THE ROLE OF COMMUNICATION IN KNOWLEDGE MANAGEMENT AND KNOWLEDGE EXCHANGE IN ORGANIZATIONS

by

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A Dissertation submitted to the

Graduate School – New Brunswick

Rutgers, the State University of New Jersey

in partial fulfillment of the requirements

for the degree of

Doctor of Philosophy

Graduate Program in Communication, Information and Library Studies

written under the direction of Claire R. McInerney, Ph.D.

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New Brunswick, New Jersey

April, 2007

ABSTRACT OF THE DISSERTATION

The Role of Communication in Knowledge

Management and Knowledge Exchange in Organizations

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The research described in this dissertation studied how knowledge is exchanged and created in teams, what practices are used to accomplish the sharing, and the nature and acquisition processes of individual team members' knowledge. The context of the research was organizational teams engaged in information technology outsourcing, with the study subjects being teams and individuals engaged in the outsourcing work. The study was an exploratory one, with no testing hypothesis postulated beforehand. The intent was to observe the communicative practices used by teams and to describe and characterize the team-based practices as they are employed to share and create knowledge. Communication theory was used in conjunction with that of knowledge management and task teams as a framework for developing an understanding of knowledge sharing in task-directed teams in the accomplishment of organizationally-directed objectives. Multiple methods were used for collecting data, with the primary being interviews with team members and leaders. Data were analyzed through descriptive content analysis. The research followed in scope and method other studies in the fields of knowledge management, communication, and task-directed teams (Desouza, 2003; Heaton & Taylor, 2002; Heaton, Bergeron, Bertran-Gastaldy, & Mercier, 2005), and sought to extend that research. The study was done to develop a deeper understanding of the actual communication practices used by teams and

team members engaged in situated, task-directed activities. This study's import lies in the theoretical aspects that may be used by scholars to expand or deepen the work of existing theoretical studies and in the practical findings that may be used by organizations. Findings from the research included the characteristic of the sharing and creation of knowledge in task-directed teams as an active process, responding to dynamic business and technical environments, and that the knowledge is held substantially tacitly. Many communication practices were used to share and create knowledge, with non-mediated, person-to-person dialogue playing an important role, and with information and communication technologies playing important *enabling*, not central, roles. Knowledge was shared and created through communication processes, and while individually held, the communication constituted the socially held knowledge of the team, represented in the teams' processes, procedures, and non-documented norms. Lastly, outsourcing is a rapidly evolving business model used by organizations to manage their processes and costs, and in the cases of the teams studied in this research, the management of knowledge exchange in the start-up and on-going team operations played a significant role in their success.

ACKNOWLEDGEMENTS

What would you do if I sang out tune?
Would you stand up and walk out on me?
Lend me your ears and I'll sing you a song
I will try not to sing out of key, yeah
Oh, baby I get by with a little help from my friends,
By with a little help from my friends.
All I need is my buddies
By with a little help from my friends

Paul McCartney, 1967, “A Little Help from My Friends”

Few of us are blessed with such innate intelligence, acquired skills, and emotional equanimity that we can be successful in all life’s endeavors without friends and colleagues. What modest successes I have achieved can be directly attributed to the many wonderfully supportive, talented people with whom I have been privileged to live, play, work, and study.

Foremost among these is my wife Gerrie. She has been a caring and encouraging partner through my programs of study from post-masters certificate through doctorate. She has alternately filled the roles of careful editor, staunch backer, emotional supporter, and most importantly, best friend and confidant. Her help and counsel were essential factors in the completion of my program.

I have been privileged to know and work with Dr. Claire McInerney for six years. Her thoughtful guidance about entering the doctoral program, balanced tutelage as I progressed through it, and sedulous direction in the conduct of my research and completion of the dissertation were critical to the successful conclusion of my work.

I would also like to gratefully acknowledge the support of the other members of the committee in the development of the dissertation and without whose time, effort, and on-going encouragement the effort would not have been successful: Dr. Mark Aakhus, Dr.

Nicholas Belkin, and Dr. Stacey Connaughton; and Dr. Tefko Saracevic who served on my qualifying examination committee.

Without always understanding *precisely* the topic of my research or attending to *all* the aspects of methodology, my family was unwavering in its encouragement and interest. My mother; two sons, Matt and Chris; sister, Wendy Parker; and brother, Steve, never failed to ask how my work was progressing. My brother- and sister-in law Michael and `Celia Pilato took a keen and continuing interest in my work. I am only saddened that my father is not here to celebrate his contribution and support for this effort.

The friends without whom I would *never* have gotten by are the members of my extended cohort: Nora Bird, Mary Nucci, Andrea Pamploni, Chris Caldiero, William Voon, Dawn Sweet, Michael Cole, Kalpana David, Katie Lever, Judah Hamer, and Corey Lieberman. Throughout my doctoral effort no educational, technical, or other problem was too large or too small to not warrant their concern and help.

Other friends and colleagues encouraged my entrance to the program, and progress through it: Linda and Ron Roberts, their younger son Jon, and older son and my good buddy Jay; JR Hoyer; Al and Jean Mayhew; and my colleagues from the library Pat Brosenne and Audrey Harvey.

Joan Chabrak was a pillar of support and guidance throughout the program. I wonder if any of us could have made it without her assistance.

Like any such enumeration, there will invariably be people who I omit despite my careful list making, second checking, and vetting. I'll slap my forehead when I recollect, and ask their understanding. Attribute the oversight to age and not indifference.

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1.0 Chapter Overview and Purpose

The research described in this dissertation studied the communication practices used by teams to share knowledge in the accomplishment of their work tasks. Questions of how information is conveyed and shared in teams and transformed into knowledge, what the practices are that are used to accomplish sharing, and the nature of individual team members' knowledge acquisition are the topics proposed for analysis in the research. The purpose of this chapter is to provide an overview of the research area, the context within which the proposed research was conducted, and a statement of the specific problem to be addressed by the research questions.

1.1 Research Area Summary

Knowledge is increasingly seen as an organizational resource, one that can be managed as are other resources such as labor, capital, and inventory, all used in order to fulfill an organization's objectives. The attention being paid to knowledge and its uses within organizations is based on an awareness of the large and potentially untapped resources in the knowledge possessed by their work forces and in institutional data stores in which individuals' knowledge may have been captured and codified. Knowledge may be seen as a key, along with other resources, that allow businesses, not-for-profit organizations, government agencies, and other institutions to acquire and retain the *know how* and *know what* required to successfully fulfill their objectives.

Knowledge management can be characterized as processes and programs, both formal and informal, that facilitate knowledge creation, identify and support knowledge workers,

align knowledge use with organizational objectives, and measure the results (Davenport & Prusak, 1998). The management of organizational knowledge cannot be seen as simply the deployment of a technology or new application software package touted in the marketplace as being critical to an organization's successful management of knowledge, although there are challenges to the use of a term such as "managing" for a not-well-defined resource such as knowledge, and whether it's management would be appropriate and feasible (Wilson, 2002). There are complex, context-dependent interactions that take place as information is transformed into knowledge, tacit to explicit, in its use within an organization. An understanding of that transformation must address knowledge as both object *and* process (Zack, 1999); that is, the transformation is based on the interaction of organizational participants working individually, in teams, or in communities, using their previous experiences and values to interpret and react to new situations and information. Knowledge derives from information through the processes of comparison, understanding consequences, establishing relationships, communication, and sharing with other interactants about that which they know, and in so doing, gaining insights and perspectives to be applied to new situations (Nonaka & Takeuchi, 1995; Davenport & Prusak, 1998; Von Krogh, Ichijo, & Nonaka, 2000).

These processes are situated actions, bound in the activities of individuals or teams and expressed in the language used in the conduct of work tasks and activities. As noted by Suchman, "the significance of a linguistic expression on some actual occasion… lies in its relationship to circumstances that are presupposed or indicated by, but still not actually captured in, the expression itself" (1987, p. 58), constituting the work being performed. The tasks in which individuals and teams are engaged, in the broader context of an organization's

competitive strategy, functional or business model, and availability of enabling technologies, all factored into the approach taken to understanding the communicative aspects of knowledge sharing in organizations. Importantly, these factors change over time in response to external market conditions, competitive or supplier factors, changes in technology, and the many other factors that can affect an organization's activities, reflecting the dynamic nature of knowledge itself (McInerney, 2002).

The emergence of a strong interest in knowledge management as a discipline in the mid-1990s was based primarily, although certainly not exclusively, on the work of practitioners. The term "knowledge management" first appeared in journals and magazines in the mid-1980s, initially used in the computer sciences, and while that use has continued to the present, the term now encompasses application in library and information management, general business management, and communication (Wilson, 2002). Nonaka and Takeuchi's foundational *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation* (1995) draws from the authors' business experience with the practical aspects of how commercial organizations gain competitive advantage through the efficient production and introduction of new products and services. Davenport and Prusak's *Working Knowledge: How Organizations Manage What They Know* (1998) reflects a similar usage-based viewpoint, and many of the oft-referenced articles are from *The Harvard Business Review* and *Sloan Management Review*, showing business's interest in the topic. Domain-specific journals and e-zines such as *KM Review* are written from practitioners' perspectives, and while there has been a significant increase in academic interest and empirical research in the field (Blair, 2002), knowledge management remains firmly grounded in organizations' interests in gaining an understanding of how the knowledge in

their workforces might be effectively managed to increase overall organizational competence.

To support development of research results that have both scholarly interest and potential practical application, the context for this research was the situated work of task or process outsourcing. The rapid growth of outsourcing in the past fifteen years has been particularly noticeable in the field of information technology, with businesses and other organizations identifying functions that are deemed non-critical to the core competencies of those organizations and consequently transferring responsibility to a third party (Dibbern, Goles, Hirschheim, & Jayatilaka, 2004). For example, a sales and marketing company might well consider reassigning responsibility for the operation of its data center to another company, focusing its attention and resources on the critical functions it performs rather than on the day-to-day tasks of running a data center, retaining the staff needed to do so, and so on. At the start of any such transition, whether for hardware support for a data center or desk-side services or application support for software determined to be non-essential to an organization's functions, there is a structured process of knowledge transfer that is conducted in which the knowledge of the individuals with current responsibility is transferred to the individuals in the external organization assuming responsibility for the task. The process of knowledge sharing in outsourcing situations was the focus of the research, understanding the communicative practices that are used by the teams to effect the change in responsibility. It was not the intent to study outsourcing *per se*, as a domain of research, but to use it as the situated context within which knowledge sharing and the role of communication would be studied.

1.2 Problem Statement

The research examined communication practices that allow teams to share knowledge between and among team members in the accomplishment of task-directed work activities, with the understanding that communication practices may serve as inhibitors to understanding as well as enablers. While one can imagine many different contexts within which knowledge sharing could occur, one specific example is within commercial organizations in the fulfillment of their objectives, and that was the focus of this study. Although technologies and evolving business practices have created new ways in which work can be done, off-shore outsourcing being one example, the fundamental process has remained identifying tasks, assigning responsibility, allocating resources, planning the work, performing work tasks, and fulfilling assigned tasks. This work is often done for customers external to the organization, but just as frequently work is done by individuals or teams to meet internal organizational objectives such as making processes more efficient or reducing costs. Throughout these work activities, communication processes are the essential strands that bind tasks and teams together and constitute the knowledge contributing to task accomplishment. The research studied those communication processes and encompasses three different theoretical domains.

Knowledge and Knowing

An understanding of knowledge creation and exchange is based on the different forms knowledge may take. Tacit knowledge is that which is "subconsciously understood and applied, difficult to articulate, developed from direct experience and action, and usually shared through *highly interactive conversation.*… [italics added]" while "explicit knowledge is more precise and formally articulated, although removed from the original context of

creation or use" (Zack, 1999, p. 46). Context and experience are central to the concept of tacit knowledge, and that perspective is captured in Polanyi's oft-used quote about human knowledge, "we can know more than we can tell," (1983, p. 4), by which he meant that the store of knowledge possessed by individuals is not directly expressible without losing an individual's context. When organizations seek to capture or codify tacit knowledge, they are faced with the dilemma that tacit knowledge is difficult to share due to its context dependency when compared to articulated or documented knowledge. To date, this topical domain has not focused on the communicative aspects of knowledge sharing or on the specific characteristics of task-directed teams.

Communicative Aspects of Knowledge Sharing

While organizational knowledge creation starts with individuals (Nonaka & Takeuchi, 1995), organizations themselves are not sentient but are composed of thinking individuals. If an organization can be said to know something, it is a phrase that more accurately reflects the shared, common understanding of its members. The process of knowledge creation and transfer involves different forms of knowing and is captured by Nonaka and Takeuchi in their four-stage model of tacit to explicit and back to tacit knowledge conversion, a dynamic and on-going process depicted by Nonaka and Takeuchi as an expanding spiral. An alternative model is one of knowledge creation and transfer that is based on communication practices in communities. A definition of communication proposed by Lievrouw and Finn (1990) can serve as a foundation: communication is "… human behavior that facilitates the sharing of meaning and which takes place in a particular social context" (p. 49). Heaton and Taylor (2002) challenge the assumptions made by Nonaka and Takeuchi that knowledge is text of individual understanding, and that once explicated,

communication is not problematic, suggesting instead that knowledge arises in community, reflecting the practices of that community, and is therefore highly context dependent. Knowledge is not the product of individuals, but of communities and the language through which that knowledge is expressed. It represents the fabric of behaviors and processes that constitute the community. The communication can be seen as constitutive [1], created through the achievement of understanding by the interactants. To date, this topical area has not focused on knowledge and its characteristics *per se* or on the specific practices of knowledge sharing in teams.

Teams and Knowledge Sharing

This domain deals with the nature of teams in the exchange of information, specifically teams engaged in task-directed activities. There is an understanding of the role that task-directed teams play in the functioning of larger organizations and in the accomplishment of task-specific activities and collaboration on research and development tasks for example. This will often entail the spanning of spatial, temporal and cultural barriers that have not previously been crossed. Technology can facilitate dialogue between interactants, but not wholly replace the negotiated, communicative aspects of knowledge exchange within teams and communities of practice (Dyer & Nobeoka, 2000; Wenger & Snyder, 2000). This topical area does not provide focused insights to the nature of knowledge or its communication-based characteristics. Current research emphasizes the

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[1] The constitutive model of communication posits that "the elements of communication, rather than being fixed in advance, are reflexively constituted within the act of communication itself," and that there is an "… on-going process that symbolically forms and reforms … our common world of meaningful objects and events, ... and our routine ways of expressing these socially-constructed realities" (Craig, 2000, para. 5). It represents a continuing process of achievement by the interactants. This model can be contrasted to the traditional transmission one wherein messages have a source (sender), are transmitted, and then received.

interest in the communicative aspects of knowledge sharing and transmission, and the intersection of the three domains of research summarized above. The works of Heaton and Taylor (2002); Heaton et al. (2005); and Ipe (2003) analyze the communication that is posited as an integral part of knowledge sharing, but also highlight the need for developing better-grounded understanding of the actual practices used by teams in the exchange of knowledge.

The attention being paid to knowledge and its uses within organizations is based upon awareness that social collectives have large and substantially untapped assets in the knowledge possessed by their members. Understanding how information is exchanged in workaday situations through communicative processes and transformed into knowledge in organizations and in the task-directed teams that comprise those organizations may reveal approaches for its more effective use and potential benefits in the functions that are performed. The intent of the research was to:

1. Develop a better understanding of the actual communication practices used by teams and team members engaged in task-directed activities, that is, how knowledge is transmitted and shared in teams;
2. Describe what communication practices are used to foster knowledge creation and sharing;
3. Explain the role task-directed teams have in knowledge management practices and the approaches used by the teams to share knowledge; and
4. Characterize the nature of individual team members' knowledge acquisition, assessing whether the knowing is individually-centered or group-centered and the role communication practices play.

Development of this understanding may lead to the expansion of theoretical aspects of existing studies and be of interest to scholars while also providing insight into ways to better align the overall approach to the management of knowledge with organizational needs. The research in the this dissertation can be differentiated from other work in its methodological approach of combining in-depth interviews and observations with a supporting survey instrument, its research focus on the intersection of knowledge management and communication studies, and its context of task-directed teams engaged in information technology outsourcing.

Chapter 2
Literature Review

2.0 Chapter Overview and Purpose

Study of the role played by communication practices in the exchange of knowledge in organizations and its effective management draws from the subject areas of knowledge, its relation to data and information, and its management; organizational communication; and teams and communities of practice. Taken individually, each of these literatures provides useful and necessary insights to different aspects of the overall problem area proposed in this research, but only when taken together do they provide the foundation to fully and sufficiently understand it, as will be described subsequently. The purpose of this chapter is to review the literature in the different theoretical domains upon which the proposed research rests, and to differentiate the new work from that done previously, suggesting why it is worthwhile to pursue (Rudestan & Newton, 2001, p. 56).

2.1 Data, Information, and Knowledge

Comprehending the role of communication in the exchange of knowledge rests on an understanding of the relationships that exist among data, information, and knowledge. These concepts should be seen as distinct and substantially non-interchangeable. Data can be defined as a "set of discrete, objective facts about events… and is most usefully described as structured records of transactions" (Davenport & Prusak, 1998, p. 2), distinguished from information in that the latter "has meaning…. Not only does it potentially shape the receiver; it has a shape: it is organized to some purpose" (p. 5). In this study, information should be seen as knowledge that has been or is being communicated (interpersonally,

organizationally) or otherwise conveyed (reified in databases or in documentation, among others).

Knowledge can be defined as the application of the information a person possesses to address specific problems or opportunities, for instance, in an outsourcing engagement the transfer of knowledge when responsibility for support for some function is transferred from individuals in one organization with current responsibility to individuals in an external organization assuming responsibility for the function. From another perspective, knowledge may be seen as enacted information.

> Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experience and information. It originates and is applied in the minds of knowers. *In organizations, it often becomes embedded not only in documents or repositories but in organizational routines, processes, practices, and norms* [italics added] (Davenport & Prusak , 1998, pp. 4 – 5).

As described earlier, tacit knowledge is that which is held by individuals, rich in context and difficult to codify, typically shared most effectively through dialogue and representations. Collins (1974) argues that "all types of knowledge, however pure, consist, in part, of tacit rules which may be impossible to formulate in principle," and cites as an example that learning algebra is more than memorization, but involves "knowing how to *do* [italics added] something," which may not be made directly explicit (p. 167). Explicit knowledge is that which has been captured in some way and codified such that it can be accessed and exchanged in a comprehensible fashion. The key aspect of explicit knowledge is that it can be expressed and shared between and among individuals formally and in a consistent, understandable manner. Information technologies are frequently used to facilitate this exchange once the process of codification is complete and the knowledge is digitally available.

Although less-widely studied, there is a third category of knowledge identified and used by some researchers, implicit knowledge (Nickols, 2000). Not all tacit knowledge is explicable, but that which might be objectified but has not yet been, may be described as implicit knowledge. Its presence may be inferred from the behaviors of individuals. One of the tasks that might be faced in a knowledge management initiative is the identification of those observed behaviors that might be capture-able and turned into codified, or explicit, knowledge, oftentimes through articulation of the do-er (knower). The sharing of knowledge may be done through "learn[ing] by doing" (Baumard, 1999, p. 23), and this highlights both the personal nature of tacit and implicit knowledge and the social context within which the possibility of sharing may take place.

The traditional view of knowledge creation and transition involves the interaction of tacit and explicit knowledge, captured by Nonaka and Takeuchi (1995) in their model of four modes of conversion (pp. 62 – 68).

1. *Socialization* involves the creation of a shared cognitive model often seen as specific skills and know-how with experience-based context a critical factor in the transfer.
2. *Externalization* involves the explication of individually-held tacit knowledge and takes place through the use of "metaphors, analogies, concepts, hypotheses or models" (p. 64).
3. *Combination* is the creation of knowledge structures, the movement from explicit to explicit, one knower to another, in the knowledge cycle, the aggregation of discreet knowledge; and takes place through writing and discourse, as a base, but with higher levels of structuring.

4. When explicit knowledge is *re-internalized* by an individual, and applied to the actual doing of her or his work, the transition is from explicit to tacit.

These transformations are not static, but rather are ongoing processes depicted by Nonaka and Takeuchi as an expanding spiral. This is the creative engine that, if understood and appropriately managed, allows organizations to grow and gain a competitive advantage in the marketplace or service sector. Based on the understanding of the increased importance organizations are assigning to the communicative aspects of the management of institutional knowledge, there is a heightened interest in understanding the role of human interaction. Factors that influence the sharing of knowledge are its tacit, implicit, or explicit nature, the transformation from one form to another, and the value assigned to that knowledge and within that framework, organizations seek ways to increase individuals' willingness to share and to provide opportunities for that sharing, though, for example support of informal sharing environments (Ipe, 2003).

2.2 Knowledge Sharing and Communication

Knowledge creation and sharing within the traditional framework has as its locus the individual, with communication activities seen as the processes through which knowledge is shared. These activities are *not* seen as constitutive in themselves, that is, *not* creating the context within which knowledge is created. Deriving from this model, knowledge management programs are seen as the capture, organization, and utilization of knowledge objects or the codification of tacit knowledge, and are often referred to as knowledge bases rather than the information databases. Management of these stores of knowledge objects increasingly is seen as the management of decentralized, loosely coupled nodes of information that are related through networks (Contractor & Monge, 2002), but the

fundamental paradigm remains of facilitating the exchange of knowledge amongst individuals. The communicative dimensions of the management of these networks involve understanding the spread of ideas and messages.

If knowledge processes were to be seen as a cycle of creation, refinement, and utilization that is based upon an organization capturing previously unstructured tacit knowledge and transforming it into explicit knowledge, or in some cases "discursive knowledge" (Heaton & Taylor, 2002, p. 211), then its management requires focus on the dialogue of the organizational interactants, specifically when viewed as groups of people with common or shared interests, known as communities of practice. Heaton and Taylor suggest that this codified knowledge needs to be seen both as a representation, or knowledge object, but also as a depiction of the process through which the knowledge is transformed and an artifact of how organizations sustain themselves through that codification. The knowledge is situated, context based, and grounded in process, and marks a clear movement away from the cognitively based, individual-focused model of knowledge posited by Nonaka and Takeuchi. Discourse is seen not only as the method for explicating knowledge through its sharing with others in the community, but perhaps more importantly in Heaton and Taylor's model, the medium through which the organization gains its shared identity and is sustained. Knowledge is seen as collaboratively created, not individually, and embedded in the group practices through which it is created and communicated. Tacit knowledge is not that which is cognitively possessed by individuals but as "the set of background assumptions possessed by the community that *enables its communication and makes it possible for it to collaborate* [italics added] in accomplishing tasks cooperatively" (Heaton & Taylor, 2002, p. 221). A community- and communication-based approach to understanding the sharing of

knowledge is positioned in research that studies communities of practice which are characterized by common processes and vocabularies and the roles of individuals in knowledge sharing (Iverson & McPhee, 2002).

From the perspective of an individual, the exchange of personally-based know-how can be influenced by the larger organizational context within which the sharing of knowledge takes place, and would include the influencing factors of the nature of the knowledge (tacit and explicit), motivations to share, factors of reciprocity of trade in markets, relationships, rewards and recognition, and opportunities to share within informal settings rather than structured ones (Ipe, 2003). Within the teams themselves, other factors may influence the willingness *or* unwillingness of individual members to participate in team actions including the sharing of knowledge. Collective action models suggest that individuals will interact in order to accomplish shared goals and objectives and to utilize individuals' capabilities, and that team-level social influences and competency-based technology contributions contribute to individuals' motivation to participate in team actions, specifically information sharing and the transfer and creation of team-based knowledge (Yuan et al., 2005).

Another perspective on collective action is provided by the theory of transactive memory that posits group behavior can be understood through the interactions and processes of its members for structuring their shared information (Wegner, 1986, p. 185). While not suggesting some group mind, it looks at the collective actions of the individuals in the group constituted by their interactions.

> Transactive memory…is not traceable to any of the individual alone, nor can it be found somewhere `between' individuals. Rather, it is the property of a group. This unique quality of transactive memory brings with it the realization that we are speaking of a constructed system, a mode of group operation that is built up over time by its individual constituents (p. 191).

This memory is based upon the group members' understanding of the individuals' capabilities and areas of knowledge. Research in this area has focused on teams engaged in task-directed activities (Akgün, Byrne, Keskin, & Lynn, 2006; Marks, Mathieu, & Zaccaro, 2001). Communication practices are the fabric that binds the team members together, allowing the sharing of group knowledge, learning from others, and accessing other information; and in so doing, forwarding work of the group (Hollingshead & Brandon, 2003).

Recognition of the dynamic nature of knowledge and the consequent challenges that would have to be addressed by any system that sought to manage it are influenced by the comprehension of the role of social context in the creation of knowledge and the importance of discourse not simply in the exchange of knowledge but in its creation and structuring (McInerney, 2002, pp. 1012 - 1013). Coupled with the growing understanding that technology alone is not sufficient to fully define a knowledge management program, despite the assiduous efforts of software creators to make the marketplace believe so, these lead to a perspective of knowledge and its management in organizations as dynamic communicative processes rather than viewing knowledge as static repositories of objects or artifacts.

The performative aspects of knowledge sharing, seen in the enactment of information possessed by individuals, is also questioned by a communication-based perspective of knowledge (Heaton et al., 2005). Recognizing the dynamic, iterative, and social aspects of knowledge creation and sharing, this position posits that knowledge sharing cannot be based solely on its possession and reification by individuals, focusing instead on the discourse of interactants. In these exchanges

> … meanings both emerge from interactions involving actors in context and shape those contexts in turn. The continual (re)formation of the mutual context introduces possibilities for ambiguity and instability into each communication episode. *Knowledge is both a resource for, and a product of, situated interactions* [italics added]…. Knowledge construction is a goal-directed, pragmatic accomplishment. (Abstract).

Heaton and her colleagues refer to this as "the capacity to act" in which knowledge has the potential to be enacted, contributing to the achievement of some task or activity, and clearly situated in some organization context. Participants negotiate and create inter-subjective knowledge not individually but through interaction in grounded situations, continuously re-creating this knowledge through discourse and ongoing constitution in response to new situations.

Another critique of the tacit/explicit dichotomy is made by Hislop (2002, 2003) who argues that knowledge is inexorably composed both of implicit and explicit, not readily divisible; and that it cannot be managed as separate entities. Based on this model, the role of communication in the exchange of information becomes more important in the knowledge management processes. Knowledge is seen as deeply ingrained in organizational practices and contexts, as well as manifest in the people who perform these tasks and establish the contexts through their interactions and communication. Hislop states that "in order to be effective, the sharing of knowledge requires individuals to develop an appreciation of the tacit assumptions and values on which all knowledge is based" (2002, p. 172). The application of technologies may prove only partially effective in enabling information and knowledge sharing due to this dependence on the situated organizational context established through person-to-person (dyadic, interpersonal) communication. In situations of information exchange, the interactants may need to understand what they know, but have not explicated, and then reveal this knowledge through the communicative activity. Hislop

suggests that the differentiation of tacit and explicit is an inappropriate division, envisioned perhaps to allow explicit knowledge to be packaged and moved around an organization as documents, messages, database records, or other reified objects, but in so doing, these objects are removed from their originating context and lose much of their value. Innovation processes are a specific reflection of the management of knowledge networks wherein less structured but nonetheless rigorous methods are used to support communicative processes through team support processes, mediated communication, and structured meetings, among other approaches (Hislop, 2003; Hislop, Newell, Scarbrough, & Swan, 2000b). It is interesting to note the close similarity of the work of Hislop and that of McInerney at about the same point of time (in the early part of the decade) but that the two do not cite each other in any of their works. Perhaps the omission reflects the two subject domains from which they work, one situated in communication and the other in library and information science, the bringing together of which is one of the purposes of the proposed research.

Speech Act Analysis and Business Action Theory

Another frame of analysis within the larger field of communication studies may be provided by speech act analysis which seeks to understand individuals' discourse as expressed in utterances such as greetings, questions, and acknowledgements, among others. The study of speech acts has the purposes of organizing different types of acts (representatives, directives, commissives, expressives, and declaratives within Levinson's taxonomy [1983] based on Searle), explaining the structure of necessary and sufficient conditions (felicity conditions) that explain the nature of speech acts, and understanding the complex nature of the ways in which they are used. This conceptual approach provides a worthwhile framework within which the discourse of teams might be analyzed.

A specific application of speech act analysis is the study of language uses in businesses interactions. Business action theory (BAT) is based on the language action perspective and the relationships that are found in communication practices. In the mid-1990s interest grew in better understanding business processes as communicative processes (Goldkuhl, 1996, p. 1). Although the focus of the interest was on information systems and how to make them more inclusive of human factors within the system as much as data and its management, this framework was extended to business process re-engineering and the organizational processes and practices being modeled for assessment and restructuring. This theoretical approach looks at the relationships between suppliers (broadly, of capacities, knowledge, capabilities) and customers (broadly, with requirements or needs) and the communication processes that are involved in negotiating the work to be done, agreeing on deliverables, and ensuring fulfillment (pp. 4-6).

BAT posits a framework for establishing the "meaning, function and structure for such processes" (Goldkuhl, 1998, p. 1). Goldkuhl proposes six phases that can be identified in any general business process, each with communication aspects ranging from business requirements definition, resource identification and selection, through contractual development, fulfillment, and completion phases (p. 5). For example, the contractual phase would include the making of an offer by a supplier, negotiation by the participants, and then acceptance, if agreed to by the customer; and these reflect different communicative conditions expressed in language action perspective (LAP), that is, the felicity conditions associated with the making of an offer. At a summary level, this interaction entails the "exchange(s) of knowledge about business prerequisites" and other aspects of the business environment and processes required to complete agreed-upon tasks (pp. 14-15). These

interactions can be extended to a more general model of business interactions that range from basic business acts, corresponding to speech acts, to business exchanges and transactions, and broader groupings (Lind & Goldkuhl, 2001) establishing potential units of analysis for assessing team dialogue. BAT provides a business-specific analytical framework that will prove useful in the analysis of the team-based communication.

2.3 Task-directed Work Teams

The third subject area that informs the proposed study is team and team-based activities including communication. Although much focus has been placed on communities of practice for the study of knowledge sharing (Brown & Duguid, 1991; McDermott, 1999; Wenger & Snyder, 2000; Wenger et al., 2002), in practice, much day-to-day work performed in organizations is done by teams, formally or informally constructed, more so than in the less-formally-structured communities of practice. Differentiation can be made between task-directed teams and knowledge communities in that the latter are defined by the knowledge they share rather than the tasks they perform, a focus on value for members rather than fulfillment of externally-developed task deadlines, functioning as a group with social dimensions, and development of the tools necessary to enable their practices, for example, special vocabulary and artifacts (see Table 1).

The presence of external objectives and timetables, tasks and activities aligned with functions from within a larger organizational context, and formal or close-to-formal organizational structure are clear identifying characteristics of task-directed teams. Processes such as planning and developing team strategy and team coordination are used to organize and integrate tasks, with the different processes performed in step-wise sequences, often

Table 1

Task Teams and Knowledge Communities (Communities of Practice)

Task-directed Teams	Knowledge Communities
Driven by *deliverables* - Shared goals and results - Value defined by charter - Value in results delivered	Driven by *value* - Shared interest or practice - Value discovered / evolves - Value in ongoing process
Defined by *task* - Interdependent tasks - Clear boundaries	Defined by *knowledge* - Interdependent knowledge - Permeable boundaries
Develops through a *work plan* - Everyone contributes - Managed objectives through objectives and work plan	Develops *organically* - Variable contributions - Managed by making connections
Bound by *task commitment* - Joint accountability - Based on explicit agreement - Team leader or manager	Bound to *identity* - Reciprocal contributions - Based on trust - Core group / contributor

Note: Based on McDermott (1999)

simultaneously, and all entail some level of internal and external communication drawing from group norms (Marks et al., 2001). For instance, one can envision a group of people engaged in new product development with specific design parameters within which to work, development and manufacturing cost estimates to meet, and timetables to fulfill. The participants interact through interdependent tasks or activities and work towards an externally-directed goal. The work entails functional tasks (designing, contracting) *and* project tasks (coordinating, communicating, budgeting). This could be contrasted with a community of engineers that collaborates on design processes and tools but without specific

design requirements, cost constraints, or timetables in mind. In the latter case, the participants interact to learn and share around the shared interest in engineering process improvement. Tasks entail functional ones only (designing).

