Software Project

The software project had its own cycle. The idea for the new version of POS software was a combination of one participant's experience in the POS industry and other software companies' ideas about how to put Microsoft Window's based products together. According to Kyle, the initial idea was not shared because he had nobody to share it with, at least not at a technical level comparable to what would have been beneficial. Rather than making the concepts of the new product explicit through dialogue, therefore, the concept remained largely tacit. Only certain aspects of the concept, which had been made explicit through an informal business plan, could be combined with the existing business of the company.

The new product concept did not appear to be well internalized by others. Before Kyle explained the details of the project to Haley, it did not appear that Haley had a good grasp of what software development was required. It also appeared that Haley's interest in the project was more to do with financing requirements than the technical components of the product plan. Only when the project required funding from the government were attempts made to share and document what was "in the head" of the software designer.

When Tim, the programmer, was first exposed to the software product he seemed to have difficulty accessing the detail behind the existing software product despite his technical expertise. To familiarize himself with the product in an effort to understand the new software project, Tim described a process of internalization whereby he studied what documentation already existed and then attempted to make it explicit in his own way.

Knowledge about the software project, which represented a more radical than incremental innovation, was kept primarily in tacit form. What little knowledge was shared remained between two or three individuals and did not appear to be amplified to the rest of the organization. This largely individual process seemed to counter the posited model that the spiral would move up to other organizational levels.
A Knowledge Web

While there are certainly areas where a vague spiral can been seen in the data, it does not appear to be as strong as is indicated by the framework. Additionally, within the scope of the projects described, there seems to be more diversity than patterned similarity. A pattern of knowledge interactions does emerge for each project but appears to be linked to the specifics of the particular undertaking, thereby resulting in a slightly different pattern for each innovation.

Any pattern that emerges reflects more of a “web” structure than a spiral (Figure 6). The web appears to be constructed differently depending on the circumstances and actions of the individuals involved. The web denotes a more flexible and complex interaction during the knowledge creation process and may better reflect the impact of context. Finally, although the framework clearly shows knowledge transformation within multiple levels of the organization, and the study’s data does as well, it is not always clear that a knowledge spiral or web is created only in an upward direction.

The web structure provides a mechanism for illustrating the uniqueness of a knowledge creating process. It values the importance of multiple forms of knowledge and its very creation suggests that a balance needs to occur between tacit and explicit forms of knowledge. Additionally, the web becomes dimensionally stronger when knowledge is shared beyond the individual. Finally, the web structure permits repeated and iterative attempts to convert knowledge in one mode before moving to another.
Summary

This chapter has examined how knowledge creation themes, explored in Chapter Five, relate to the conceptual framework that informs this study. While several areas of fit can be noted, there are also several discrepancies. The importance of both tacit and explicit knowledge are evidenced, but it appears that tacit, rather than explicit knowledge, plays a larger role in the daily business activities of the firms.

The four modes of knowledge conversion can be traced to the data in the study but there is some question as to the nature of the relationship between socialization and externalization. Specifically, the question arises as to whether there may be different forms of externalization, some more repeatedly accessible than others.

Finally, the knowledge spiral does not consistently appear as a spiral. When a spiral does occur, it is roughly drawn and may require several attempts in one mode before advancing in a clockwise fashion to the next mode. There is even data which suggests that the spiral may be more of a web which is spun according to the specific context of the knowledge interaction.

In the following and final chapter, I will attempt to uncover explanations for the discrepancies which exist between the model and the reality. Areas for further research will also be discussed.
CHAPTER SEVEN: DISCUSSION AND CONCLUSION

This study has examined how knowledge is created in a small business. It has drawn on existing theory, primarily Nonaka and Takeuchi’s (1995) theory of organizational knowledge creation, and attempted to explore parts of this theory in the light of practice. Using a multiple methods case study, data was collected over a six month period at a single field site. Data was then coded, categorized, and analyzed for emerging themes related to the creation of knowledge.

While several data themes appear to fit the conceptual framework, others appear to fit less neatly. Possible interpretations that suggest how to account for these differences will be discussed here. Additionally, this study has generated yet more questions about knowledge creation and the organizational learning of a small business. These questions will be raised and suggested as areas for further research.

