INFORMATION PARTNERSHIPS: A STRATEGY FOR THE ROUTINIZATION OF INFORMATION SYSTEMS

by

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Abstract

Information Partnerships: A Strategy for the Routinization of Information Systems

by

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Information partnerships are defined as the partnerships forged between different user groups (such as production, materials planning or finance) and the analyst groups as well as among the user groups themselves in an organization. In any information systems (IS) project, there are multiple user-analyst and user-user groups involved, with each individual in the IS project group representing a single or multiple groups at different levels in the organization, such as division, department or unit.

Each group in the organization is concerned primarily with its specific function(s), and attempts to specialize in that function(s). Information partnerships combine the skills and expertise of the all the different user-analyst and user-user groups to produce a collective synergy and bring together the organization's capabilities and resources to effectively develop and routinize any IS in the organization.

Routinization of an IS goes beyond the development and implementation stages of the IS. Routinization of the IS occurs when the IS becomes a normal or routine part of the organization's daily business operations and is not considered a novel innovation anymore.

Using ethnography, this study looked at one organization, and explored how information partnerships among the various user-analyst and user-user groups are formed

and fostered in the IS project, the characteristics of the information partnerships, and how they lead to the positive routinization of the IS in the organization.

It was found that information partnerships actually comprise a complex profile of social and personal identities, many of which may be conflicting and/or antagonistic. At the same time, there are several attributes or characteristics, both negative and positive, in the organization that significantly influence these information partnerships. Also, timely interventions, both by senior management and by the individuals in the information partnerships, cause significant empowerment to the information partnerships. As the information partnerships evolve over time, they influence the routinization of the IS in the organization.

Strategies are provided for IS practitioners in organizations to develop, foster and facilitate information partnerships in organizations and enable the routinization of IS in the organization. The implications of this study for researchers are outlined along with indications for future research.

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In all humility I first pray to the Lord Almighty who always blesses His children on earth and constantly watches over them. Without praying to Him first, I could not possibly thank anyone else. The Lord enables us to achieve everything in life and does this using other people as His instruments to help us and guide us through life.

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Chapter 1

Introduction

Business organizations are perhaps the largest users of computer-based information systems (IS). Information technology (IT) and successfully implemented and routinized IS form a critical part of the success or failure of today's business organizations.

Several companies have witnessed the sad failure, and sometimes the demise, of multi-million dollar business IS, such as Enterprise Resource Planning (ERP) systems, Materials Requirement Planning (MRP) systems, Supply Chain Management (SCM) systems, Customer Relationship Management (CRM) systems, or any other such business IS. The IS research and trade literature is replete with examples of such failures or demises of business information systems, for example, Perlman (2005), Wailgum (2005).

According to the Gartner Group, through the year 2006, more than 50 percent of all customer relationship management system implementations will be viewed as failures. These failures will be due to a combination of inability to link channels, lack of process redesign, or failure to provide any real customer benefits (Gartner News, 2001).

Osterland (2000) describes how the $115 million massive enterprise resource planning system from SAP AG and two other vendors failed miserably at Hershey Food Corp. in Hershey, Pennsylvania. Osterland (2000) states that during the busiest time of the year for Hershey, big customers like WalMart and Kmart were loading up on extra Halloween candy from competitors like Mars and Nestlé, while Hershey warehouses piled up with undelivered Kisses, Twizzlers, and peanut-butter cups. As a result,

Hershey's third-quarter sales in 1999 dropped by a staggering 12.4 percent compared with the previous year, and earnings were off 18.6 percent (Osterland, 2000).

According to Osterland (2000), several other companies have faced similar struggles and/or disasters with ERP systems, some prominent companies being Whirlpool, Boeing, Dow Chemical, Dell Computers, Apple Computers and Waste Management.

Gibbs (1994) describes how the Denver's new international airport was delayed for more than a year, at a cost of more than $1 million a day, due to a software problem in the automated baggage-handling system.

India's Indira Gandhi Conservation Monitoring Centre was intended to be a national information provider based on a set of core environmental IS. Despite more than a year of planning, analysis and design work, these IS never became operational, and the whole initiative collapsed (Heeks, 2002, Puri et al., 2000).

In Thailand, the Tax Computerization Project in the Revenue Department set out with the task of computerization of seven areas of taxation. At the end of the project, only two areas had been partly computerized, and five others were not operational (Kityadisai, 2000).

These and other business organizations have seen the gross dysfunctionality of such IS and, in attempting to revive these systems for some use to the organization, are trying to figure out what the reasons are for such dysfunctionalities.

For example, in the Accounts and Personnel Computerization Project of Ghana's Volta River Authority, it was figured out that most managerial staff in the finance

department were pleased with the changes brought about by the new IS. On the other hand, the lower-level staff in the department was filled with feelings of resentment, bitterness, and alienation caused by the implementation of the new IS (Tettey, 2000).

One possible explanation that has been offered is that it is not the technology that is at fault, but it is the people involved in the process of assessing business and user requirements before, during and after the development and routinization of the computer-based IS and associated applications (for example, Buxbaum, 2004). IT in most cases has been heavily managed, whereas the management of information processes -- identifying needs, acquiring information, organizing and storing information, developing information products and services, distributing information, and using information -- has not received the same level of attention, and in some cases, has been largely neglected. These processes significantly affect the type and functionality of the IS that are designed and developed for the business organization (Choo, 1995, 1996).

There are several people involved in any computer-based IS development and routinization project in the business organization. These include employees and junior and senior management in the specific domain or division, such as finance, accounting, marketing, materials management or production. These individuals are collectively known as users (or clients). Also included in the IS project are the people in the information systems/information technology (IS/IT) areas, such as systems analysts, systems designers, programmers, and technicians (collectively known as analysts or developers). Sometimes, there is a third group of people involved in the systems development project – the managers of the corporate libraries, which are the storehouses

of corporate information. Each group is supposed to be an expert group in its own specific domain, be it production, finance, marketing, or information technology (Choo, 1996).

Often these groups of people work in isolation, either assuming that the other groups of people are solely responsible for getting together all the information requirements for the new IS, from its conception to its routinization in the organization, or assuming that the other groups have absolutely no role in the process. In either case, the IS ends up being dysfunctional, costing the business organization several hundreds of thousands of dollars or more and hundreds of hours or more of labor to salvage it for some use to the organization.

Before proceeding with the research question, an explanation of the major terms "information partnerships" and "routinization of IS" is offered in the next section. Then the research question for this study is posed, followed by the significance of the study. This will be followed by the major contributions of the study.

EXPLANATION OF TERMS

In the present study, the term "information partnerships" refers to the relationships formed and reformed among different groups of users and analysts (as identified above) in the organization coming together for the purposes of an IS development and routinization project.

The connotation of the term "information partnerships" as used in this study differs from the connotation of the term used in the extant business and IS literature. In

the extant business and IS literature, information partnerships refer to inter-organizational partnerships, that is, partnerships formed among different organizations in the same or different industries. These information partnerships are formed for one of several reasons, such as information sharing, cross-selling and achieving economies of scale, (Konsynski and McFarlan, 1990).

In this study, however, information partnerships refer to intra-organizational partnerships. These information partnerships are formed and reformed among different groups of analysts and IS users inside the organization.

Within this perspective, two types of information partnerships have been identified among the participants in the present study – User-Analyst and User-User information partnerships. User-analyst information partnerships are the partnerships formed among the user groups and the analyst groups in the organization, and include all forms of information and knowledge sharing, communications, interactions, cooperation, and short-term and long-term relationships formed among the individuals in these groups. Similarly, user-user information partnerships are the partnerships formed among the different user groups themselves, such as those from finance, production planning, materials management, sales and marketing, and quality assurance. These information partnerships are formed across several levels and divisions of the organization.

Routinization is defined as the permanent adjustment of an organization's governance system (for example, its administrative infrastructure) to account for the incorporation of a technological innovation (Zmud and Apple, 1992; Cooper and Zmud, 1990, 1992; Kwon and Zmud, 1987) in the organization. At the same time, the usage of

the technological innovation is encouraged as a normal activity in the organization (Cooper and Zmud, 1990, 1992). An example of a technological innovation as applicable in IS research would be the implementation of a new computer-based IS in the organization.

Complete routinization of a technological innovation, such as a new IS, occurs when innovation-specific governance mechanisms are subsumed within the organization's ongoing governance systems, and when the continued use of the innovation is assured without the overt intervention of the innovation's champions or sponsors (Fischer et al., 1986; Keen, 1981).