At the heart of all team learning are the individually-based learning behaviors, referred to as "micro-level learning," with corresponding organizational constructs that would reflect the different learning behaviors (Lam, 2000). A primary differentiation can be made between the explicit-tacit dyad and the individual-organizational dyad, resulting in four distinct knowledge types: *explicit and individual*, dependent upon the individual and her or his cognitive capabilities; *tacit and individual*; *collective and explicit*, retained as objects in data stores; and *collective and tacit*, represented in group norms and practices, and comparable to Heaton and Taylor's (2002) community-based assumption set that enables group communication. Lam suggests that these four knowledge constructs lead in turn to four organizational constructs ("professional bureaucracy," "operating adhocracy," "machine bureaucracy," and "J-form [Japanese] organization") aligned with the knowledge types; and the author proposes that each organization consequently has unique organizational characteristics, learning capabilities, and inherent practices for managing tacit knowledge. There are implications for learning and education that would be associated with the organizational forms and professional development particularly as applied to facilitating the exchange of knowledge within less-formally-structured teams. An explicit relationship can be established between how tacit knowledge is managed and the resulting organizational and managerial constructs.

Differentiation can be made between the process of knowing within teams and the objectification of knowledge. The dynamic and evolving nature of the concept of knowing

within teams may more accurately capture how teams create and share their collective knowledge (Hislop, Newell, Scarbrough, & Swan, 2000a). Although objectified knowledge is used extensively, seen in documentation, practices, and routines, its impact is caused by the reflective activity of the team members in using the knowledge, redefining and re-contextualizing it. The dynamic nature of knowledge, also described by McInerney (2002), is exemplified by the on-going process of appropriation and application with high dependence on current context. The interactive and informal nature of the exchange of information and its transformation to knowledge may be defined by the character of the relationships of the interactants in the exchange, how tacit knowledge is expressed, shared, and enacted. Context for the exchange is influenced by the tasks in which participants are engaged and the categories, or genre, of the information being exchanged (Freund, Toms, & Clarke, 2005). In a study of tacit knowledge exchange in geographically-dispersed laser development teams, this was expressed as "knowledge consist[ing] of the ability to *do* [italics added] something; thus… technological knowledge is the property of people rather than documents" (Collins, 1974, p. 167).

The proposed research draws from literatures from three theoretical domains. An understanding of knowledge creation and exchange is based on the different forms knowledge may take, tacit and explicit, and the importance of context and experience in the constitution of the knowledge; but to date, there has been no focus on the communicative aspects of knowledge exchange and creation. Communication theory informs the analysis of the interactive, community-based processes of sharing meaning, but study has not centered substantively on knowledge exchange. Business action theory provides an analytical approach that is grounded specifically on business processes. Lastly, the study of teams and

knowledge sharing reveals the roles of task-directed teams in the sharing and creation of knowledge in larger organizational contexts in fulfillment of directed objectives. Taken together, the three literatures provide the theoretical bases upon which the proposed research rests.

2.4 Research Rationale

The intent of the research conducted for this paper was to develop a better understanding of the workaday communication practices used by teams and team members engaged in task-directed activities, that is, how knowledge is transmitted and shared in teams; what communication practices are used to foster knowledge creation and sharing; the role of task-directed teams in knowledge management practices; and what the nature is of individual team members' knowledge acquisition. Understanding how information is exchanged in situated team activities through communicative processes and transformed into knowledge in organizations and in the task-directed teams that comprise those organizations may reveal approaches for its more effective management. The three subject areas covered in the review of literature provide constructive insights to many facets of the overall problem area, but do not fully address all aspects of the specific area planned for research. Additional research in this area has been suggested by Grover and Davenport (2001), Heaton and Taylor (2002), and others; and the research was intended to contribute to that effort through the examination of communication practices used by teams to share knowledge in the accomplishment of their work tasks. While the research draws from previously-conducted studies, it can be distinguished from those by its focus the communicative aspects of knowledge sharing and creation more so than object creation, description, and management; on the community- and context-dependent nature of that communication rather than on

individually-based cognition; and on task-directed work teams rather than communities of practice.

Chapter 3
Research Framework and Research Questions

3.0 Chapter Overview and Purpose

The research in this dissertation followed an inductive approach. It was done within the defined theoretical boundaries based on the subject areas identified for study. The research conceptual model defines the scope of the planned study, that is, it establishes the structure and boundaries within which the research will be conducted. This chapter defines the theoretical framework as represented by the conceptual model and as based upon the review of the literature; and it poses three research questions that frame the description of communication practices used to share knowledge in task-directed work teams.

3.1 Conceptual Model and Definitions

Although no testing hypothesis is postulated for this research, there are definable and understood factors that influence the communicative practices associated with knowledge management and knowledge exchange. The relationship of the practices with the influencing factors has not been well described for task-directed teams, however, and the purpose of the research was to create such descriptions within that specific context.

Previous research suggests that the exchange of knowledge in organizations and its potential management are situated actions enacted by individuals and groups engaged in organizational work, and that this activity is highly dynamic (Hansen, Nohria, & Tierney, 2000; McInerney, 2002; Heaton et al., 2005). Different research efforts approach the study area from alternative academic and functional perspectives. The article by Hansen et al. from *Harvard Business Review* (2000) addresses the development of a knowledge management strategy appropriate for a consulting company. The paper by Heaton et al.

(2005) addresses the constitutive communication practices involved in knowledge sharing ("knowledge moves"). The research in this dissertation sought to determine if there are any common themes in these seemingly disparate perspectives:

1. Teams and the organizationally-directed tasks in which they are engaged (in *Figure 1* shown as the solid-line boxes and arrows);
2. The larger organizational context in which the teams work (shown as the dashed-line oval); and
3. Communicative practices used by individuals, teams and larger-organizational interactants (shown by the dotted-line, curved arrows).

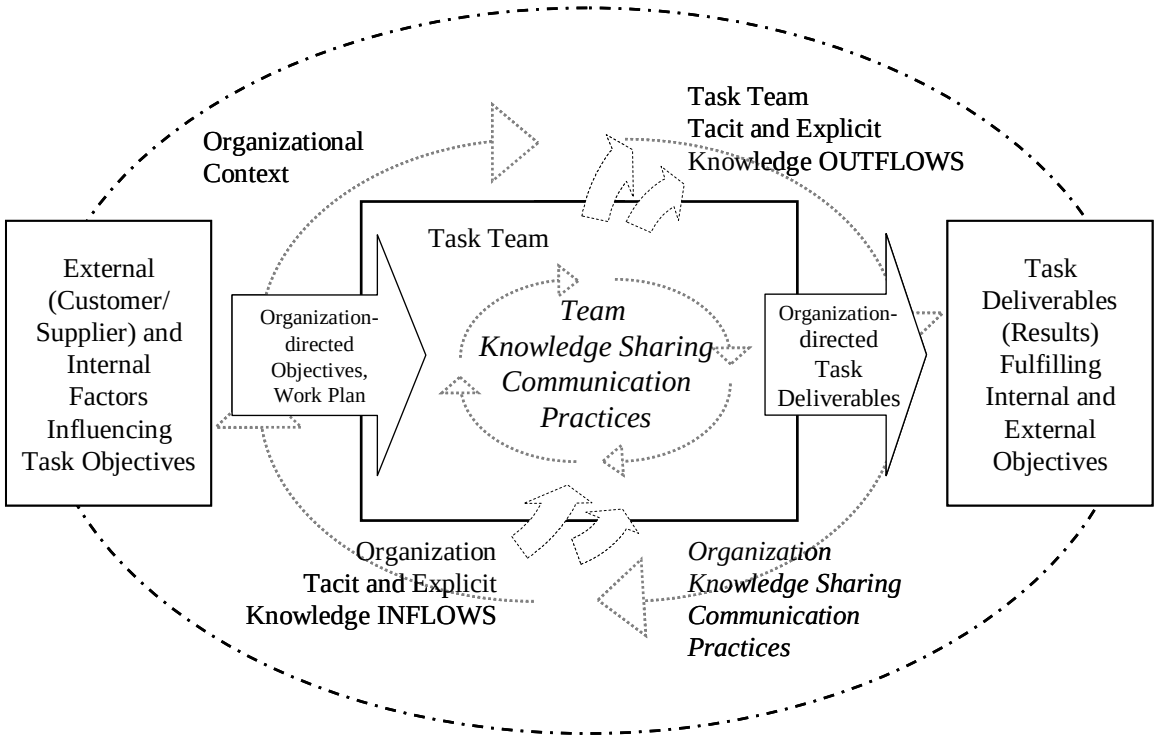

Figure 1

Conceptual Model of Knowledge Sharing in Task Teams

All of these components are influenced by external factors and change dynamically over time.

Teams and Organizationally-directed Tasks

One of the ways in which work is accomplished within organizations is by teams that address organizationally-directed objectives and that work with already-established work plans and deadlines, deliverables, and team membership; and their work involves both functional and project activities. These teams were one of the foci of the research, specifically ones engaged in the outsourcing of information technology functions. Task-directed teams can be differentiated from operational teams in that the latter are engaged in on-going production, administrative, or other work that is functionally driven but without project activities; and from communities of practices that have non-formal, functional purposes but also typically are without project responsibilities. Examples of task-directed activity can be seen in previously-conducted studies such as Hansen et al. (2000) in the actions and activities that derive from an organization's competitive strategy and economic model (e.g., "channeling individual expertise" or "reusing codified knowledge", p. 109). It is addressed by Heaton et al. (2005) in an entirely different organizational setting in the linkage of situated tasks with specific corresponding knowledge exchange activities ("information transfer," "interpretation," and "working through ambiguity," on-line).

Organizational Context

Task-directed teams perform their work within larger organizational contexts, and while they may be granted varying degrees of operational freedom in order to accomplish the given work, they are never entirely free of the many cultural, technical, and procedural influences of their parent organizations. An example of the influence of organizational

context is seen in Blackler's 1995 assessment of the uses of knowledge in the fulfillment of organizational functions. Context is highlighted as having critical importance due to the ways in which the knowledge might be used for either handling routine functions and activities or addressing more challenging problems such as responding to new market opportunities. In this analysis, knowledge is seen as continuously undergoing reconstruction and reinterpretation based on the changing organizational context, and being transformed in its uses based on changing organizational needs.

Communicative Practices

Information and knowledge move within and between teams and the parent organization through the communicative practices used by the teams and organization, and are another of the foci of the research, along with the task-directed teams in which the communication takes place. The communication practices are the mediated and non-mediated interactions through which the information is exchanged and knowledge constituted, and may entail the exchange of both tacit and explicit.

Other Influencing Factors

Other influencing factors in the conceptual model are those external to the organization. This could include competitor or partner activities, general market conditions, changes in product or services technology, and the impacts of any government or agency regulations among the many factors that might be listed. These aspects would strongly influence the characteristics of the three primary factors described previously. Additionally, although not formally or explicitly covered by previous studies, time would be a critical dimension for assessing knowledge management programs. A solution to the puzzle of understanding knowledge exchange and knowledge management that may have been

appropriate and effective at one point of time would unlikely be equally effective in the future; and assessment of programs must acknowledge and plan for changes that will impact execution over time.

Key to any understanding of knowledge management is a fundamental understanding of the concept of knowledge. Although formal definitions may not be defined within work groups, the concept itself is not problematic in their everyday activities. Organizations see knowledge as a fundamental thread that runs through their institutional processes, and whether it is tacit or made explicit, their respective processes are dependent upon its utilization. McInerney (2002) provides a more focused definition of knowledge, stating that it is "not merely an object that can be `placed,' nor should it be confused with the representations of knowledge in documents, databases, etc., but it can be seen as a collection of processes that allow learning to occur and knowing to be internalized" (p. 1010).

3.2 Research Questions

The research analyzed knowledge management as a communication process in task-directed work teams engaged in the activity of outsourcing information technology tasks or functions for day-to-day operational support. Examples would be desk-side support or help desk; maintenance of on-going, installed-base application support such as resolving break-fix trouble tickets and making mandatory application changes; and for new application support and development including design, development, and deployment of a new sales-support application. The processes of the exchange of information among team members, its transformation into knowledge, and the resulting knowledge-based work was the subject of study of the research effort, with task teams as the unit of analysis. Three research questions are posited for this study:

Research Question 1: How are procedures and tools used for information and knowledge sharing in task-directed work teams?

Tools are the technology applications, supporting infrastructure, and other procedures used for information exchange. Subtending questions associated with the first research question include:

1. How is knowledge defined in the organization? Are there context-based factors or task-specific factors that influence this definition?
2. What is a task-directed work team as actually practiced or implemented in the organization? Are there also formal or informal communities of practice, and in what ways are these different than task-directed work teams? What are the relations of task-directed teams to their parent organizations?
3. How do teams manage the knowledge they possess?
4. What are the larger organizational influences and resources that either facilitate or hinder the functions and communication of the teams, for example, what roles do information and communication technologies (ICTs) play in facilitating the exchange of information and knowledge within the teams?

Research Question 2: What communication practices are used to share information and knowledge? How do communication processes enable or disrupt information sharing and the transfer of knowledge?

Subtending questions associated with the second research question include:

1. Is there a constitutive basis to the development of meaning in the dialogue and interactions of the team?

2. What are the different methods of interpersonal and organizational communication that are used in practice? Are they used in different circumstances? Are they used to achieve different purposes?

The role of the individual is a critically important one in this context, and rather than address it as a question associated with, but subordinate to, the first team-focused research question, it would warrant a wholly separate one. The internal process through which individuals come to know something, whether independently or within a group context, are the subject of study of this aspect of the overall research effort, with the individual as the unit of analysis. The research question to frame this aspect of the study can be stated as follows:

Research Question 3:	How do individuals engaged in task-directed activity come to know something about the specific work or responsibilities with which they are involved? To what degree is the knowing individually-centered (based) or group-centered (based)?

Subtending questions associated with the third research question include:

1. How do individuals come to know that they *do* know something?
2. As noted for the team-centered research question, is there a constitutive basis to the development of meaning in dialogue and interaction from an individual team member, that is, is the individual's understanding socially constructed?
3. What role do group norms or practices play in framing individuals' structures of meaning? In what ways do the positions articulated by Nonaka and Takeuchi (1995), Ipe (2003), and others, that is, individual-centered activities of comprehension (tacit to tacit relationship), expression and understanding (tacit to explicit), utilization through and with other individuals, and internalization by those other individuals (explicit to tacit), differ from the position expressed by Heaton and Taylor (2002) and others, that is, that knowledge arises within a community or group and is an

expression of that community's norms and practices, group centered and communicatively based?

4. Is there a taxonomy of communicative practices that are used to transmit knowledge, and if so, can it be described? Such a categorization might reveal types and uses of situated communication practices and techniques, and could inform practical applications and further academic studies.

3.3 The Context of Outsourcing

The study was conducted with teams engaged in the outsourcing of information technology tasks in commercial organizations. Interest in the field of knowledge management was driven heavily, but not exclusively, in the 1990s by businesses with their interests in gaining and sustaining competitive advantage in rapidly expanding marketplaces. In the 2000s that interest expanded to include the use of knowledge to effectively manage costs and margins and to efficiently run the businesses. The last category includes the identification of tasks or processes deemed non-critical to the core functions of businesses and oftentimes includes information technology tasks and activities. Knowledge transfer in outsourcing activities consequently has become of interest to businesses. The purpose of the research was to better describe the process of knowledge sharing in outsourcing situations and specifically on understanding the communicative practices that are used by the teams. While the study has practical findings, it also has theoretical results that may be of interest to scholars. To reinforce a definitional boundary made earlier, the intent of the research was not to assess outsourcing itself but to use it as the situated context within which knowledge sharing and the role of communication was studied.

Working with outsourcing has the additional potential advantage of having well-defined work with specific start and stop dates, often contractually established. In those situations where there is no transfer of staff from the outsourcing company to the service provider, then the transaction is fundamentally one of transferring knowledge and responsibility. At the start of the task, the staff of the service provider presumably has some primary understanding of the base technologies, operating systems, and fundamental techniques that may be involved, for example, the ability to develop and debug code; but *not* of the specific business processes, packaged or custom application software, support and operational work, and other task-specific activities, for example, the ability to support commercially available, off-the-shelf software such as SAP or Oracle enterprise resource planning (ERP) applications. Therefore the work of the task team is the transfer of knowledge, with the anticipated outcome being the acceptance of responsibilities by the external service provider outsourcer to perform the agreed-upon work at the end of the knowledge transfer process and commencement of day-to-day operational responsibilities.

There are two primary types of outsourcing that were encountered in the conduct of the research, each with impacts on the data collection.

1. A *managed services* outsourcing engagement is one in which full responsibility for a function is turned over in total to an external service provder. There is a formal transition and knowledge transfer period with a fixed end date, after which the service provider has full responsibility for the transferred function, for example, managing the portfolio for a SAP business warehouse application (break/fix, enhancements, and larger projects). Measurement is done through service level agreements (SLAs) and

there is not direct management of the service provider's associates by the outsourcing firm's management.

2. A *staff augmentation* engagement is one in which responsibility for a function remains with the outsourcing firm and the external service provider only supplies technically competent staff to fill roles on the outsourcing organization's teams. There is no formal transition and knowledge transfer period as happens in managed services engagements, although there are knowledge exchange periods as newly-added associates get brought up to speed. Measurement is done through the performance assessment of the individual participants.

These two types of engagements evidence different organizational structures, timings, types of interactions, and engagement of personnel from both organizations, and directly affect the types of data collected in the research.

Chapter 4
Methods

4.0 Chapter Overview and Purpose

The purpose of this chapter is to describe the methods used for the dissertation research and why they are appropriate to address the research questions. The design of the research entailed the use of interview and observational data that were subsequently analyzed through the use of content analysis, supported by a survey instrument that sought to measure the pre- and post-task knowledge states of participating team members. The work of the pilot study is described as well as how its results contributed to the validation of the methodological approach proposed for this research.

4.1 Methodological Approach

The ability to detect surface-level communication practices, let alone more-profound ones, and to develop an understanding of the full organizational context within which the communication and sharing of knowledge takes place, requires a deep, thick description (Geertz, 1973). In order to do this and not establish any a priori framework for the specific context of the research, no hypothesis is asserted beforehand, with the intent to observe, describe, and characterize the communicative activities, and from the collected data draw conclusions, letting the data speak for themselves (*res ipsa loquitur*). As such, it would appear to be most appropriately supported by a grounded theory approach [2]. A grounded theory is one that is "derived from the data, systematically gathered and analyzed through

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[2] Grounded theory is not the same as grounded practical theory. Grounded practical theory is "conceived as a rational reconstruction of (communication) practices for the purpose of informing further practice and reflection" (Craig & Tracy, 1995, p. 248). It addresses "… the actual problems and requirements of communication praxis in particular settings" (p. 250).

the research process. In this method, data collection, analysis, and eventual theory stand in close relationship to one another…. [allowing] the theory to emerge from the data" (Strauss & Corbin, 1998, p. 12). The approach is based upon the careful description of the phenomena being observed, focusing on the different communicative processes used for the transmission of information and its ordering into some comprehensible arrangement or knowledge as used by a task-directed team. Grounded theory is an effective approach because its methods

> … rely on detailed qualitative materials collected through field, or ethnographic, research, but they are nor ethnographies in the sense of total immersion into specific communities. Nor do grounded theorists attempt to study the social structure of whole communities. Instead, we tend to look at slices of social life. Like other forms of qualitative research, grounded theories can portray moments in time (Charmaz, 2000, p. 522).

This approach to the study of team-based communication practices seeks to describe, characterize, and understand the relationships that might exist between those practices, knowledge as a shared resource and its management and utilization in the attainment of team objectives.

The three research questions are addressed through three complementary approaches:

1. The questions of how knowledge is transmitted and exchanged within teams and what communication practices are used in that sharing was addressed through the use of structured and open-ended questions and by observation.
2. The question of how individuals come to know something within the context of task-directed teams was addressed through the solicitation of open-ended, story-telling responses from team members at the end of the task.

3. Supporting these two approaches was a survey of team members' task-specific knowledge states before and after the work to establish whether something changed during the task activity, with account taken for extraneous influences.

Although knowledge objects may, and almost certainly would, pre-exist the initiation of this research effort, the objects alone would not disclose the processes that brought about their creation. Use of in-depth interviews has the great advantage of addressing and confirming both linking power and generalizing power. Transcriptions of structured interviews yielded the thought processes and context that surround the transmission and possible explication of the team's knowledge. Additionally, they were appropriate to actually observe and document team interactions and other activities in which knowledge is exchanged and used in order to validate that the interviews accurately reflect the realties of the exchange. It is not uncommon for managers to have disconnected views of what happens in the teams they oversee, and even though there may be no mal intent in the interview information provided, it would be appropriate to ensure that the reported information aligns with the actions observed in the teams. The analysis did not provide enough breadth to fulfill an outcome of the study of developing findings that would be extensible, but did provide a very deep understanding of a small number of selected organizations. A wholly quantitatively-based approach was also deemed not to be appropriate for dealing with the units of analysis of work teams and individuals, although such methods are appropriate for the assessment for changes in individual knowledge states and might prove suitable for possible subsequent assessment of broader organizational dimensions. Transcribed interviews combined with content analysis, validated through the use of field notes of observed communicative activity and through testing of inter-coder reliability of the coding structure were determined to be the most

appropriate methods to address the task. The scope was teams in five different organizations engaged in outsourcing activities, to provide sufficient breadth to ensure the capability to be generalized to some level. Observations and interviewing took place 30 times over a five month period (January through May, 2006, for post-pilot research tasks [see Appendix E]).

The results of the content analysis, in addition to illuminating the communicative practices themselves, also led to the development of a typology of the different characterizations of knowledge and teams' communication practices in the conduct of day-to-day work. The approach to classifying interactional types by identification of their modes, methods, goals, and utilized resource also informed the description and characterization of the ways in which individuals exchange and create knowledge in teams. This was the anticipated result of the coding structure derived from the interviewing and observation data. This framework could be used in subsequent research efforts to seek to establish external validity across industry and organizational types beyond the information technology outsourcing firms in the dissertation research.

The second research approach was supportive of and complementary to the primary tools of interviews and observation. It entailed the use of a survey instrument to collect supportive and descriptive information. The instrument was pre-task-initiation and post-task-completion survey to measure changes in participants' knowledge states, described in more detail in the Data Collection section that follows.

There was a high degree of interdependence among the research approaches described. While any one of the three might stand alone and provide useful insights into knowledge exchange in task teams, and an understanding how communicative practices might be more effectively managed, all may be *necessary* to fully describe the phenomena

being studied. Taken together the three provided a reasonably robust and consistent approach for the study and to provide a level of *sufficiency* of description. The story telling about how individuals come to know something in the context of team activities may not be extensible, with consequent limited ability to ensure validity, but the grounded information that emerged provided some level of anecdotal confirmation for the other interview and observational data.

Methodological Approach Process

The high-level, step-wise process that was followed in the conduct of the research is shown in the Process Flow of Methodological Approach (see *Figure 2*) with key committee approval gates indicated.

4.2 Study Population and Scope

The research studied teams engaged in outsourcing information technology functions in commercial organizations. Teams from outsourcing and service provider organizations were the subjects for the research. Selection of these organizations and teams was not random but done purposefully through contacts in those organizations with which the researcher is familiar and that have specific task teams that were, or were planned to be, performing outsourcing work, and that were willing to accept the level of analysis and scrutiny inherent in the proposed research design (criterion sampling). This methodological approach to selection of population is similar to one followed by Jackson and Jacobs (1981) in their study of argument management: “The logic of our research does not require random sampling from any population…. So our methodological problem is not of selecting representative conversations or estimating relative frequencies of certain groups so much as

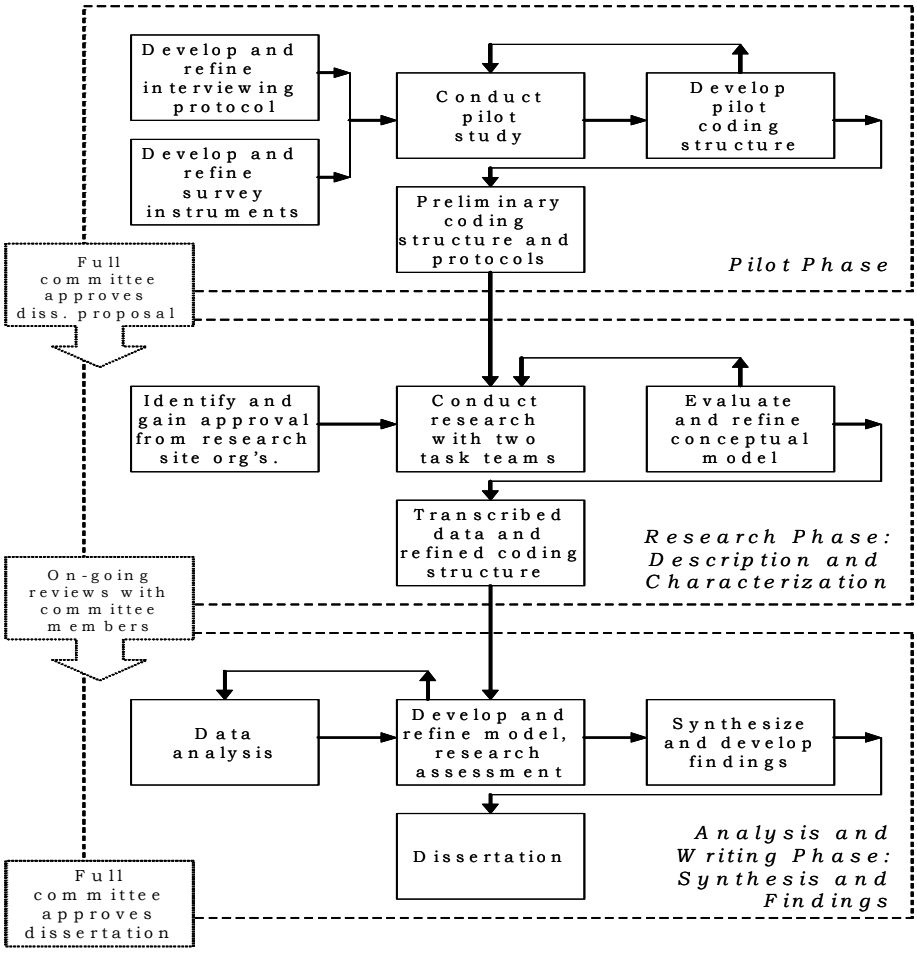

Figure 2

Process Flow of Methodological Approach

one of cataloguing all distinguishable varieties of conversation argument" (1981, p. 85), or, in the proposed study, of cataloguing knowledge exchange.

The units of analysis were be individuals and teams engaged in information technology outsourcing. These teams included primarily individuals from the service provider companies, the individuals who were the recipients of the transferred knowledge. The teams also included knowledge providers from the functional areas that are identified as being outsourced and were the people responsible for transferring the knowledge.

4.3 Data Collection

Three methods were used planned for the collection of data: interviewing, observation, and the use of a survey instrument. The proposed approach to the collection and subsequent analysis of data is similar to and consistent with methodological approaches used by other researchers in the fields of knowledge management and communication. Heaton et al. (2005) relied on interviews to examine managers' negotiation and creation of inter-subjective knowledge, with transcripts analyzed through qualitative content analysis. Ethnographically-based case studies and interviews are frequently-used approaches in the study of knowledge management practices (Desouza, 2003; Dyer & Nobeoka, 2000; Nidumolu, Subramani, & Aldrich, 2001). Appleyard (1996) used a survey instrument to collect information about knowledge exchange in the semiconductor industry and utilized descriptive statistics to explain the results.

Interviewing

The primary approach to collecting information about knowledge sharing communication in teams was through in-depth interviews of team leaders and members engaged in specific information technology outsourcing activities. The Interviewing Protocol included as Appendix A (with associated Informed Consent form included as Appendix B) was validated in a pilot study described subsequently. It comprises of a combination of closed-ended questions used to elicit basic descriptive information about the organization, teams, and outsourcing tasks, and open-ended questions to elicit information about the teams' communication practices for gaining and sharing knowledge. The intent of the closed-ended questions was to provide structure to the interviewing process. A number of different qualitative interview guides and "how to's" were used in the development of the protocol, and while they are not referenced directly, all contributed to the development of the

instrument. Fowler (1995) provided insights to soliciting information on individuals' knowledge; Kvale (1996) described approaches to developing in-depth insights without overly-long interview processes; and McCracken (1988) and Rubin and Rubin (1995) described how to discern and understand qualitative information obtained through interviewing. These are reflected in the fabric of the interview protocol.

One question is worth noting specifically: How does an individual come to know something? This open-ended question was used only in the post-task interviews to have individuals describe in their own words how they came to know something associated with the specific outsourcing work. The interviewer sought to have the interviewees tell a story about what it means for her or him to develop the level of understanding needed to take responsibility for fulfilling a function or task, using specific examples from the outsourcing work with as much detail as possible. The intent of this question was to develop as rich a description as possible of an individual's understanding of how she or he came to know something in a non-abstract, real-world sense. Storytelling rather than response to closed-ended questions seems the most appropriate way to elicit this information.

Interviewing was used to address the research questions of how knowledge is transmitted and exchanged in teams and what communication practices are used in the sharing. Interviewing and transcription provided grounded descriptions of the communication practices used in team knowledge sharing and the context in which it is done. The open-ended question was used to obtain in-depth information from individuals about how they come to know something in the situation of task-directed teams.

To ensure that each interview question is relevant and tied to a specific research question, and that there were not any seemingly-nice-to-have-but-really-not-germane ones,

each interview question is mapped to at least one research question (see Table 2). Furthermore, through this process a confirmation was made that each research question would have adequate information collected. This mapping process revealed a good correlation between both the primary and subtending research questions and the interview questions. One research question (the first subtending question of RQ2) was addressed *primarily* by observing individual and team interactions to attempt to discern whether there is a constitutive basis to the development of meaning, and *supported* by two of the interview questions.

Observation

The primary methodological approach of interviewing was supported by observation of the teams and individuals performing their work. This was used to both supplement the interviewing data and to corroborate it. Although individuals are presumed to accurately describe the work activities in which they are engaged when being interviewed, it proved worthwhile to confirm this through observation. Observations were direct, with the researcher acting as a participant observer, that is, becoming part of the community being observed and bringing to it his own perspective (Colorado State University, 2006). All participants were made aware of the observations being performed with the understanding that participants may react to the observation process. Initial preparatory work at one research site indicated a low likelihood of this being problematic, but was monitored on an on-going basis as the research progressed. Application was made to the Rutgers Institutional

Table 2

Research Questions Mapped to Interview Questions

		Interview Questions
RQ1: How are procedures and tools used for information and knowledge sharing in task-directed teams?		10, 11A, 11B, 12, 13C + open-ended (20, 21)
RQ1 Subtending questions	How is knowledge defined in the organization?	13A, 13B, 13C
	What is a task-directed team as practiced in the organization?	8, 9, supported by 23
	How do teams manage the knowledge they posses?	13C, 18, 19, 20
	What are the larger organizational influences…?	17, supported by 18, 19, 20
RQ2: What communication practices are used to share information and knowledge? How do communication…?		10, 11A, 11B, 12, 13C, 14 + open-ended (20, 21)
RQ2 Subtending questions	Is there a constitutive basis to the development of meaning?	Primarily through observation, supported by 13A, 13B
	What are the different methods of interpersonal and organization communication used… in practice?	11A, 11B, 12, 13C, 14
RQ3: How do individuals engaged in task-directed activity come to know something…?		14, 15, 16 + open-ended (20, 21)
RQ3 Subtending questions	How do individuals know that they do know something?	Primarily 16 supported by 14, 15
	Is there a constitutive basis to the development of meaning?	Primarily through observation, supported by 13A, 13B
	What role do group norms and practices play?	10,11A, 11B
	Is there a taxonomy of communicative practices?	11A, 11B, 13C
Background, demographic and administrative questions		1, 2, 3, 4, 5, 6, 7, 8, 9, 22, 23, 24, 25, 26, 27

Review Board (IRB) and approved to waive the requirement for informed consent for the observational research, consistent with its guidance that such consent is not required when the research involves minimal or no risk to the subjects, does not adversely affect the rights and welfare of the subjects; and as a practical matter the research could not be carried out without the waiver. The formal and informal meetings that were observed had on-site and dial-in participants, and some participated for only portions of the meetings, all weighing against the ability to practicality of using informed consent forms. Additionally, the authorizing letters from the non-Rutgers sites included observational work as part of the research agenda the organizations approved. Observations were not continuous as would be the case in a truly ethnographically-based approach, but at planned (scheduled), non-random team meetings and activities over the five-month period of research. All field notes were recorded on a standard form (see Appendix C). The intent of the form was to allow for the reliable and consistent description of the communication practices used by the teams and the context within which those practices and approaches are used (Brown, n.d.).