A Summary of Findings

This study’s findings highlight several important points. Firstly, knowledge is created by individuals and therefore the skills, perceptions and experiences of individuals form the knowledge base of the organization. Because individuals span boundaries between work and social worlds, knowledge creating activities occur both in and outside the world of work.

Secondly, knowledge is created primarily through dialogue. Individuals develop ideas, solve problems, and learn new activities by talking about them with other individuals. This talk occurs on a primarily informal basis rather than in structured communication processes such as meetings or planning sessions.

Thirdly, new knowledge is not radically different than existing knowledge. New ideas, products and services follow a pattern of continuous improvement and tend to be incremental rather than radical innovations.

Fourthly, the individuals and organizations in this study appear to learn through experience, particularly experience which is negative. Knowledge is also created
experientially when individuals mimic ideas from other companies or work together in strategic alliances to bring new products to market.

Fifthly, some knowledge is difficult to access because it remains largely in tacit form. Tacit knowledge is not accessible unless it can be externalized through dialogue, documentation, or action. Several iterations of surfacing knowledge occur before an individual’s “gut feel” knowledge can be used by other employees. Therefore knowledge is created somewhat inefficiently because of the limitations of accessing the tacit side.

Finally, knowledge is created in an environment where intense time pressures and lack of financing constrain daily business activities. Knowledge is sometimes difficult to transform into innovations because time pressures restrict the participants’ ability to focus on a single subject for extended periods of time. A shortage of money and pressures related to cash flow mean that additional resources, primarily human resources, are only acquired once they can be supported by the firm. This results in a situation where new knowledge may be required but not yet be “affordable”. New employees, once hired, serve to augment the knowledge base of the firm.

While several of these themes fit the conceptual framework of this study, discrepancies do exist. While both tacit and explicit forms of knowledge are in evidence, it appears that the small business relies more heavily on tacit than explicit. Modes of knowledge conversion are in evidence but externalized knowledge seems to exist in two forms; knowledge that is momentarily externalized through dialogue and knowledge more permanently externalized through documentation. Whether or how this discrepancy affects the knowledge spiral is unclear.

However, the knowledge spiral does not appear to be as neatly evidenced as Nonaka and Takeuchi’s (1995) model of knowledge conversion would lead one to believe. When a spiral does occur it is “roughly sketched”, indicating that several attempts must be made at converting one knowledge mode to another before the cycle can continue. There is also evidence to suggest that the spiral is not only “organizationally amplified” but that it may follow a pattern of amplification, deamplification, and reamplification.
Possible Interpretations

Deciding upon suitable explanations for the differences between the framework and findings will clearly require further research. However, it may be helpful to consider some possible interpretations for the differences, both to help the reader further appreciate the complexities of knowledge creation and to cast a critical eye on the nature of this study.

Small Versus Large Organizations

Firstly, there may be a significant difference between how knowledge is created in a large organization and how knowledge is created in a small business. Differences in firm size have been explored in several studies (Baldwin, 1995; Link & Rees, 1991; Scherer, 1991) and may be further exaggerated by the cultural differences between Japanese organizations, from which the theory was drawn, and a Canadian organization, to which the theory was applied. Size differences may also be linked to life cycle stage and organizational structure.

The lifecycle stage of an organization may impact the way it creates knowledge; newly formed firms may spend more time generating new knowledge than established organizations. Nelson and Winter’s (1982) concept of organizational routines, or “the skills of the organization” (p. 124) would suggest that well established organizations have routine activities which become the foundation for organizational skill. In this case study, an early lifecycle stage linked to a lack of organizational routine might explain why various projects underwent different knowledge creation processes. Because the organizations that made up this case study were only at the start of their lifecycles, significant growth and change accompanied almost everything they did. They could therefore be seen to be developing routines rather than working within the confines of established ones. It would be interesting to examine how knowledge creating processes evolved as small businesses grew into larger organizations. At what point would knowledge crystallize to form a routine within the organization?
Organizational structures in small businesses are often less formally established than in the complex hierarchies of large firms. The informal nature of communication in this study appeared to have much in common with the relatively flexible network structure of the business. Less hierarchical patterns of communication, based on flexible organizational structures might help to explain why the small firm knowledge creation process did not resemble Nonaka and Takeuchi’s (1995) smooth spiral.