More on these two terms "information partnerships" and "routinization of an IS" is provided in chapter 2 (Literature Review).

This research project explores and understands information partnerships in the organization and their impacts on the routinization of IS in the organization. The project also provides strategies for IS practitioners to foster positive aspects impacting information partnerships and minimize negative factors impacting the information partnerships in the organization. Using this understanding of information partnerships in organizations, the IS practitioner is able to formulate policies to develop, facilitate and foster information partnerships leading to successful routinization of IS in the organization.

THE RESEARCH QUESTION

This research project uses a qualitative interpretive approach with the ethnographic methodology for studying information partnerships and their impacts on the routinization of IS in the organization.

Several researchers have offered suggestions for writing qualitative research questions (for example, Creswell, 1994, 1998, 2003; Miles and Huberman, 1994, 2002). These questions are open-ended, evolving, and non-directional. They start with words such as "what" or "how" rather than "why." They are few in number and are posed in various forms, from the "grand tour" questions to more specific questions. Creswell (1998, 2003) suggests the use of a single, overarching question and several sub-questions, and that advice is followed in this study.

The primary purpose of this study is to develop an understanding of information partnerships in organizations, including their characteristics, and the processes through which they influence the routinization of IS in the organizations. The purpose of the study is also to provide strategies to foster the positive factors impacting information partnerships while attempting to minimize the negative factors impacting the information partnerships. Therefore the research question can be posed as follows:

“How do multiple participants who belong to one or more of the involved groups (users or analysts) influence each other and, ultimately, the information systems development and routinization?”

The sub-questions follow:

1. How are information partnerships formed, maintained and utilized in IS development and routinization projects in organizations?
2. What are the characteristics of information partnerships?
3. How can information partnerships be profiled?
4. What factors impact information partnerships?
5. What are the processes through which these information partnerships influence the routinization of IS in the organization?

SIGNIFICANCE OF THE STUDY

This research study is significant in several aspects. The research problem is:

1. timely,
2. interesting,
3. important in the world today, and
4. significant in the IS field and in business in general.

Several organizations around the world are engaged in different types of IS development and routinization projects, such as integrated materials management systems (IMMS), enterprise resource planning (ERP) systems, materials requirements planning (MRP) systems, supply chain planning/management systems, and customer relationship management (CRM) systems. Every one of these IS projects requires large amounts of resources, including financial, time and human resources. Unfortunately, today many of these IS projects are not being implemented and routinized successfully, as given in the earlier examples. Therefore this study is timely and interesting. This study does not

apply to any one region in the world, rather, it is applicable to all organizations the world over, as IS development and routinization projects are being conducted in several large-, medium- and small-scale organizations in both developed and developing countries.

Several researchers have stressed the importance and significance of the human factors involved in any IS development and routinization project (for example, Avison and Wood-Harper, 2003; Fisher, 2003). With so many packaged IS solutions in the market today, such as the enterprise resource planning system or the supply chain management system or the customer relationship management system, it becomes important to incorporate the human and social elements into the implementation and post-implementation processes. Theories such as the adaptive structuration theory (DeSanctis and Poole, 1994) criticize the techno-centric view of technology and emphasize the social aspects.

Routinization forms one of the last stages of the IS implementation process. It is not enough to only look at the role of human factors during the adoption of a particular IS of interest. Rather, it becomes even more significant to look at human and social factors impacting the post-implementation or routinization processes when the IS becomes a normal or routine artifact in the day-to-day business operations of the organization and when several groups of users are intimately involved with the IS.

IS practitioners in organizations would benefit from an understanding of information partnerships and their impacts on the routinization of IS in organizations. Using the lessons learned from the study they can facilitate and foster information partnerships in organizations and, ultimately, enable successful routinization of IS in their

organizations. At the same time, many of the lessons learned here may also be transferred to other areas of business where information partnerships in similar or different forms are present.

ORGANIZATION OF THE REMAINING CHAPTERS

Chapter 2 presents the literature review and theoretical background. The methodology and research design are presented in Chapter 3. This is followed by the analysis of the findings from the data in Chapter 4, and the findings are discussed and interpreted using the theoretical lens of an established theory – social identity theory – in Chapter 5. Finally, Chapter 6 presents the contributions of this study, followed by implications for both IS researchers and IS practitioners, limitations of the study and conclusions. Chapter 6 also identifies areas for continued and future research.

Chapter 2

Literature Review and Theoretical Background

This chapter presents the literature review and theoretical background required for this study. This study is a qualitative interpretive study using ethnography as the methodology.

The general purpose of this study is to develop an understanding of information partnerships in organizations, their characteristics, and the processes through which they influence the routinization of information systems (IS) in the organizations. The purpose of the study is also to provide strategies to foster the positive factors impacting information partnerships while attempting to minimize the negative factors impacting the information partnerships. Using this understanding of information partnerships in organizations, the IS practitioner is able to formulate policies to develop, facilitate and foster information partnerships leading to successful routinization of IS in the organization.

Consistent with the ethnographic methodology, the study develops, using cultural analysis, a holistic cultural portrait (Creswell, 1998; Wolcott, 1994) of the information partnerships in the organization considered for this study.

At the core of developing a cultural portrait of the organization lies the process of cultural analysis. The expressive, subjective, and non-rational qualities of organizational experience make up organizational culture, which becomes the major focus of study in an ethnography (Smircich, 1983).

Culture is an 'amorphous' term, not something 'lying about' (Wolcott, 1987, p. 41) but rather something that the ethnographer attributes to a group as he/she looks for patterns of daily living (Creswell, 1998, 2003). It is inferred from the words and actions of members of the group and is assigned to the group by the researcher. It consists of looking for behaviors (what people do), language (what people say) and artifacts (what people make and use) (Spradley, 1980).

The power of cultural analysis resides in the contextual interpretations of observable behaviors, language and artifacts so that patterns of deeply held assumptions and underlying values are revealed (Schein, 1985; Smircich, 1983). Cultural analysis acknowledges that variable social meanings may emerge from a given context. When members of a culture-sharing group (Wolcott, 1994) interpret the different symbols of culture (be they stories, behaviors, customs, or artifacts, etc.), "their perceptions, memories, beliefs, experiences, and values will vary, so that interpretations will differ even of the same phenomenon. The patterns or configurations of these interpretations, and the ways they are enacted, constitute culture" (Martin, 1992, p.3).

Thus, in doing a cultural analysis, the ethnographer gathers artifacts and physical trace evidence; finds stories, rituals, and myths; and uncovers cultural themes. In order to guide the ethnographer uncover the cultural themes and interpret his findings, the ethnographer uses an established theory or paradigm. The theory or paradigm guides the interpretation of the culture-sharing group looking for meanings of social interaction and, possibly, generalizations about human (or organizational) social life (Wolcott, 1994). The theory will act as an interpretive lens through which the ethnographer will look at the

data and make sense of the multiple interpretations of the behaviors, language and artifacts of the culture-sharing group.

For purposes of this study, social identity theory, developed by Henri Tajfel and John Turner (Tajfel and Turner, 1979; Tajfel, 1969), is used as the theoretical interpretive lens for making sense of the data and developing a cultural portrait of the information partnerships in the organization. Social identity theory has proven to be a useful framework for understanding several significant features of organizational life, organizational behavior, and organizational culture (for example, Ashforth and Mael, 1989; Hayes, 1992). More on this theory will be discussed later in the chapter under "The Theory."

Consistent with the purpose of the study (understanding information partnerships and their influence on the routinization of IS in an organization) and the ethnographic methodology, literature should be reviewed continually before, during as well as at the end of the data analysis process in order to completely develop the cultural portrait (Creswell, 1998; Wolcott, 1994). The literature review serves two major purposes – one, to find a gap in the literature where the existing study can make a contribution, and two, to describe the theory which will act as a lens through which the data collected can be studied (Creswell, 1998; Glaser and Strauss, 1967; Orlikowski and Baroudi, 1991; Strauss and Corbin, 1990).

The next section presents a literature review of "information partnerships". Then a review of "routinization of IS" in the IS literature is presented. Later, social identity theory and a framework through which the data can be studied and interpreted are

presented. The motivations behind selecting social identity theory as the theoretical lens to interpret the data findings are presented first, followed by the major tenets of social identity theory and the theoretical framework.