To validate the approach taken to conducting field observations, techniques and methods from dissertation research that used observational research methods similar to those proposed in my dissertation were assessed and incorporated as appropriate, and an additional pilot study was conducted.

1. Sonnenwald (1994) studied interactive design processes requiring communication among the end users of the design, the designers, and the developers. A model was developed and then refined (initial, expanded, and "synthesis") showing communication behaviors and the interactants' perceptions of those patterns. Case histories including written and oral accounts were used for the research along with

actual field observations and interviews, with data analysis following a step-wise approach of identification of participants, development of "data maps" reflecting the interactants' uses and interaction with data elements, temporal depiction of the events, depiction of intra- and inter-group communication patterns, and then "conceptualiz[ation] of the underlying patterns of behavior" (p. 46). The researcher filled the role of peripheral observer (Adler & Adler, 1987, and their defined roles of peripheral, active membership, and complete membership). A sociometric survey form was used for the structured collection of observational data.

2. Algon (1999) studied the influences of task on information behaviors of individuals engaged in task teams, with a focus on the individuals' information-related behaviors and tasks in which they were engaged, and the organizational context. Observational research supported data collected by a survey instrument. In this case, the researcher filled the role of a participant observer and utilized a critical incident approach to ensure answers were grounded in specific situations. The survey form was comprehensive in its collection of the team-related activities and tasks, and while there was an enumeration of the data collected in the observational work (pp. 65-66), there was no form or other structured data gathering instrument. Data analysis was conducted through classification of the interactions of the participants with people, with ideas (e.g., "information manipulative," "analytic"), and with things; and with extensive quantitative analysis used in the development of findings.

With modifications made to the initial field observation form based on the work of Sonnenwald (1994) and Algon (1999), pilot field observations were conducted with two organizations (O3 and O4) in March, 2005, on five different occasions. My role in these

interactions (all scheduled meetings) was defined as *active participant* based on my level of previous work experience in information technology contracts management and outsourcing, base of knowledge, and as requested by the participants. The updated form incorporated techniques used by both Sonnenwald and Algon (updated form included as Appendix B), specifically the approaches to identifying and describing different forms of interaction, describing the relationship of the interactants, providing as full a description as possible of the context and purposes of the meeting or other interaction, describing the media used, and, importantly, obtaining examples of documents used in the meetings, for example, trouble ticket records. The approach was intended to guard against having a pre-established categorization guide or in other ways influence the ways the data were described and characterized, and the approaches used by both Sonnenwald and Algon appeared to provide a structured way of approaching the data collection without prejudicing the subsequent data analysis.

This approach was used in support and expansion of the information developed through interviewing to address the questions of how knowledge is transmitted and exchanged and the communication practices utilized in that sharing. It validated the data collected through interviewing.

Survey Instrument

A survey instrument was administered prior to the initiation of any outsourcing activity (other than contract development and approval), that is, any substantive work that might involve knowledge transfer; and then re-administered upon completion of the outsourcing activity, specifically the end of the project activity of transferring responsibility from a client to the responsible service provider (Survey Protocol included as Appendix D

with informed consent embedded in survey form). The intent of the survey is to measure participants' understandings of their before and after knowledge states rather than their knowledge *per se*, and to assess if there has been any change in the states of the participating team members, with forms color-coded to clearly differentiate pre- (green paper) and post-task (goldenrod) versions. The survey queries relate to the research questions by establishing the pre- and post-task knowledge of the participants and framing the research questions dealing with the communication practices related to the knowledge sharing.

The survey instrument was developed to address the specific contextual requirements of the proposed research, that is, the assessment and description of knowledge sharing communication practices in teams engaged in information technology outsourcing. Although this is a narrowly-defined requirement, it was not assumed that no similar instrument may have been created previously. In order to avoid the development of an entirely new instrument if an appropriate tool were already in place, a search was conducted in indexes and guides to test reviews and descriptions, for example, *Tests in Print VI* (Murphy, Plake, Impara, & Spies, 2002). No tool was found that was even roughly equivalent using categories such as "Intelligence and General Aptitude," "General Skills in Business," and "Vocations" to conduct the search. The newly-developed survey does draw from an instrument developed and used by Appleyard and Brown (1994) to study the exchange of information in the semiconductor industry. Concurrence was obtained from Professor Appleyard for this use.

4.4 Approach to Data Analysis

Assessment of the transcribed interview and observational data was done through descriptive content analysis. Human coding was used rather than machine-based with

development of the consequent supporting processes for coding structures, codebooks and coding forms. This was done in collaboration with two additional researchers to establish and confirm inter-coder reliability (Neuendorf, 2003). The intent of this process was to describe faithfully and in as much detail as possible the answers given by the interviewees and to create a coding structure that accurately represents the different facets of those descriptions.

"Grounded theory building (GTB) *builds theory*, it does not test or verify theory. GTB theories capture the inherent complexity of social life by conceptualizing organizational issues in terms of their interactions with the actual context of practice" (Dougherty, 2002, p. 849). This analytical approach follows a careful, stepwise process by which data are collected, analyzed through comparative assessment, and then categorized through a series of coding steps/procedures (Strauss & Corbin, 1998; Borgatti, n.d.).

1. *Open coding* is "the analytic process through which concepts are identified and their properties and dimensions are discovered in the data" (Strauss & Corbin, p. 101). This level of coding is accomplished through the identification of key terms and descriptors found in the transcript, and seeking to accurately and completely describe the context and characteristics of the data, its *manifest content*. In the transcripts of interviews this would be done through identification and use of the interviewers' own words. The process would be supported by some level of conceptualization of the phenomena being observed and with the process of abstracting. Tools used in this part of the analytical process include detailed, form-based observational notes and assessment memos. As noted previously, characterizing and categorizing the observed organizational activities are important aspects of the analysis.

2. *Axial coding* is "the process of relating categories to their subcategories, termed `axial' because coding occurs around the axis of a category, linking categories at the level of properties and dimensions" (Strauss & Corbin, p. 123). The second level of coding seeks to describe the *latent content* of the data and the patterns and structures that may exist in the concepts identified in the open coding. The framework that links the potentially disparate factors consists of a number of elements as shown in the following table (see Table 3). The examples are drawn from the data collected in the pilot study and that were illustrative of the types of phenomena, causal factors, and other elements encountered in the research.
3. *Selective coding* is the "process of integrating and refining the theory" (Strauss & Corbin, p. 143) and represents the synthesis of the various themes that emerged through the comparative analysis of the data and presented as an integrated, structured set of concepts.

Analysis was a highly iterative process particularly in the open and axial coding steps where the data was analyzed on an on-going basis in an effort to discern patterns and to allow theory to emerge from the data. A codebook was used to guide the process of axial coding. A nominal level of measurement was used, one that established non-mutually exclusive descriptive categories for the phenomena but with no intention to rank or order the categories as would be done with ordinal, interval, or ratio scales. The assessment involved the identification of various non-mutually exclusive descriptors that would differentiate the knowledge being exchanged, the communication practices, uses of technology, and other characteristics. To address inter-coder reliability, the codebook was developed in

Table 3

Factors Influencing Axial Coding

Element	Description	Pilot Study Examples
Phenomenon	"In schema theory… the schema or frame. It is the concept that holds the bits together…. The outcome of interest."	Team-based communication practices, e.g., face-to-face communication in team meetings
Causal conditions	"Events… that lead to the occurrence or development of the phenomenon. It is a set of causes and their properties."	Information technology outsourcing driven by outsourcing organization's business requirements, e.g., need to divest responsibility for running accounts payable application
Context	Definition of the "… specific locations (values) of background variables. A set of conditions influencing the action/strategy." Causal and contextual factors	In the processes being outsourced, the availability and use of enabling technologies, spatial and temporal factors affecting the teams, e.g., off-shore outsourcing versus near-shore
Intervening conditions	Mediating factors that influence causal factors and context	Overall business environment external to the organization being studied, e.g., market-driven cost-reduction forces
Action strategies	"Purposeful, goal-oriented activities that agents perform in response to the phenomenon and intervening conditions."	Specific communication practices utilized by team participants to create and exchange knowledge in order to fulfill transfer of responsibility for business function from outsourcing organization to service provider organization, e.g., running accounts payable application
Consequences	Outcomes or results "… of the actions, strategies, (both) intended and unintended."	Intended outcome is the formal transfer of responsibility for an information technology function, while unintended outcome is loss of functional acumen in outsourcing organization

Note: from Borgatti (n.d., Axial Coding section table, based on Glaser & Strauss, 1967, and Strauss & Corbin, 1990)

collaboration with two co-coders and with measurement of subsequent coding activity. These categories were not be pre-established in the pilot study but represented patterns seen in the full-research data.

The framework used for the analysis was those areas in the review of literature, that is, data, information, and knowledge; knowledge sharing and communication; and task-directed work teams. Various conceptual models that describe knowledge were employed in the assessment, characterization, and comparison of the research data. One example is that developed by Blackler (1995) in his assessment of organizational knowledge in which knowledge is characterized as dependent upon knowers' conceptual skills and cognitive abilities reflecting an abstract understanding about what is known, or embodied in the actions of the knowers and oftentimes only partially explicated. Another was one used by Hansen et al. (2000) and by Zack (1999) who categorize knowledge's manageability, that is, as processes or objects subject to certain management oversight and controls in order to be used to fulfill organizational objectives. In a grounded-theory approach, it would be inappropriate to pre-establish a schema for categorizing the research data, and the two foregoing examples represent what would be anticipated from the conduct of the coding process of the observational and interview data.

Interest lies in the manifest content of the transcribed interviews and observations, "that which is on the surface and easily observable" (Potter & Levine-Donnerstein, 1999, p. 259). Value was also obtained through the assessment of latent content, "the meaning underlying the elements on the surface of a message" (p. 259), relying on theory-based frameworks and detailed coding structures that would be based on the transcribed data and consistent with a grounded-theory approach. Following this approach, validity, the

capability to actually assess what is being claimed to be assessed, would be addressed through inter-subjective understanding of and agreement upon the coding schema collaboratively developed by the researcher and co-coder. Reliability, the consistency and stability of the methods, was more difficult to address due to the unique, non-repeatable circumstances of the phenomena being observed, viz., the specific outsourcing activity; this was approached through structured and systematic review and validation of the coded results to ensure accuracy in transcription (Potter & Levine-Donnerstein, pp. 270-271).

The data collected by the survey instrument is described statistically. No inferential statistical analysis was planned due to the anticipated small sample size. The data was used to assess participants' knowledge states before the initiation of the outsourcing task and after, to describe planned and actually-used communication practices, and to describe the planned and actually-used network of interactants with whom knowledge would be exchanged. The information gathered was corroborated through observation and interviewing. Many factors may influence the participants understanding of their pre- and post-task knowledge states and it was a challenge to appropriately account for extraneous influences. This was addressed through correlation of the interview and observational data to account for other factors and to verify that the survey data adequately and accurately reflects the changes, and in so doing, address the validity of the survey data. As noted for the analysis of the transcribed data, reliability was more difficult to address due to the non-repeatable circumstances of the specific team-based knowledge exchange being observed.

Grounded theory is used as the analytical method for the research proposed in this paper with the understanding that it is an approach the intent of which is to capture the complexity of everyday social activity, and with questions that

> … concern how and why actual organizational phenomena occur, play out, emerge. GTB *centers on* the "blooming, buzzing confusion" of social life, going beneath or beyond such constructs as "density dependence," "job satisfaction," "race," or "functional structure," for example, to see what people actually do and think, how they enact such structures, how the many processes in the situation might interact dynamically, and how, why, or under what conditions these enactments might "slip." The object is to create new theory or to elaborate upon existing ones by discovering and articulating core themes and patterns among them to explain the particular organizational phenomenon being studied (Dougherty, 2002, p. 851).

4.5 Pilot Studies

Activities began in late 2004 with planning for the pilot research, coordinating with the participating organizations, and gaining the needed approvals including those required by the IRB. Pilot interviews were conducted in late 2004 through early 2005, and pilot field observations were performed in March 2006 (see Appendix E for log of pilot activities). The survey instrument was developed in early 2005 and subjected to user testing in April through May.

Conduct of Pilot Studies

A pilot study of the interviewing protocol was initiated in fall of 2004 and was completed in January 2005. IRB continuing review re-approval was received in 2005 and 2006. Five individuals from two organizations participated in the pilot interviews. Participants, their positions, and the organizations from which they came are summarized in Table 4 (see also Appendix F, Table F1). The intent was to develop an initial interviewing protocol, validating it through the conduct of interviews (see Appendix A and associated Informed Consent Appendix B), and to start development of a coding structure that would be used in the subsequent dissertation research. Initial interviews were conducted in late 2004 with members of task-directed teams at a hospital (organization 1) and an outsourcing service

Table 4

Summary of Pilot Interviews

	Interviewee Position	Number of Interviews	Organizations
Pilot Interviews	Director	1	- Hospital (Organization 1)
	First-line supervisor and team member	3	- Hospital (Organization 1) - Outsourcing service provider (Organization 2)
	Team member	1	- Hospital (Organization 1)

provider (organization 2) that had recently completed information technology outsourcing activities or other interactions with service provider organizations. Interviews were transcribed and were analyzed with descriptive content analysis in order to assess a process for developing a coding structure for use in the dissertation research.

The field observation process and form were subjected to pilot study in March 2006 with changes incorporated into the data collection form (see Appendix C). The initially approved study was amended to include the field observations in March 2006 and IRB continuing review re-approval was received later in 2006. The organizational teams observed in the pilot activity, their functions, and parent organizations to which they belonged are summarized in Table 5 (see also Appendix G, Table G1).

The survey instrument was added to the overall protocol in late 2005 and piloted late in that year (see Appendix D). The initially approved study was amended to include the survey instrument in December 2005 and IRB continuing review re-approval was received in 2006. The survey instrument was tested in October 2005 with three members of the

Table 5

Teams Participating in Pilot Field Observations

	Team Function	Number of Observations	Organizations
Pilot Field Observations	Portal team	3	- High technology research and manufacturing (Organization 3) - Outsourcing service provider (Organization 4)
	Business data warehouse team	1	
	Netweaver briefing	1	

outsourcing service provider team (organization 2) focusing on understandability and ease of use. All changes were incorporated prior to the instrument's amendment submission to the IRB in November, with approval received in December.

Pilot Research Results and Consequent Changes

Analysis of the results of the pilot activities informed consequent revisions made to the research instruments and processes. The interview protocol was tested prior to the initiation of pilot interviews in October 2004 and the pilot interviews included a set of questions that asked the respondents about the clarity of the questions, ease of responding, and suggestions for changes. As the result of the pre-tests, pilot activities, feedback, and review with members of the dissertation committee, a number of changes were made prior to the start of the full research interview process (see Appendix A). The most important of these changes was the inclusion of open-ended questions that allowed the respondents to tell stories about their own experiences, such as, "tell me a story about what it means for you to develop the level of understanding needed to take responsibility to fulfill a function or task" (question 16). Additional, scripted sections were added to ensure every participant was

provided the same explanation of purposes and initial set of framing definitions. Detailed lists were added in some questions to increase the likelihood for covering all options for that question. A more explicit question was added to address the role of communication and information technologies. On-going assessment during the period of research resulted in a small number of minor modifications made in response to participants' suggestions after determining these modifications would not change the comparative nature of data collected from prior interviews.

The field observation process was piloted in March 2006. The initial form designed to record the interactions was modified to include a checklist for communication practices, that is, a "memory jogger"; and a broader listing of the processes, problems, interactions and issues that might be observed during an interaction (see Appendix C). When supporting materials were used during a meeting or teleconference, and the information was not deemed to be proprietary, then these were collected and included with the observation form.

The survey was tested in October 2005. Change suggestions received from the pilot participants included modifying the format of the Likert scales to allow easier and clearer responses and the inclusion of a limited number of short-answer questions.

4.6 Study Limitations

One limitations of the research lies in its ability to be generalized. The interviews and observations provided an in-depth view of task teams engaged in information technology outsourcing and the communication practices that they use for knowledge sharing, but may not form a sufficiently broad base upon which to build generalizations. A second major limitation is that the collection of data only took place in planned and scheduled interactions with the researcher. Even the observations of day-to-day, situated actions would have a

different atmosphere (feel) than the many informal, in-the-hallway conversations or exchange of e-mails and instant messages that would allow people to share information and ask questions as situations arise, and would therefore not be subject to the researcher's purview.

4.7 Summary of Methods Chapter

The purpose of this chapter was to describe the methods that were used in the proposed research and why they were appropriate to address the research questions. Interviewing and transcription followed by content analysis was used as the primary method to address the questions of how knowledge is transmitted and exchanged in teams and what communication practices are used. These provide description and characterization of the communicative practices used in team-based knowledge exchange and creation. Responses to open-ended, in-depth questions were used to obtain answers to how team members come to know something about the functions or responsibilities associated with the outsourcing work. Direct observation of the teams in their day-to-day work supported and validated information gathered through interviewing, and provided substantiating depth. Lastly, the survey instrument assessed the participants' understanding of the changes in their knowledge states that occurred during the activity, supporting the research questions that develop descriptions and characterizations of the communication practices related to the knowledge sharing.

Chapter 5
Results

5.0 Chapter Overview and Purpose

The previous chapter described the methodological approach to be taken in the conduct of the research. This chapter reviews the results achieved through execution of the various methods employed. The initial section details the process and timing of the research effort and characterizes the results from the three methods. The subsequent sections describe the results as they apply to the research questions. The data are categorized and assessed.

5.1 Conduct of Research

The interviews and field observations provided insights into the day-to-day workings of task-directed teams in organizations, and the rich, complex, and varied ways in which members of the teams communicate to share and create the knowledge needed to accomplish the teams' objectives. The number of organizations in which research was conducted was comparatively small by design, affording the opportunity for in-depth study. The researcher's interactions with team members and engagement in typical formal and informal team activities, including participants located in India, allowed a grounded understanding to be formed of the ways in which team members communicated and exchanged knowledge in the conduct of their work. The most commonly noted characteristics of the participants' understandings of knowledge were of it being procedural, that is, knowledge of *how* to perform tasks and activities; and of it being functional, understanding *what* tasks were to be performed in the context of the teams' objectives and purposes and the larger organizations' work plans and objectives.

Two categories of organizations were involved in the research program. The first involved those engaged in outsourcing functions such as information technology tasks that were assessed as being non-critical to the core functions of the business or areas in which cost reductions or improvements in efficiencies could be obtained. The situations observed in the research were substantially tactical outsourcing engagements, focused on addressing specific problems or opportunities, rather than strategic engagements in which broader or longer-term goals were involved (Brown & Wilson, 2005).

The second category was service provider organizations who assumed the responsibilities and functions from the outsourcing firms. These organizations brought staff with the requisite technical skills needed to perform the outsourced work. The research participants were individuals involved in different aspects of the outsourcing work, ranging from the planning and initiation of the work through the knowledge transfer and reassignment of responsibilities for the actual work, and on-going sustaining activities.

In the conduct of the study, the researcher filled the role of participant observer. He brought over twenty-eight years of experience in the management of information technology functions to the engagement, the most recent of which were in the planning and oversight of outsourcing activities for a large, high technology organization, and as such, was able to actively engage in and contribute to the work of the teams rather than simply being a passive observer. The involvement included contributing to the teams' work plan development and management, budget development and oversight including integration with the parent organization's budgetary process, team communication and work practices, and other application-specific tasks. In all cases, every participant was aware of the role played by the

researcher, and the appropriate Rutgers Institutional Review Board (IRB) approvals were obtained prior to the conduct of any research activities.

Development of the analytical categories described in the subsequent sections was based on the interview data to describe and explain the observed phenomena. The axial category names were created by the researcher, but in some cases were the exact terms or phrases used by the research participants, although "rarely are these concepts or statements the exact words of one respondent or case, although they could be (e.g., in vivo codes). Usually they represent the voices of many" (Strauss, & Corbin, 1998, p. 145). Categorization was not discreet and mutually exclusive unless otherwise noted. For example, respondents might, and did, categorize knowledge in several different ways, and all such characterizations were noted. The three areas of categorization that were mutually exclusive were those dealing with outsourcing management paradigms, the role of group norms, and the presence of a taxonomy of communication practices; and are so noted in the respective tables.

The research process timing and approach are explained in this sub-section and the organizational and individual participants are detailed. Several of the participating organizations placed constraints on some aspects of the conduct of the research, especially access to perform field observations, and these are explained.

Research Timetable and Approach

As noted previously, research activities began in late 2004 with planning for the pilot research and coordinating with the participating organizations, and gaining the needed approvals including those required by the IRB. Pilot interviews were conducted in late 2004 through early 2005 (see Appendix E). Planning for the full research program began in late

2005 with interviewing starting in early March 2006 and ending in late April. In order to take advantage of *ad hoc* emergent situations, some field observations and less formal interactions were conducted from late March through June that did not follow the full interviewing protocol but for which field observation forms (see Appendix C) were used and did conform to the informed consent requirements for the field observations, which were used to validate the interviewing information and to collect *in situ* observations about team-based communication practices.

The survey instrument was used with only six participating individuals from two organizations due to its planned linkage to specific interactions, that is, the start of specific and formally-identified knowledge transfer activities tied to the initiation of an outsourcing engagement. During the timeframe within which the research was conducted (April through August, 2006) there were very few such situations because of shifting business conditions, and due to the changes that occurred in the participating organizations' work plans, several hoped-for opportunities to use the survey instrument did not, in fact, happen. Although the researcher obviously was *not* involved in the day-to-day business decisions concerning the initiation and timing of outsourcing work, he *was* making judgments in collaboration with the organizations' participants about ways to effectively use the survey instrument. Knowledge transfer actions in the outsourcing work would include the start of activity in which a service provider would assume responsibility for a task or function identified as no longer critical to the core functions of an outsourcing organization. The purpose of the survey was to assess participants' understandings of their level of knowledge about the work involved in the outsourcing and whether that level changed during the formal knowledge

transfer process associated with initiation of an outsourcing activity or assimilation of a new team member.

Organizational Participants

Six organizations participated in the research program: one in the pilot study only, one in the pilot and full research, and four in the full research program. As described in the methods chapter, selection of these organizations and teams was not random but done purposefully through contacts in those organizations with whom the researcher is familiar. Each had specific task teams that were, or would be, performing outsourcing work. In addition, all organizations had to be willing to accept the level of analysis and scrutiny inherent in the research design (criterion sampling). Participating organizations, a brief description of their organizational functions, focus of the research in each, and research methods used in each are summarized in Table 6.

Each participating organization was assigned a unique identifier during the conduct of the research (O1, O2, etc.). For the purposes of reporting the results, however, to provide a more explanatory title, fictitious but descriptive names are given to each. For example, organization 2, a U. S. based service provider supporting outsourced work, is titled ServeProUS.

1. *Organization 1* (O1), MedServices, is a 172 bed hospital [3] and participated only in the pilot phase of the research. The research focus was on intra-team communication practices with no outsourcing activity included. Three interviews were conducted with persons filling different roles, including a director, a first-line supervisor and

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[3] Descriptive information about this and the other participating organizations was obtained from

publicly-available sources or, for the non-public ones, from information supplied by the organizational contacts and authorized for use. Citations for these descriptive data are not provided in order to protect the confidentiality of the organizations.

Table 6

Organizations Participating in Research

Org. Code	Description and Assigned Name	Research Focus	Research Method		
			Interview	Field Observations	Survey Instrument
O1	Hospital (MedServices)	Team communication *Pilot study only*	3 (*pilot study*)	Access not requested to conduct field observations	NA
O2	U. S. based info. technology service provider, that is, organization engaged in performing information technology tasks transferred from outsourcing organizations (ServeProUS)	Performing info. technology tasks outsourced from other organizations with task teams engaged in start-up transfer and on-going knowledge exchange activities	5 (*incl. 2 pilot study*)	Access not granted to conduct field observations	Access not granted to employ survey instrument
O3	Large, high-technology research and manufacturing organization (2005 sales $1.7B, with 5,000 employees worldwide) (HighTech)	Outsourcing info. technology tasks to service provider organization with task teams engaged in start-up transfer and on-going knowledge exchange activities	7	5 pilot field observations & 9 research field observations conducted in conjunction with O4	NA
O4	Info. technology service provider based in India (ServeProOffshore)	Performing info. technology tasks outsourced from other organizations with task teams engaged in start-up transfer and on-going knowledge exchange activities	2	5 pilot field observations & 9 research field observations conducted in conjunction with O3	2 pre- and post-task surveys done in coordination with O3
O5	Large chemical research and production organization (2005 sales $8.1B, with 20,000 employees worldwide) (ChemResearch)	Outsourcing info. technology tasks to service provider organization with task teams engaged in planning knowledge exchange activities	6	Access not granted to conduct field observations	NA
O6	U. S. based info. technology service provider (ServeProSpecialized)	Performing info. technology tasks outsourced from other organizations with task teams engaged in start-up transfer and on-going knowledge exchange activities	None	Not conducted - organization was targeted for survey only	4 pre- and post-task surveys

team participant, and a non-supervisory team member. Access to conduct field observations was not requested and the survey instrument was not used.

2. *Organization 2* (O2), ServeProUS, is a large, privately-held, U.S. based information technology service provider, that is, one that performs work given to it by another organization that does not wish to perform the transferred work. Examples of such work include maintenance of application software, staffing a help desk, or running a data center. Approximately seventy percent of its revenue comes from managed service partnerships. The company has over 2000 full-time associates and has offices in the United States, Canada, and the Philippines. The research focus was on teams engaged in the start-up and on-going support for work outsourced from another organization participating in the research program, ChemResearch (O5), and the communication practices used to transfer and share knowledge about ChemResearch's business and information technology environment, practices, and procedures and other context-specific information. ServProUS was the recipient of the transferred knowledge, but through the use of the word "recipient" it is not implied that a transmission, sender-receiver model of communication was being used. For example, understanding the basic, "out of the box" code and technical requirements for a module in a large, organization-wide enterprise resource planning (ERP) computer system [4] is not sufficient in itself to configure and run that module, but would additionally require an understanding of the business rules and

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[4] In this specific case, *Systeme, Anwendungen und Produckte in der Datenverarbeitung*, or much more commonly known as simply SAP.

configuration needed to address the specific business requirements of the using organization. In most engagements, the service provider would be expected to bring to a relationship an understanding and demonstrated experience with the basic code and technical environment, but would need to know the business requirements and the consequent configuration requirements to actually set-up and run the application to meet the outsourcing organization's business needs. Five interviews, two of which were for the pilot study, were conducted with four first-line supervisors and team participants and one non-supervisory team member, in other words, five separate interviews. Because of the proprietary nature of the knowledge involved in the specific outsourcing activities and the extremely tight time constraints associated with the then on-going project activities, ServeProUS did not grant access to conduct field observations of the work being done with ChemResearch or to allow ServeProUS associates to take the survey.

3. *Organization 3* (O3), HighTech, is a publicly held manufacturer of high technology devices with 2005 sales of over $1.7 billion and 5,000 associates globally. The Chief Information Officer (CIO) organization has responsibility for providing technology solutions to meet HighTech's business needs, from core voice and data infrastructure to a full range of applications. As part of that function, it is actively engaged in outsourcing a number of different tasks in order to more effectively manage costs, access technical expertise that is difficult to obtain in the marketplace, and expand its global presence by establishing outsourcing partnerships. In late 2004 a new initiative was launched to move more outsourced services from a staff augmentation model to a full managed service environment. In a staff augmentation model,

associates with the appropriate technical skills are supplied by a service provider organization to supplement teams in another organization. The supplied associates work under the direction of the outsourcing organization's supervisors. In this case, ServeProOffshore associates were assigned to and worked for HighTech supervisors and directly managed by them. In a managed service model, services are delivered by service provider organizations rather than people (e.g., help desk services, application support services) and managed through service level agreements and budgets rather than direct management of staff. The focus of the research in HighTech and its service providers was on teams engaged in start-up and on-going support for work being outsourced to other organizations participating in the research: ServeProOffshore (O4) and ServeProSpec (O6). The research examined the communication practices used to transfer and share knowledge about HighTech's business and technology environment, practices and procedures, and other context-specific information. Seven separate research interviews were conducted with persons filling the roles of director (one interview), first-line supervisors and team participants (three), and non-supervisory team members (three). Access to conduct field observations with work being done in conjunction with ServeProOffshore was provided, and five pilot observations and eight research observations were made. Associates from HighTech worked with the researcher to coordinate the scheduling of the survey to be taken by participants from ServeProOffshore and ServeProSpec, but its actual conduct was directly managed by the researcher.

4. *Organization 4* (O4), ServeProOffshore, is a large, internationally-based information technology service provider. The company has over 9500 full-time associates in 15

nations. Projected 2005 revenues were $390 million globally. It is an active leader in developing and delivering six sigma-based services [5] to the information technology industry through continuous improvement activities with its outsourcing partners. The research focus was on teams engaged in the start-up and on-going support for outsourced work from HighTech, and with the associated communication practices needed to transfer organization- and context-specific knowledge from HighTech to this organization. Two separate research interviews were conducted with first-line supervisors and team participants. Access to conduct field observations with work being done with HighTech was provided and five pilot observations and eight research observations were made. Associates from HighTech coordinated the survey responses that were completed by members of this organization.

5. *Organization 5* (O5), ChemResearch, is a publicly held chemical research and production organization with 2005 sales of over $8.1 billion and 20,000 associates globally. The office of the knowledge management director supports the functions of company-wide knowledge communities which includes outsourcing partners, facilitating team practices. In 2004 a process was initiated to transfer responsibility for support of the company's SAP application suite and other installed-base applications from its internal information technology group to a managed services model provided by ServeProUS. The phased implementation took place through early 2005 with most of the application functions and support under the service control of

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[5] Six Sigma is an approach for process and quality improvement. Specifically, "six sigma refers to having 3.4 defects in a million activities. The phrase relates to the root of the approach – total qiuality management and statistical analysis" (Lientz & Rea, 2002, p.9) .

that company by mid-2005. The focus of the research with this organization was on teams engaged in research and development and other tasks which in some cases included work with service provider organizations including ServeProUS. ChemResearch associates were the source of the knowledge being provided. Six separate research interviews were conducted with persons filling the roles of director (four interviews) and first-line supervisors and team participants (two). Access to conduct field observations with the teams engaged with ServeProUS was requested but not granted. The survey instrument was not used because this was not a service provider organization.

6. *Organization 6* (O6), ServeProSpecialized, is a privately-held, U. S. based information technology service provider focusing on specialized support for human resource applications and processes. This organization was added to the research program comparatively late in the process and was included in order to support the use of the survey. The utilization of the instrument is dependent upon known start and stop dates for knowledge transfer programs, and during the timeframe within which the research was conducted there were very few such situations. The one instance when this did occur was ServeProSpec's initiation of an outsourcing relationship for a new human resource application for HighTech that allowed the use of the survey. No field observations or full research interviews were conducted. On-going dialogue with the organizational contact did inform the research and contribute to the findings.

The organizational relationships are summarized and depicted in *Figure 3*.