In sum, any one or a combination of factors including organizational size, cultural background, lifecycle stage, or organizational structure, may have influenced the difference between this study’s findings and what the conceptual framework would suggest.

A Knowledge Web

A second interpretation of the data suggests that the theory of organizational knowledge creation is only a partial account and could be further developed. While Nonaka and Takeuchi (1995) make a considerable contribution to the field of organizational learning, their knowledge spiral appears to be somewhat prescriptive and simplistic. This is both powerful because it is easy to understand, and limiting because it may not fully or accurately represent the variety of contexts in which organizational knowledge is created.

A web structure provides a stronger metaphor to account for the findings of this study. The web could represent both the product and process of knowledge creation. Strands on the web that corresponded to different modes of knowledge conversion could represent the action of conversion as well as the resulting knowledge product. Most importantly, the web suggests that context impacts knowledge creation although the most influential contextual constructs have yet to be identified. The notion of the importance of communities of practice to knowledge creation (Brown, Collins, & Duguid, 1989; Lave & Wenger, 1990), could also be represented by a web which embeds individual actions within other strands of work groups and inter-firm alliances.
The web may also help to account for differences between core and peripheral knowledge (Lyles & Schwenk, 1992). Core knowledge, including shared organizational goals, could be viewed as main web supports (the connections between tacit and explicit knowledge). Peripheral knowledge, developed through activities designed to achieve shared goals, would be spun around the core knowledge structure to complete the web. An imbalance between core and peripheral knowledge might cause the web to collapse, thereby arguing the central importance of core knowledge to the firm.

Inter-firm activities such as "know-how trading" (Von Hippel, 1988) could cause the web to expand, particularly in areas where explicit concepts were being traded. In the case of organizational knowledge creation, the web could represent the firm's activities, with individual employees and groups responsible for developing the strands between the main supports of core knowledge. If each organization had its own web, connections with other companies through such activities as strategic alliances would represent several strands of each firm's web structure. Interactive learning between firms (Lundvall, 1993) might be illustrated by common elements in different firm web structures.

The web could also account for cases of "unlearning" (Hedberg, 1981) where portions of organizational knowledge were deliberately discarded. Such knowledge structures could be removed from the web without destroying it entirely; like any diligent spider, the organization could work to replace the "unlearned" knowledge with new concepts.

A recent study by Engeström (1996) focused on innovative learning in work teams within large organizations. While Engeström used the concepts of activity theory and expansive learning as a basis for his study and focused on work team meetings as sites for data collection, his findings fit with many of the conclusions of this study. Firstly, all four modes of knowledge conversion were evident in his data although, "sharing sympathized knowledge was much more difficult to find" (Engeström, 1996, p. 10) as it was in this study. Additionally, he identified two sequences which did not fit Nonaka and Takeuchi's (1995) framework: formulating/debating a problem and
analyzing/debating a problem. These sequence types appear to relate to my data, which suggests that the sharing of tacit knowledge is triggered by an unresolved business problem. I am unclear about the extent to which my participants felt they were formulating problems although I saw little evidence that problems were defined by anyone other than the individuals responsible for solving them.

Secondly, Engeström’s work failed to identify a sequential pattern to the phases of innovate learning, suggesting, as my study does, that knowledge creation may vary according to context. “The processes of innovative knowledge creation are not pure. They contain both expansive and non expansive phases, both steps forward and digressions” (Engeström, 1996, p. 13). The notion of a roughly sketched spiral appears to capture some of this contextually based variation.

Thirdly, an instance of joking in Engeström’s data served to divert attention from an emerging idea and may be likened to the notion of interruptions in my study. Although the process of knowledge creation may vary, it appears that certain actions enhance innovative learning, while others, such as interruptions, may hinder the process.