INFORMATION PARTNERSHIPS

As mentioned earlier in chapter 1, the term "information partnerships" has different connotations and is used in the literature from different perspectives.

In the extant business and IS literature, the term "information partnerships" refers to the partnerships or alliances formed among diverse corporations for the explicit purposes of sharing information, creating economies of scale, cross-selling, and in general, gaining strategic advantage (Fiala, 2005; Konsynski and McFarlan, 1990). Konsynski and McFarlan (1990) identify four kinds of information partnerships among organizations:

- joint marketing,
- intra-industry,
- customer-supplier, and
- information technology vendor-driven.

This connotation of information partnerships is along the lines of inter-organizational partnerships among corporations. These information partnerships are formed across organizations in the same industry or across industries. These information partnerships also include inter-organizational web partnerships, that is, partnerships forged among organizations online, particularly those organizations engaged in electronic

commerce and collaborative commerce, for example, as in supply chain partnerships (Fiala, 2005; Laudon and Laudon, 2006; Strozniak, 2003; Stubbs, 2004).

In the library and information science literature, the term "information partnerships" refers to the partnerships formed within an organization among various groups of "experts" (Choo, 1996, 2002). According to Choo (1996, 2002), these information partnerships are critical in:

(a) bringing together the organization's capabilities to create and use information and knowledge,

(b) organizing the information and knowledge, and

(c) building infrastructures that enable the effective management of information and the effective management of knowledge in the organization (Choo, 1996).

Choo (1996) identifies three groups of experts at the heart of any "intelligent" organization that need to work together:

(a) the domain experts,

(b) the information experts, and

(c) the information technology experts.

The domain experts are individuals who engage in the specific function(s) in the organization, such as production, materials management, marketing, finance and accounting, or sales and distribution. These individuals, such as managers, professionals, technologists, and other operators, create and use knowledge during the course of the day-to-day operations of the organization, interpreting situations and scenarios, solving problems, and making decisions. Their knowledge and expertise is specialized and

focused on the specific domain of activity, be it production, materials management, marketing, finance, or any other domain, in order to learn, discover, innovate, and adapt to eventually achieve organizational effectiveness.

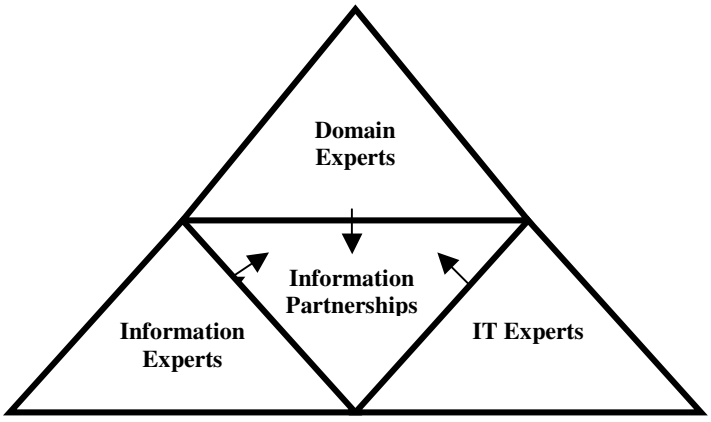
The information experts are individuals who organize the knowledge into systems and structures that facilitate the productive use of information and knowledge resources. These individuals, such as corporate librarians, records managers, archivists and other information specialists, are involved in developing methods and systems of structuring and accessing information, designing the representations of the various kinds of information in the organization, information storage and retrieval, and information distribution and delivery. The general focus is to enhance the accessibility and quality of the information in the organization so that the organization will have an enlightened view of itself and the environment, which is critical for any organization to achieve competitive advantage (Choo, 1996).

The information technology (IT) experts are individuals who design and develop the information infrastructure of the organization. These individuals include systems analysts, systems designers, programmers, data administrators, network managers, and other specialists who develop computer-based information systems and networks. They build applications, databases and networks that allow the organization to do its work with accuracy, reliability and speed. The general focus is on establishing and maintaining an information infrastructure that models the flow and transaction of information, and accelerates the processing of data and communication of messages (Auster and Choo, 1996; Choo, 1995, 1996).

Traditionally, these various expert groups function in a fragmented manner in the organization. Each expert group is concerned primarily with its specific function(s), and attempts to specialize in that function(s). For example, the production managers are concerned primarily with production details and strategies, while marketing mangers are concerned primarily with marketing details and strategies. Information experts, such as corporate librarians and records managers, are concerned with maintaining the organization's collection of printed information, files and documents. IT experts, such as systems analysts, systems designers and programmers, are concerned with designing and developing computer-based information systems.

Choo (1996) states that the "intelligent" organization breaks any from this functional fragmentation, and forges new partnerships, as shown in Figure 2-1, that bring together the organization's capabilities and resources to effectively execute any project in the organization. Each "expert" group forges information partnerships with the other "expert" groups, working together towards a common project goal.

Figure 2-1: Information partnerships in the organization, according to the library and information science literature (adapted from Choo, 1996)



In the IS literature in general, the term "users" or "clients" is used to represent the domain experts, since they are the primary users of the information system. Practitioners and researchers generally refer to the IT experts as "developers" or "analysts."

The term "information experts" does not usually appear in IS literature. Instead, it appears in the library science and information science literature, as evident from Auster and Choo (1996), Choo (1995, 1996), etc.

For the purposes of this study, a different take on information partnerships is adopted. Multiple user groups (or domain experts, as described earlier) are considered along with the developers or analysts (IT experts, as described earlier), in accordance with the IS literature.

Therefore, the term "information partnerships" in this study could be defined as the different partnerships, alliances or relationships formed and reformed among the

different user groups and the analyst groups in the organization for the purpose of developing, implementing and, eventually, routinizing the IS in the organization.

The major difference, however, in this study from the rest of the IS literature is the fact that this study focuses on the user-user information partnerships in the organization, along with the traditional focus on user-analyst information partnerships. Both user-user and user-analyst information partnerships form the topic of interest in this study.

Research studies in the IS literature (such as Davidson, 1997; Guinan, 1988; Guinan et al., 1998; Tan, 1989; Urquhart, 1997) have primarily focused on the user-analyst or the client-analyst relationships and communications in organizations.

Other studies (Alavi and Joachimsthaler, 1992; Barki and Hartwick, 1989, 1994; Baroudi et al., 1986; Bostrom and Heinen, 1977; Churchman, 1968; Doll and Torkzadeh 1989, 1990; Ehn, 1988; Episkopou and Wood-Harper, 1986; Flynn, 1992; Franz and Robey, 1986; Ginzberg, 1979, 1981; Hirschheim and Klein, 1989, 1992, 1994; Ives and Olson, 1984; Lucas, 1975; Melone, 1990; Vroom and Jago, 1988; Westrup, 1997; Wetherbe, 1991; Zaichowsky, 1985) have focused on the user involvement and user participation in IS development projects.

Both foci are variations of just one part of information partnerships in organizations, which are the user-analyst information partnerships.

None of the studies address user-user interactions and relationships (that is, information partnerships) in organizations. First, all the studies have focused on the

"users" as a single entity, be it an individual or a group of people, and their relationships with the analysts (also called developers) have been studied (as mentioned above).

Greenbaum and Kyng (1991), however, have rightly noted that "users are seen as not one homogenous group, but, rather, as diverse groups of people who have competence in work practices" (p.3).

The user-user information partnerships become significant because each user group is fundamentally interrelated and interdependent on other user groups in the organization (Kendall and Kendall, 2005). To assume that all user groups would unite into a single entity for the cause of the organization without any vested interests, while ideal, would be naïve.