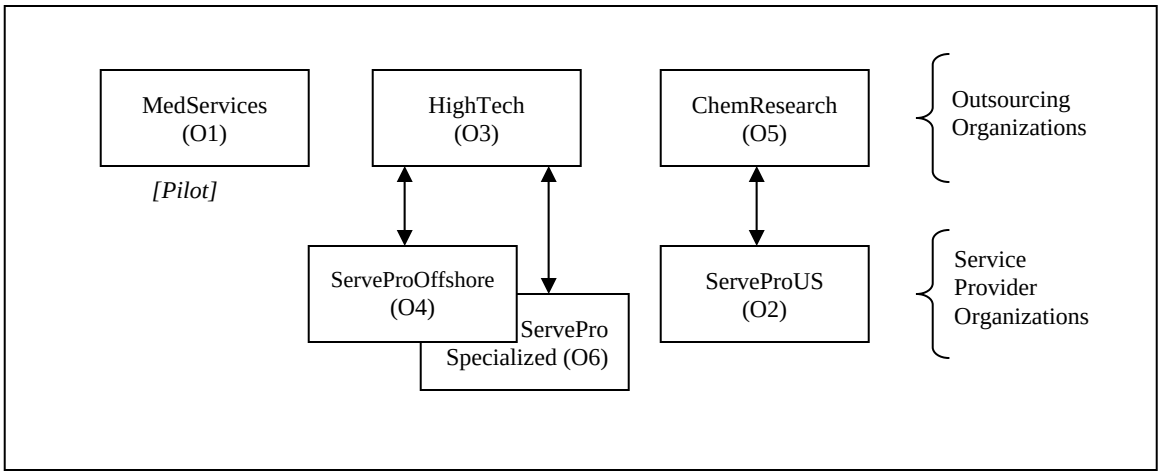

Figure 3

Relationships of Organizations Participating in Research

MedServices participated only in the pilot interviews. Interviewees talked about their team activities and engagement with service providers, but none of MedServices' service providers participated in the research. ServeProUS performed work outsourced from ChemResearch. Both organizations had individuals who participated in the full interviewing protocol, but no field observations were conducted because access was not granted. ServeProOffshore and ServeProSpecialized performed work outsourced from HighTech. ServeProOffshore and HighTech had individuals who participated in the full interviewing protocol, field observations were made of the joint teams performing the outsourced work, and several individuals completed surveys when they joined the teams and engaged in formal knowledge transfer activities. ServeProSpecialized had no participants in the full interviewing protocol, but as noted above, an on-going dialogue was conducted with the organizational contact, not a formal interview following the protocol but captured on a field observation form. Individuals completed surveys as part of a formal outsourcing transition program. MedServices was engaged in the interviews for the pilot study.

Interview Individual Participants

Eighteen individuals from four organizations participated in the full research interviews. Participants, their positions, and the organizations from which they came are summarized in Table 7 (see also Appendix F). A wide range of formally-defined positions were included in the participating interviewees but can be categorized into three basic positional roles with corresponding sets of responsibilities.

1. *Directors,* or in some cases managers, were individuals involved in the planning and oversight of task team activities but not engaged in day-to-day functioning of the teams or involved in the teams' communication practices.
2. *First-line supervisors and team members* were individuals involved in both the planning and oversight of task team activities and in the day-to-day functioning of the teams and their communication practices. These leaders provided the hands-on

Table 7

Summary of Research Interviews

	Interviewee Position	Number of Interviews	Organizations
Research Interviews	Director	5	- HighTech - ChemResearch
	First-line supervisor and team member	9	- HighTech - ChemResearch - ServeProUS - ServeProOffshore
	Team member	4	- HighTech - ServeProUS

direction for the work the teams were performing and the practices used to achieve the teams' objectives.

3. *Team members* were individuals engaged in the work of the teams and were often key players in the knowledge transfer activities, but not formally involved in the planning and oversight of the task teams.

All interviews were conducted in person. The participants from ServeProOffshore were based in Bangalore, India, but planned their interviews to coincide with regularly-scheduled business travel associated with the activities of their respective teams; and the interviews with these two participants were conducted in New York. The visits also allowed their face-to-face participation in team meetings that were also part of the field observations.

As in most organizations today, few of the participants held only one role, and oftentimes juggled multiple sets of responsibilities that spanned hierarchical accountabilities. For example, one of the individuals filling a director role had the formal title of "section manager" and the function of a technical subject matter expert, but also had other responsibilities.

> I led the community (of practice) building project. I've also been active in knowledge management and currently lead our lessons learned project team. Among the other roles that I do, I'm also a recruiter for the company so I'm out showing the company brand and trying to bring people in (organization 5, interviewee 1).

This highlights the broad diversity of functions that were present in the teams or in roles supporting them, and the wide range of skills that were brought into the functioning of the teams. A listing of the different roles identified by the participants is included in Appendix I, Table I4.

Field Observations

To corroborate the information collected in the interviews and help develop a grounded understanding of the day-to-day work and communication practices of two of the teams, field observations were made of several team interactions, both by direct participation in the meetings and by teleconference, both in the role of participant observer. Activities included involvement in scheduled team meetings, informal interaction during the 30 different visits and interactions with research sites, participation in 10 scheduled teleconferences, and numerous telephone and e-mail interactions that entailed the exchange of research-focused information plus planning and coordination of research activities. The type of involvement included contributing to the teams' work plans and budgets, evaluating and making suggestions about team communication and work practices, and addressing other computer application-specific tasks. The observed organizational teams, functions, and parent organizations to which the teams belonged are summarized in Table 8 (see also Appendix G).

Individual participants in the field observations involved team members and other interactants beyond the 18 individuals with whom interviews were conducted. These included members of HighTech and ServeProOffshore who were members of the task teams being observed (business data warehouse and enterprise portal), and two individuals with whom extended but informal, non-recorded interviews took place; and the organizational contact for ServeProSpecialized with whom on-going dialogue took place to develop the contextual information to support that organization's use of the survey instrument as it conducted knowledge transfer activities with members of HighTech.

Table 8

Teams Participating in Research Field Observations

	Team Function	Number of Observations	Organizations
Research Field Observations	Portal team	3	- HighTech - ServeProOffshore
	Business data warehouse team	4	
	HR portal knowledge transfer	2	

Note: Does not include informal, non-recorded interactions.

Use of the Survey Instrument and Limitations

As described in the methods chapter, the intent of the survey instrument was to measure participants' understandings of their before- and after-task knowledge states, and to assess if there had been any change in the states. Use of the survey was intended to frame the research questions and establish whether some change in the participants' knowledge occurred during structured knowledge transfer processes, indirectly supporting their answers. Effective use of the instrument was wholly dependent upon the timing of the specific outsourcing knowledge transfer activities with known start and stop dates, typically managed through a work plan, used to trigger administration of the survey. Based upon the participating organizations' work plans at the time of the start of the research program, it was anticipated that several such outsourcing activities would take place, but only one did, HighTech's engagement with ServeProSpecialized; and it is reported in the survey results. Additionally, two individuals from ServeProOffshore who joined HighTech's portal team and who went through a planned and structured knowledge transfer process under the

direction of HighTech's first-line supervisor for that team, were also administered the survey. The total number of six participants is not sufficient to derive any statistically significant inferences, but does provide initial descriptive information. Results are reported in a subsequent section (5.5) and contained in Appendix H.

5.2 How Are Procedures and Tools Used for Information and Knowledge Sharing in Task-directed Teams? (Research Question 1)

The results associated with answering the first research question and the several subtending questions are addressed in this sub-section. In what ways do organizational participants define knowledge, and how might those definitions be categorized? What are the characteristics of task-directed teams as they are practiced in the participating originations, and what different outsourcing paradigms are used? What are the procedures, tools and practices used by the teams to manage the knowledge they posses? And what are the larger organizational influences such as the availability of tools, practices and the influence of the larger organization's culture that may affect the teams in the conduct of their activities?

How Is Knowledge Defined in the Organization?

Describing the procedures and tools used by teams in the performance of their work rests to some degree on the individual members' understanding of knowledge: what it is, how it is acquired in terms of the work and activities performed by the team, and determining when someone knows "enough." If interviewees hold understandings of knowledge as highly explicit and object-ifiable, then team procedures and tools might show support for the creation and exchange of documentation, maintenance of databases, and support for other forms of codification to capture group knowledge. On the other hand, if interviewees hold

understandings of knowledge as tacit and not easily explicated, then procedures and tools might show support for interpersonal and team interactions to share knowledge and develop a shared understanding of the business context within which work was being done, and collaborative development of solutions to emerging problems. In the interviewing process, effort was made to carefully indicate no *a priori* definition of knowledge, or framework for such a definition. The questions followed a script that first addressed roles and responsibilities, then team characteristics, procedures and tools; and then to the individuals' understandings of knowledge within the context of the activities of the team. A critical incident-based approach was followed that asked the participants to describe specific instances that had occurred that led to or supported their understanding of knowledge and this served to ensure their descriptions were based on recent particular experiences.

Descriptions of knowledge were grounded very firmly in the work being done. This view was consistently expressed by the research participants although stated in many different ways, from the individual contributor team members to the first-line supervisors and team members and to the directors, differentiating technical knowledge exchange from more-general business knowledge exchange. The results are summarized in Table 9 (see also Appendix I, Table I1, for all content analysis categories for Research Question 1).

The research participants' characterization of knowledge fell into the five categories listed in the table. The categorization was based on the participants responses to a number of questions but primarily the different sections of the one which asked them to define knowledge, how it related to the work of the team, and how it was shared (question 13); and supported by the field observations of teams actually engaged in task-directed activities. The

categories are not mutually exclusive, and if different characterizations were expressed by the

Table 9

Characterization of Knowledge in Organizations

Research Questions and Subtending Questions			Results Summary	
			Axial Categories	Number of Respondents
RQ1: How are procedures and tools used for information and knowledge sharing in task-directed teams?	How is knowledge defined in the organization?	Characterization	Procedural ("know how")	16
			Functional ("know what")	12
			Networked ("know where" or "know who")	6
			Synthesized and integrated (applying to new situations)	5
			Extended (transferring to new teams)	4

interviewees, then these were recorded; but they are fully inclusive, that is, for this question every respondent provided at least one characteristic. Additionally, three of the interviewees discussed the tacit and explicit nature of knowledge as a separate but identifiable dimension of the definition of knowledge.

Procedural Knowledge

The most commonly-noted characteristic of knowledge was its procedural aspect manifest in the behaviors of the knowers, or "know how." In the context of task-directed teams engaged with outsourcing work wherein the team is working toward the delivery of specific results or deliverables and defined by the work at hand, tightly bounded by due dates and the rapid correction of problems, these descriptions emphasize the importance of the "know how" of the individual team participants. The interviewees from ChemResearch who had long-standing engagement in formal knowledge sharing program development and

communities of practice support asked astute clarifying questions about his or her conceptual understanding of knowledge, but the focus was on everyday work experience.

Representative descriptions that reflect the procedural, behaviorally-based characteristic of knowledge include the following:

1. "Knowledge is knowing how to apply and use that information," referring to the methods of learning and acquiring new information he had just described (organization 5, interviewee 5). This statement was provided by a first-line supervisor and team member from ChemResearch when asked to differentiate information and knowledge, then supported that definition with an example of obtaining knowledge about the taxable implications of employee relocation expenses through actively doing tax returns based on documention and other information she had obtained. To this respondent, the knowledge was in the doing.
2. A first-line supervisor from ServeProUS described knowledge as the possession of "the information necessary to quickly and accurately correct problems (supporting applications), solve issues, answer questions," and subsequently in the interview, "applying information" (organization 2, interviewee 3).
3. Another first-line supervisor and member of the service provider team (ServeProOffshore) supporting HighTech used a specific example from the application area in which he was working.

> Okay, let me again take this example only, a table in the SD (sales and distribution) area. Okay, I know that it has been working so far in this way. Okay, and if, uh, a user, okay, asks me some question, why he is not able to see something or how he can extract information which is needed and if I'm able to satisfy that, then I think that I know (the application) (organization 4, interviewee 2).

There was no discernable difference in the characterization of knowledge based on the organizational position held by the interviewees. Sixteen of the 18 respondents identified the procedural aspects of knowledge, and these included all three positional categories (directors, first-line supervisors and team members, and non-supervisory team members). The field observations directly corroborated the information from the interviews. The nine different field observations were all of scheduled (*i.e.*, planned) day-to-day team meetings of which two were focused specifically on knowledge transfer involving an application's developer who had subsequently moved to a new position with the new team members who would be assuming responsibility. Through the use of multiple communication methods including audio conferencing combined with web-based collaboration tools such as WebEx, information exchanges were held directly related to providing hands-on guidance on how applications work, typical problems that would be encountered in the support of the applications including review of the previous 30 days trouble tickets as a grounding mechanism, and the specific procedural knowledge that would enable rapid problem identification and resolution. Characterization by the respondents of knowledge as procedural was further supported by their answers to the question of how individuals know they have come to know something. Several characterized sufficiency as the ability personally to do or perform a task, or, in assessing someone else's capability to complete assigned work, when they can see that *that* person can do or perform it.

Functional Knowledge

The second most commonly noted characteristic was the functional nature of knowledge, that is, "knows what," with 12 respondents characterizing knowledge in this way. Understanding which tasks needed to be addressed and in what priority they should be

handled is representative of this type of knowledge. Also significant was knowing how to apply the appropriate resources with the required skills to accomplish the work. This knowledge was represented by that required to manage the trouble ticket queues and work plans and was most often mentioned by the first-line supervisors and directors. Only one team member characterized knowledge in this way but were noted frequently in the field observations.

Representative descriptions that show this "know what" characteristic of knowledge can be seen in the following:

1. "The understanding of a system, of an application, of a process, of the database behind it, of the hardware, of the software. It's everything," and then in describing the uses of the knowledge metaphorically, "Well, do you want it (the application solution) to really go a hundred miles an hour or is fifty miles per hour acceptable? … what you can pull together and what you can't" (organization 4, interviewee 7). This was expressed by a director from HighTech who had just been promoted from a first-line supervisor's job to his current position.
2. "It (knowledge) is nothing written down, although it helps. It's… I think people retain it through experience and they share," was provided by a first-line supervisor and team member from ServeProUS, who then went on to describe the sources of this knowledge as training and job experience in his area of expertise (organization 2, interviewee 5).

This perspective on knowledge was observed in the team meetings in which the first-line supervisors were the ones who assessed what work needed to be done and when, ascertaining who had the needed skills to perform the work and availability of the resources

before assessing how the task was to be performed. While there was little hierarchical structure noted in the communication channels with internal-to-the-organization customers, that is, team members having to report to their supervisor rather than directly with the customers, it was the first-line supervisors who primarily addressed priority setting and resource allocation issues with the customer communities. Having a grounded understanding of the business context in which problems needed to be addressed was a key component of this type if functional knowledge.

Networked Knowledge

Networked knowledge emerged as a distinct category with six respondents mentioning this characteristic. The descriptions did not entail what to do or how, but distinctly and alternatively the knowledge of *where* to go for the needed information or support, or *to whom* to turn to accomplish a task. While this may be categorized as an alternative form of "know what," the respondents' descriptions were clearly articulating the ability to comprehend and act in a networked, "intertwingled" (Morville, 2005), environment. Morville uses the term to describe the non-hierarchical, complexly-related worlds in which many people work and interact.

Representative descriptions that show this networked aspect to people's understandings of knowledge can be seen in the following:

1. In responding to the question of defining knowledge, a team member from ServeProUS stated that knowledge "… is a clear understanding of our application and how things work and if they're not, how to go about finding out why not. *Where to go to look for things,*" and in the broader context of the answer, where to go beyond the code set itself (organization 2, interviewee 4).

2. "So if anything comes up in that area (sales application), obviously they'll be the persons to reach out and see what they can drive the project…. But if it's a focused area, probably we will try to *reach the person* who has spent lots of time," was a response provided by a team member from HighTech in describing how her team worked (organization 3, interviewee 6).

Networked knowledge was observed in team meetings, although it was never explicitly described as such, when members reviewed problems and their statuses, and the response or question frequently arose, "Doesn't Bob know the answer to this?" or, "Hasn't Betty solved this thing before?"

Synthesized and Integrated Knowledge (Applying to New Situations)

The assessment of knowledge to be used in new situations or to address problems in different contexts beyond routine changes is categorized as synthesizing and integrating knowledge. This type of knowledge is distinct from its application to solve everyday problems because it entails the use in some new problem domain. This was exemplified by members of ChemResearch who sought ways to use existing gas manufacturing technologies to solve new market demands or to reduce production costs.

Descriptions that typify this type of knowledge can be seen in the following:

1. A director from ChemResearch had a quite refined and well-articulated understanding:

> … I look at knowledge at being the pinnacle of a pyramid that starts with data and then the middle tier is information and the pinnacle is knowledge. So, I'm in the business of collecting data, interpreting data to form information and then *synthesizing information to form knowledge.* And that's really what I do (organization 5, interviewee 1).

In response to a follow-up question, he provided the additional clarification that more directly grounded that definition in the context of the research activities in which he and the teams with which he worked were engaged.

> It means that when I've got knowledge that it's going to be broadly transferable within a given context, maybe I should say that it's going to be broadly transferable *despite its original context*.

The five respondents who characterized knowledge in this way all held managerial positions.

Extended Knowledge (Transferring to New Teams)

The least-mentioned characteristic of knowledge identified by the participants was its extension to other teams and might include the utilization of the knowledge by the new team to a new context.

A description that typifies this type of characterization can be seen in the following:

1. A director from ChemResearch described working with an external partner company, stating that "… in helping them set up their business, we facilitated this business, where we gave them equipment, *we gave them methods*…" (organization 5, interviewee 1)

Tacit and Explicit Knowledge

Several of the participants discussed the explicit and tacit nature of knowledge not as characteristic along the same continuum as the five just reviewed but as orthogonal to them, that is, procedural knowledge might be seen both explicitly and retained tacitly, functional knowledge may also be so seen, and so on. All of these characterizations came from members of organization 5, and as noted previously, who had been working with formal

knowledge management and community of practice programs and possessed reasonably sophisticated understandings of knowledge, for example:

> … it would be easier for me to define explicit knowledge, and then tacit is everything that explicit is not. So, explicit means that it can be readily put into words. I can tell it to you or I can write it down on a piece of paper, and the key word there is "readily." I can readily communicate the key concepts and activities in normal spoken or written language (organization 5, interviewee 1).

What Is a Task-directed Team as Practiced by the Organization?

The primary focus of the research was teams engaged in outsourcing information technology functions in commercial organizations. Selection of the participants and the teams with which they were engaged was done purposefully in organizations that had specific task-directed teams engaged in such outsourcing work. Though the scope of responsibilities of the participants in some cases extended beyond information technology, all were engaged in task teams. Some of the participants from ChemResearch were involved in communities of practice activities; but these were not the focus of this study. The characteristics identified are *not* intended to be comparative across different organizational types such as communities of practice, but descriptive of one type, task-directed teams.

Eight descriptive categories were identified from the statements made by the interviewees (see Table 10). The two most commonly-noted were externally-driven team deliverables and task direction as the cohesive factor that bound the teams together with every respondent mentioning these characteristics in some way in their interviews. Dichotomous categories were identified in each area, although they were not mutually

Table 10

Characterization of Task-directed Teams in Organizations

Research Questions and Subtending Questions			Results Summary	
			Axial Categories	Number of Respondents
RQ1: How are procedures and tools used for information and knowledge sharing in task-directed teams?	What is a task-directed team as practiced by the organization?	Characterization	Source of objectives, funding - external	16
			Source of objectives, funding – internal	5
			Team deliverables - external	18
			Team deliverables – internal	6
			Organizing framework – work plan or tickets	13
			Organizing framework – other than work plan or tickets	6
			Team cohesion (what keeps team together, aligned) – task	18
			Team cohesion (what keeps team together, aligned) – non-task	6
		Primary Outsourcing Management Paradigm (mutually exclusive)	Management by direct staff supervision (staff augmentation)	10
			Management by measures (SLAs, etc.)	5
			Not noted	3

exclusive. For example, team deliverables were substantially driven by internal-to-the-organization but external-to-the-team customer requirements, parent organization financial requirements, or trouble tickets, among others (18 respondents); but were also driven by internal requirements such as developing new products and processes or finding team efficiencies (6 respondents). Trouble ticketing systems and other user-submitted enhancement requests were the specific sources of the externally-directed work for four of the teams observed in the research: two function-specific teams supporting activities in HighTech (business data warehouse and corporate portal), the human resource help desk team at ChemResearch, and the application support team from ServeProUS providing services to the information technology department at ChemResearch. The importance of the

trouble ticketing systems was evident in their function as the primary organizing mechanism for meetings as seen during the field observations when the list of open tickets served as the agenda and reporting framework. "The main focus point is they [the team members doing the development or repair work] have the ticket, so we drive it from there, and we do keep a status report. Every day they send a status report to me on where the status of each of the tickets is" (organization 3, interviewee 3). Budgets were based on ticket volume and the staffing level required to meet that volume while fulfilling service level agreements.

The internally-focused dichotomous categories received the lowest number of responses, one five and several sixes, reflecting the externally driven and task-directed nature of the work the teams were performing. One additional set of categories was identified when characterizing the work performed in an outsourcing environment. The categories are mutually exclusive. Ten respondents identified their primary outsourcing management model as direct supervision or oversight of the service provider organization personnel, referred to as staff augmentation. Five identified their model as management by measures, that is, use of SLAs or other measures that do not entail day-to-day direction of the service provider staff. Three respondents did not speak about or identify an outsourcing model. There was no specific question on the outsourcing management model included in the interview protocol.

How Do Teams Manage the Knowledge They Possess?

The approaches used by teams to manage the knowledge their members possess fell into two broad categories: procedures, tools and processes used for non-codified knowledge and interactions with knowledge objects or codified knowledge. Table 11 summarizes the categories is presented with several of the category types combined, specifically application

Table 11

Procedures, Tools and Processes for Managing Knowledge

Research Questions and Subtending Questions			Results Summary	
			Axial Categories	Number of Respondents
RQ1: How are procedures and tools used for information and knowledge sharing in task-directed teams?	How do teams manage the knowledge they possess?	Procedures, tools and processes	Creation and/or acquisition	15
			Update and maintain	10
			Assessment for use, applicability	6
			Application, utilization	14
			Refining for re-use or extension	3
			Communication (formal and informal)	18
		Interactions with knowledge objects	Creation and/or acquisition	13
			Update and maintain	12
			Assessment for use, applicability	5
			Application, utilization	11
			Refining for re-use or extension	4
			Communication (formal and informal)	18

application and communication. Within procedures, tools, and processes and within interaction with knowledge objects, ten different sub-categories were identified (see Appendix I, Table I1), with the same sub-categories for each of the broader categories. The interviewees often described these activities as disparate and unconnected, but when taken as a whole and structured, a life-cycle emerged of team-based knowledge management practices: creation or acquisition, assessment for use, application and utilization, refining for possible extension or re-use, and communication formally and informally both inside outside of the teams. In the context of the “Procedures, tools and processes” category, the term `communication’ means different forms of interpersonal and organizational communication. In the context of the “Interaction with knowledge objects” category, `communication’ means the sharing and use of the knowledge objects.

The most-frequently cited practices for both non-codified and codified knowledge had to do with communication. This was done in both formally structured environments such as scheduled team meetings that used face-to-face engagement, audio conferencing for remote participants, and web collaboration tools to span spatial boundaries; and in informal, unplanned collaboration that also relied on the same technologies. The field observations strongly corroborated the participants' descriptions provided in the interviews. Typical meetings were structured by the use of an agenda based on outstanding items in the trouble ticket queue and/or review of non-ticket project statuses. Through the use of a web collaboration tool such as WebEx, the meeting facilitators, most-often the first-line supervisors, ensured that everyone was "on the same page" by the real-time sharing of information in the trouble ticket systems. As illuminating as the real-time sharing of knowledge was, the collaborative actions (doing) needed to actually identify and solve a problem. In one session, a participant from India was given control of the interactive tool and then demonstrated the changes made to the application program in question, virtually walking through the actual solution needed to correct a problem.

What Are the Larger Organizational Influences?

The parent organizations played significant influential roles in the work done by the teams (see Table 12). Six different influences were identified. The most-often mentioned were the technology tools and infrastructure provided by the parent organization. While virtually all of the participants evidenced a high degree of technical sophistication and could

Table 12

Parent Organizational Influences

Research Questions and Subtending Questions			Results Summary	
			Axial Categories	Number of Respondents
RQ1: How are procedures and tools used for information and knowledge sharing in task-directed teams?	What are the parent organizational influences?	Influences	Tools - IT	18
			Tools – non-IT	11
			Policies	5
			Practices	14
			Culture	10
			Leadership (outside of team leadership)	11

navigate with apparent ease through the various tools that were available, all acknowledged the importance of having the applications and needed infrastructure available to perform their work. This use of technology was often highlighted as an enabling factor that allowed spatially separated workgroups to accomplish their tasks, for example, the use of web-based collaborative tools that supported team meetings with participants located in the U. S. and in India (HighTech and ServeProOffshore), or in the U. S. and in the Philippines (ServeProUS intra-team meeting).

What is not as evident in the categorization is the importance of non-IT tools and practices provided by the service provider organizations that enabled the structured transfer of knowledge at the start of outsourcing relationships. The mention of non-IT tools and practices was not directly observed due to the timing of the research and access to a formal knowledge transfer programs, but use of such tools and practices *was* mentioned by participants from ServeProUS, HighTech, and ServeProOffshore. At the start of an engagement the service provider organizations brought with them a formal methodological

approach to guide and structure the knowledge transfer. Each of the organizations providing outsourcing services, ServeProUS, ServeProOffshore, and ServeProSpec, had structured, highly-detailed questionnaires that were used during the knowledge transfer process, and that covered the full range of applications, practices, legal requirements (Sarbanes-Oxley for example), and so on. They were willing to have the questionnaire instruments reviewed, but unwilling to have copies made in order to protect the intellectual property contained in them. At a summary level, the instruments contained questions about an outsourcing firm's technical infrastructure (servers, desktop, voice and network), application environment (all applications, operating systems, database management systems, reporting applications), support infrastructure (help desk, desk-side support), processes and procedures (those used by the IT department, non-IT departments, suppliers, customers), and geographic distribution of all functions. While providing useful insights to the categories assessed and the highly-detailed nature of the information sought, access to them would not have made a significant contribution to the research effort had they been made available. There were also policy-directed documents that were created. ServeProUS had its own proprietary knowledge-capture format known as application knowledge transfer documents while ServeProOffshore used the documenting requirements of the supported organizations with which it worked, HighTech in the engagement observed for the research. In both cases, support for this codified form of knowledge involved its creation, update, and on-going review for currency and as appropriate, quiescence.

An important enabling non-IT influence was the support provided for travel, allowing face-to-face meetings. A first-line supervisor commented on her ability to travel to India to conduct training and knowledge transfer sessions, and just as importantly, to get to know the

associates there. "Face time is important. I feel that, ah, you know, sometimes you can feel disconnected…. So, just to make sure that it's just like they're working here, we make sure they're up to date with what's going on," and subsequently, spoke about the need for a shared vocabulary and understanding of the work in which the team was engaged, in this case, support for a business data warehouse.

Leadership was a critical factor, particularly in creating a vision for the purposes of outsourcing activity and providing the work environments in which that work could be pursued. Outsourcing can be an extremely threatening process, and creating the appropriate environment and clearly articulating goals, objectives, and consequences for the outsourcing organizations' staff can support or detract from the achievement of those goals and objectives. A director at HighTech, very recently promoted from a first-line supervisory position, spoke about the practice of leadership in everyday situations, counseling his team members to "sit on a conference call and give input, valuable input and to me, that's what's needed" (organization 3, interviewee 5); and then went on to discuss his approach to building collaborative support across the inter-organizational teams, the work that needed to be accomplished, and not focus on the outsourcing aspects per se. The role of executive leadership was important. Although no one above the level of director was interviewed or observed I meetings, the research participants spoke of the importance of the senior staff clearly articulating the business objectives of the outsourcing engagements and the implications for the effected staff. It should be noted that in all the outsourcing organizations participating in the research, none were reducing staff as a result of the outsourcing and reassigned impacted staff to other functions.

5.3 What Communication Practices Are Used to Share Information and Knowledge? (Research Question 2)

The results associated with answering the second research question and the several subtending questions are addressed in this section. What are the different methods of interpersonal and organizational communication used in knowledge management practice? The question of whether there is a constitutive basis to the development of meaning will be addressed in the results section for the third research question.

What Are the Different Methods of Interpersonal and Organizational Communication Used in Practice?

A wide range of interpersonal and organizational communication methods were used in the conduct of the team's activities (see Table 13, see also Appendix I, Table I2, for all content analysis categories for Research Question 2). The categories are not mutually exclusive. A significant number had responses from every interview, and while this may not be surprising, it highlights the importance of person-to-person communication practices in both informal and formal (planned) settings, the use of telephone communication, the pervasive use of audio-conferencing often used in conjunction with web-based collaboration tools, and e-mail. Instant messaging was consistently used not only as a primary tool but as a method to initiate another form of communication: "R U there for call?"

Trouble ticketing systems served the dual purposes of holding information on tickets and as a communication tool. Team members would update the status of tasks and trouble tickets in the database with the understanding that their colleagues would check the system periodically for new information much as they would check e-mail. This allowed for single input and maintenance of ticket information and the availability of current, broadly available,

Table 13

Communication Practices

Research Questions and Subtending Questions			Results Summary	
			Axial Categories	Number of Respondents
RQ2: What communication practices are used to share information and knowledge?	What are the different methods of interpersonal and organizational communication used…in practice?	Communication Practices	Person-to-person - individual, formal	1
			Person-to-person – individual, informal	18
			Person-to-person – group, formal	18
			Person-to-person – group, informal	18
			Person-to-person - mixed (face-to-face combined with mediated)	13
			Video-conferencing	0
			Telephone person-to-person	18
			Group audio-conferencing	18
			E-mail	18
			Instant Messaging	17
			Process, procedures, tools, applications	5
			Trouble ticketing system	13
			Websites, project chat rooms	1
			Documentation, meeting minutes or other objects	11
			Collaborative working (doing)	14
			Other (web collaboration)	13

and consistent status information; and in situations where four to eight hour turnaround was the benchmark for performance, those characteristics of a communication process were critically important. The field observations corroborated the use of the communication tools identified during interviews. Additionally, on-going interaction pre- and post-research showed that all the interviewees do, indeed, effectively use the wide range of communication practices identified.

The research followed an inductive approach, and as such, one might not anticipate seeing a category with no responses, in this case, video conferencing. No hypothesis was asserted that this method would or would not be used, but from its broad-base popularity in the business and non-business world, it may have been anticipated to see some use of it; but the combination of audio-conferencing and web-based tools displaced its use in the studied teams. The technical infrastructure for such meetings were available in many, but not all, of the facilities used by the participants studied in the research.

5.4 How Do Individuals Engaged in Task-directed Activity Come to Know Something? (Research Question 3)

The results associated with answering the third research question and the several subtending questions are addressed in this sub-section. How do individuals come to know something and know that they know it? What role do group norms and practices play? Is there a taxonomy of communicative practices evident in the work that is done by the teams? And is there a constitutive basis to the development of meaning?

How Do Individuals Know That They Know Something?

To attempt to address how individuals come to know in the context of team-based work, an open-ended question was posed to the participants: "How does an individual come to know something? Can you describe in your own words how you came to know something associated with this outsourcing work? Tell me a story about what it means for you to develop the level of understanding needed to take responsibility for fulfilling a function or task. Please take one specific example and tell me about it in as much detail as you can." From the answers an assessment was made of the different ways in which people come to know something, and how they might know that they know it, or assess another's knowing it

(see Table 14, see also Appendix I, Table I3, for all content analysis categories for Research Question 3).

The narratives provided by the participants to describe how they came to know something were reflective of the positions and roles that were filled and consistent with the individuals' characterizations of knowledge as primarily procedural ("know how") and functional ("know what"). In each case, the narratives were grounded in the everyday work of the individuals. The descriptions reflected the specific tasks and activities in which the individuals were engaged and *the context within which they demonstrated their knowledge*.

1. A first-line supervisor in a service provider organization (ServeProUS) reflected on the changes that had occurred as his position and responsibilities had changed in his way of knowing, and in the assessment, his comprehension and demonstration of personal knowledge, with the focus shifting from procedural know how to functional know what:

> I personally have changed over the years. Initially my background is a computer science degree in college, very math, very technical oriented, and I needed to understand all aspects of a problem. I needed to dive into all of the

Table 14

Characterization of How People Know They Know

			Results Summary	
Research Questions and Subtending Questions			Axial Categories	Number of Respondents
RQ3: How do individuals engaged in task-directed activity come to know something?	How do individuals know they know something?	Characterization	Demonstrated or applied	13
			Recited (individually, compared to taught)	5
			Documented	13
			Taught (shared with group)	5

> details to really feel connected to this issue and to resolve it. As I've moved on to these leadership roles, I no longer, no longer (*sic*.) need to understand all of these details. So, if there's a problem, I need to *understand the context around the problem, the impact that it's having* [italics added], the people who're involved, the revenue that's being lost, and use…. I need to know those things to help drive decisions that need to be made and I no longer need to know exactly where it is failing (organization 2, interviewee 3).

A follow-up question elicited the clarification that "at the pace we move, that is all the knowledge that I have the opportunity to gather. I don't have the opportunity to gather a lot of knowledge just to enrich my life, to understand, you know, more about the application. That's not the pace we're moving at." When assessing how he or others on his team know that they know something, he stated it is when the knowledge can be applied in a specific situation demonstrating the behaviorally-based aspect of procedural knowledge.