The idea of different types of innovations fits with my findings that work activities related to knowledge creation occur in different forms. Engeström’s (1996) notion of innovations applied to a single problem (solution innovations), or distributed and applied elsewhere (trajectory innovations) may help to characterize the nature of project and non-project work in my study. Project work appeared to be a specific response to an anticipated problem, whereas process innovations, such as the use of office technology, appeared to have application in several contexts. The concept of radical and incremental innovations (Barley, 1988; Von Hippel, 1988) further illustrates the importance of continuous improvement activities over an exclusive regard for large scale innovations.

Thus, the knowledge creation process appears to be significantly more complex than Nonaka and Takeuchi’s (1995) knowledge spiral would lead one to believe. While the spiral does recognize the cyclical nature of innovations (Dixon, 1994, cited in Engeström, 1996), it fails to adequately account for variation in innovation processes.
Perhaps the theory of expansive learning can be regarded as a basis for defining the phases of a cycle, while Nonaka and Takeuchi’s (1995) categories are useful in defining the alternative modes of representation available to the participants as complementary instrumentalities in each phase of the cycle. (Engeström, 1996, p.23)

In particular, the notion of a knowledge spiral seems too rigid to be applicable to a broad range of situations. For example, this study has shown that a rough spiral occurs in some instances but in other cases a more weblike structure appears. Is the web a magnified view of a spiraling process or is it something entirely different? Does the spiral or web change shape with context and if so, what features of the context may impact the nature of the process? Does the web extend outside of the organization or is it merely an internal phenomenon? These and other questions should be further explored through additional studies.

Methodological Differences

A final interpretation would center the explanation, not in the external world of the theory or the organization, but in the research design and methodology that guided this study. Nonaka and Takeuchi (1995) created their theory from retrospective case study interviews. That is, they sought to understand how an innovation had occurred after it had taken place. This perspective may have encouraged interview respondents to highlight successful rather than unsuccessful events or to oversimplify a substantially more complex process.

The design and methodology of this study looked at both successful and unsuccessful events (from the participant’s point of view) as events occurred. Data was collected during a six month field study and attempted to capture the entire essence of the business rather than just case examples of innovative activity. Data was also collected using multiple data sources including not just interviews, but also observations, field journal notes, and business documents.
Implications and Recommendations

Small business organizations, of the size referred to in this study (i.e. less than 20 employees) are unlikely to have formal human resource departments to operationalize human resource strategies. Nonetheless, there are important implications for human resource development that emerge both from the framework and from the study’s findings. Interestingly, no evidence of formalized activities related to the training or development of employees was found in this study. Even the process of new employee orientation was almost completely absent.

Both the model and the findings imply that traditional assumptions about learning, as evidenced only by a change in behavior, and knowledge, as a static and easily transmittable commodity, are inadequate. Learning can result in a change in behavior but not in all cases; sometimes learning results in new ideas or perspectives without an immediate, observable, behavioral change. Likewise, framing knowledge as an external, transmittable commodity negates the importance of individual experience. In sum, it is important for small business entrepreneurs to value the individuality of learning and knowledge and not succumb only to traditional “training” type strategies to develop their people.

Traditional human resource development efforts often rely on expert teachers who are responsible for conveying important knowledge and skills to their trainees. This study suggests that experts already reside in the business and that a great deal of expertise can be shared amongst the employees of a small business without having to recruit external authorities. This study also suggests that the traditional notion of teacher-learner relations is inappropriate for a small business in this industry because it assumes a fixed position for an individual regarded as a teacher who may in some cases have expertise and at other times require guidance. A more appropriate conceptualization might be learner-learner relations where everyone is responsible for contributing to the learning process. It should be noted that organizational learning in some industries may be quite successfully based on traditional teacher-learner relations as is the case for industry sectors that follow apprenticeship models.
While this study supports the notion that learning occurs at an individual level, it also supports a socially situated viewpoint which implies that learning also occurs, perhaps in a more profound and powerful way, in naturally occurring communities of practice. Small business entrepreneurs should take advantage of these naturally occurring groups to promote knowledge creation. In fact, because of the lack of formal organizational structure in small businesses, naturally occurring groups may be easier to identify than artificially contrived ones.