We can ask ourselves the following research question:

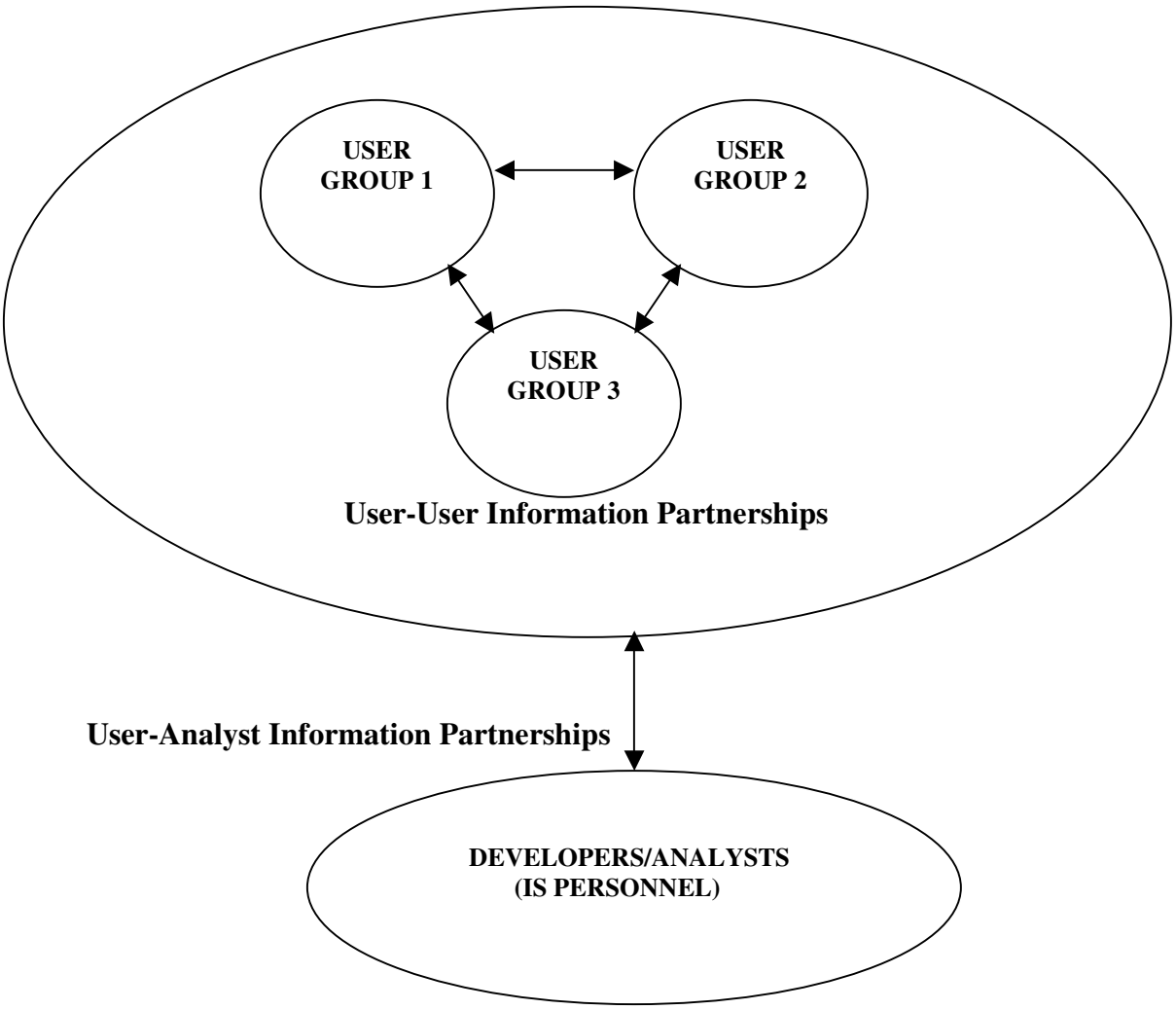
"How do multiple participants who belong to one or more of the involved groups (users or analysts) influence each other and, ultimately, the information systems development and routinization?"

This is the first gap in the IS literature that this study will address. The study will focus on both the user-user information partnerships (that is, the information partnerships among several groups of users) as well as the user-analyst information partnerships (that is, the information partnerships among the users and the analysts or developers) in the organization.

A new model of information partnerships in the organization, as shown in Figure 2-2, can be developed showing both user-user information partnerships and user-analyst information partnerships.

Figure 2-2: Information partnerships in the organization:

new model showing both user-user and user-analyst information partnerships



ROUTINIZATION OF INFORMATION SYSTEMS IN ORGANIZATIONS

The purpose of this study is to develop an understanding of information partnerships in organizations and the processes through which they influence the routinization of IS in the organization.

Routinization is defined as the permanent adjustment of an organization's governance system (for example, its administrative infrastructure) to account for the incorporation of a technological innovation (Zmud and Apple, 1992; Cooper and Zmud, 1990, 1992; Kwon and Zmud, 1987) in the organization. At the same time, the usage of the technological innovation is encouraged as a normal activity in the organization (Cooper and Zmud, 1990). An example of a technological innovation as applicable in IS research would be the implementation of a new computer-based information system in the organization.

Complete routinization of a technological innovation, such as a new IS, occurs when innovation-specific governance mechanisms are subsumed within the organization's ongoing governance systems, and when the continued use of the innovation is assured without the overt intervention of the innovation's champions or sponsors (Fischer et al., 1986; Keen, 1981).

Different researchers refer to routinization differently as confirmation (Rogers, 1983, 2003), routinization (Cooper and Zmud, 1990; Hage and Aiken, 1970; Kwon and Zmud, 1987; Saga and Zmud, 1994; Zmud and Apple, 1992), institutionalization (Silva and Backhouse, 1997; Webber, 2004) and continued-sustained implementation (Zaltman et al., 1973).

Routinization of the IS is only one stage out of the six stages of the information technology (IT) implementation process. Building upon Rogers' (1983) work on classical innovation diffusion, Cooper and Zmud (1990) modified a stage model of IS/IT implementation that was originally proposed by Kwon and Zmud (1987), based on organizational change, innovation and technological diffusion literatures. The six-stage model of the IT implementation process according to Cooper and Zmud (1990) is given in Table 2-1. As can be seen from Table 2-1, all the six stages of the IT implementation process are closely related, and they affect, and are in turn affected by, organizational change.

Kwon and Zmud (1987) examined and synthesized the literature in technology diffusion, organizational innovation and IT implementation. They identified five major contextual factors which impact the processes and products associated with each of the six stages of the IT implementation process, as given in Table 2-1. These factors relate to:

- characteristics of the user community (job tenure, education, resistance to change),
- characteristics of the organization (specialization, centralization, formalization),
- characteristics of the technology being adopted (complexity),
- characteristics of the task to which the technology is being applied (task uncertainty, autonomy, and responsibility of the person performing the task, task variety), and
- characteristics of the organizational environment (uncertainty, inter-organizational dependence).

Table 2-1 – A stage model of the IT implementation process (adapted from Cooper and Zmud, 1990)

Stage	Process	Product
Initiation	Active and/or passive scanning of organizational problems and/or opportunities and IT solutions are undertaken. Pressure to change evolves from organizational need (pull), technological innovation (push) or both.	A match is found between an IT solution and its application in the organization.
Adoption	Rational and political negotiations ensue to get organizational backing for implementation of the IT application.	A decision is reached to invest resources necessary to accommodate the implementation effort.
Adaptation	The IT application is developed, installed and maintained. Organizational procedures are revised and developed. Organizational members are trained both in the new procedures and in the IT application.	The IT application is available for use in the organization.
Acceptance	Organizational members are induced to commit to IT application usage.	The IT application is employed in organizational work.
Routinization	Usage of the IT application is encouraged as a normal activity.	The organization's governance systems are adjusted to account for the IT application; the IT application is no longer perceived a something out of the ordinary.
Infusion	Increased organizational effectiveness is obtained by using the IT application in a more comprehensive and integrated manner to support higher levels of organizational work.	The IT application is used within the organization to its fullest potential.

In addition, the interaction among these factors was shown to be important, such as the compatibility and economic advantage of the technology with organization and task characteristics (Cooper and Zmud, 1990; Kwon and Zmud, 1987). After an extensive review of the IT implementation literature, Kwon and Zmud concluded that prior studies had focused on too few of the model stages and factors, and advocated that

future research should explore the impact of multiple contextual factors on multiple implementation stages.

Of all the stages of the IT implementation process, considerable research has been conducted in the area of adoption of information technology (IT), under the theory of classical innovation diffusion. Rogers (1983) reviewed over 3000 studies of adoption and diffusion, and defined five general attributes of innovations that regularly influence adoption – relative advantage, compatibility, complexity, observability and trialability. Tornatzky and Klein (1982) reviewed 105 articles in this area and added five other characteristics to the list – cost, communicability, divisibility, profitability and social approval. Fichman (1992, 2000) provides a good review of the classical innovation diffusion literature. Other researchers (for example, Davis, 1986; Moore and Benbasat, 1991; Tornatzky and Klein, 1982) have worked on the adoption stage of the IT implementation process.