2. Training and hands-on experience served as the foundation for a team member in HighTech supporting a business data warehouse application:

> I was sent for training to the SD (sales and distribution) Academy also for a BW (business data warehouse) course, then, you know, *the only way you learn to swim is you jump in the waters* [italics added], so, you know, the moment I had moved into the team, I was also doing production support, all these [trouble] tickets (organization 3, interviewee 5).

In referencing collaborative work with another team member, an associate from the service provider organization, she reinforced the hands–on nature of becoming familiar with the application: "`See, you (referring to the interviewee) had this (trouble) ticket under your name. This is the way how you do it and this is the match, see?'" The procedural characteristic of her understanding of knowledge was also reflected in the familiarity she sought to obtain with the language used by the team:

> The BW (business data warehouse) concept is fundamental so at least *I am even in a position to talk in that language*, you know, in info objects, queries,

> you know, somebody's coming up to me that, you know, "my query is not working," and they are all introducing at the (meeting?), that I'll be supporting BW and you can come to me (Italics added).

3. A first-line supervisor from ServeProOffshore and member of a team supporting outsourced work from HighTech described a step-wise process through which he came to know about the technology he was supporting. This began with fundamental training in the field of information technology, then about ERP packages such as SAP and Oracle, and lastly with specific modules within those packages, for example, sales and distribution. He was professionally certified, and then filled a number of consulting roles prior to taking his current position in ServeproOffshore. The thread that ran through his narrative was the hands-on experience and procedural knowledge he gained through the training and actual work experience. He stated that he knew something when he could do it (organization 4, interviewee 2).
4. In the midst of a product review with a supplier, a director and chemical engineer gained insight into how the technology being demonstrated could be utilized in an entirely different environment to solve a different problem:

> We [referring to a colleague participating in the demonstration] looked at each other with this `Uh huh!' because we now saw how we could react gas with the plastic and have the surface be treated, and it would react instantly…. Knowing how it flowed, all of a sudden, we integrated all our knowledge about what we had done in the past and it just happened that the two of us did it simultaneously and then we filed a patent on it (organization 5, interviewee 4).

Earlier in the interview the person spoke about his general approach to developing knowledge when responding to a question about how his team worked:

> A lot of small focused meetings with white boards. Our white board, we have six white boards in a relatively small conference room, probably smaller, well, half the size of this one, and they're always full of information. We're… I'm a visual person. Some people receive and process information orally, but, uhm,

> I think most of us are much better in developing and progressing ideas if we put things on a white board, challenge something, add to the idea and build on to it, so we have a lot of 1 on1 or 6 on 1 interactions, depending.

These stories of how people came to know something, to understand the required skills and context of the work in which they were engaged was also reflected in the categorization of how people know they know something with 13 of the 18 respondents stating that it was the ability to do or apply their knowledge, supporting peoples' understandings of knowledge as procedural. Thirteen also noted the importance of documenting what they know as a way of recognizing the possession of the knowledge while five characterized speaking or reciting what they knew and five characterized it as teaching others.

What Role Do Group Norms and Practices Play?

Group norms played a role in the practices of the teams (see Table 15). Norms are the socially-enforced rules of conduct and guidelines evidenced in the teams that governed the work performed, and with the one exception noted, very few were formally documented and were found in the actions of the team members. The one exception dealt with the protection

Table 15

Role of Group Norms

			Results Summary	
Research Questions and Subtending Questions			Axial Categories	Number of Respondents
RQ3: How do individuals engaged in task-directed activity come to know something?	What role do group norms and practices play?	Presence or absence (mutually exclusive)	Present – recognized and followed	17
			Present – not well recognized or followed	1
			Not noted or observed	0
			No response for respondent	0

of intellectual property and other proprietary information possessed by the outsourcing organizations, the service providers, and other third parties. All organizations tightly controlled this form of information exchange through the use of non-disclosure agreements or other restrictive language contained in the contracts. With the amount of cross-organizational work that was observed in the participating teams, it is understandable that all were concerned about appropriately protecting product and procedural information. Data that contributed to the characterization of group norms came from the interviews and was confirmed through observing the activities of the teams

Rather than attempt to enumerate the diversity and nuanced complexity of the group norms themselves across the different teams, characterization was made as to whether such norms appeared to exist, whether they were recognized by team members, and were followed. The categories are mutually exclusive. Seventeen of the 18 respondents appeared to have a clear understanding of the group norms and the behaviors that were expected to support them, and these were confirmed for seven of the participants by observing their actions in team meetings. In the context of the work being done by the teams, examples of conformance to group norms would include such activity as maintaining documentation or trouble ticket status without having to be directed to do so, understanding when issues needed to be escalated and when not, and rules governing assuming day-to-day task without having to be told what to do.

In outsourcing relationships there may not always be an immediate alignment of groups' norms, and in practice, one would anticipate some transitional period in which the groups learned to work with one another. The teams with which the research was done had been in place for a minimum of six months and intra-team relationships appeared consistent

with that length of relationship, and certainly did not evidence any aspects of start-up associations. With the exception of one first-line supervisor who had just assumed responsibility for a new application area and a working relationship with a new service provider team, all respondents were aware of group norms and followed them, and this was corroborated when observing actual behaviors in team meetings.

Is There a Taxonomy of Communicative Practices?

The intent of this question was to determine if the teams had an understood set of ways in which they communicated. To assess this, the focus was not on listing the communication practices themselves, addressed in an earlier question, but on determining if such a taxonomy existed and whether it was understood and followed (see Table 16). Did the participants use communication practices that were seen as appropriate by the other participants and for the given situation? Was there an agreed upon if not necessarily formally documented set of practices that could be used by the team members? The question was not explicitly asked, "Do you have a set of communication practices," but results were gathered by categorizing the responses to questions of how the teams worked and communicated

Table 16

Team Taxonomy of Communication Practices

			Results Summary	
Research Questions and Subtending Questions			Axial Categories	Number of Respondents
RQ3: How do individuals engaged in task-directed activity come to know something?	Is there a taxonomy of communicative practices?	Presence or absence (mutually exclusive)	Present – recognized and used	11
			Present – not well recognized	6
			Not noted or observed	1
			No response for respondent	0

(interview questions 10 and 11); and through the field observations that showed the actual practices of the teams not the interviewees description of the practices.

Eleven people indicated the presence of a set of agreed-upon communication practices, a taxonomy, that was understood and used by the teams. Six others indicated some understanding of commonly-used practices but not that they were well understood and used. The participants exhibited this understanding of communication practices by their *uses* of situationally appropriate techniques. For example, there was an understanding by themembers of the joint HighTech – ServeProOffshore team that employing web-based collaboration tools in conjunction with audio conferencing was effective and suitable when sharing know how across spatial and temporal boundaries while using formal documentation was appropriate for codifying changes made to application code.

One participant did not indicate any such set of practices was understood and used, and in this case observations were not made of the team activities to confirm this person's understanding.

Is There a Constitutive Basis to the Development of Meaning?

Participants were not asked if they had a constitutive view of the development of meaning. Few, if any, would be expected to have an understanding of the question, and any effort on the part of the researcher to define or explain the position likely would have resulted in biasing the answers. What was possible was to listen to the participants' descriptions of their understandings of what it means to know something and their processes for coming to know something. Observing them and the teams in which they interacted with other team members would provide another set of data upon which to base an answer to the research question.

The constitutive view posits that meaning is developed interactively by the participants, constituted through the communication process, leading to the development of a shared understanding of that meaning (Mokros & Deetz, 2000). No hypothesis is asserted with this definition but a descriptive framework is suggested with which to characterize the research data. If interactions were seen in which participants develop an inter-subjective understanding and negotiate meaning, then this might reflect a constitutive view of communication. This could be contrasted to a cognitively-based, individual-centered model in which knowledge is individually held and then communicated with (sent to) others.

No effort was made to have a characteristic assigned or identified by the interviewees. From the interviews and field observation data examples were sought that might represent this type of communication model, and perhaps while not being generalize-able, from these instances to be better able to describe and characterize the communication, the context in which it took place, and the behaviors of the interactants.

1. In describing how his team communicates and shares knowledge, a first-line supervisor provided insights to the development of meaning: "I just think people retain it through experience and they share. They see how things get done, and that *(pause)* they just absorb it. That's, that's, at least in my experience, you know with the team environment like that, people have certain pockets of expertise" (organization 2, interviewee 5). This is reflective of the procedural view of knowledge.
2. The development of a shared understanding and new knowledge was described by the director and chemical engineer from ChemResearch when explaining how people meet around white boards to develop solutions to problems (full quote contained in

an answer previously presented in the results). He went on to describe facts and interrelations between and among facts can lead to new knowledge in teams:

> You know, facts are things that kind of everybody agrees to and insights are more perspectives about facts or connections between facts and the insights typically *lead to, uh, new ideas and new products.* The facts are just kind of the bricks in the wall and the insights are the mortar to hold the bricks together (Italics added) (organization 5, interviewee 4).

3. A team member from ServeProUS described the ways in which she communicated procedural knowledge: "Bringing up code on a screen and sitting down side by side to say, `What are you doing', or, you know, `point me to some piece of code you think I can look at'" (organization 2, interviewee 4). In describing the communication practices used, timing and the level of detail desired guided the choice:

> If I want to explain something in great detail, email is a good way to gather it, put it in illustrations, snapshots, spreadsheets, whatever. A dialogue, if I really need feedback and I want something more, like I don't want a day for an answer, than a dialogue is much better.

4. Two members from the business warehouse team in HighTech traveled to India to meet with their outsourcing partners from ServeProOffshore to conduct knowledge sharing sessions and to develop a common vocabulary and understanding of the application environment they would jointly be supporting. Additionally, it allowed them to develop interpersonal relationships beyond the business relationships that they believed contributed the overall effectiveness of the team's work. Team meetings frequently included celebratory comments about individuals' birthdays or other special events and appeared to contribute to the overall effectiveness of that team's work practices.

5.5 Survey Results

The purpose of the survey instrument was to assess participants' knowledge of the technical and application work environment pre-task and post-task. It was to be administered prior to the initiation of any outsourcing activity and then re-administered upon completion of the outsourcing activity, specifically the end of the project activity of transferring responsibility from a client to the responsible service provider. The intent of the survey was to measure participants' understandings of their before and after knowledge states rather than their knowledge *per se*, and to assess if there had been any change in the states of the participating team members and related to the research questions by establishing the pre- and post-task knowledge of the participants and framing the research questions dealing with the communication practices related to the knowledge sharing. The researcher was included as a participant in the discussions about the start-up of outsourcing tasks, but could not influence let alone dictate the actual "go" or "no go" decisions and timings. Within these constraints, and because the scheduling was dependent upon the participating organizations' timing of work, only six surveys were completed. Four were from ServeProSpec who were engaged in a formal knowledge transfer process associated with outsourcing the support for an application package while two were members of ServeProOffshore who were newly assigned to support work in HighTech's portal team and went through a planned and structured knowledge transfer process. This number does not constitute a sufficiently large sample for any inferential statistical analysis but provided descriptive information (see Appendix H).

At a summary level, five of six responses showed a positive change in understanding ("What is your current level of understanding of…?") for the majority of questions while one respondent showed no change in understanding. One respondent showed a negative change to one question. With a Likert scale ranging from one ("None") to seven ("Great Depth and

Breadth"), the average changes in scores ranged from a positive (increase in understanding) of 3.00 for the desktop software, 2.33 for the operating systems being outsourced, 2.00 for the client business organization and the client business processes, 1.83 for customer-developed software, and a positive 1.67 for the technical aspects of the hardware platform. A neutral response (0.00 change) was shown for understanding of purchased software which may reflect the service providers' staff's technical acumen brought to the engagement, and therefore would be unlikely to reflect change.

Little information was provided by the responses to the questions about what communications practices were anticipated to be used and what were actually used, and with whom did the participants plan to communicate and with whom did they actually participate.

5.6 Other Results

In addition to the results that dealt directly with the research questions, other data were gathered that described different approaches to managing outsourced resources, specifically the management of information technology; communication practices associated with outsourcing activities especially those used to span spatial and temporal boundaries at different stages of outsourcing processes; and the inter-cultural aspects of teaming activities in the context of outsourcing activities.

Managing Outsourced Resources

Although there are many different outsourcing management models that are used in practice, they can be categorized into two main groups: *managed services* wherein full responsibility for a function is turned over in total to a service provider with measurement done through SLAs and consequently no direct management of the service provider's associates by the outsourcing firm's management; and *staff augmentation* in which responsibility for functions remains with the outsourcing firm and the service provider only supplies technically competent staff to fill roles on the outsourcing organizations' teams with measurement done through the performance assessment of the individual participants.

HighTech was moving from a staff augmentation model to a full managed services model in late 2004 and early 2005 evidenced by new contracts established with ServeProOffshore, ServeProSpec, and others. The directors and managers responsible for deploying the new model therefore had to support and encourage a change in the practices of the first-line supervisors. Prior to the change, teams had been integrated, composed of both HighTech and service provider associates, with first-line supervisors providing day-to-day direction to all team members regardless of their parent organizations, often based on trouble ticket queues and project plans. In the new managed services model, the first-line supervisors no longer directed the activities of the service providers' associates, but instead managed the measures: were tickets being closed within the agreed-upon time periods, was rework below the prescribed level, and so on. This was not necessarily an easy transition for the first-line supervisors who had developed management styles and communication practices that had proven effective in the direct management of staff, but they had to move to a significantly different approach when managing in the new model. *Their* performance was,

in turn, being managed by their immediate supervisors (managers and directors) by conformance to the SLAs. The research showed the critical role that first-line supervisors played in the generally successful deployment of outsourcing program in the examples studied for this research effort, and the different practices that are required when moving from one outsourcing management model to another.

ChemResearch had been employing managed services for the support of portions of its information technology environment for several years, and the management team, from first-line supervisors to managers and directors, were comfortable with and competent in managing by measures. Its service provider studied in this research effort, ServeProUS, had a long-standing engagement with ChemResearch, and although there had been new work transferred to it in late 2004, the managed services management model and reliance on measures-based service delivery was one with which both organizations were comfortable.

Communication Practices Related to Outsourcing Life-cycle Stage

Communication practices observed in the specific context of outsourcing fit into several categories based upon the type of engagement (managed service or staff augmentation) and the phase in which the work was being done in the life cycle of outsourcing (start-up and initiation or on-going steady-state) (see Table 17).

1. During the start-up phase of managed services engagements, there was focus on formal knowledge transfer processes guided by methodologies and procedures that the service providers brought with them to the engagement. Focus was on understanding current levels of performance, establishing agreed-upon SLAs, and

Table 17

Outsourcing Life Cycle and Communication Practices

		Life-cycle Stage	
		Start-up	On-going Steady-state
Outsourcing Engagement Type	Managed Service	- Structured knowledge transfer processes - Development of measurement framework - Face-to-face communication - Creation of knowledge objects	- Periodic, regular reviews of service providers' performance as measured by SLAs - Measurement reports as channel of communication - Maintenance of knowledge objects
	Staff Augmentation	- No special start-up program - Knowledge transfer via collaborative team activity - Use of current (outsourcing organizations') measurement framework - Team meetings, remote and face-to-face communication - Use and maintenance of existing knowledge objects	- Knowledge transfer via collaborative team activity - Use of current (outsourcing organizations') measurement framework - Team meetings, remote and face-to-face communication - Use and maintenance of existing knowledge objects

determining benchmark levels of performance. Face-to face communication was the preferred method of interaction often entailing international travel to achieve that objective, and resulting in the creation of shared knowledge of the work to be performed and supported by the creation of knowledge objects such as documentation.

2. Once in steady state, periodic communication took place with the SLA measurement reports serving as the medium for communication. Management staff from the outsourcing organizations did not directly supervise associates from the service providers' staffs, working instead through management counterparts from the service provider organizations.

3. Staff augmentation models did not have formal start-up programs with personnel from the service provider organizations joining the outsourcing organizations' teams based on an as-needed basis dependent upon business needs. Knowledge was shared informally through collaborative team activity. No new measurement frameworks were established such as SLAs, with the outsourcing organization's existing measurements used. Communication practices followed the then in-place practices used by the team, and existing knowledge objects were used and maintained.
4. Management and communication practices in the staff augmentation model did not differ when in steady-state, on-going operation.

Inter-cultural aspects of teaming activities

HighTech teams worked closely with ServeProTeams based in Bangalore, India. Members from both the web portal and data warehouse teams from both organizations traveled frequently to the others' locations to facilitate knowledge sharing and ensure common understandings of the work to be performed and practices and procedures used to accomplish it. Developing an understanding of the cultural differences was one of the initially less-well-recognized aspects of the ways the groups interacted, but ultimately one of the important ones. Factors as mundane as understanding the different countries' holidays and when team members would and would not be at work proved essential for the effective performance of the teams. In one incident, a well-known Indian movie star, extremely popular in the Bangalore region, died and the ServeProOffshore associates were not able to get to their facility due to demonstrations and traffic delays in the city!

5.7 Reliability of Methods and Intercoder Reliability

Approaches to validity and reliability as defined in quantitative research activities ("the degree to which researchers measure what they claim to measure," and "the external and internal consistency of measurement," (Williams, 1992, p. 29)) are equally important in the conduct of qualitative research but are addressed in different ways. "Validity in qualitative research has to do with description and explanation and whether or not the explanation fits the description. In other words, is the description credible?" (Janesick, 2000, p. 393). Establishing reliability in qualitative research creates the foundation of credibility for the results of the research being performed.

> Given that a goal of content analysis is to identify and record relatively objective (or at least intersubjective) characteristics of messages, reliability is paramount. Without the establishment of reliability, content analysis measures are useless. Remember that without reliability, a measure cannot be considered valid. (However, reliability does not ensure validity; i.e., reliability is a necessary but not sufficient condition for validity.) (Neuendorf, 2002, p. 141).

Krippendorf states that there are three types of reliability: stability, reproducibility, and accuracy; and of these, accuracy is the strongest (2004). "Accuracy is the degree to which a process conforms to the specifications and yields what it is designed to yield" (p. 215). The more-specific conditions needed for reliable reproducibility are defined as clear, communicable instructions for coding; objective criteria for coder selection; and independence in the work done by the coders (p. 217). These were the benchmarks used for developing the intercoder reliability testing used in this research.

Two coders were used in addition to the researcher. Each independently assessed the same two transcripts. This was done in order to evaluate the consistency of coding for a set of data rather than following the alternative approach of having the pairs assess different

transcripts with the consequent broadening of the reviewed data. Potter and Levine-Donnerstein argue for the former approach, the one followed in this research, stating that

> … in order for the results of any test of reliability to be convincing, (the researchers) must show that the coders in the test made decisions consistently, so that the readers can infer that anyone competently trained as a coder would also have been consistent in his/her decision making. Therefore, the more people involved in the same test, the better the researcher is able to assess the degree to which different people would *all* arrive at the same decisions (1999, p. 274).

The coders were volunteers but ones who filled the requirement of being qualified to conduct the work due to their previous work with content analysis coding and/or other related research methods. Two training sessions were held prior to performing the actual comparative assessments using a codebook and coding sheet developed for the research (see Appendix J). One transcript was coded by each of the coders as a pilot activity and then reviewed in detail with changes consequently made to the codebook prior to conducting the actual comparative assessment. Potter and Levine-Donnerstein (1999) discuss the importance of training and refining rules when coders initially vary in their assessment decisions and this was evidenced in the pilot coding with adjustments accordingly made to definitions and directions based upon review sessions.

The reliability sample used for testing consisted of two transcripts (11.1% of the total of 18 transcripts) each with 70 different assessable characteristics or categorizations. One question (number 2) was excluded from the testing because it called for free-text responses about other roles and responsibilities filled by the participants, e.g., subject matter expert, program manager, or chemical engineer.

Results are reported as two pair-wise comparisons for both percent agreement and Cohen's *kappa* (see Table 18, see also cross tab tables and other statistical detail in Appendix

Table 18

Intercoder Reliability

	Researcher and Coder 1	Researcher and Coder 2
Agreement	.978	.929
Cohen's *kappa*	.948	.831

H, Table H1). Initial results from each of the coders were reviewed with the researcher to assess issues or misunderstanding that occurred during the process. The post-review numbers are used to calculate percent agreement and Cohen's *kappa*. Pre-review percent agreement was .936 for the researcher with the first coder, and .879 with the second. A number of authors state that reporting *only* percent agreement is not sufficient due to the inherent drawbacks of the measure, principal of which is not accounting for agreement by chance (Neuendorf, 2002; Lombard, Snyder-Duch, & Bracken, 2005). Cohen's *kappa* was chosen as an alternative to using only percent agreement because it does account (deflate) for chance agreement. While there are no generally-accepted standards for intercoder reliability, there are a number of guidelines that are commonly used. Neuendorf summarizes a number of authors' positions: Ellis's `widely accepted rule of thumb' of coefficients exceeding .75 to .80 indicating high reliability (1994, p. 41); Frey, Bolan, and Kreps stating that .70 agreement is reliable (2000); Popping's .80 or higher level for Cohen's *kappa* as indicating reliability (1998); Banerjee et al. use of .75 and higher for Cohen's *kappa* for good agreement beyond chance (1999); Krippendorf's guidance for use of reliability coefficients generally of .80 and higher (1980); and Riffe, Lacy, and Fico's specification of coefficients in the .80 to .90 range as being reliable (1998) (from Krippendorf (2000, p. 143)). Lombard,

Snyder-Duch, and Bracken report that "coefficients of .90 or greater are nearly always acceptable (while) .80 or greater is acceptable in most situations… (with) lower criteria… used for indices known to be more conservative ((such as) Cohen's *kappa*….)" (2005, on-line). The reliability coefficients calculated in this research fit within the range of guidelines with the lowest being .831 for the Cohen's *kappa* for the reliability of the researcher's assessment compared to the second coder's.

Additionally, the field observations provided significant and grounded validation of the data collected through the interview protocol.

5.8 Summary of Results

This chapter reviewed the results achieved through the use of the methods described in chapter 4. The initial section detailed the process and timing of the research effort and described the six participating businesses that included both outsourcing and service provider organizations. Results for each research question were reported, highlighting the characterization of people's definition of knowledge, team practices and communication methods, and the influences of the parent organization, both technological and non-technological.

The most-commonly noted characteristics of the participants' understandings of knowledge were of it being procedural, that is, knowledge of *how* to perform tasks and activities; and of it being functional, understanding *what* tasks were to be performed in the context of the teams' objectives and purposes and the larger organizations' work plans and objectives. Other characterizations were of knowledge being networked, synthesizing and integrating, and extending to new teams. Teams manage the knowledge they possess through

its creation and/or acquisition, maintenance, assessment for use, application, and refining for reuse and extension.

A wide range of interpersonal and mediated communication practices were used to share knowledge within the teams, ranging from informal person-to-person communication, the most commonly noted, to web-based facilitating groupware, e-mail and instant messaging. In the context of the task-directed teams studied in this research, the participants noted demonstration or application and documentation as the most common ways for individuals to confirm that they knew something. Parent organizations influenced the work of their teams through the provision of facilitating tools, deployment and use of policies and practices, and presence of supportive corporate culture and organizational leadership.

Chapter 6
Discussion

6.0 Chapter Overview and Purpose

The Results Chapter described the research findings and the five ways in which knowledge was characterized by the respondents: procedural ("know how"), functional ("know what"), networked ("know where" or "know who"), synthesizing and integrating (applying knowledge to new problems in same or similar context), and extending (applying existing knowledge in new or different context). Characterizations also were made of the teams and the communication practices used in knowledge sharing and creation. The purpose of this chapter is to review and assess the findings.

6.1 Major Findings

The research conducted in this study may be of interest to scholars and practitioners, but unlikely to be considered an item of interest to the more general public; and a prominent newspaper does not often address work being conducted in a research project. However, such was the case regarding tacit and explicit knowledge. In early December, 2006, *The New York Times,* considered by many to be the paper of reference for the country, carried an article by David Brooks that discusses the conscious and non-conscious aspects of human thought using an elephant as a metaphor for the non-conscious and its mahout for the conscious. The article describes different approaches to education, and within that framework, tacit and explicit knowledge. Brooks posits that "… the elephant is the repository of tacit knowledge. As Robert Steinberg of Yale notes, tacit knowledge is procedural. It's knowing how, not knowing what. It's knowing how to listen, how to see and organize what you see" (2006, p. 4-12). While the research described in this dissertation

studied neither elephants nor mahouts, it did examine people's understanding of knowledge, with procedural knowledge, or know how, emerging as one of the most important and commonly-noted characteristics within the context of the task-directed teams that were studied. The results of the study produced major findings that are summarized here.

The processes of sharing and creating knowledge in task-directed teams were active ones, responding to dynamic business and technical environments. Much of the knowledge was held tacitly and was not easily codified and captured in documentation. Procedural and functional knowledge were the most commonly noted characterizations of the knowledge possessed by team members.

A wide variety of communication practices were used by the teams to share and create knowledge, with non-mediated, person-to-person discourse playing an important role in the initial stages of outsourcing engagements supporting the development of shared vocabularies by the participants. Information and communication technologies played important *enabling*, not central, roles.

The knowledge of the teams was shared and created through communication processes. While individually held, the communication constituted the socially held knowledge of the team, represented in the teams' processes, procedures, and non-documented norms.

Outsourcing is a rapidly evolving business model used by organizations to manage their processes and costs, and the management of knowledge in the start-up and on-going operations of these engagements plays a significant role in their success. The organizations involved in outsourcing tasks studied in this research had effective processes for managing

the work being done, drawing upon program management and other task management practices. Each of these areas will be examined in more detail in the balance of the chapter.

6.2 Results Related to Procedures and Tools Used for Information and Knowledge Sharing in Task-directed Teams (Research Question 1)

Comprehending team procedures and tools used for the sharing and creation of knowledge rests upon an understanding of the participants' view of knowledge itself and the ways in which teams work. These can serve as the basis for characterizing the communication practices used by the team members and for the teams' procedures and tools.

Knowledge in Task-directed Teams

Findings of the research showed a connection between people's understanding of knowledge and the performance of their work in the teams to which they belonged. When asked to explain their concepts of knowledge, the respondents grounded their answers in the activities in which the teams were engaged and is shown in 16 of the 18 respondents identifying procedural knowledge, or know how, as one of its salient facets. Referencing again the response of a first-line supervisor from ChemResearch, "… knowledge is knowing how to *apply and use that information*" (italics added) (organization 5, interviewee 5). Collins in his study of scientists and engineers engaged in developing early versions of lasers notes this point when he states that "... this has been appreciated in the studies of the transfer of technology, where it is more clear that knowledge consists of the ability to do something" (1974, p. 167). The work being done in the studied teams involved application development and support, enterprise resource planning (ERP) configuration management, and chemical research, development, and production, all of which entailed some level of hands-on activity

by the interactants in order to fulfill team tasks (e.g., code development, application configuration management and support, chemical research methods application).

Procedural knowledge is oftentimes difficult to explicate and may be substantially or wholly context dependent which contributes to the difficulty of codifying this type of knowledge, and why it is often characterized as being tacit. Explicit knowledge is distinguished as being comparatively easily captured, expressed, and structured formally in some consistent manner with written documentation serving as a good example of codified explicit knowledge. Through the codification process, however, the context in which the knowledge was created or used may be obscured or lost entirely. The team members examined in this research recognized this characteristic without necessarily being able to express it in terms of tacit or explicit knowledge. In situations where team members were not physically proximate, they enacted knowledge sharing through the use of multiple communication channels, most notably through web collaboration tools such as WebEx, augmented by audio conferencing. This was noted in the interview data wherein collaborative activity (doing) was noted by 14 of the 18 respondents, and use of web tools by 13 of 18; and in descriptions of how people know that they know something with 13 of 18 characterizing that knowledge as being demonstrated or applied. Thirteen of 18 respondents also noted that people demonstrated their knowledge through the creation of documentation.

The behaviorally-based view of procedural knowledge was more directly noted in the field observations. These situations involved scheduled (planned) program reviews with members of the extended teams. The focus of these meetings was on reviewing task or ticket statuses (“Prajesh, where do you stand with resolving the sales and distribution interface problem?”), but just as frequently included review and clarification of how problems were

resolved. For example, in one of the daily business data warehouse reviews with participants from HighTech and ServeProOffshore, provider of the information technology outsourcing services, a HighTech team member and subject matter expert in a SAP ERP module communicated her expertise. She was given control of the web collaboration tool to share her topical acumen of command syntax and sequence needed to correct a problem, discussing the solution via the audio connection so that the team members could both see and hear (in person in the U. S. or virtually in India) what was being reviewed. This was followed by an active discussion and invitation for clarifying questions by e-mail, instant messaging or telephone. Establishing and clarifying the business and technical context were vital components of the discussion beyond the direct construction of the code solution. In the example just cited, that included identifying the specific business problem being resolved, its urgency (severity), and the impact on internal-to-HighTech and external customers. Some of the information may have been able to be codified, and in this case was done as e-mailed meeting notes, but much of the knowledge was not as easily codified and was embedded in the communication and constituted through the interactive discourse of the participants. In the just-described interaction, confirmatory responses were made by the participants ("Uh-huh" or "Got it") indicating their understanding of what was communicated, and was subsequently confirmed through their actions in actually doing similar work and making changes to the SAP module in question.

Tacit knowledge cannot always be easily differentiated from explicit as suggested by the work and communication in the studied teams. In situations of informal information exchange this is important to note due to the interactants' need to understand tacitly-held procedural knowledge. It may not have been explicated directly but shared and revealed

through conversational activity (Hislop, 2002). The differentiation of tacit from explicit allows for explicit knowledge to be packaged and moved around an organization as documents, but in so doing removing it from its originating context. Hislop argues that knowledge is inexorably composed of both tacit and explicit, not readily divisible, and that it cannot be managed as separate entities. Based on this model, the role of interpersonal communication in teams becomes more important in knowledge management processes. Knowledge is seen as deeply ingrained in organizational practices and contexts, and the people who perform these tasks and constitutively establish the contexts through their interactions and communication. The application of technologies may prove only partially effective in enabling all forms of information and knowledge sharing due to this dependence on person-to-person communication to define and establish context. The embodied aspect of knowledge and its integration into group practices limits technologies' effectiveness to fully capture and communicate it. In the example noted previously, however, the technologies clearly did enable the sharing of less context dependent procedural knowledge.

Hislop notes that the criticisms of the uses of information technology center on the neglect of social and cultural factors associated with the sharing of knowledge, over emphasis on an objectivist perspective that cannot deal effectively with highly tacit and distributed organizational knowledge, and the fact that sharing involves active agency and cooperation of interactants which technology (alone) may not allow. Tacit knowledge is shared through communication, often seen as collective in nature (e.g., reflected in groups' value systems) (Szulanski, 1996; Leonard & Sensiper, 1998). Knowledge exchange requires active and direct communication shared socially through language and stories. The embedded-ness of many types of knowledge increases the difficulty of its sharing with

explicit knowledge not easily divided from tacit and its embodied nature. An example was provided by one person's characterization of procedural knowledge at ChemResearch. A manager responsible for delivering company-wide technical production processes engaged in highly interactive dialogues with his supplier base and internal and external customers to fully understand and assess current and emerging manufacturing capabilities. This entailed the use of codified product and process information in the form of chemical specifications, process definitions and technical requirements, and manufacturing procedures and equipment. While these were necessary, they were not sufficient to comprehend the context of specific user requirements and application. Hislop states, "Knowing does not exist outside of the knowing subjects… and deeply embedded within and inseparable from the practices and activities that people undertake" (p. 167). The research showed the importance of person-to-person communication as an essential aspect of the sharing of knowledge in teams, and was highlighted by the willingness of HighTech and ServeProOffshore to support international travel by its team members from both organizations. Types of direct and mediated interpersonal communication were the most-frequently noted communication practices in the forms of informal, direct person-to-person communication (18 respondents), formal and informal team meetings often facilitated by audio conferencing (both 18), telephone interaction (18), and email (again 18, or all respondents).

Boland and Tenski (1995) suggest that knowledge is socially constructed and culturally embedded with language not having fixed meanings, with its meaning being highly ambiguous. "The epistemology of practice perspective suggests that, in order to be effective, the sharing of knowledge requires individuals to develop an appreciation of the tacit assumptions and values on which all knowledge is based" (p. 172). As just noted, the

research supports this perspective by noting the close personal interaction that facilitated the sharing of tacit information, extending to an appreciation of Indian holidays by non-Indian team members based in the U. S. Sharing of knowledge via the use of technology is problematic because there is no "neat dichotomy" between tacit and explicit knowledge with these being mutually constituted and inseparable. Hislop also suggests that all knowledge is deeply embodied, embedded in practices and activities, subjective in character, and to some or great extent socially constructed and embedded in social values and cultural contexts of those who develop and use it (p. 174).)