Tacit knowledge, strongly evidenced in this study, appears to be a rich reservoir for new ideas. However, despite its promise, it is apparently difficult to capitalize on. Strategies for helping to access tacit knowledge and make it efficiently usable to individuals in the organization should be further investigated. In some cases this may require the addition of structural features such as regular meetings or project documentation, in other cases it may be sufficient to have tacit knowledge surface verbally only to disappear again.

Although this study has only investigated one small business site, several recommendations are possible. These recommendations are first, and foremost, intended to help the small business entrepreneurs who were the participants in this study. They are not intended to be rigid prescriptions but rather areas for further reflection. How helpful they might be to other small business entrepreneurs is uncertain. If this case possesses similar characteristics to other firms or if other firms appear to connect to the theory of this study, the following recommendations may have some applicability.

Whatever DataSystems and PC TechnoDev are doing, they seem to be doing a good job of it. If success is determined by financial position alone, they are probably ahead of most small businesses, who struggle to survive cash flow issues in their early years. Putting aside cash issues for the moment, it appears that the participants are generally excited about the business and their own employment futures; they like working together and appear to be a supportive and learning oriented team.

They should have confidence in their own abilities and feel good about what they have accomplished so far. There is a wealth of expertise and experience within the firms
to be drawn upon for generating knowledge. Their emphasis on the importance and centrality of individuals to the business is important to recognize and promote. Their reliance on tacit knowledge is most helpful but they should revisit how they uncover the tacit knowledge. Does it suit their needs to do it the way they do? Would additional formalized knowledge be helpful?

Group work, where possible, should be used to surface and share personal experiences in an effort to capitalize on the knowledge and skills of the individuals working in the business. Sharing experiences outside of work is considered to be extremely helpful especially to the degree that it helps the entrepreneurs to focus on strategic issues which appear to be difficult to discuss within the context of a business day at the office. The extent to which relationships and roles limit access to shared knowledge particularly outside the office should be reviewed, and participants should consider how the formation of additional or modified groups might enhance knowledge creation.

Finally, I would encourage the participants to reflect on the nature of this study’s findings, to see if it “fits” with their tacit understanding and to use this and other opportunities for reflection and discussion about how they can best make use of their human resources.

Areas for Further Research

This study did not aim to address and resolve entirely the issue of organizational knowledge creation. Although I hope to have added, in some small way, to current thinking about organizational learning and knowledge creation, there are a number of issues which remain unresolved at the end of this thesis. These are areas for further study.

While the purpose of my study was not specifically interested in gender related business issues it is hard to ignore the fact that the participants in my study were all male. Even those participants who were hired during the course of my study were male. In addition, most of the suppliers and many of the customers in this study were also male.
The women who did show up in this study were often relatives or friends of the participants. There was also a temporary clerical, accounting person and her boss, a sales representative from a coffee company, a cleaner, a representative from the office leasing company and myself. While I don't feel that the participants overtly discriminated on the basis of gender, I do sense there is something about the culture of the business and its corresponding industry which favours and promotes men over women. This leads to an interesting question: how does gender affect knowledge creation?

This case can be statistically compared to other small businesses in the same industry and to small businesses in other industries. Points of comparison which are easy to access include statistical categories such as financial results, standard industry classification, and number of employees. These tell us little about how knowledge is created. Further research could attempt to broaden the findings of this study by asking the same question in another context. For example, how is knowledge created at site X?

Although data for this study was collected over a six month period, the business was undergoing rapid change and will likely be quite different in structure, processes or employees at a later date. While this study sought to confine data collection to a short period of time, a further study could investigate knowledge creation in a more longitudinal fashion.

Reflections on the Research

It seems entirely befitting that the researcher in a qualitative study share reflections on the research process as a final offering to the reader and as a method of making explicit, as much as is possible, the reflexive nature of the study. As I complete the research process I am left with a number of interesting impressions.

Firstly, I am aware that as much as I might have hoped to illuminate some shady theoretical corner, the research process appears to develop as many questions as it does answers. In this regard, research is very much process and less so, product. To liken my endeavours to knowledge creation, I have but begun to frame the web concerning
innovative organizational learning in small business organizations. Many more research iterations are required for the details of the phenomenon to be fully explored.