There have been few studies in the area of routinization of innovations in business organizations. Yin (1979) studied implementation of new technologies and measured routinization by examining the following:

- whether or not formal rules describing organizational functions and responsibilities were changed to accommodate the innovations,
- whether or not budget lines were added to fund the innovations,
- whether or not training procedures regarding the innovations were internalized, and
- whether or not stable maintenance and supply arrangements were established to support the use of the innovations.

Yin (1979) concluded routinization was a significant and measurable construct, and that the proponents of technological innovations should pay close attention to the routinization processes of technological innovations.

Extending the work of Cooper and Zmud (1990) and drawing extensively on prior theoretical and empirical research, Saga and Zmud (1994) developed more detailed conceptual and operational definitions of constructs for each of the last three stages of the IT implementation process, as presented in Table 2-1. These three stages are acceptance, routinization and infusion. Among them, the measures of routinization included administrative infrastructure development, use of the IS/IT perceived as "normal," and standardized use of the IS/IT in the organization. Each of these constructs addresses the notion that in this stage of the IT implementation process, that is, routinization, the IS/IT is perceived as being a part of "business as usual" (Agarwal, 2000; Ritti and Silver, 1986; Yin, 1981).

Surprisingly, very few studies have followed up on the routinization stage of IS/IT implementation. One such study (Silva and Backhouse, 1997) focuses on the institutionalization of information systems, another term for routinization. This study focuses on the failure to institutionalize the London Ambulance Service information system and unravels the political factors that influenced the system breakdown and its abandonment (Silva and Backhouse, 1997).

A couple of studies have focused on the last stage of the IT implementation process, infusion, but have contradictory results.

Cooper and Zmud (1990) studied material requirements planning (MRP) system implementations using a random sampling of 62 manufacturing facilities in the United States. They focused on the interaction of managerial tasks with the information technology and the resulting effect on the adoption and infusion that technology. They found that the interaction affected MRP adoption, but did not affect MRP infusion. Cooper and Zmud (1990, 1992) concluded that political and learning models may be more useful when examining infusion.

Zmud and Apple (1992) measured both routinization and infusion of electronic scanners in supermarket chains and found that infusion is distinct from routinization, and that both routinization and infusion are measurable constructs, and that they capture important aspects of an organization's innovative behavior.

As recently as 2000, Fichman (2000) stated that routinization of IS has not been well studied in the IS literature.

None of the studies have addressed the combination of information partnerships and the process of routinization of IS in the organization. This is the second gap in the literature that this study will address. While this study does not rule out infusion of information systems, the initial focus is on routinization of information systems, as routinization is more easily achieved by more organizations than infusion (Zmud and Apple, 1992).

THE THEORY

The general purpose of this study is to develop an understanding of information partnerships in organizations and the processes through which they influence the routinization of IS in the organization. The purpose of the study is also to provide strategies which will help IS practitioners foster the positive factors impacting information partnerships while attempting to minimize the negative factors impacting the information partnerships. Using cultural analysis in the ethnographic methodology, a holistic cultural portrait of information partnerships in the organization will be developed.

As mentioned earlier, in doing a cultural analysis, the ethnographer gathers artifacts and physical trace evidence; finds stories, rituals, and myths; and uncovers cultural themes. The study of organizational culture offers a holistic view of the organization, and is less concerned with the quantification, prediction, and determinism, than with qualitative, appreciative and contextual understanding of organizations (Louis, 1985; Knights and Wilmott, 1987).

In order to guide the ethnographer uncover the cultural themes and interpret his findings, the ethnographer uses an established theory or paradigm. The theory or paradigm guides the interpretation of the culture-sharing group looking for meanings of social interaction and, possibly, generalizations about human (or organizational) social life (Wolcott, 1994). The theory will act as an interpretive lens through which the ethnographer will look at the data and make sense of the multiple interpretations of the behaviors, language and artifacts of the culture-sharing group.

The ethnographer has a vast array of specific theories from which to choose. Fetterman (1989) notes that most researchers, explicitly or implicitly, use one of two types of theory: ideational or materialistic. Ideational theories suggest that fundamental change is the result of mental activity, thoughts and ideas. Materialists believe that material conditions, ecological resources, money, and modes of production, are the prime movers in the organization. Neither approach answers all problems; individual ethnographers select one of the two approaches to suit their training, personality, and specific needs or questions of interest (Fetterman, 1989).

Cognitive theory is the most popular ideational theory in anthropology. Cognitive theory assumes that researchers can describe what people think by listening to what they say, not an unreasonable assumption. Using linguistically driven (ethnosemantic) techniques, they can create taxonomies of how people view the world. Ideational theory researchers view the human world from the perspective of its mental origins, ideas, cognitive maps, beliefs, and knowledge. Classic ideational theories in anthropology include culture and personality theory (including psychoanalytic theory), sociolinguistics (Cazden, 1979; Gumperz, 1972; Heath, 1982), symbolic interactionism (Blumer, 1969), and ethnomethodology (Bogdan & Taylor, 1975; Garfinkel, 1967; Mehan, 1987; Mehan & Wood, 1975).

In contrast, ethnographers who adopt materialist theories view the world according to observable behavior patterns. A limited but classic political and economic materialist theory is historical materialism, or neo-Marxism. Marxist theory assumes that all change results from shifts in the modes of production and in the control over these

modes. Economic forces, class consciousness, class conflict, and various forms of social organization drive social and cultural change. Other materialist approaches in anthropology include techno-environmentalism (Harris, 1971) and cultural ecology (Geertz, 1973; Steward, 1955).

For purposes of this study, social identity theory, an ideational theory developed by Henri Tajfel and John Turner (Tajfel and Turner, 1979; Turner, 1969), is used as the theoretical interpretive lens for making sense of the data and developing a cultural portrait of the information partnerships in the organization.

Why Social Identity Theory?

There are many organizational theories that could serve as a theoretical lens to interpret the data findings. These theories could stem from sociology, anthropology, social psychology, cognitive psychology, or organizational studies. Examples of theories that could serve as a theoretical lens in this study include social identity theory (for example, Tajfel and Turner, 1979), identity salience theory (for example, see Stryker, 1987; Stryker and Serpe, 1982, 1994), social network theory (for example, see Barnes, 1954, Ethier, 2005), structuration theory (Giddens, 1984), and adaptive structuration theory (DeSanctis and Poole, 1990, 1994).

These different theories are briefly described below, after which social identity theory is characterized as ideal for this study and then is described in greater detail.

Identity salience theory is closely linked with social identity theory. Identity theory links self-attitudes or identities to the role relationships and role-related behavior

of individuals. Identity theorists argue that the self consists of a collection of identities, each of which is based on occupying a particular role (Stryker, 1968). The term "salience" is used to indicate the activation of an identity in a situation. Salience is important because the salience one attaches to one's identity influences how much effort is put into each role and how well one performs in each role (Burke and Reitzes, 1981). According to Stryker (1968), the different identities exist in a hierarchy of salience, where the identities that are ranked highest are most likely invoked in situations that involve different aspects of the self.

A social network is a social structure between actors, mostly individuals or organizations. It indicates the ways in which they are connected through various social familiarities ranging from casual acquaintance to close familial bonds. Social network theory views social relationships in terms of nodes and ties. Nodes are the individual actors within the networks, and ties are the relationships between the actors. The social network is a map of all the relevant ties between the nodes being studied (Barnes, 1954).

Structuration theory was developed by Giddens (1984) to explain and integrate agency and structure. Giddens notes that human agency and social structure and not two separate concepts or constructs, but are two ways of considering social action. There is a duality of structures so that on one side it is composed of situated actors who undertake social action and interaction, and their knowledge activities in various situations. At the same time, it is also the rules, resources and social relationships that are produced and reproduced in social interaction. Structuration means studying the ways in which social systems are produced and reproduced in social interaction (Giddens, 1984, pp. 25-26).

Adaptive structuration theory is based on Giddens' structuration theory. DeSanctis and Poole (1990, 1994) adapted Giddens' theory to study the interaction of groups and organizations with information technology, and called it adaptive structuration theory. This theory criticizes the techno-centric view of technology and emphasizes the social aspects. This theory is a viable approach for studying the role of advanced information technologies in organization change.