The understanding of what tasks were required to be done, the functional knowledge associated with team activities, was seen in the results as substantially explicit in nature, that is, knowledge that has been captured and codified such that it can be accessed, used, and exchanged in a consistent, comprehensive manner. Of the twelve respondents who characterized knowledge as functional, eleven filled management roles (directors or first-line supervisors) reflecting their managerial and program management accountabilities. This perspective was also seen in the characterization of the tools and processes used for managing team knowledge where all 18 respondents indicated some level of interaction with knowledge objects including creation and acquisition (13), utilization (11), and update and maintenance (11). Thirteen respondents noted creating and maintaining documentation as an important way in which individuals demonstrated that they know something in addition to demonstrating or applying that knowledge. Explicitly capturing functional knowledge allows the exchange of the information upon which the knowledge is based, and extending its use within the team to new but similar situations, or providing it to other teams that may be engaged in similar types of work. Differentiating the knowledge that can be made explicit

such as the examples identified in the research from that which cannot easily be made explicit, if at all, has implications for understanding how knowledge can be managed. Codified knowledge could be subject to management practices to enable its identification and description through cataloging and classification, and dissemination ("push") or providing access to it ("pull"); but the management of tacit knowledge would not entail such direct management practices, and would focus on facilitating knowledge exchange and sharing between and among the knowers in either individual or collective contexts (Baumard, 1999).

The business action theory (BAT) model provides another perspective of analysis. The phases of the BAT model describe inter-company actions from activity inception through fulfillment and the levels of contractual engagement that are entailed in the phases (Goldkuhl, 1998; Goldkuhl & Lind, 2004). While centering on major processes such as order fulfillment (prerequisite activities through and including assessment of after-activity satisfaction or dissatisfaction of the customer and supplier), the same model may be applied to the component process that create the web of relationships across firms. The teams that participated in the research were involved in an ongoing series of such activities, driven by project tasks, and that consequently required negotiation of the work to be done (offers to the service provider and its capability to meet (supply) the needed service), making commitments associated with delivery dates and priorities of work done, and fulfillment (delivery to the outsourcing firm and payment to the supplier) (Goldkuhl, 1998, pp. 7-13). There was a continuous process that required the participants to be engaged in discourse, making commitments, and responding to changing business priorities and resource availability; and through this process, achieving the understanding needed to support the work in which the teams were engaged.

One of the specific areas where information technology enabled the work of the teams was the creation and maintenance of documentation. The service provider organizations had well defined, structured and, for certain parts of the process, carefully scripted procedures for the initial stages of outsourcing engagements. These provided their associates reasonably comprehensive approaches that are applicable in most outsourcing situations and ensured that no obvious items slipped through procedural cracks during the knowledge transfer processes. All documentation was stored digitally and made accessible to all team members on group share points. In one ServeProUS application, knowledge transfer documents formed a core around which the transfer took place and which provided on-going support for the process once in place, and were part of that organization's formalized procedures. In other service provider organizations, documentation was done in conformance with its customers' requirements rather than the service providers procedures. In environments where creating and maintaining documentation is a core part of the knowledge transfer process, the team members' use of these processes, procedures and technology-dependent tools reflected knowledge's explicit nature.

The processes used by the service provider organizations were ones based on flexible models that sought to address their customers' varying business needs and included some of the features of the approaches to managing knowledge posited by Hansen et al. (2000). One model focuses on codification in which institutional knowledge is codified, stored and then utilized with a heavy reliance on information and communication technologies as fundamental enablers. The second approach is coined "personalization" wherein person-to-person contact is emphasized, from knowers to others with consequently less reliance on information for knowledge capture and storage. The organizational factors noted by Hansen

et al. as influencing the selection of a process were evidenced in the studied organizations. ServeProUS relied heavily on codified knowledge due to its business model of knowledge reuse by geographically-dispersed team members, utilization of information technology to store and facilitate access to the knowledge transferred to it from the outsourcing organizations, and the use of technically competent staff who could be trained in the contexts of the outsourcing organizations' specific business requirements and processing environments. No organizations studied in the research utilized the "personalized" model described by Hansen et al., but the organizational characteristics the authors noted as influencing the selection of a model were not present in the studied organizations, that is, reliance on highly independent, deeply experienced experts.

While not possessing the same dynamic, time-bounded, and often chaotic conditions as military environments, knowledge sharing in task-directed teams does evidence some of the same attributes that other research has found (Sonnenwald & Pierce, 2000). The work in Sonnenwald and Pierce's study focused on information behaviors in military work groups, but it is suggested that some of the key characteristics may be seen in communication and other behaviors in the studied task-directed teams. The same complex patterns of situational awareness encompassing individuals and groups (inter-group and intra-group) observed by Sonnenwald and Pierce were seen in the teams studied in this research. Collaborative behaviors were critical to the success of the teams with individual participants bringing different technical capabilities and contextual knowledge to the teams in a way that is similar to military command and control environments requiring such "intertwined situational awareness" (p. 471) although in significantly less hostile situations than actual combat. The second similar characteristic was the presence of social networks that relied upon individuals

understanding not only what was known but by whom and where (organizationally, spatially, and temporally) including context, task, and technical capabilities. A third characterization found by Sonnenwald and Pierce, "contested collaboration" (pp. 475-476) where individuals would hinder and block the work of others, was not seen in teams studied in this research.

Social networks were significant factors in enabling the interactants to successfully complete their work. Much as military personnel need to possess knowledge of units' missions and objectives, technical capabilities, states of readiness, and the specifics of the dynamics of combat or training settings, all this knowledge is seldom, if ever, held by one individual; and consequently, knowing to whom to turn, or where to turn, represents a different type of knowledge and is tightly bound in the social networks in which it exists. Lesser and Prusak (2000) in writing about communities of practice, social capital, and organizational knowledge refer to Nahapiet and Ghoshal's definition of social capital as "the sum of the actual and potential resources embedded within, avialbel through, and derived from the *network of relationships* [italics added] possessed by an individual or social unit (Nahapiet & Ghoshal, 1996, p. 243). Lesser and Prusak go on to identify three dimensions: (a) the structural entailing "the formation of networks that enable individuals to identify others with potential resources" (p. 126); (b) the relational involving "trust, shared norms and values, obligations, expectations, and identification that are critical to develop social capital among members" (p. 127); and (c) the cognitive that "addresses the need for a common context and language" (p. 127).

Six of the respondents in the research noted knowledge from social networks. A supervisor from ChemResearch stated, "I know where I can get information about the benefit plan, so that's knowledge (of) knowing where to go…." (organization 5, interviewee 5) and

an individual contributor from HighTech noted "… but if it (the problem being resolved) is like a focused area, probably we try to reach the person who has spent lots of time (on it)" (organization 3, interviewee 6). The characterization of knowledge as networked may reflect the group behavior ascribed to transactive memory. Communication is seen as an important factor in groups' learning processes and accessing or obtaining information from other group members (Hollingshead & Brandon, 2003; Marks et al., 2001). When members may not personally possess specific knowledge, they will know to whom to turn in the group in order to obtain the needed knowledge, and through this, progress the work of the task in which the group is engaged.

The application of knowledge to new situations or to address different problems in new contexts, characterized as synthesizing and integrating knowledge, was noted by five of the respondents. Each of the four filled a managerial position as either directors or first-line supervisors. This portrayal of knowledge is representative of a knowledge-creating environment that provides competitive advantage in marketplaces as new solutions must be sought for merging opportunities or problems (Nonaka & Takeuchi, 1995; Nonaka & Konno, 1998). Aspects of the iterative process of tacit to explicit, extension, and then internalization, or explicit to tacit, taking place in small groups as seen in this study, supported by organizational tools and practices, was demonstrated in the studied teams. In this cognitive-based view, knowledge is seen as individually possessed and extended. The current research suggests that communication plays a pivotal role in the process, however, with meaning negotiated through communication practices and established by inter-subjective understanding rather than being solely individuals' cognitive processes (Heaton et

al., 2005). From this perspective, tacit knowledge is the individual's pre-existing structures of understanding that are given new form in response to new situations.

This characterization of knowledge is best represented in a quote from a director in ChemResearch in speaking about technology transfer processes. "I've got knowledge that it's going to be broadly transferable within a given context. Maybe I should say that it's going to be broadly transferable despite its original context" (organization 5, interviewee 1). Understanding the potential applicability of knowledge independent of its current or originating context would be one of the hallmarks of synthesizing and integrating knowledge.

Four respondents described knowledge as its extension and use in new teams. This is noted as using existing knowledge in its application to known problems but sharing with other teams for their use in addressing similar problems, thus extending its utility. Reflecting some of the same attributes as synthesizing and integrating knowledge, this type of knowledge is differentiated by not being used as the basis of solving different problems. Its key component of this is the capability of knowers to understand how other teams might potentially use the knowledge that he or she possesses.

Practiced Characteristics of Task-directed Teams

All of the teams engaged in the research were task-directed ones, that is, teams formed for and engaged in work to accomplish organizationally-directed goals and objectives. The teams were purposefully selected to meet these criteria. The work was primarily, but not wholly as subsequently described, supporting information technology functions through either outsourcing tasks or providing the services needed to perform them. The ChemRes organization, teams were also engaged in chemical research, engineering, and

production design but also explicitly included teams engaged in outsourcing activities. ChemRes had a robust, long-standing program to develop and support communities of practice, and several of the participants were engaged in those activities, but such communities were not part of the research program.

Four salient attributes of task-directed teams were identified: external sources of objectives of funding, team deliverables to external parties, an organizing framework that is based on task as manifest in work plans or trouble tickets, and team cohesion aligned around task. These align extremely closely with those identified by McDermott and differentiate task-teams from communities of knowledge (1999). The teams' objectives were established externally and given to them in the form of objectives or other defined deliverables. The business data warehouse team and the portal team at HighTech, composed of members from both HighTech and ServeProOffshore, were created specifically to support two important information technology platforms through on-going maintenance and response to trouble tickets. The latter would include both correction of broken code and responding to users' request for minor changes or enhancements that would not rise to the level of a major project, typically work efforts of 40 hours or less. ServeProUS performed contractually-directed technology support for ChemResearch, measured by SLAs; while other teams at ChemResearch developed and delivered chemical gas solutions to external and internal customers. Periodic upward and outward reporting were integral parts of the teams' work, communicating their accomplishments against task objectives. This reporting also included financial status and validation of going-forward staffing and financial requirements. The work completed was for external-to-the-team customers and ranged from work such as

resolving information technology trouble tickets to designing new chemical production processes.

It should be noted that not all tasks were undertaken by external direction. In the aftermath of the Katrina hurricane emergency in mid-2005, shortly before the period of the research, a team at ChemResearch supporting a human resources helpdesk and composed of internal and service provider personnel quickly identified the need for a company-wide "touch point" to respond to the natural disaster. ChemResearch had a major facility in New Orleans, and as the situation rapidly unfolded, the team members realized their associates would be impacted. Without direction from their parent organization, they became the clearinghouse for all hurricane-related messages, most importantly serving as a safety net for the directly-impacted associates.

The work of these task-directed teams can be differentiated from the characteristics of communities of knowledge identified by McDermott in other ways. The organizing framework was work plans and trouble tickets, each with specific deliverables and due dates rather than organizing around shared a body of knowledge which would be representative of a community. The organizing principle for the teams was the task, and this was seen in the team meetings in which the structure was provided through reviews of the specific task plans, deliverables, delivery dates, problems encountered, work accomplished to date, and so on. While knowledge sharing was an important, even critical, aspect of all such meetings, the primary purpose was task review. Knowledge sharing supported that activity rather than being the primary intention. During the early stages of outsourcing activities, participants reported that meetings *were* conducted with the specific intent of sharing knowledge as a service provide was brought up to speed with the technology and business environment of an

outsourcing organization, but these were within the context of a workplan-defined knowledge transfer program as an outsourcing activity was initiated.

Team-based Knowledge Management Practices and Larger Organization Influences

A number of different practices were used by the teams to manage the knowledge possessed individually and collectively, the latter reflected in the collective team norms and behaviors. Characterizations formed around the processes used by the teams of different stages of a knowledge life cycle. For example, stages might include acquiring and/or creating non-codified knowledge and knowledge objects, or codified knowledge; updating and maintaining the knowledge; assessing it for use; applying; refining or modifying it for reuse; and sharing and communicating it. All of the respondents noted formal and informal communication as one of the interactions with knowledge while 15 noted creation and acquisition of non-codified knowledge. The latter characterization was best exemplified by the various team meetings that took place where knowledge sharing was done, as noted previously. Application and use were also commonly noted interactions for both knowledge objects (11 respondents) and non-codified knowledge (14).

The practices exhibited by the teams align closely with Blackler's characterization of organizational knowledge (1995). The four of Blackler's five aspects that were seen in the studied teams were, first, that the knowledge was dynamic and in an on-going state of change as also noted by McInerney (2002). Solutions that may have been appropriate in the past may no longer be so in the face of rapidly changing business or organizational conditions. This was seen over the period of the research as the teams had to adjust solutions to new customer requirements. As new products were added to HighTech's portfolio, the business

data warehouse had to modify its reporting capabilities, and understandably in a competitive climate, this was a continuing requirement.

A significant aspect of Blackler's approach to understanding knowing has to do with the role of context. He used the term "situated" knowledge (p. 1041) to denote the relation that exists between individuals' knowledge and the work they are doing. It would include all the characterizations of knowledge posited in this research: procedural knowledge, functional, networked, synthesizing and integrating, and extending. Communication practices and team procedures were observed to differ for the various types, but all were grounded in the contextual work of the teams. Blackler noted that "… as activity systems become interrelated and complex, traditional approaches to organizing are likely to be ineffective. Research is needed into the possibilities for developing communal narratives" (p. 1041). This third trait, the pragmatic aspects of knowing, was seen in the task orientation demonstrated by all the teams.

One of the strands that connected the geographically and temporally dispersed teams was the use of information and communication technologies. In the complex, rapidly changing environments in which the teams worked, these technologies were used as mediated channels and for housing and organizing team information. The observation made by Blackler in 1995 that "… changes associated with new information and communication technologies are combining with other developments, such as new economic and organizational structures and new approaches to management to transform the context of action" (p. 1040) uncannily forecasts the global, multi-organizational work of outsourcing, knit together by enabling technologies, studied in this research.

Blackler posited a fifth quality of knowing, of it being contested, that is, closely related to the use of power. While this may be an appropriate characterization, it was not studied in this research.

Few teams work in total isolation. They work in environments in which they are influenced by external factors: larger organizational influences, activities of other teams, customers, and suppliers, among others. All eighteen of the respondents noted different information technology tools provided by their respective parent organizations as one of the more important enabling factors although it was not universally expressed without misgivings. Several commented on the problems and pressures created by having to continuously in touch via e-mail and instant messaging, to always be on line. These can be important tools enabling person-to-person connection but were also noted as being extremely intrusive. The influences of larger organizational practices and non-technology tools were also noted as important. The formal, structured knowledge transfer practices used by the service provider organizations was one example, and another was the highly developed project management practices used by all the teams, supported by commercially available project management software such as Microsoft Project. The influence of organization culture was evident in the work of the teams and noted by ten respondents, particularly from the participants form ChemResearch. As noted previously, that organization had a long-standing program to support communities of practice and team behaviors, and all stated the importance of the support program in all aspects of team activities.

6.3 Results Related to Communication Practices Used by Teams (Research Question 2)

The intent of this research was to examine the role of communication in the activities of task-directed teams specifically seeking to describe and characterize communication practices in the management of teams' knowledge. Beyond a simple enumeration of the many different direct and mediated ways in which team members communicated (eighteen of 18 mentioned person-to-person dialogue in both formal and informal settings, use of telephone and audio-conferencing, and use of e-mail; 15 noted use of instant messaging; 14 mentioned collaborative activity (doing) as a method of communication; and with decreasing numbers noting other methods), the practices represent the warp and weft of the fabric of communication that bound the teams together. Heaton and Taylor (2002) posit that knowledge is *not* text of individuals' understandings but that it is created and formed in communities, is representative of the practices of that group, and is highly context dependent. Language is what binds the community. Tacit knowledge, they claim, is the set of "background assumptions" (p. 217) that allows the communication to take place. The tacit knowledge is constituted through the discourse of the interactants based on their inter-subjective understanding. This was seen in the studied teams in a number of ways. All relied on face-to-face interactions at the initiation of team activities and respondents stated that this was done to establish a level of interpersonal credibility and trust, and just as importantly, to start the process of building a common vocabulary that would be continuously reconstituted by the interactants through on-going communicative activities. This was demonstrated by the organizations' support for travel that allowed person-to-person contact and knowledge exchange when outsourcing tasks started and entailed travel to and from India as well as extensive travel in the United States. In the observed team meetings

and as described in the interviews, knowledge was shared through unstructured processes of questions and answers, challenge and validation, that led to the constitution of a shared understanding of the problem or issue being addressed.

Trust was a critical dimension of the interactions. Without the climate of trust that existed among the team members from different organizations, for example, the portal support team composed of members from HighTech and ServeProOffshore, the collaborative work and knowledge sharing of the team would not have progressed as easily, if at all (McInerney & Mohr, 2007). The foundation of the trust in these situations was the demonstrated technical expertise and know how evidenced by the individual members.

Another perspective is provided by Southon, Todd and Seneque (2002). They sought to understand how a law firm, an educational institution and a local government council managed and utilized the knowledge that existed in their organizations, and how the functions were integrated into their respective processes and organizational structures. They found that the organizations fundamentally understood the importance of communal information in the work they did, and could differentiate tacit and explicit knowledge. The research showed that information services were present, and used, in each outsourcing and service provider organization and was an essential part of the infrastructure that bound the teams together. This was particularly evident in the work of geographically dispersed teams in HighTech, ServeProOffshore, and ServeProUS that knit their teams' functioning together through the use of enabling information technologies. They shared a common approach to technology utilization and process management, but varied in their management of content, with responsibilities falling in some cases to information professionals while in others to the functional staff (pp. 12 – 27, in-press version). Southon et al. concluded by observing that all

three of the organizations had a firm understanding of the importance of knowledge in the work they did. There may not have been an understanding of the academic or theoretical foundations of this work, but it did not seem to prevent the evolution of situation-specific and sophisticated approaches to managing the knowledge that their organization required. The role of information professionals was not consistent across the three studied organizations, but in some cases they had integrated themselves into the core *de facto* knowledge management practices (pp. 28 – 30).

"Burns has written that technological knowledge is the property of people rather than documents" (Collins, p. 167). Collins goes on to state, "the nature of much of scientific knowledge is such as to make it difficult to organize and hence difficult to investigate accurately with conventional sociological techniques" (p. 167). The traditional social science-based techniques look at more formally defined and accessible knowledge. Knowledge flow should not be seen as simply a process of information packaging in journals, documents, and other objects, but as a small scientific culture wherein knowledge is seen as heterogeneous and its transmission often capricious. The research in this study showed that comparatively more respondents identified interpersonally-based forms of communication as the way information was shared within teams, for example, with 18 noting informal, person-to-person communication, group meetings, and telephone interaction, rather than the most noted explicit, codified forms (13 for trouble ticketing system, 11 for documentation and meeting minutes). Interestingly, collaborative work was also noted more frequently than documenting as a way of sharing information, with 14 responses. From another perspective, using documentation was one way in which participants characterized demonstrating knowledge (13 respondents), but equal importance was given to its

characterization as applied or demonstrated (13). One example of the characterization of knowledge sharing as through its application was provided by a team member from ServeProUS when responding to interview questions about how her team worked. Knowledge is shared by "… bringing up code on a screen and sitting down side by side to say, `What are you doing?' or you know, `Point me to some piece of code you think I can look at'" (organization 2, interviewee 4). In another instance, a manager of the learning performance group at ChemResearch noted that "… the communication is embedded in the process" of collaborative work (organization 5, interviewee 3).

6.4 Results Related to Individuals Engaged in Task-directed Activity Coming to Know Something (Research question 3)

Definitions of personal knowledge begin with an understanding of its relation to information. There is a complex, context-dependent interaction that takes place as personally-held information goes through a transformation to knowledge. Knowledge derives from information through the processes of comparison, understanding consequences, establishing relationships, communicating and sharing information with others and gaining their insights and perspectives (Davenport & Prusak, 1998; Nonaka & Takeuchi, 1995). Further differentiation of knowledge from information can be based on the importance of context in the establishment of knowledge. Information is comparatively context free whereas knowledge is substantially or wholly context dependent (Blair, 2002). This section of the paper deals with individuals' understanding of their knowledge, the influence of group norms and communication practices, and the constitutive development of meaning.

Individual's Understanding of Knowing

The most commonly noted ways in which people stated they knew something, or could validate that another person knew something, was through its demonstration or application (thirteen respondents) or creation of documentation (13). The work that was done was oftentimes collaborative, with several participants from a team working on a solution. There were occurrences seen in the field observations, but more were seen in the informal discussions that preceded and followed scheduled participation in meetings or interviews. In one instance, a HighTech associate with a deep understanding of a particular technical area shared her knowledge with a teammate from ServeProOffshore, and then confirmed that person's understanding by using a web collaboration tool to observe the next work performed when a similar problem was encountered and the newly-informed person had to actually perform a task or function for the first time.

Other methods were used to demonstrate individuals' understanding of their knowledge and of others. These included speaking about the topic, most often informally in meetings or working sessions, noted by five respondents; and teaching others, a more formal approach, also mentioned by five.

Group Norms and Communication Practices

The presence of group norms was noted by all respondents although one did not voice a strong understanding of their use. This characterization based on the interviews was confirmed from the observational data. The participants' practices were consistent with behavioral models that reflect the norms of the teams. These were not documented and were clearly more complex than the structured formalities of customer-supplier relationships. Seventeen of 18 respondents noted the presence of agreed-upon and understood

communication practices. Six struggled with their descriptions of the particular uses of the practices, however, indicating some level of lack of full comprehension and use.

Constitutive Development of Meaning

A constitutive approach to the evaluation of conversation in the work place establishes the role the interactants play in the establishment of meaning and of context. The collaborative development of meaning is dependent upon the conversation itself, as it progresses, based upon the roles the participants fill in the organization as established in the dialogue. Drew and Heritage suggest that "`context' and identity have to be treated as inherently locally produced, incrementally developed and, by extension, as transformable at any moment" (1992, p. 21). Of importance is the concept of framing. Drew and Heritage draw from the work of Goffman in establishing the key role the interactants play in defining the purposes of the activity in which they are engaged. This is continuously being revised and confirmed through the process of the conversation (pp. 8 – 9). This position can be compared to a dialogue extrinsic position in which the factors of the organization are seen to establish structures, or constructs, within which the exchange of information and knowledge may take place. The assessment of organizational communication focuses on the movement of information and different aspects of that movement, for example, the quality of the information, timing and the influence of mediating technologies. In much of the published literature, however, neither the substantial role of the interactants is acknowledged nor the process for the constitutive development of meaning. Conrad and Haynes acknowledge that the communication interactants are seen as processors of the information and not developers of meaning. Meaning, within this framework, is seen as existing prior to interaction and external to the communicators (2001, pp. 51 - 53). "Information remains something that

exists independent of perceivers, and is still some*thing* that social actors use and process…" (p. 53). As noted in the results chapter, the participants were not directly asked if they had a constitutive view, but an inferential understanding was developed through their descriptions of how they came to know something. Expressions such as "… people retain it (knowledge) through experience and share it," (organization 2, interviewee 5), and "… facts are things that kind of everybody agrees to and insights are more perspectives about facts or connections between facts" (organization 5, interviewee 4). The work of the interactants to have implicit knowledge, that which may be explicable but has not yet been explicated, is reflective of the process through which topics are discussed, clarified and resolved through interaction order.

Context is a critical dimension of relationships within organizations, and permeates the assessment of those relationships. Schegloff proposes that dialogue, or the text, determines context to a substantial degree. The ways in which the discursive activity is enacted creates and maintains the context. Within this framework, the concept of "superior" and the authority that accrues to that role during the exchange of information, as a formal assignment or as an informal and situational assumption, carries with it a set of presumed actions and a structuring mechanism for communication. A conversation analytic approach would assess the small structures that constitute interpersonal discourse, for example, turn-repair situations [6]. Conversation analysis was not the methodology used in this research,

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[6] Turns in conversation are the orderly arrangement by interactants in speaking. "Conversation is characterized by **turn-taking**: one participant, A, talks, stops; another, B, starts, talks, stops; and so we obtain an A-B-A-B-A-B distribution of talk across two participants (Levinson, 1983, p. 296). Turn repair occurs when there is some disruption or error in expected flow of conversation and the speaker or the other interactant take steps to correct and continue the orderly flow (Levinson, pp. 339-342; Sacks, Schegloff, & Jefferson, 1974, pp. 723-724).

while a broader assessment looks at the dimensions of context, race and gender (Schegloff, 1987). There was not any strong or overt evidence of formal leadership roles in the activities seen in the field observations with HighTech and ServeProOffshore, but there was clear deference to the person with the subject matter know-how required in a given situation, carrying with it a clear situational constitution.

There are many organizational situations that may be dependent upon the exchange of information but are not the primary purpose of the exchange, or the embedding of information in other implementing actions such as the conduct of meetings, assessment of business cases and competitive analysis. All may entail some form of interactive talk.Huisman asserts that an analysis of the conversation in which decisions are made does not always readily reveal the moment of information exchange or of decision making, but that the conclusions emerge through the turns of conversation and agreement of the participants. These decisions are drawn from the interactants' assessment of the situational variables and the dialogue within which they are established. The formulation and content of decisions are connected to the situations in which they are produced and dependent upon the communicative norms of the decision-making group. These assertions are supported by conversation analysis of several group decision making situations. Implicit in decision making dialogue is the exchange of information, although it is not explicitly identified within the set of situational variables (Huisman, 2001). The director of a ChemResearch group involved with developing new business opportunities described the interactive and discursive nature of idea development and decision making with suppliers and service providers. Work was done "…in small, focused meetings with white boards… always full of information…. Most of us are much better at developing and progressing ideas if we put things on a white

board, challenging something, add to the idea and build on it" (organization 5, interviewee 4).

Stamp and Knap proposed a framework for assessing intent in interpersonal communication that is based alternatively on the perspective of the sender of the message(s), the receiver, and the constitutive interaction that takes place between them. They suggest that the intent is manifest in the behavior of the persons engaged in the dialogues, but based upon differing standpoints. Both the sender and receiver will reflect his or her level of consciousness and may dynamically change throughout the course of the interaction. The interactive perspective suggests that intent lies neither in the sender nor receiver, but in the process of creating intent through the interaction (1990, pp. 282 – 296 (in original text)). Stamp and Knapp's article addresses a general framework for assessment of intent in dialogue, but would seem to be readily adaptable to the specific situation of information exchange in which organizations share and create knowledge. In the interactions observed in the research, the more-general intent of the discourse was framed by the work in which the team members were engaged, the sharing of knowledge used for the accomplishment of tasks such as making corrections to software code in response to trouble tickets. Instances of the task direction in the progress of the team interactions were observed in the face-to-face meetings and teleconferences when participants would bring to the discussion of a particular problem their own initial understandings, but were subject to change during the discussion through the ongoing reconstitution of that understanding based on others' inputs and the problem at hand.

The ability of the interactants to comprehend the situation that is being communicated can lead to the enactment of different interactional strategies. In the work of Cody et al.

(1986) some categories of message exchange are defined, for example as “self-benefit request,” and “exchange.” In this latter category, the authors provide examples of exchange that include promises, debts and bargaining, but interestingly, not information itself. Again, this may be based upon an understanding that information is inherent in the communication and does not need to be explicitly identified, but leaves open the question of whether different strategies would be appropriate and enacted if the primary purpose were information exchange (Cody et al., 1986). In this research on task-directed teams, much of the interaction of the team members entailed the information and knowledge exchanged in the accomplishment of work activities. A wide range of communication practices were evidenced in the teams’ interactions (Appendix A, sub-table B) with the identified purposes of creating and acquiring knowledge, maintaining it, and so on (Appendix A, sub-table A). The research did *not* examine other possible categories of message exchange as defined by Cody et al.

The structured management of institutional knowledge has been subject to heightened interest and study in the past several years as organizations develop a better understanding of the importance of these processes in their organizational effectiveness. The collaborative nature of the work may entail group sessions, often via mediating technologies when groups are geographically dispersed, but also face-to-face interchanges dependent upon interpersonal communication. The establishment and maintenance of context becomes one of the important aspects of successful collaborative actions, based upon an agreed-upon understanding of the information requirements of the group. While the use of facilitating technologies may be an important factor, the underlying functions of understanding the task(s) at hand, geographic and time constraints, and organizational composition of the work

groups need to be confirmed through the process of group communication. Explicitly acknowledged in the work of Garrett and Caldwell are the roles of the interactants in the information exchange and the establishment of context through their dialogue (2002). The model developed by the authors was the closest to a direct recognition of the interpersonal exchange of information within groups or organizations. More technical models describe knowledge management systems that address the cognitive dimensions of information sharing combined with functions and available computational and human resources. These constructs combine knowledge (as an entity) and its manipulating processes, but recognizes the social aspects and organizational aspects of the processes through the roles of the interactants (Abou-Zeid, 2002).

6.5 Other Findings

The purpose of the research was not to study outsourcing models *per se*, with information technology and other outsourcing activities intended to be the context within which communicative aspects of knowledge management would be studied. During the course of the study, however, it was difficult *not* to make observations about the management and communication aspects of outsourcing.

The transition from direct supervision of people to achieve team objectives to managing by measures and SLAs to achieve the same ends, with staff supervised indirectly via the measures, is not an easy one. Many managers prefer the direct interaction of person-to-person supervision. Managed services engagements are designed to be management by measures, so time and effort are devoted to defining the appropriate measures to be used and are reflective of the outsourcing organizations' business requirements and the service providers' capabilities. The generally successful deployment of this model at both HighTech

and ChemRes, with HighTech still in the formative stages of the process, began with extended periods in which first-line supervisors were trained and coached in the new techniques.

Different communication practices were evident based upon the type of outsourcing engagement and maturity of the effort. In managed services engagements, there was focus on formal knowledge transfer processes guided by methodologies and procedures that the service providers brought with them to the engagement. Focus was on understanding current levels of performance, establishing agreed-upon SLAs, and determining benchmark levels of performance with face-to face communication the preferred method of interaction. When operational, periodic communication took place with the SLA measurement reports serving as the medium for communication. Staff augmentation models did not have similar communication practices. They did not have the same formal start-up programs as managed services engagements. Personnel from the service provider organizations joined the outsourcing organizations' teams based on an as-needed basis dependent upon business needs. Knowledge was shared informally through collaborative team activity. No new measurement frameworks were established, with the outsourcing organization's existing measurements used. Communication practices followed the then in-place practices used by the team, and existing knowledge objects were used and maintained.

6.6 Contribution of the Study

A number of summary-level findings were made. The first is that the processes of sharing and creating knowledge in task-directed teams is an active one, responding to dynamic business and technical environments. Much of the knowledge is held tacitly and is not easily codified and captured in documentation. A wide variety of communication

practices were used by the teams to share and create knowledge, with non-mediated, person-to-person discourse playing an important role in the initial stages of outsourcing engagement supporting the development of shared vocabularies by the participants.

Information and communication technologies played an important *enabling* but not the central role. The knowledge of the teams was constituted through the process of communication. While individually held, the communication constituted the socially held knowledge of the team, represented in the teams' processes, procedures, and non-documented norms. Outsourcing is a rapidly evolving business model used by organizations to manage their processes and costs, and the management of knowledge in the start-up and on-going operations of these engagement play a significant role in their success.

Knowledge management practices that rely heavily or wholly on codifying knowledge would not be successful in the team environments observed in this research. The dynamic nature of the knowledge involved in the work, the strong contextual basis of the knowledge, and the tacit nature of the procedural knowledge that formed the basis of the teams' activities would not lend itself easily to codification.

Chapter 7
Conclusion

7.0 Chapter Overview and Purpose

The focus of the research conducted for this dissertation was on developing an understanding of how information is exchanged in everyday work situations through the use of the communication processes of interpersonal discourse, team communication such as meetings, and mediated methods such as web-based collaboration. The information is transformed into knowledge useable by the individual team members through assessment, comparison, and extension, among other techniques, allowing them to fulfill their responsibilities through their actions or providing them with the "capacity to act" to meet organizational objectives (Heaton et al., 2005). The research answered the questions of how procedures and tools are used for information and knowledge sharing, what communication practices are used, and how individuals come to know something.