Secondly, hindsight, as they say, is twenty twenty. If I could do it all over again, I would make many of the same choices. But, there are also a number of methodological details which I would change. This is yet another argument for future studies to begin where I have left off, to expand and build upon the knowledge that exists, and amplify it in other contexts and from new perspectives.

Finally, I have learned as much, if not more, about the process of research as I have about the topic of knowledge creation. I have developed new skills and new perspectives. I have struggled and I have grown. Mostly, I have learned that the road to disciplined inquiry is paved with good intentions and a lot of hard work.

Summary

This study is complete. And yet, for every question it appears to have answered, I hope it has raised at least several more. After all of the collection and sifting of data, I believe that the further study of knowledge is very important. It may even be critical. To small business organizations, who like larger organizations, count on their people to keep them competitive, the ability to generate new knowledge may be the key that sees them through the immediate pressures of time and money to a future that is bright with promise.
References


Appendix A

Interview Schedule  
M.A. Thesis Research - Suzanne C. Allan  
University of British Columbia

General Information
1. Please describe your business.
2. What industry sector(s) do you see your business fitting into/with?
   - Based on 1980 Standard Industrial Classification...
     A. Primary industry
     B. Manufacturing
     C. Construction
     D. Transportation, Communication and Utilities
     E. Wholesale Trade
     F. Retail Trade
     G. Finance, Insurance and Real Estate
     H. Non-Commercial Services (educational, health, & social services)
     I. Commercial Services (business services, accommodation, food & beverage, personal services)
     J. Government Services
3. What does your organizational structure look like?

Trends and Changes in the Industry
4. How has your industry changed in the last 5 years? 10 years?
5. What are the major factors affecting your business success today?
6. What future trends do you anticipate affecting your business?

Effects of Trends and Changes in the Industry
7. How has your business responded to changes in your industry and external environment?
8. How is your business responding to anticipated future changes?

Knowledge Creation Processes
9. Does your organization have a vision or strategy? If so, what kinds of activities are you undertaking as part of this vision or strategy?
10. Can you give me an example of a process you would follow when developing a new product or service?
11. Who is responsible for developing new ideas within your organization?
12. Does your organization experience periods of chaos or crisis? If so, can you give me an example of a chaotic event or crisis and how you responded?
13. Where do you get the information you need for your business?
14. How is information distributed within your organization?
15. Can you give me an example of a “successful” event that illustrates how you or your organization were able to generate new ideas/products/services from information in your environment?
16. Can you think of an event that you would classify as “unsuccessful”? Why was this event “unsuccessful”?
17. How do you capitalize on the expertise of your organization’s people?
December 15, 1995

Mr. Kyle Webster
President
PC TechnoDev Corporation
Address...
City, Province
Postal Code

Dear Mr. Webster,

I am writing to inquire if you would be interested in participating in a research project I am currently undertaking for the completion of my Master of Arts degree in Adult Education at the University of British Columbia. The purpose of the project is to examine how knowledge is created in a small business context. I believe that this study is particularly timely given the current prominence of small business organizations in British Columbia and the increased emphasis on knowledge as a component of successful competitive advantage. I hope that the findings of my study will provide a better understanding of the dynamics surrounding the creation of new ideas, products, and/or services and that this will lead to new ways of thinking about potential organizational learning opportunities and creative alternatives to traditional methods of human resource development in a small business context.

I anticipate that your organization will benefit from this study in several important ways. Firstly, the study will attempt to identify processes in your organization which are helpful to the creation of new ideas. Secondly, the study will explore possible disabling factors which limit or prevent the successful creation of new ideas, products or services. Finally the study will attempt to make recommendations concerning knowledge creation which may help your organization to more efficiently plan and implement strategies for developing your human resources.

During the study I will be interested in collecting data from several sources. Initially it would be useful for me to review any organizational documents which allow me to better understand how you plan and manage your business. Examples of such documents might include business or strategic plans, operational reports, organizational charts, or product/service manuals. In addition to documentation, I would like to observe some of your meetings or planning sessions and interview employees of your organization.