Describing each of the above-mentioned theories in detail and gauging its relevance to serve as a theoretical lens to interpret the data findings is outside the scope of this study. This, however, serves as an excellent source for further research.

Each theoretical lens may offer a different perspective on the data findings. Different perspectives, and different theories, may be chosen depending on the purpose of the study.

Social identity theory has proven to be a useful framework for understanding several significant features of organizational life, organizational behavior, and organizational culture (for example, Ashforth and Mael, 1989; Hayes, 1992; Jost and Elsbach, 2001). Social identity theory becomes particularly relevant and useful as a theoretical lens to interpret the data when the data reveals that people tend to classify themselves based on several criteria, tend to group themselves as a group against other groups, and begin to compare their own group with the other groups. All these features have been portrayed in the data findings in Chapter 4.

Social identity theory has been applied in several disciplines, including sociology, social psychology, organizational behavior, organizational psychology, marketing (for

example, Ashforth and Mael, 1989; Ellemers et al., 2004; Hayes, 1992; Jost and Elsbach, 2001; McGarty et al., 1994; Reed and Forehand, 2004; Schwarz and Watson, 2005; Turner et al., 1987). Social identity theory has not yet found applications in the information systems literature.

Hogg and Terry (2000) note that over the past ten to fifteen years, there has been a marked revival of interest among social psychologists in the study of groups and group processes (for example, Abrams and Hogg, 1998; Ashforth and Mael, 1989; Bargh, 1990; Boen and Vanbeselaere, 2001; Dahler-Larsen , 1997; Forsyth, 1999; Hernes, 1997; Hogg and Abrams, 1999; Hogg and Moreland, 1995; Moreland, Hogg and Hains, 1994; Tarrant, North and Hargreaves, 2001; Van Hiel and Mervielde, 2002).

Information partnerships, the focus of this study, deal with the experiences of groups and individuals in multiple groups, and group processes. They also deal with individuals who tend to categorize themselves and move towards forming their own groups and later compare their groups with other groups. Therefore, social identity theory seems to be an ideal theory through which information partnerships in organizations can be understood and interpreted.

Basic Tenets of Social Identity Theory

Social identity theory (Hogg and Abrams, 1988; Tajfel and Turner, 1985) poses the question "Who am I?" from the point of view that an individual's identity may be linked to the group(s) of which the individual is a member (called the ingroup) as opposed to other group(s) of which the individual is not a member (called the outgroup).

Why is this relevant? Organizations are internally structured groups that are located in complex networks of inter-group relations characterized by power, status and prestige differentials (Hogg and Terry, 2000). To varying degrees, people derive part of their identity and sense of self from the organizations and workgroups to which they belong. Indeed, for many people their professional and/or organizational identity may be more pervasive and important than ascribed identities based on gender, age, ethnicity, race or nationality (Hogg and Terry, 2000). These identities lead to multi-dimensional bias, competition and conflict among the different groups. Researchers have been studying sources and techniques of reducing and resolving inter-group conflict, and building and promoting inter-group cooperation (for example, Brewer and Brown, 1998; Brewer and Miller, 1984; Wilder et al., 1996).

Social identity theory is a social-psychological theory that was developed by Henri Tajfel and John Turner in 1979. Social identity theory involves three central ideas:

1. social categorization,
2. social identification, and
3. social comparison.

The three central ideas are briefly presented below.

Social categorization

The first idea of social identity theory states that people tend to classify themselves and others into various social categories, such as organizational memberships, religious affiliations, ethnic associations, gender and age cohorts, and professional

memberships (Ashforth and Mael, 1989; Tajfel and Turner, 1985). A person may be classified into various categories, such as a manager, a Christian, a black person, a male, a young person, and an IS professional, going by the sample social categories listed earlier. Also, different individuals may utilize different categorization schemas to categorize themselves. Some individuals focus more on categorizing themselves by organizational memberships while others focus more on professional or age-based memberships, and some others focus more on ethnic memberships.

Turner (1985) notes that the social categories are defined by the prototypical characteristics abstracted from the members of the group, also called category. For example, the social category "manager" is assigned the many prototypical characteristics that people, who call themselves managers, exhibit. Similarly, the category "IS analyst" is assigned the many prototypical characteristics that people, who refer to themselves as IS analysts, exhibit.

This categorization cognitively segments and orders the social environment, providing the individual with a systematic means of defining others. At the same time, the individual is assigned the prototypical characteristics of the category into which he/she is categorized (Ashforth and Mael, 1989). A new individual possessing the roles and prototypical characteristics of the category "manager" will be assigned to the category "manager" and will be referred to as "manager." A new individual possessing the roles and prototypical characteristics of the category "IS analyst" will be assigned to the category "IS analyst" and will be referred to as "IS analyst."

Social identification

The second idea of social identity theory states that the individual identifies himself/herself with the group(s) that he/she perceives he/she belongs to. According to social identity theory, the self-concept is comprised of two identities – the personal identity and the social identity.

The personal identity entails a person's idiosyncratic characteristics, such as bodily attributes, abilities, psychological traits, and interests. Then the individual thinks of himself/herself as "I" or "me" versus "he/she" or "him/her." On the other hand, the social identity entails a person's salient social or group categorizations. Then the individual thinks of the group as "we" or "us" versus "they" or "them."

Social identification, therefore, is the 'perception of oneness with or belongingness to some human aggregate' (Ashforth and Mael, 1989, p. 21). Through this identification, the members of a group come to recognize how similar they are to other members of the group. Identification cements individuals to their own group, called the "ingroup," but it widens the gap between these individuals and all other groups, called the "outgroup" (Tajfel, 1982; Turner, 1982).

At the same time, social identification with a group gives the individual self-worth or self-esteem. When individuals join a group, their self-concept becomes connected to the group, and the value of that group comes to influence their feelings about their self-worth.

Social Comparison

The third idea of social identity, 'social comparison,' has been borrowed by Turner and Tajfel from Festinger (1954). The basic idea here is that in order to evaluate themselves, individuals compare themselves with similar "others." Tajfel and Turner (1985) note that group members compare their group with other groups in order to define their group as positive and, therefore by implication, see themselves in a positive light and enhance their feelings of self-worth and self-esteem.

The tendency to view one's own group more positively than other groups is called the "ingroup-outgroup bias." People choose to compare their group with other groups in ways that reflect positively on themselves. This leads to two ideas – positive distinctiveness and negative distinctiveness. Positive distinctiveness notes that people are motivated to see their own group as relatively better than similar, but inferior, groups. Negative distinctiveness notes that groups tend to minimize differences between groups, so that their own group is seen more favorably (Hogg, Terry and White, 1995; McGarty et al., 1994).

A Theoretical Framework

The purpose of the study is to understand information partnerships in organizations, their characteristics and how they influence routinization of IS in the organization. A theoretical framework derived from social identity theory focuses on three features of the theory – social categorization, social identification and social comparison.

The implication of the first feature of social identity theory, social categorization, is cohesion among the various information partnerships formed and reformed during the different stages of the IS systems development and routinization processes. The information partners, that is, the people in the organization who are in one or more of these different information partnerships, need to feel themselves to be part of the group to see clearly how they fit in with the whole. The questions now become –

1. How can cohesion be established and maintained within a working group so as to maintain a strong sense of belonging to the same group?
2. How can one take advantage of the common prototypical characteristics of the group so as to foster and facilitate information partnerships in the organization?

Another important issue is internal communication – promoting the idea of membership of the group through an understanding of the group as a whole. Effective internal communication aids the development of a sense of being part of a team and acknowledging the diversity of different members' contributions. Inadequate internal communication may result in failure to appreciate the contribution of others, and result in internal and counter-productive 'us versus them" distinctions which go against teamwork (Hayes, 1992).

The implication of the second feature of social identity theory, social identification, is the group divide. "Us versus them" concepts may apply to technical and non-technical people in the organization, or may apply to different departments, units or branches of the organization, or may apply to workers and bosses, or may apply to other groups working in the organization. Social identity theory also seems to accentuate

intergroup differences, which suggest how different groups working in the organization may come to focus more on competition or rivalry, and ignore what they may have in common (Hayes, 1992).

The implication of the third feature of social identity theory, or social comparison, is the self-esteem or self-worth that individuals derive from their group memberships. Without this, they may distance themselves from the group or even leave the group. This may also provide a key to understanding the development of counter-cultural groups, as individuals distance themselves or leave the main culture or the main group, and thus provide an understanding of the different information partnerships in the organization.