The context of the research was task-directed teams engaged in outsourcing activities, primarily information technology functions. The interviews and field observations encompassed work done in multiple business organizations in different geographic locations including U.S. and non-U.S. sites. At a summary level, results included the characterization of team-based knowledge as procedural ("know how"), functional ("know what"), networked ("know who" or "know where"), synthesizing and integrating, and extending to new teams. The communication practices used by the teams were seen as diverse and context dependent, and included person-to-person discussion, organization communication, and mediated techniques. The teams' processes and procedures used for the management of knowledge were categorized through the stages or phases of creation and/or acquisition, maintenance

and update, assessment for use, application, and refinement for re-use and extension. Application and codification were seen as the ways in which individuals confirmed their knowledge or demonstrated it to others. The influences of the parent organizations were important in providing facilitating tools and practices, primarily information technology software and hardware infrastructure, and enabling organizational leadership and culture.

The purpose of this chapter is to present the conclusions drawn from the research findings, explain the study limitations, propose areas for additional research, and highlight the significance of the findings. Alternative approaches are assessed that might be used for managing knowledge within the context of organizational work associated with functional task outsourcing.

7.1 Conclusions Drawn from Research Findings

Peeling away the layers of descriptive tables, interview transcripts, SPSS statistical tabulations, and graphic models, there was a buzzing, dynamic, messy world of people communicating to share personal information ("Hey Anujha, how's the new baby?"), work knowledge ("(Manager's name) conducted a session for a week or so to explain everything, whatever objects we have in the BW (business data warehouse) area, and the corresponding R3 (reporting) areas" (organization 4, interviewee 1); and innumerable other task- and ticket-specific exchanges), and the multiplicity of other information that is required to allow teams to function ("Bob, do we still have budget left for hardware in this quarter," or "Is the gang in Bangalore on holiday this Friday?"). The responses to the interview questions allowed for and were designed to have the respondents reflect on their answers, even if briefly, and as such, may not have always conveyed the interactive and untidy nature of the discourse itself. The field observations certainly provided the opportunity for closer examination of the

grounded nature of the teams' dialogues even though the observed situations were scheduled or planned. Drawn from both the neatly tabularized and summarized results of the research and the messiness of the actual, workaday interactions of the teams, there are a number of conclusions that can be drawn from the research results within its defined context, that is, the examination of the role of communication in knowledge management and knowledge exchange in task-directed teams engaged in outsourcing tasks.

Knowledge sharing and creation in the task-directed teams were dynamic processes, responding to the continuously shifting business and technical environments in which the teams worked. Discourse was rarely neat, linear, and continuous as information was gathered on an on-going basis to help resolve the current problems at hand, and could be characterized as iterative and collaborative. Information was shared with other team members and brought to bear on the solution of problems, and through this enactment or potential for enactment, recognized as knowledge. The tasks in which the teams were engaged framed the dialogue and kept the interacteants focused on their resolution. This type of knowledge, know how, was observed to be held substantially tacitly, not easily codified and captured in documentation. While the pressures of time may be one contributing factor to the lack of codification, with new trouble tickets appearing in the queue or other issues arising as quickly as other problems were resolved, the nature of procedural knowledge may not lend itself easily to formal codification, bringing to mind Polanyi's maxim that "we can know more than we can tell" (1983, p.4).

Many communication practices were used to share and create knowledge with non-mediated, person-to-person dialogue playing an important role in the initial stages of outsourcing engagements supporting the development of shared vocabularies by the

participants. Information and communication technologies played important *enabling*, not central, roles. The findings showed that the constitution of tacit knowledge through the discourse of the interactants was based on their inter-subjective understanding and was seen in a number of ways. The participants relied on face-to-face interactions at the initiation of team activities. Respondents stated that this was done to establish a level of interpersonal *credibility and trust*, and to start the process of building a common vocabulary that would be continuously reconstituted by the interactants through on-going communicative activities. To demonstrate shared understandings of meaning, participants in the research used demonstrating their know how to others and through collaborative action ("doing"), speaking about the topic, most often informally in meetings or working sessions, and teaching others.

Knowledge was shared and created through communication processes; and while individually held, the communication constituted the socially held knowledge of the team, represented in the teams' processes, procedures, and non-documented norms. The constitutive nature of communication processes is characterized by Berger and Luckmann in their description of knowledge in everyday life:

> … the sum of linguistic objectifications pertaining to my occupation constitutes another semantic field, which meaningfully orders all the routine events I encounter in my daily work. Within the semantic fields thus built up it is possible for both biographical and historical experience to be objectified, retained, and accumulated…. By virtue of this accumulation a social stock of knowledge is constituted, which is transmitted from generation and which is available to the individual in everyday life….
>
> Since everyday life is dominated by the pragmatic motive, recipe knowledge, that is knowledge limited to pragmatic competence in routine performances, occupies a prominent place in the social stock of knowledge…. (1967, pp. 41-42).

"Everyday life" in this research program was the work performed by teams in the conduct of outsourcing work, and the "routine events" were the information technology or other tasks in which the teams' participants were engaged.

There are implications for instituting knowledge management programs in such contexts with the understanding that the findings cannot be generalized beyond situations such as studied in this research project. While there were formal knowledge transfer programs noted in the initial stages of outsourcing work (ServeProUS's work with ChemReseach, ServeProOffshore and ServeProSpecialized's efforts with HighTech), with formal knowledge transfer documents created, on-going work was not as structured and therefore less likely to be easily codified and captured. The approach of Hansen et al. (2000) to develop knowledge management programs around business practices rather than technology would appear to be an appropriate one to follow in these types of situations wherein "knowledge is closely tied to the person who develops it and is shared mainly through direct person-to-person contact. The chief purpose of computers… is to help communicate knowledge, not store it" (p. 107); and this was amply demonstrated in the collaborative outsourcing work of HighTech with ServeProOffshore and with ServeProSpecialized, and of ChemResearch with ServeproUS. Communication and information technologies were used extensively to enable the teams to communicate and participate in collective action such as on-line code development and debugging but not utilized significantly to capture and codify the knowledge of the team members.

Outsourcing is a rapidly evolving business model used by organizations to manage their processes and costs, and the management of knowledge in the start-up and on-going operations of these engagements plays a significant role in their success. In all the instances

studied, management took an active role in understanding the work that was being done and its progress, and providing support as needed with the most notable example being the provision of the financial resources to allow travel by members of HighTech's teams to travel to India for face-to-face meetings with members of ServeProOffshore at the start of the outsourcing activities.

7.2 Study Limitations

When initially proposed, two limitations were identified. The first was the extent to which the study results can be generalized. While the interviews and field observations provided a grounded, in-depth understanding of two outsourcing and three service provider organizations engaged in information technology and other outsourcing work, and the communication practices used by the team members for knowledge sharing, they do not constitute a sufficiently broad base to form more general conclusions. They *do* support other research as noted in the preceding chapter on research findings and may point the way to other research.

The second limitation that was posited upon proposal was that the collection of data would take place only in planned and scheduled situations. The day-to-day, informal, in-the-hallway conversations or interpersonal e-mails and instant messages that provide important channels for knowledge and information sharing, the *ad hoc* asking of questions as situations arose, were not, for the most part, subject to direct observation as part of this research. The researcher did make numerous visits to the participants' sites, and was able to interact informally; but this provided only a limited window of visibility to such everyday interactions. Much as the practice of "management by walking around" can be an extremely effective method of leadership, rather than simply sitting in one's office, so can "research by

walking around" be an effective method for developing an understanding of the everyday, unscheduled actions of individuals rather than simply doing so in planned meetings. The numerous field visits allowed a reasonably extensive engagement with the research participants in other than formally-planned meetings, and the many uses of informal communication practices were clearly evident, but were not the focus of this research effort. It is suggested that a deeper, ethnographically-based program of research would provide additional insights and is subsequently proposed as an area for additional research.

An additional limitation emerged during the course of the research. The survey instrument, based in part on a tool used by Appleyard and Brown (1994), was designed to assess participating individuals' understandings of their before- and after-task knowledge of the work being performed, assessing whether there was any change that occurred during the knowledge transfer phase of a large outsourcing activity. It was not intended to assess their subject matter knowledge *per se*. Use of the survey was dependent upon the business-requirements-based timing of outsourcing activities, with specified start and end dates, within the period of time in which the research was done. While it had been anticipated that a number of such outsourcing projects would take place during the study, in fact only one did, HighTech's engagement with ServeProSpec. The rapid changes in the participating organizations' business environments that occurred affecting the originally-planned projects was exemplified by the involvement of one organization in a corporate merger at the end of the research, resulting in reassessment of several information technology outsourcing initiatives. As a consequence, the results obtained from the survey were extremely limited; but additional data may provide valuable insights, and may find use in follow-up research

activities that would study other outsourcing projects as part of a post-doctoral research agenda.

7.3 Areas Proposed for Further Research

The study provided answers to the research questions but also revealed a potentially rich vein of information that might prove useful if mined for other valuable results or approached with different techniques. As Heaton et al. suggested in their 2005 study of communication practices used for knowledge sharing by civil servants, extending the study to other functional domains would broaden the understanding of knowledge management practices. Several other areas would warrant assessment for further study:

1. An ethnographically-based program of research in which the researcher would have the opportunity to observe and participate in unplanned, everyday team activities, and individuals' work tasks would provide access to these important channels for knowledge and information sharing, providing additional insights.
2. Extending the use of the survey instrument would allow the assessment of individuals' understanding of their before- and after-task knowledge of the work being performed, and assessing whether there was any change that occurred during the knowledge transfer phase of a larger outsourcing activity. As noted previously, this would need to be planned closely with the participating organizations' outsourcing work plans.
3. Developing a deeper understanding of knowledge elicitation practices would contribute to comprehending ways in which different approaches to explication and codification could support knowledge sharing, and may also have implications for organizational learning programs.

4. As noted previously, in all the situations studied in this research, management took an active role in supporting and guiding the outsourcing activities. Although not within the scope of the program, regular status review meetings were conducted with senior staff members from all participating organizations including the chief information officers and engagement managers. Oftentimes much can be learned from failures or programs that are faltering, and another avenue of possible research would be to identify and conduct research in problematic situations.

Extending the research to other functional domains, assessing the full range of communication practices used in formal and informal settings, and using other research techniques could lead to better understanding of effective knowledge management practices. Communication is central to the sharing and creation of knowledge in teams. "Habitualized actions… retain their meaningful character for the individual although the meanings involved *become embedded as routines* in the his general stock of knowledge, taken for granted by him *and at hand for his projects in the future* (italics added)" (Berger and Luckmann, 1967, p. 53).

7.4 Significance

The significance of the research may be seen along a number of dimensions. The attention being paid to knowledge and its uses within organizations is based upon awareness that businesses, government agencies, and non-governmental organizations have large and substantially untapped assets in the knowledge possessed by their members. Understanding how information is exchanged in workaday situations through communicative processes and transformed into knowledge in organizations and in the task-directed teams that comprise those organizations revealed the everyday practices used for its effective application in the

accomplishment of team activities. This would be of interest to scholars while also providing insight into ways to better align the overall approach to the practical management of knowledge in organizations.

A second dimension of the study's significance lies in its development of deep, grounded descriptions of communication practices and their contribution to the sharing and creation of knowledge in teams. The approach was based upon the careful description of the phenomena being observed, and sought to describe, characterize, and develop and understanding of the relationships that exist among the communication practices, knowledge as a shared resource, and its management and utilization to attain team objectives. This research done in the context of teams engaged in outsourcing activities and expands the theoretical aspects of existing studies (Heaton et al., 2005; Heaton and Taylor, 2002, others).

Perhaps the most significant aspect of the research is the value an interdisciplinary approach yielded to the study. Addressed only from the perspective of library and information studies, insights would have been developed about the explicit nature of the knowledge possessed by teams, and approaches to its management. Alternatively, addressed only from a communication perspective, the discourse-based and constitutive nature of the interactions would have been revealed. Together, based on an understanding of the way in which communication constitutes the way interactants gain and share knowledge, they provided a rich, broad-based viewpoint to assess knowledge sharing and knowledge creation in task-directed teams.

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Appendix A

Rutgers, the State University of New Jersey

School of Communication, Information and Library Studies
4 Huntington St.
New Brunswick, NJ 08901

Interview Protocol and Questions for Assessing Communication Practices in Task-directed Teams

Principal Investigator: Stewart Mohr, doctoral candidate, SCILS
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(908) 256-1450 (cellular)
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Research Focus: The purposes of this pilot study are to develop and refine an interviewing protocol that would be used to assess knowledge management as a communication process in task-directed teams; and to develop a coding structure that would be utilized to assesses the interview transcripts through content analysis. The developed protocol and coding structure would subsequently be used in a full research effort in support of the researcher's Ph.D. dissertation.

Time Frame: Sept. 2004 - Jan. 2006 subject to Rutgers' Institutional Review Board (IRB) continuing approval. Most-current continuing review for Protocol 05-021M received July 28, 2005, with an expiration of July 12, 2006.

Approach: The initial approach will involve the identification of selected organizations in which task-directed teams are performing work. The parent organizations will be contacted, task-directed teams identified, and then members of the teams will be identified along with supporting management. Interviews will be conducted with those agreeing to participate at both the organizational and individual levels; but it is important to *engage knowledgeable participants* and not simply any that might be volunteered by their parent organizations. Interviews will be conducted at various points of the team activities to assess planned or anticipated practices and compare to actual. Transcripts will be made of all interviews and made available to interviewees when requested.

All information will be maintained as confidential, not anonymous. Identifying code will be maintained to ensure linkage between subject's response (interview) and the team and organization to which the response applied. The codes will be maintained by the researcher

as a separate, non-mechanical file (not on researcher's PC) in a secured container.

The principal researcher successfully completed the Human Subjects Certification program on October 18, 2001.

The interview questions will be pre-distributed to the identified participants along with notification that an informed consent will be requested at the time of the interview, and that the interview is completely voluntary with no consequences for non-participation.

- The interviewee will be asked to review the tasks and processes of the team in which he or she works or supports in some way.

- Emphasis will be placed on developing an understanding of the communicative processes employed by the teams to perform their tasks.

Sessions will be recorded and transcribed.

It is estimated that each interviewing session will take approximately 45 – 50 minutes, and should be structured and managed to fit within that window.

Methods: A structured interviewing approach will be followed, but will allow for substantial non-structured, more ethnographically based interviewing information.

Pre-session Reminders: Code interview for subsequent identification and secure code in separate location and medium.

Become familiar with the digital recorder and how to work it.

Bring extra batteries.

Conduct practice sessions with the device.

Ensure the microphone is near the person speaking.

Take notes that will support the recording.

Arrive with sufficient time for setup.

Dress professionally.

Preview the questionnaire, and rehearse the interview

session. Prepare thoroughly. Keep in mind Fowler's three principles of asking factual questions:

"1. Ask people questions they can answer.

2. Make sure that all the key terms and concepts are clearly defined, so people know what question they are answering and they are all answering the same question.

3. Provide a context in which people will see answering questions accurately to be the best way to serve their own interests." (Fowler, 1995, p. 151).

Review Kvale's framing of the qualitative research interviewing process (Attachment 1).

Ask follow-up questions to probe and develop depth and context for the answers.

Stay focused and on topic.

Ask for specific examples to ground respondent's answers.

Interview Outline:

Participant ID: _____

Interview Date: _____

1. *Introduction:* Explain purposes of research and background. Use this and subsequent scripted descriptions as closely as possible for each interview.

   I am a doctoral student at Rutgers University. This work is part of my dissertation research which is studying how team use communication practices to share and create knowledge in the accomplishment of their work.

   Please use your own language and terms when explaining things and answering questions. Don't hesitate to ask questions or to request clarification if anything is unclear.

   The interview should take about 30 – 40 minutes of your time. As you answer each question, try to think of specific instances of what is being asked about that have occurred in the past month.

2. *Introduction:* Explain that all information will be *confidential*.

3. *Introduction:* Explain consent form, and ensure the participant *reviews* and *signs* the form in *both locations*, including agreement to record and have the interview transcribed. Leave one copy with the interviewee and retain one copy for the researcher's records.

4. *Introduction:* Briefly establish agreed-upon definitions for key terms likely to be used in the interview: task-directed teams, communities of practice and knowledge.

   Understanding your use of terms will be one of the areas in which I am particularly interested and I therefore don't want to pre-establish my understanding of knowledge and team communication practices; but I will be interested in your understanding of what task-directed teams are, how you define knowledge in the context of the work you are doing, and what different communication practices mean.

5. What is your role? Title?

6. Describe the work that *your* team has done *in the*

specific current outsourcing activity. What are the specific deliverables that are involved, e.g., prompt for project tasks completed, etc.

7. What is the scope of the project in which you're involved? That is, what work is involved, interactions beyond the organizational boundaries of the task-team itself.

8. How is the team organized? Full-time participants? Virtual organization (explain this would be one that is separated by physical/geographic boundaries or composed of members from multiple parts of the organization and/or external members)?

9. Who established the parameters for the team?

   - Deadlines?
   - Budget?
   - Staffing?
   - Other resources?
   - Processes, procedures, tools, applications?
   - What other external constraints, if any, do you see being imposed on the team?

10. Describe how ***your team works*** in your own terms. What are the nuts-and-bolts mechanics of the team that *you* have seen *in the past month*?

11A. Describe how ***your team communicates***. What are the various practices that are employed? Which are effective and have contributed to the team's working?

Seek characterizations of media used, mode (person-to-person, meeting, etc.), and network (one-to-one, one-to-many, etc.).

Prompt for:

   - Informal, interpersonal
   - Informal group

- Formal face-to-face meetings
- Video-conferencing
- Telephone
- E-mail
- IMing
- Meeting minutes
- Project websites, chat rooms
- Processes, procedures, tools, applications?
- Documentation or other objects?
- *Doing* the task or work, e.g., configuring software.
- What other boundaries, constraints or other do see as being imposed from external to the team?

11B. Describe how the team members communicate with others external to the team. What are the various practices that are employed? Which are effective and have contributed to the team's working?

Seek characterizations of media used, mode (person-to-person, meeting, etc.), and network (one-to-one, one-to-many, etc.).

Prompt for:

- Informal, interpersonal
- Informal group
- Formal face-to-face meetings
- Video-conferencing
- Telephone
- E-mail

- IMing
- Meeting minutes
- Project websites, chat rooms
- Processes, procedures, tools, applications?
- Documentation or other objects?
- *Doing* the task or work, e.g., configuring software.

12. Can you describe in your own words the type(s) of dialogue (exchanges, conversations, interactions) that occur among team members?

13A. Knowledge can be difficult to define, and different people may view it in different ways. How would you define knowledge? How might it be characterized, for example, as documentation, or in people's minds, or in undocumented but practiced procedures.

Seek characterizations of interactions such as knowledge creation, sharing, reification, evaluation, and so on.

13B. How does it relate to the team on which you're working?

13C. How is knowledge shared?

Seek characterizations of these actions such as interacting with documentation (objects), interactions with others, randomly or systematically, completely or partially, and so on.

14. How do individuals go about the process of coming to know something (learning), for example, when a new member joins the team? Are there communication practices that would differentiate this type of communication or dialogue from other, day-to-day dialogue within the team?

15. What measures are used to determine whether "enough" or "sufficient" has been learned? For example, if you will be assuming the work done by another, how do you know when you've learned enough to actually perform the job? Is documentation sufficient?

16. *(Use only in the post-task interview.)* How does an individual come to know something? Can you describe in your own words how you came to know something associated with this outsourcing work? Tell me a story about what it means for you to develop the level of understanding needed to take responsibility for fulfilling a function or task. Please take one specific example and tell me about it in as much detail as you can.

17. Are there parent-organization communicative practices that affect the way the team worked? That the team used, for example, use of on-line corporate bulletin boards and/or websites?

18. Impacts of spatial and temporal boundaries? Cultural?

19. What roles do ICTs play, from the micro to the macro?

20. Are any objects created, for example, documentation? Artifacts? Please describe.

21. *Content closure*: Ask the interviewee to expand on the programs that may exist at his or her organization, expanding on earlier questions.

22. *Communication process closure*: What *didn't* I ask about that you think is worth mentioning? Any un-addressed issues, topics, whatever?

23. *Demographics*: Ask about micro- and macro-organizational context:

    - Industry segment
    - Team size full-time, consultants, etc.
    - What is the experience level of the team participants? Level of training in processes, procedures, communication practices?
    - Team budget (if it would be divulged)
    - Team locations (geographically spread, centralized)
    - Parent organization size in staff, budget, products
    - How long have you been working with the organization?

- … other?

24. *Wrap up* ***for pilot***: Ask about the ease of use taking the interview. Was it easy to take? Did it address all the areas of team practices and communicative processes that are relevant?

25. *Wrap up* ***for pilot***: In terms of the interview, are there changes you would suggest that would make it more effective? Inclusive?

26. *Wrap up*: Reconfirm that the interviewee would like a copy of transcript once completed.

27. *Wrap up*: Thank her or him.

(Appendix A) Attachment 1

Kvale's "Aspects of Qualitative Research Interviews" (1996, pp. 30-31)

"The purpose of the qualitative research interview treated here is to obtain descriptions of the lived world of the interviewees with the respect to interpretations of the meaning of the described phenomena.

Life World. The topic of qualitative interviews is the everyday lived world of the interviewee and his or her relation to it.

Meaning. The interview seeks to interpret the meaning of the central themes in the life world of the subject. The interviewer registers and interprets the meaning of what is said as well as how it is said.

Qualitative. The interview seeks qualitative knowledge expressed in normal knowledge language, it does not aim at quantification.

Descriptive. The interview attempts to obtain open nuanced descriptions of different aspects of the subjects' life worlds.

Specificity. Descriptions of specific situations and action sequences are elicited, not general opinions.

Deliberate Naïveté. The interviewer exhibits an openness to new and unexpected phenomena, rather than having ready-made categories and schemes of interpretation.

Focused. The interview is focused on particular themes; it is neither strictly structured with standard questions, nor entirely "non-directive."

Ambiguity. Interviewee statements can sometimes be ambiguous, reflecting contradictions in the world the subject lives in.

Change. The process of being interviewed may produce new insights and awareness, and the subject may in the course of the interview come to change his or her descriptions and meanings about a theme.

Sensitivity. Different interviewers can produce different statements on the same themes, depending on their sensitivity to and knowledge of the interview topic.

Interpersonal Situation. The knowledge obtained is produced through the interpersonal interaction in the interview.

Positive Experience. A well carried out research interview can be a rare and enriching experience for the interviewee, who may obtain new insights into his or her situation."

Appendix B

Informed Consent Form

(Protocol 05-021M – Interview)

Rutgers, the State University of New Jersey

School of Communication, Information and Library Studies
4 Huntington St.
New Brunswick, NJ 08901

Researchers at the School of Communication, Information and Library Studies at Rutgers University are investigating task-directed work teams and their uses of different communication practices, for example, face-to-face meetings, e-mail, and video conferences. The purpose of this initial part of the study is to develop and refine the processes with which to assess team-based knowledge and information sharing. Interviews with team participants and management will be used to collect the research information. A transcription will be made for each interview with a copy provided to the interview participant upon request after the text has been transcribed. It is anticipated that each interview will take approximately 45 minutes to one hour. *All participants are free to terminate their participation in the study at any time without consequence*.

Results will be reported confidentially, that is, without the identities of the individuals or organizations. When the data are compiled and reported, if there are any instances when disclosure might reveal any specific firm and its activities, that data will be removed. The interview recordings will be kept in a secured location, identified only by code; transcription files will be maintained on the researcher's PC, identified only by code; and the reference list will be maintained on a secured, separate medium. All data files will be physically destroyed three years after research and reporting are completed.

If you have questions about this study after the conduct of the interview, please contact the principle investigator Stewart Mohr at (908) 735-4423 (daytime), (908) 256-1450 (cellular), or e-mail smohr1029@earthlink.net.

If you have any questions about your rights as a research subject, you may contact the Sponsored Programs Administrator at Rutgers University:

Rutgers University Institutional Review Board for the
Protection of Human Subjects
Office of Research and Sponsored Programs
3 Rutgers Plaza
New Brunswick, NJ 08901 – 8559

(732) 932-0150 extension 2104

humansubjects@orsp.rutgers.edu

Continued on Next Page

Continued from Previous Page

I have read and understand the information contained in this letter. The researcher has answered all questions I had to my satisfaction.

Principle Investigator	Stewart M. Mohr	Name of Interviewee	_____
Signature:	_____	Signature:	_____
Date	_____	Date:	_____

I understand that a recording will be made of the interview and that the audio recording will be transcribed. A transcription will be provided upon request after the text has been copied.

Name of Interviewee	_____
Signature:	_____
Date:	_____
Transcript Requested?	☐ Yes ☐ No.

Appendix C

Field Observation Form

(Protocol 05-021M)

Organization ID: _____

Observation Date: _____

Activity being observed. Describe purposes, agenda, other factors.

_____

_____

- ☐ Entail knowledge exchange and sharing between outsourc*er* (service Provider) and the outsourc*ing* organization?
- ☐ Communication about managing the *process of* knowledge exchange and sharing between outsourc*er* and outsourc*ing*?
- ☐ Other? Describe fully

Participants. Describe who is participating and whether in person or by dial-in, web access, video-conference or other.

_____

_____

Length of meeting or activity. _____

Communication practices uses. Describe in detail the communication practices used by the interactants. Indicate occurrences of use, durations and purposes. Indicate medium, mode and interactions (one-to-one, one-to-many, and so on)

- ☐ Formal face-to-face meetings
- ☐ Telephone
- ☐ IM-ing
- ☐ Project websites, chat rooms
- ☐ Documentation or other objects?
- ☐ Web hosting tools (WebEx, NetMeetings, etc.)
- ☐ Video-conferencing
- ☐ E-mail
- ☐ Meeting minutes
- ☐ Processes, procedures, tools, applications?
- ☐ Doing (together, remote or face-to-face)

Field Observation Form

(Protocol 05-021M)

Communication practices uses (Cont'd.) _____

_____

_____

_____

What boundaries, constraints or other problems are observed?

_____

_____

_____

_____

If communication problems are encountered, describe. As an observer, how did you recognize the problem? How was it resolved?

_____

_____

_____

_____

Did issues of trust arise in the knowledge sharing? Explain

_____

_____

_____

_____

Field Observation Form

(Protocol 05-021M)

What was discussed? Topics, agenda, other? Briefly describe the subjects and items covered.

Describe team interactions. Who runs the meeting? What practices used? What activities such as information dissemination, evaluation, or others are observed?

If not described previously, what is the overall context of the meeting or activity?

Attachment(s)? ☐ Yes and describe ☐ No

Appendix D

Rutgers, the State University of New Jersey

School of Communication, Information and Library Studies
4 Huntington St.
New Brunswick, NJ 08901

Pre- and Post-Task Survey Protocol for Assessing Communication Practices in Task-directed Teams

Principal Investigator: Stewart Mohr, doctoral candidate, SCILS
Phone: (908) 735-4423 (daytime)
(908) 256-1450 (cellular)
e-mail: smohr1029@earthlink.net

Research Focus: The purposes of this survey instrument is to support the assessment of knowledge management as a communication process in task-directed teams. The developed instruemnt will be used in a full research effort in support of a doctoral dissertation.

Time Frame: December 2005 - April 2006 subject to Rutgers Institutional Review Board (IRB) approval. Overall protocol received continuing review approval on July 28, 2005, with an expiration of July 12, 2006. This instrument received IRB approval December 7, 2005.

Approach: The approach will involve the completion of the survey instrument at two times during the task process: once before the task has been initiated (printed on green paper), before any knowledge transfer may have taken place; and a second time at the end of the process, when the outsourcing firm is assuming full responsibility for the task or function (printed on goldenrod paper). This is intended to provide an assessment of whether there has been any change in the participants' knowledge states during the knowledge transfer process.

The instrument is intended to be taken by all members of the team assuming responsibility for a task, that is, the outsourcing team.

The principal researcher successfully completed the Human Subjects Certification program on October 18, 2001.

It is estimated that completing each survey will take approximately 10 – 15 minutes

Participant ID: _____

Survey Date: _____

Rutgers, the State University of New Jersey

School of Communication, Information and Library Studies
New Brunswick, New Jersey, U. S. A.

Pre*-task Survey for Assessing Communication Practices in Task-directed Teams*

Researchers at the School of Communication, Information and Library Studies are investigating task-directed work teams and their uses of different communication practices, for example, face-to-face meetings, e-mail, and video conferences. The purpose of this part of the study is to assess participants' understanding of the work to be performed prior to its start, and will be followed by a similar post-task survey. It is anticipated that taking each survey will take approximately 10 – 15 minutes. *All participants are free to terminate their participation in the study at any time without consequence.*

Results will be reported confidentially, that is, without the identities of the individuals or organizations. When the data are compiled and reported, if there are any instances when disclosure might reveal any specific firm and its activities, that data will be removed. Files will be maintained on the researcher's PC, identified only by code; and the reference list will be maintained on a secured, separate medium. All data files will be physically destroyed three years after research and reporting are completed.

If you have questions about this study after the conduct of the survey, please contact the principle investigator Stewart Mohr at (908) 735-4423 (daytime), (908) 256-1450 (cellular), or e-mail smohr1029@earthlink.net.

If you have any questions about your rights as a research subject, you may contact the Sponsored Programs Administrator at Rutgers University:

Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs
3 Rutgers Plaza
New Brunswick, NJ 08901 – 8559
(732) 932-0150 extension 2104
humansubjects@orsp.rutgers.edu

I have read and understand the information contained in this letter and by continuing with the completion of the survey, agree to participate. The researcher has answered all questions I had to my satisfaction.

This informed consent form was approved by the Rutgers Institutional Review Board (IRB) for the Protection of Human Subjects on December 7, 2005, with an expiration on July 7, 2006

PRE-task survey conducted before start of outsourcing activity.

(1) What is your current level of knowledge about the **business or organization** that is outsourcing a function, application or other work?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

(2) What is your current level of knowledge about the **business processes** that are being outsourced?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

(3) What is your current level of knowledge about the **purchased, off-the-shelf application software** that is being outsourced, for example, Oracle or SAP enterprise software?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

(4) What is your current level of knowledge about the **custom-developed application software** that is being outsourced?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

PRE-task survey conducted before start of outsourcing activity.

(5) What is your current level of knowledge about the **technical hardware platform** that is being outsourced?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

(6) What is your current level of knowledge about the **operating system(s)** that is/are being outsourced?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

(7) What is your current level of knowledge about the **desktop software** that is being outsourced?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

(8) What is your current level of knowledge about the **tools, processes, and techniques** that is being used to support the outsourcing activity?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

PRE-task survey conducted before start of outsourcing activity.

(9) What communication practices ***do you anticipate using*** to exchange knowledge in this outsourcing activity?

Check all that apply:

____ Informal, interpersonal

____ Informal group

____ Formal face-to-face meetings

____ Video-conferencing

____ Telephone, audio-conferencing

____ E-mail

____ IMing

____ Meeting minutes

____ Processes, procedures, tools, applications

____ Websites, project chat rooms

____ Documentation or other objects

____ Doing work or tasks

____ Other (please describe): _____

_____

_____

(10) With whom ***do you anticipate communicating*** to exchange knowledge in this outsourcing activity?

Check all that apply:

____ Members of your own team, including participants and leaders

____ Members of your parent organization beyond your own team

____ Clients/customers of the specific outsourcing task in which you are involved

____ Other clients or customers

____ Other outsourcing resources

____ Other (please describe): _____

_____

_____

Thank your for your participation!

Principal Investigator: Stewart Mohr, doctoral candidate, Rutgers University
Phone: (908) 735-4423 (daytime)
(908) 256-1450 (cellular)
e-mail: smohr1029@earthlink.net

Participant ID: _____

Survey Date: _____

Rutgers, the State University of New Jersey

School of Communication, Information and Library Studies
New Brunswick, New Jersey, U. S. A.

Post*-task Survey for Assessing Communication Practices in Task-directed Teams*

Researchers at the School of Communication, Information and Library Studies are investigating task-directed work teams and their uses of different communication practices, for example, face-to-face meetings, e-mail, and video conferences. The purpose of this part of the study is to assess participants' understanding of the work performed after it has been completed, and was preceded by a similar pre-task survey. It is anticipated that taking each survey will take approximately 10 – 15 minutes. *All participants are free to terminate their participation in the study at any time without consequence.*

Results will be reported confidentially, that is, without the identities of the individuals or organizations. When the data are compiled and reported, if there are any instances when disclosure might reveal any specific firm and its activities, that data will be removed. Files will be maintained on the researcher's PC, identified only by code; and the reference list will be maintained on a secured, separate medium. All data files will be physically destroyed three years after research and reporting are completed.

If you have questions about this study after the conduct of the survey, please contact the principle investigator Stewart Mohr at (908) 735-4423 (daytime), (908) 256-1450 (cellular), or e-mail smohr1029@earthlink.net.

If you have any questions about your rights as a research subject, you may contact the Sponsored Programs Administrator at Rutgers University:

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Office of Research and Sponsored Programs
3 Rutgers Plaza
New Brunswick, NJ 08901 – 8559

(732) 932-0150 extension 2104

humansubjects@orsp.rutgers.edu

I have read and understand the information contained in this letter and by continuing with the completion of the survey, agree to participate. The researcher has answered all questions I had to my satisfaction.

This informed consent form was approved by the Rutgers Institutional Review Board (IRB) for the Protection of Human Subjects on December 7, 2005, with an expiration on July 7, 2006

POST-task survey conducted after implementation of outsourcing activity.

(1) What is your current level of knowledge about the **business or organization** that is outsourcing a function, application or other work?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

(2) What is your current level of knowledge about the **business processes** that are being outsourced?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

(3) What is your current level of knowledge about the **purchased, off-the-shelf application software** that is being outsourced, for example, Oracle or SAP enterprise software?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

(4) What is your current level of knowledge about the **custom-developed application software** that is being outsourced?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

POST-task survey conducted after implementation of outsourcing activity.

(5) What is your current level of knowledge about the **technical hardware platform** that is being outsourced?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

(6) What is your current level of knowledge about the **operating system(s)** that is/are being outsourced?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

(7) What is your current level of knowledge about the **desktop software** that is being outsourced?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

(8) What is your current level of knowledge about the **tools, processes, and techniques** that is being used to support the outsourcing activity?

Circle choice that best describes:

None		Some		Large Amount		Great Depth and Breadth	Don't Know	Non-Appl.
1	2	3	4	5	6	7	D	N

POST-task survey conducted after implementation of outsourcing activity.

(9A) What communication practices ***did you actually use*** to exchange knowledge in this outsourcing activity?

Check all that apply:

____ Informal, interpersonal

____ Informal group

____ Formal face-to-face meetings

____ Video-conferencing

____ Telephone, audio-conferencing

____ E-mail

____ IMing

____ Meeting minutes

____ Processes, procedures, tools, applications

____ Websites, project chat rooms

____ Documentation or other objects

____ Doing work or tasks

____ Other (please describe): _____

_____

_____

(9B) Which ***one or two proved most effective***? Please list and briefly describe why.

_____

_____

_____

(10A) With whom ***did you actually communicate*** to exchange knowledge in this outsourcing activity?

Check all that apply:

____ Members of your own team, including participants and leaders

____ Members of your parent organization beyond your own team

____ Clients/customers of the specific outsourcing task in which you are involved

____ Other clients or customers

____ Other outsourcing resources

____ Other (please describe): _____

_____

_____

POST-task survey conducted after implementation of outsourcing activity.

(10B) Of the people with whom you communicated, which ***one or two proved to be the greatest source of knowledge*** about the specific work or responsibilities with which you were involved? Please list and briefly describe why.

_____

_____

_____

(11) Is there anything about the communication practices ***actually used*** to exchange knowledge in this outsourcing activity that was unique or that helped you achieve the team objectives in some way? If so, would you briefly describe.

_____

_____

_____

Thank your for your participation!

Principal Investigator: Stewart Mohr, doctoral candidate, Rutgers University
Phone: (908) 735-4423 (daytime)
(908) 256-1450 (cellular)
e-mail: smohr1029@earthlink.net

Appendix E

Interview and Field Observation Activity Log

Date:	*Location*	*Purpose and length*
Tues., Oct. 5, 2004	Pennsylvania	Initial meeting and request for support from O2 for *pilot* activity (1 hr.)
Mon., Oct. 18	New Jersey	Initial meeting and request for support from O1 for *pilot* activity (1 hr.)
Mon., Oct. 25	New Jersey	Interview one O1 associate for *pilot* (1½ hrs.)
Mon., Nov. 8	New Jersey	Interview one O1 associate for *pilot* (1 hr.)
Mon., Dec. 6	New Jersey	Interview one O1 associate for *pilot* (1 hr.)
Tues., Dec. 28, 2004	Pennsylvania	Interview one O2 associate for *pilot* (1½ hrs.)
Thurs., Jan. 6, 2005	New Jersey	Interview one O2 associate for *pilot* (1 hr.)
Fri., Dec. 9, 2005	New York	Planning and coordination of interviews and field observations with O3 (3 hrs.)
Wed., Jan. 25	Pennsylvania	Planning and coordination of interviews with O2 (1½ hrs.)
Fri., Feb. 10	Pennsylvania	Initial meeting and request for support from O5 (2 hrs.)
Tues., Mar. 7	Pennsylvania	Interview two O2 associates (2 hrs.)
Wed., Mar. 8	New York	Interview three O3 associates (3 hrs.) + plan follow-on field observations

(Cont'd.)

Interview and Field Observation Activity Log *(Cont'd.)*

Mon., Mar. 20	Teleconference	O3 & O4 portal team - *pilot* field observation (1 hr., N.J., N.Y. and Bangalore)
Tues., Mar. 21	Teleconference	O3 & O4 portal team - *pilot* field observation (1 hr., N.J., N.Y. and Bangalore)
Tues., Mar. 21	Pennsylvania	Interview one O2 associate (1 hr.)
Wed., Mar. 22	New York	Interview one O3 associate (1 hr.) + O3 business warehouse team – *pilot* field observation (1½ hrs)
Tues., Mar. 28	Teleconference	O3 & O4 portal team - *pilot* field observation (1 hr., N.J., N.Y., and Bangalore)
Wed., Mar. 29	New York	One abbreviated "story telling" interview with O3 associate (½ hr.) + interview one O4 associate (1 hr.) + web conf. – *pilot* field observation (1 hr.) + O3 & O4 business warehouse team – field observation (1½ hrs, N. J., N.Y., and Bangalore)
Wed., Apr. 5	Teleconference	O3 & O4 business warehouse team – field observation (1 hr., N.J., N.Y., and Bangalore)
Thurs., Apr. 6	Teleconference	Planning and coordination of interviews with O5 (1 hr., N.J. and N.Y.)
Fri., Apr. 7	Teleconference	O3 & O4 portal team – field observation (1 hr., N.J., N.Y., and Bangalore)
Tues., Apr. 11	Pennsylvania	Interview three O5 associates (5 hrs.)

(Cont'd.)

Interview and Field Observation Activity Log *(Cont'd.)*

Wed., Apr. 12	New York	O3 & O4 business warehouse team - field observation (1 hr., N.Y. and Bangalore) + one full interview with O4 associate + one abbreviated "story telling" interview with O3 associate
Wed., Apr. 19	New York	Interview 1 O3 associate + add'l. field observations + informal interview
Tues., Apr. 25	Pennsylvania	Interview three O5 associates + Informal interview (6 hrs.)
Wed., Apr. 26	Teleconference	O3 & O4 portal team – field observation (1 hr., N.J., N.Y., and Bangalore)
Fri., May 5	Teleconference	O3 & O4 portal team – field observation (1 hr., N.J., N.Y., and Bangalore)
Tues., May 9	Teleconference	O3 & O4 HR portal knowledge transfer (1½ hrs., N.J., N.Y., and Bangalore)
Tues., May 23	Teleconference	O3 & O4 HR portal knowledge transfer (1½ hrs., N.J., N.Y., and Bangalore)
Apr. – Aug.	Telephone	On-going dialogue with O6 organizational contact (N.J., Atlanta)

Appendix F

Interviewees and Organizations

Table F1

Pilot Interviews

	Interviewee Position	Org. Code	Organization	Interview Date	Interview Length
Pilot Interviews	Director	O1	Hospital	10/25/2004	36:30
	First-line supervisor and team member	O1	Hospital	11/8/2004	32:00
	Team member	O1	Hospital	12/6/2004	24:18
	First-line supervisor and team member	O2	Info. technology service provider	12/28/2004	37:20
	First-line supervisor and team member	O2	Info. technology service provider	1/6/2005	41:15

Table F2

Research Interviews

	Interviewee Position	Org. Code	Organization	Interview Date	Interview Length
Research Interviews	First-line supervisor and team member	O2	Info. technology service provider	3/7/2006	42:40
	Team member	O2	Info. technology service provider	3/7/2006	28:57
	First-line supervisor and team member	O3	High technology research and manufacturer, outsourcing	3/8/2006	30:06
	First-line supervisor and team member	O3	High technology research and manufacturer, outsourcing	3/8/2006	50:08
	First-line supervisor and team member	O3	High technology research and manufacturer, outsourcing	3/8/2006	37:35
	First-line supervisor and team member	O2	Info. technology service provider	3/21/2006	40:40
	Team member	O3	High technology research and manufacturer, outsourcing	3/22/2006	30:34
	Team member	O3	High technology research and manufacturer, outsourcing	3/29/2006	18:15
	First-line supervisor and team member	O4	Info. technology service provider	3/29/2006	39:19
	Director	O5	Chemical research and manufacturer, outsourcing	4/11/2006	44:08
	Director	O5	Chemical research and manufacturer, outsourcing	4/11/2006	36:40
	First-line supervisor and team member	O5	Chemical research and manufacturer, outsourcing	4/11/2006	37:56
	First-line supervisor and team member	O4	Info. technology service provider	4/12/2006	42:28
	Team member	O3	High technology research and manufacturer, outsourcing	4/12/2006	39:20
	Director	O3	High technology research and manufacturer, outsourcing	4/19/2006	42:00
	Director	O5	Chemical research and manufacturer, outsourcing	4/25/2006	36:37
	First-line supervisor and team member	O5	Chemical research and manufacturer, outsourcing	4/25/2006	45:23
	Director	O5	Chemical research and manufacturer, outsourcing	4/25/2006	32:07

Appendix G

Field Observations

Table G1

Pilot Field Observations

	Team Function	Participating Organizations	Observation Date
Pilot Field Observations	Portal team	- High technology research and manufacturer, outsourcing (O3) - Info. technology service provider (O4)	3/20/2006 *(via teleconf.)*
	Portal team	- High technology research and manufacturer, outsourcing (O3) - Info. technology service provider (O4)	3/21/2006 *(via teleconf.)*
	Business data warehouse team	- High technology research and manufacturer, outsourcing (O3) - Info. technology service provider (O4)	3/22/2006
	Portal team	- High technology research and manufacturer, outsourcing (O3) - Info. technology service provider (O4)	3/28/2006 *(via teleconf.)*
	Netweaver briefing	- High technology research and manufacturer, outsourcing (O3) - Info. technology service provider (O4)	3/29/2006

Table G2

Research Field Observations

	Team Function	Participating Organizations	Observation Date
Research Field Observations	Business data warehouse team	- High technology research and manufacturer, outsourcing (O3) - Info. Technology service provider (O4)	3/29/2006
	Business data warehouse team	- High technology research and manufacturer, outsourcing (O3) - Info. Technology service provider (O4)	4/5/2006 *(via teleconf.)*
	Portal team	- High technology research and manufacturer, outsourcing (O3) - Info. Technology service provider (O4)	4/7/2006 *(via teleconf.)*
	Business data warehouse team	- High technology research and manufacturer, outsourcing (O3) - Info. Technology service provider (O4)	4/12/2006
	Business data warehouse team	- High technology research and manufacturer, outsourcing (O3) - Info. Technology service provider (O4)	4/19/2006
	Individual interview	- High technology research and manufacturer, outsourcing (O3)	4/19/2006
	Individual interview	- Chemical research and manufacturer, outsourcing (O5)	4/25/2006
	Portal team	- High technology research and manufacturer, outsourcing (O3) - Info. Technology service provider (O4)	4/26/2006 *(via teleconf.)*
	Portal team	- High technology research and manufacturer, outsourcing (O3) - Info. Technology service provider (O4)	5/5/2006 *(via teleconf.)*
	HR portal knowledge transfer	- High technology research and manufacturer, outsourcing (O3) - Info. Technology service provider (O4)	5/9/2006 *(via teleconf.)*
	HR portal knowledge transfer	- High technology research and manufacturer, outsourcing (O3) - Info. Technology service provider (O4)	5/23/2006 *(via teleconf.)*
	HR application outsourcing (individual interviews)	- Info. Technology service provider (O6)	Various

Appendix H

Survey Results

Table H1

Survey Results

Question	Familiarity with…	New Team Members						Outsourcing Project												Summary		
		O4S1			O4S2			O6A1			O6B1			O6C1			O6D1					
		Before	After	Change	Before	After	Change	Before	After	Change	Before	After	Change	Before	After	Change	Before	After	Change	Before	After	Avg. Change
1	outsourcing business org.	5	5	0	3	4	1	3	6	3	3	6	3	3	6	3	3	5	2	20	32	2.00
2	outsourcing business processes	3	3	0	3	4	1	3	6	3	3	6	3	3	6	3	3	5	2	18	30	2.00
3	purchased software	6	6	0	3	3	0	7	7	0	3	5	2	5	5	0	5	3	-2	29	29	0.00
4	custom-developed software	5	5	0	3	5	2	1	4	3	0	3	3	5	6	1	5	7	2	19	30	1.83
5	technical hardware platform	0	0	0	4	4	0			0			0			0	0	5	5	4	9	1.67
6	operating systems	0	0	0	4	6	2			0			0			0	0	5	5	4	11	2.33
7	desktop software	0	0	0	3	6	3			0			0			0	0	6	6	3	12	3.00
8	outsourcing tools, processes…	6	7	1	4	5	1	1	5	4	2	6	4	1	5	4	1	7	6	15	35	3.33
9	thought would be used, didn't	Person-to-person																				
		Documentation																				
	not anticipated, used							telephone						telephone								
10	thought would comm. with, didn't																					
	not anticipated, comm. with	Larger org.						clients			clients											

Appendix I

Research Results for All Categories from Interview Content Analysis

Table I1

Research Question 1 Content Analysis Axial Categories

			Results Summary	
Research Questions and Subtending Questions			Results Axial Categories	Number of Respondents
RQ1: How are procedures and tools used for information and knowledge sharing in task-directed teams?	How is knowledge defined in the organization?	Characterization	Procedural ("know how")	16
			Functional ("know what")	12
			Networked ("know where" or "know who")	6
			Synthesizing and integrating (applying to new situations)	5
			Extending to new teams	4
		Tacit / Explicit	Tacit / Explicit	3
	What is a task-directed team as practiced by the organization?	Characterization	Source of objectives, funding - external	16
			Source of objectives, funding – internal	5
			Team deliverables - external	18
			Team deliverables – internal	6
			Organizing framework – work plan or tickets	13
			Organizing framework – other than work plan or tickets	6
			Team cohesion (what keeps team together, aligned) – task	18
			Team cohesion (what keeps team together, aligned) – non-task	6
		Primary Outsourcing Management Paradigm (mutually exclusive)	Management by direct staff supervision (staff augmentation)	10
			Management by measures (SLAs, etc.)	5
			Not noted	3
	How do teams manage the knowledge they possess?	Procedures, tools and processes	Creation and/or acquisition	15
			Update and maintain	10
			Assessment for use, applicability	6
			Application, utilization – routine use	12
			Application, utilization – non-routine use	2
			Refining for re-use or extension	3
			Communication – within team, formal	16
			Communication – within team, informal	18
			Communication – outside team, formal	12
			Communication – outside team, informal	12

(Continued on next page)

(Continued from above) RQ1: How are procedures and tools used for information and knowledge sharing in task-directed teams?	*(Continued from above)* How do teams manage the knowledge they possess?	Interactions with knowledge objects	Creation and/or acquisition	13
			Update and maintain	12
			Assessment for use, applicability	5
			Application, utilization – routine use	14
			Application, utilization – non-routine use	4
			Refining for re-use or extension	4
			Communication – within team, formal	12
			Communication – within team, informal	12
			Communication – outside team, formal	6
			Communication – outside team, informal	8
	What are the larger organizational influences?	Influence categories	Tools - IT	18
			Tools – non-IT	11
			Policies	5
			Practices	14
			Culture	10
			Leadership (outside of team leadership)	11

Table I2

Research Question 2 Content Analysis Axial Categories

Research Questions and Subtending Questions			Results Summary	
			Results Axial Categories	Number of Respondents
RQ2: What communication practices are used to share information and knowledge?	What are the different methods of interpersonal and organizational communication used…in practice?	Communication Methods	Person-to-person - individual, formal	1
			Person-to-person – individual, informal	18
			Person-to-person – group, formal	18
			Person-to-person – group, informal	18
			Person-to-person - mixed (face-to-face combined with mediated)	13
			Video-conferencing	0
			Telephone person-to-person	18
			Group audio-conferencing	18
			E-mail	18
			Instant Messaging	17
			Process, procedures, tools, applications	5
			Trouble ticketing system	13
			Websites, project chat rooms	1
			Documentation, meeting minutes or other objects	11
			Collaborative working (doing)	14
			Other	13

Note: Subtending question within RQ2 concerning the constitutive basis to the development of meaning not captured in axial coding categories.

Table I3

Research Question 3 Content Analysis Axial Categories

Research Questions and Subtending Questions			Results Summary	
			Results Axial Categories	Number of Respondents
RQ3: How do individuals engaged in task-directed activity come to know something?	How do individuals know they know something?	Characterization	Demonstrated or applied	13
			Recited (individually, compared to taught)	5
			Documented	13
			Taught (shared with group	5
	What role do group norms and practices play?	Presence or absence (mutually exclusive)	Present – recognized and followed	17
			Present – not well recognized or followed	1
			Not noted or observed	0
			Not response for respondent	0
	Is there a taxonomy of communicative practices?	Presence or absence (mutually exclusive)	Present – recognized and used	11
			Present – not well recognized	6
			Not noted or observed	1
			Not response for respondent	0

Note: Subtending question within RQ3 concerning the constitutive basis to the development of meaning not captured in axial coding categories.

Table I4

Non-positional Roles

Research Questions and Subtending Questions		Results Summary	
		Results Axial Categories	Number of Respondents
Other information	Non-positional roles	Project / program manager	8
		Subject matter expert (SME)	18
		Coordinator (“boundary spanner”)	4
		Knowledge management and communities of practice support	4

Appendix J

Code Book and Coding Sheet

Document Purpose: This codebook provides guidance to coders on how to assess the transcripted interviews for research protocol 05-021M, the study of knowledge management as a communicative process in organizations

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Research Focus: The purpose of the overall research is to assess knowledge management as a communication process in task-directed teams. A coding structure will be utilized to assesses the interview transcripts through content analysis.

Approach: The initial research activity entailed the identification of selected organizations in which task-directed teams are performing work. The parent organizations were contacted, task-directed teams identified, and then members of the teams were identified along with supporting management. Interviews were conducted with those agreeing to participate at both the organizational and individual levels; but it was important to *engage knowledgeable participants* and not simply any that might be volunteered by their parent organizations. Interviews were conducted at various points of the team activities to assess planned or anticipated practices and compare to actual. Transcripts were made of all interviews and made available to interviewees when requested. Each interviewing session took approximately 45 – 50 minutes, and was structured and managed to fit within that window.

The resulting transcripts range in length from 14 pages to 22.

Purpose: The purpose of the descriptive content analysis is to portray and characterize the phenomena defined within the scope of the research questions. Some of these descriptions and characterizations may not, will not, necessarily be found in the response to any one question but through the breadth of the respondent's answers, for example, a characterization of knowledge. Framing the coding are the three research questions:

Research Question 1:	How are procedures and tools used for information and knowledge sharing in task-directed work teams?
Research	What communication practices are used to share

Question 2:	information and knowledge? How do communication processes enable or disrupt information sharing and the transfer of knowledge?
Research Question 3:	How do individuals engaged in task-directed activity come to know something about the specific work or responsibilities with which they are involved? To what degree is the knowing individually-centered (based) or group-centered (based)?

Methods: A structured interviewing approach was followed, but allowed for substantial non-structured, more ethnographically based interviewing information. The transcribed interviews reflect this less-structured collection.

Level of Measurement: The categories proposed in this codebook are at a nominal level of measurement, that is, identification of groupings that are distinct form one another, but are *not* mutually exclusive unless so noted

Process: Review the transcripts one by one. For each response to an interview question, assign at least one characterization category and as many additional as appropriate. *Important to note that any one interview response may contain characterizations applying to multiple descriptive categories.*

13 different descriptive categories are identified in the coding structure (see the analysis criteria in the following section and Appendix A). Many have several sub-categories.

When assigning characterizations that may be subject to question, note the location in the margin of the Code Form (Appendix A).

May of the characterizations are reasonably straight forward and simply need to be noted, for example, use of e-mail or instant messaging. *The more challenging will require discernment on the part of the coder, for example, characterizing knowledge; and may require review and confirmation through the coding structure and training.*

Analysis of Transcribed Interviews to Establish Inter-coder Reliability

1. Identify the formal organizational position of the respondent and categorize. This may (will) not be directly discernable from the person's title. *Categories are mutually exclusive*.
   a. *Directors,* or in some cases managers, are individuals involved in the planning and oversight of task team activities but not engaged in day-to-day functioning of the teams or involved in the teams' communication practices.
   b. *First-line supervisors and team members* were individuals involved in both the planning and oversight of task team activities and in the day-to-day functioning of the teams and their communication practices. These leaders provided the hands-on direction for the work the teams were performing and the practices used to achieve the teams' objectives.
   c. *Team members* were individuals engaged in the work of the teams and were often key players in the knowledge transfer activities, but not formally involved in the planning and oversight of the task teams

2. Identify the informal roles filled by respondents. Examples of these non-positional roles would include but not be limited to the following:
   a. Project / program manager
   b. Subject matter expert (SME)
   c. Coordinator ("boundary spanner")
   d. Knowledge management and communities of practice support

3. Assess how knowledge is characterized by the respondents in the context of their responses.

   Respondents may characterize knowledge in a number of different ways throughout the interview. Note each that occurs. *Categories are not mutually exclusive.*

   Characterizations:
   a. Procedural ("know how"). Indication of task-directed or task-based work often associated with performing work. Examples would include comments about coding practices, inputting or maintain trouble tickets.
   b. Functional ("know what"). Understanding the business context of the work to be done. Indicated by expression of the priority in which work should be addressed, business partners for whom work would be done, integration with other applications.
   c. Networked ("know where" or "know who"). Expression of not knowing what or how to perform a task, but comprehension of to whom to turn to get an answer, or where to look, for example, specific documentation.
   d. Synthesizing and integrating (applying to new situations or problems). Based upon current base of knowledge, does respondent describe how it might be used in other situations, other problems? This would be reflected as some non-serial ("jump shift") extension.

e. Extending to new teams (using existing knowledge in new context). Can another team use the current team's knowledge? This may seen in the use of the first team's documentation, knowledge sharing sessions.

f. None noted at any point throughout interview.

4. Tacit or explicit

Respondents may also characterize knowledge as either tacit or explicit. This characterization is separate from the preceding ones. Note when occurs but not whether defined in one way or another. *Categories are mutually exclusive*, that is, respondents either mention this aspect of knowledge or they don't. Respondents should use the exact word, and coder should not attempt to make inferential assumptions.

5. Describe characteristics of task-directed teams as practiced by the organizations are characterized. These characteristics may be found in responses to many different questions. Please enumerate all.

Respondents may identify various aspects of how the teams work. *Categories are not mutually exclusive*.

Characterizations:

a. Source of objectives, funding – external to the team

b. Source of objectives, funding – internal to the team

c. Team deliverables – external

d. Team deliverables – internal

e. Organizing framework – work plan or tickets

f. Organizing framework – other than work plan or tickets

g. Team cohesion (what keeps team together, aligned) – aligned around tasks, deliverables

h. Team cohesion (what keeps team together, aligned) – non-task

i. Other

6. If discernable, identify the primary outsourcing management paradigm (mutually exclusive). By this is meant whether the first line supervisors directly manage the service providers' (outsourcers') resources, or whether they manage indirectly through measures such as SLA and do no get engaged in the direction of day-to-day activity. *Categories are mutually exclusive*

a. Management by direct staff supervision (staff augmentation)

b. Management by measures (SLAs, etc.)

c. Not noted

7. How do teams manage the knowledge they possess? What procedures, tools and processes are used and in what ways? This would involve all aspects *other than* when interacting with knowledge objects.

   Respondents may identify various characterizations. *Categories are not mutually exclusive*.

   a. Creation and/or acquisition
   b. Update and maintain
   c. Assessment for use, applicability
   d. Application, utilization – routine use
   e. Application, utilization – non-routine use
   f. Refining for re-use or extension
   g. Communication – within team, formal
   h. Communication – within team, informal
   i. Communication – outside team, formal
   j. Communication – outside team, informal

8. How do teams manage the knowledge objects they possess? What procedures, tools and processes are used and in what ways? This would involve all aspects when interacting *with knowledge objects*.

   Respondents may identify various characterizations. *Categories are not mutually exclusive*.

   a. Creation and/or acquisition
   b. Update and maintain
   c. Assessment for use, applicability
   d. Application, utilization – routine use
   e. Application, utilization – non-routine use
   f. Refining for re-use or extension
   g. Communication – within team, formal
   h. Communication – within team, informal
   i. Communication – outside team, formal
   j. Communication – outside team, informal

9. Identify the larger organizational influence categories.

   Respondents may identify various characterizations. *Categories are not mutually exclusive*.

   a. Tools – IT
   b. Tools – non-IT
   c. Policies
   d. Practices
   e. Culture
   f. Leadership (outside of team leadership)
   g. None identified

10. What communication practices are used to share information and knowledge? What are the different methods of interpersonal and organizational communication used… in practice?

    Respondents may identify many different practices. Identify them all at as granular a level as possible. *Categories are not mutually exclusive*.

    a. Person-to-person - individual, formal
    b. Person-to-person – individual, informal
    c. Person-to-person – group, formal
    d. Person-to-person – group, informal
    e. Person-to-person - mixed (face-to-face combined with mediated)
    f. Video-conferencing
    g. Telephone person-to-person
    h. Group audio-conferencing
    i. E-mail
    j. Instant Messaging
    k. Process, procedures, tools, applications
    l. Trouble ticketing system
    m. Websites, project chat rooms
    n. Documentation, meeting minutes or other objects
    o. Collaborative working (doing)
    p. Other

11. How do individuals know that they know something, or understand that others know something?

    Respondents may identify many ways. Identify them all at as granular a level as possible. *Categories are not mutually exclusive.*

    a. Demonstrated or applied
    b. Recited (individually, compared to taught)
    c. Documented
    d. Taught (shared with group)
    e. Other or not indicated

12. What role do group norms and practices play? Note the presence or absence of these norms, but not separately enumerating them for this question.

    These categories are mutually exclusive.

    a. Present – recognized and followed
    b. Present – not well recognized or followed
    c. Not noted or observed
    d. Not response for respondent

13. Is there a taxonomy of communicative practices? Note the presence or absence of these taxonomies, but not separately enumerating them for this question.

    These categories are mutually exclusive.

    a. Present – recognized and used
    b. Present – not well recognized
    c. Not noted or observed
    d. Not response for respondent

Participant ID: _____
Coder: _____

Interview Date: _____
Coding Date: _____

1. **Formal Organizational Position**
   a. Directors
   b. First Line Supervisors
   c. Team Members

2. **Informal Roles Files**
   a. Project / Program Manager
   b. Subject Matter Expert
   c. Coordinator (boundary spanner)
   d. Knowledge management & communities of practice

3. **How Knowledge is Characterized**
   a. Procedural (know how)
   b. Functional (know what)
   c. Networked (know where, who)
   d. Synthesizing and integrating
   e. Extending to new teams
   f. None noted

4. **Tacit or Explicit**

5. **Characteristics of task-directed teams**
   a. Source of team objectives, funding- external to team
   b. Source of team objectives, funding- internal to team
   c. Team deliverables- external
   d. Team deliverables- internal
   e. Organizing Framework- work plan / tickets
   f. Organizing Framework- other than work plan / tickets
   g. Team cohesion- aligned around tasks, deliverable
   h. Team cohesion- non taks
   i. Other

6. **Primary outsourcing management paradigm**
   a. Direct staff supervision (staff augmentation)
   b. Measures (SLA's etc)
   c. Not Noted

7. **How Knowledge is Managed**
   a. Creation or acquisition
   b. Update and Maintain
   c. Assessment for use, applicability
   d. Application, utilization- routine use
   e. Application, utilization- non-routine
   f. Refining for re-use or extension
   g. Communication w/in team formal
   h. Communication w/in team informal
   i. Communication outside team formal
   j. Communication outside team informal

8. **How Knowledge Objects are Managed**
   a. Creation or acquisition
   b. Update and Maintain
   c. Assessment for use, applicability
   d. Application, utilization- routine use
   e. Application, utilization- non-routine
   f. Refining for re-use or extension
   g. Communication w/in team formal
   h. Communication w/in team informal
   i. Communication outside team formal
   j. Communication outside team informal

9. **Larger Organizational Influence Categories**
   a. Tools- IT
   b. Tools- non IT
   c. Policies
   d. Practices
   e. Culture
   f. Leadership (outside of team leadership)
   g. Non identified

10. **Communication Practices**
    a. P2p individual, formal
    b. P2p individual, informal
    c. P2p group formal
    d. P2p group informal
    e. P2p mixed (f2f w/ cmc)
    f. Video conferencing
    g. Telephone p2p
    h. Group audio conferencing
    i. Email
    j. IM
    k. Process procedures, tools, apps
    l. Trouble Ticketing System
    m. Websites, project chat rooms
    n. Documentation, meeting minutes, other objects
    o. Collaborative working (doing)
    p. Other

11. **How do people know they know something?**
    a. Demonstrated, applied
    b. Recited
    c. Documented
    d. Taught (shared)
    e. Other, not indicated

12. **Role group norms play**
    a. Present, recognized and followed
    b. Present, not recognized or followed
    c. Not noted or observed
    d. No response

13. **Taxonomy**
    a. Present, recognized and followed
    b. Present, not recognized or followed
    c. Not noted or observed
    d. No response

Appendix K

Intercoder Reliability Statistical Analysis (from SPSS)

Researcher * Coder_1 Crosstabulation

Count

		Coder_1			
		.00	1.00	2.00	Total
Researcher	.00	37	2	0	39
	1.00	0	99	0	99
	2.00	0	1	1	2
Total		37	102	1	140

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Measure of Agreement	Kappa	.948	.030	11.668	.000
N of Valid Cases		140			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Researcher * Coder_2 Crosstabulation

Count

		Coder_2			
		.00	1.00	2.00	Total
Researcher	.00	35	4	0	39
	1.00	4	94	1	99
	2.00	0	1	1	2
Total		39	99	2	140

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Measure of Agreement	Kappa	.831	.051	10.332	.000
N of Valid Cases		140			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Curriculum Vita

Education

2007	Ph.D., School of Communication, Information and Library Studies, Rutgers, the State University, New Brunswick, New Jersey
2002	Post-masters Certificate, School of Communication, Information Library Studies, Rutgers, the State University, New Brunswick, New Jersey
1976	Master of Business Administration, School of Business Administration, University of Massachusetts, Amherst, Massachusetts
1970	Master of Library Service, School of Library Service, Rutgers, the State University, New Brunswick, New Jersey
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Nov., 2000 - Sept., 2004	Senior Manager, Financial Planning, Strategy and Library Services, Agere Systems, Allentown, Pennsylvania
Apr., 1994 - Oct., 2000	Information Technologies Director, Microelectronics CIO and Service Provider CIO, Lucent Technologies (post-AT&T), Berkeley Heights, New Jersey
June, 1976 - April, 1994	Manager, Application Systems, Pratt and Whitney, division of United Technologies Corporation, East Hartford, Connecticut
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Publication

2007	McInerney, C. R., & Mohr, S. M. (2007). Trust and knowledge sharing in organizations: theory and practice. In C. R. McInerney & R. E. Day (Eds.). *Re-thinking Knowledge Management: from Knowledge Objects to Knowledge Processes* (in press). Dortrecht, the Netherlands: Springer-Verlag.