The links between the three features of social identity theory and information partnerships warrant a deeper study. Through a cultural analysis of the data using these three features of social identity theory, it is hoped that an understanding of the important characteristics of information partnerships will be portrayed.

Chapter 3 describes the methodology in detail. Chapter 4 presents the context of the culture-sharing groups and the analysis of the findings from the data. Chapter 5 provides the discussion and interpretation of the findings from the culture-sharing group as seen through the theoretical interpretive lens of social identity theory. Chapter 6 provides the contributions of the study, implications of the research for both IS researchers and IS practitioners, limitations of the study and conclusions.

Chapter 3

Methodology and Research Design

The general purpose of this study is to develop an understanding of information partnerships in organizations, their characteristics, and the processes through which they influence the routinization of information systems (IS) in the organizations. The purpose of the study is also to provide strategies to foster the positive factors impacting information partnerships while attempting to minimize the negative factors impacting the information partnerships. Using this understanding of information partnerships in organizations, the IS practitioner is able to formulate policies to develop, facilitate and foster information partnerships leading to successful routinization of IS in the organization.

This study is an interpretive qualitative study using the ethnographic methodology. The next section will present the background concepts of "qualitative research" and the "interpretive research tradition." Then, the philosophical assumptions underlying the interpretive research tradition and ethnography are presented. The final section will present the research design molded from this tradition specifically for this study.

BACKGROUND

This study is an interpretive qualitative study using the ethnographic methodology. In keeping up with the traditions of ethnography, it is important to understand the context and the history of the methodology before beginning the

methodology for the study. In order to understand the context of the methodology, a brief discussion of qualitative research and the interpretive research traditions is presented in the next two sections.

Qualitative Research

Qualitative research has been defined in many ways and means different things to different people. Qualitative research does not represent a unified set of techniques or philosophies, but has grown out of a wide range of intellectual and disciplinary traditions (Mason, 1996). Qualitative research crosscuts disciplines, fields and subject matter (Denzin and Lincoln, 1994). Essentially, it is most commonly associated with the interpretive sociological tradition that includes, among others, ethnography, ethnomethodology, grounded theory, phenomenology, introspection, case studies, life histories, conversational analysis, and symbolic interactionism (Denzin and Lincoln, 1994; Mason, 1996; Strauss and Corbin, 1990).

Very simply, Strauss and Corbin (1990) define qualitative research as *"any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification"*.

Denzin and Lincoln (1994) define qualitative research as follows: *"Qualitative research is multi-method in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them.* (Denzin and Lincoln, 1994, p. 2).

The term "qualitative" implies an emphasis on the processes and meanings that people attach to the phenomena and which cannot be examined or measured quantitatively, that is, in terms of quantity, amount, intensity or frequency (Garcia and Quek, 1997; Van Maanen, 1979).

Qualitative research aims to produce a well-rounded understanding of phenomena on the basis of rich, contextual and detailed data. There is more emphasis on building a "holistic" picture of the phenomenon with a detailed analysis of the words used and detailed reports of the views held by the informants on the phenomenon (Creswell, 1994). This is in contrast to quantitative research methods that involve charting surface patterns, trends and correlations. While qualitative research may use some form of quantification, statistical forms of analysis are not central to qualitative research study (Mason, 1996).

Myers (1997a) notes that the motivation for doing qualitative research, as opposed to quantitative research, comes from the observation that, if there is one thing which distinguishes humans from the natural world, it is their ability to talk! Qualitative research methods are designed to help researchers understand people and the social and cultural contexts within which they live. Kaplan and Maxwell (1994) argue that the goal of understanding a phenomenon from the point of view of the participants and its particular social and institutional context is largely lost when textual data are quantified.

Table 3-1 lists some basic characteristics of qualitative research. Additionally, as opposed to quantitative research methods, qualitative research methods have been described to be:

- more subjective than objective,

- concerned with the uniqueness of each particular situation (idiographic) versus being concerned with the discovery of general laws (nomothetic),
- aimed at explanation and understanding versus prediction and control,
- taking an insider (emic or endogenic) versus an outsider (etic or exogenic) perspective (Burrell and Morgan, 1979; Myers, 1997a, Prasad, 1997).

Table 3-1 – Characteristics of qualitative research (adapted from Creswell, 1998, with additions from Geertz, 1973; Lee, 1999; and Mason, 1996).

CHARACTERISTICS OF QUALITATIVE RESEARCH
1. Natural setting (field-focused) as source of data.
2. Researcher commitment to extensive time in the field.
3. Researcher as key instrument of data collection.
4. Evolving research design and research question.
5. Importance of the situational and historical context in the research.
6. Importance of the cultural context in the research.
7. Multiple forms of data collection.
8. Data collected as words or pictures.
9. Researcher bias or subjectivity a critical part of data analysis.
10. Critical self-scrutiny or active reflexivity by the researcher.
11. Outcome as process rather than product.
12. Analysis of data inductively with attention to particulars.
13. Presentation of multiple realities, multiple interpretations.
14. Focus on participants' perspectives, their meanings.
15. Social explanations to intellectual puzzles.
16. Use of expressive language.
17. "Thick" descriptions of contexts, situations, incidents, etc.
18. Use of the personal pronoun "I" in writing.
19. Persuasion by reason (verisimilitude).
20. Focus on generality and not generalizability.

Qualitative researchers can be found in many disciplines and fields, using a variety of approaches, methods and techniques. In Information Systems (IS), there has

been a general shift in IS research away from technological to managerial and organizational issues, and therefore, there is an increasing interest in the application of qualitative research methods (Myers, 1997a, 1997b). In addition, the top-tier journals in the field of IS, such as *MIS Quarterly, Information Systems Research, Journal of Management Information Systems*, and *Information and Organization (formerly Accounting, Management and Information Technologies)*, have been encouraging qualitative research studies.

For example, a special issue of *MIS Quarterly* has been devoted to qualitative research. Called the "Special Issue on Intensive Research in Information Systems: Using Qualitative, Interpretive, and Case Methods to Study Information Technology," this issue was published in three installments (March 1999, March 2000 and September 2000) featuring two qualitative articles in each installment.

Myers (1997a) has an entire site on the ISWorld Net (the largest worldwide online community of IS academicians and professionals) dedicated to qualitative research at http://www.qual.auckland.ac.nz/.

The International Conference on Information Systems (ICIS), the leading annual conference for IS researchers, routinely includes panels and paper presentations involving qualitative research. Lee (1999) also notes that more and more doctoral dissertations now involve qualitative research.

The Interpretive Research Tradition

This section discusses the interpretive research tradition that has been used in this study. It is important to understand the background of the research tradition that is employed in a study.

Researchers and authors warn against considering the term "qualitative" as a synonym for "interpretive" (for example, Denzin and Lincoln, 1994; Myers, 1997a, 1997b). Qualitative research may or may not be interpretive, depending upon the research tradition and philosophical assumptions of the researcher.

In the field of IS research, Orlikowski and Baroudi (1991), following Chua (1986), refer to three research traditions or ideological perspectives that can be adopted to provide a philosophical and conceptual framework and guide a research study – positivism, critical social theory and interpretivism. In other social science research, different researchers have referred to these traditions or perspectives differently. For example, Creswell (1998) calls attention to three ideological perspectives – postmodernism, critical theory and feminist approaches. Lincoln and Guba (1985) and Denzin and Lincoln (1994) refer to these traditions or perspectives as paradigms and analyze four paradigms – positivism, post-positivism, critical theory and constructivism (also referred to as naturalistic inquiry).

The interpretive research tradition that has been employed in this study is presented below. Walsham (1995b) and Klein and Myers (1999) note that interpretive research can help IS researchers to understand human thought and action in social and

organizational contexts. Interpretive research has the potential to produce deep insights into IS phenomena, including the management of IS as well as IS development.

Interpretivism, or the interpretive research tradition, focuses on how people understand their worlds and how they create and share meanings about their lives. The research is not about classifying and categorizing, but figuring out what events mean, how people adapt, and how they view what has happened to them and around them (Berger and Luckman, 1967). Interpretive research does not pre-define independent and dependent variables, but focuses on the complexity of human sense making as the situation emerges (Kaplan and Maxwell, 1994; Klein and Myers, 1999).

Interpretive studies assume that people create and associate their own subjective and inter-subjective meanings as they interact with the world around them (Orlikowski and Baroudi, 1991). The intent of the research turns out to be an in-depth understanding of the phenomenon of interest in its cultural and contextual situations. Walsham (1993) writes, "the interpretive methods of research in IS are aimed at producing an understanding of the *context* of the IS, and the *process* whereby the IS influences and is influenced by the context" (Walsham, 1993, p. 4-5).

Interpretive studies reject the possibility of an "objective" or "factual" account of events and situations, and argue that not everything that is important can be measured with precision, and that trying to do so is a distracting and inappropriate task. These studies also argue that searching for universally applicable social laws can distract the researcher from learning what people know and how they understand their lives (Rubin and Rubin, 1995). Instead, they seek a relativistic, though shared, understanding of

phenomena as understood, interpreted and portrayed by the individual people (Orlikowski and Baroudi, 1991).

In an interpretive study, inquiry about the phenomenon of interest is conducted in its natural settings, and more contextual or situational information is collected to put the phenomenon in perspective. Since there is no one reality out there to be measured, and since people construct their own realities, multiple interpretations of objects or events are expected and utilized to fully understand the context of the phenomenon. Discovery is reintroduced as an element in inquiry, and insider (emic) viewpoints are solicited to assist researchers in determining the meanings and purposes that people ascribe to their actions (Denzin and Lincoln, 1994; Glaser and Strauss, 1967; Orlikowski and Baroudi, 1991; Strauss and Corbin, 1990).

Although positivism has been the dominant research tradition in IS research (Orlikowski and Baroudi, 1991), in recent years, interpretive studies have gained ground and are becoming mainstream research (Klein and Myers, 1999).

In IS research, for example, Walsham (1995a) addresses philosophical and theoretical issues concerning the nature of interpretive case studies, and methodological issues on the conduct and reporting of this type of research. Klein and Myers (1999) draw up a set of seven principles for the conduct and evaluation of interpretive field research, and illustrate the usefulness of the principles by evaluating three published interpretive field studies.

Dube and Robey (1999) report insights into software development practices that were revealed through a cultural interpretation of organizational stories by members of

one company engaged in software development. The study was conducted as an interpretive case study.

Trauth and Jessup (2000) studied the use of a group support system to support employee discussions about gender equity in a university. They conducted the study using both positivist and interpretive traditions, and concluded that the interpretive tradition yielded multiple, rich types of information. While the positivist analysis yielded some useful information, the interpretive analysis provided a different understanding of the same evidence as well as new information not found in the positivist analysis of the group discussions.

Orlikowski (1991) used a contextualized interpretive organizational ethnography to examine the extent to which information technology deployed in work processes facilitates changes in forms of control and forms of organizing. Walsham and Sahay (1999) drew upon contextualism to study the efforts made in India to develop and use geographical IS to aid district-level administration. Walsham and Waema (1994) describe and analyze an in-depth case study of the formation and implementation of strategy with respect to computer-based IS in one U.K. organization, and relate the strategy formation and implementation process to its organizational contexts. Myers (1993, 1994) used critical hermeneutics (combining both interpretive and critical theory elements) to analyze a failed IS project in the New Zealand Education Department.

In the present study, I have adopted the interpretive research tradition to better understand the profiles and roles of information partnerships in organizations, and the

processes through which they influence IS development, implementation and eventual routinization.

Philosophical Assumptions

This section presents the philosophical assumptions guiding the design of an interpretive qualitative study using the ethnographic methodology.

According to Creswell (1998), five philosophical assumptions guide the design of all qualitative research studies. These five assumptions are related to: (Guba and Lincoln 1994):

- the nature of reality (the ontology)
- the relationship of the researcher to the researched subjects (the epistemology)
- the role of values in the study (the axiology)
- the language of research (the rhetoric)
- the process of research (the methodology).

Guba and Lincoln (1994) discuss only the ontological, epistemological and methodological assumptions, but compare and contrast the various research traditions with respect to these assumptions. Mason (1996) refers to these assumptions as basic questions and only discusses the ontology and epistemology. She adds three other basic questions concerning (a) the broad substantive area of the research, (b) the "intellectual puzzle" in the research, and (c) the purpose of the research.

Creswell (1998) rightly argues that instead of contrasting different research traditions with respect to these assumptions, it is more useful to describe each of these assumptions according to the research tradition adopted. Table 3-2 lists these assumptions, as adapted from Creswell (1998) with some modifications to suit the interpretive research tradition. The label in the fourth column of the table has also been changed from "implications for practice (Creswell, 1998) to "procedures followed" for more suitability. A discussion of these philosophical assumptions in light of the interpretive research tradition adopted in this study follows.

Table 3-2 – Philosophical assumptions guiding the research study (adapted from Creswell, 1998)

PHILOSOPHICAL ASSUMPTIONS GUIDING THE RESEARCH STUDY			
Assumption	***Question***	***Characteristics***	***Procedures followed***
Ontological	What is the nature of the social reality being investigated? What is the worldview?	Reality is subjective, "not given" but socially constructed, and multiple. It is as seen by the participants in the study.	Researcher uses quotes and themes in words of participants and provides evidence of different perspectives.
Epistemological	What is the relationship between the researcher and the researched? What represents knowledge or evidence of the social reality?	Researcher attempts to lessen the distance between himself/herself and the subject being researched. Interpretation of the interpretations of the participants occurs. Shared meanings become important.	Researcher collaborates and spends time in the field with the subjects. He/she allows participants to provide subjective interpretations of the words, views, images, and themes in light of the background, history, their experiences, and the situational and cultural contexts.
Axiological	What is the role of values?	Researcher acknowledges that the research is value-laden and that biases are present.	Researcher openly discusses values that shape the narrative and includes own interpretation in conjunction with the interpretation of the participants.
Rhetorical	What is the language of research?	Researcher writes in a literary, informal style using the personal voice. Uses qualitative terms and limited definitions.	Researcher uses an engaging style of narrative. Uses the first person pronoun, and employs the language of qualitative research.
Methodological	What is the process of research?	Researcher uses inductive logic, studies the topic within its context, and uses an emerging design.	Researcher works with particulars (details), describes in detail the context of the study, and continually revises design and research questions from experiences in the field.

The ontology

The ontological assumption addresses the nature of reality for the researcher. The interpretive research tradition emphasizes that the social world is not "given." Rather, the social world is a constructed reality (Dube and Robey, 1999; Orlikowski and Baroudi, 1991), produced and reinforced by the individual human beings through their various actions and interactions (Creswell, 1998; Orlikowski and Baroudi, 1991). There exist multiple realities, such as the realities of the researcher, the realities of the research subjects, and the realities of the readers or the audience interpreting the study (Creswell, 1998).

Mason (1996, p. 11) lists several components that could make up social reality in any qualitative interpretive study. In this study, the components relate to one or more of the following items:

- individual people in the organization – the employees, the junior and senior management, the IS / information technology (IT) people (developers), etc.
- the different groups and sub-groups that the individuals (as described above) fall into
- rationality, emotions, thoughts, feelings, memory, senses of the individuals/dyads/ triads/groups formed within the organization, units, divisions/departments, etc.
- interactions and social relations among the various individuals/dyads/triads/groups
- information partnerships formed and reformed in the organization before, during and after the systems development projects
- representations, cultural and/or social constructions
- experiences, accounts, stories, narratives

- understandings, interpretations, motivations, ideas
- attitudes, beliefs, views
- words, codes, communications, language
- actions, reactions, behaviors, events/situations
- social or cultural practices; social processes
- rules, morality, belief systems
- identity, self being, individualism/collectivism
- organization/disorganization, patterns/haphazardness, order/disorder, regularity/ chaos, connectedness/disconnectedness in the organization, as well as among the various information partnerships continually formed and reformed.

Interpretive researchers recognize that as individual human beings interact in a given situation, they give meaning and a certain status to the reality or social world they construct. These ongoing interactions may change the meaning and the status of the social world over time, as new players enter the social world or other players leave the social world, or as circumstances and objectives change. These interactions, therefore, continuously reform, reuse and renegotiate the meanings and statuses of the social world, shifting the interpretations of reality over time (Orlikowski and Baroudi, 1991).

Consequently, the researcher needs to report on these realities, and the subjective and inter-subjective meanings of the social world. He/she relies on the multiple voices and interpretations of the participants or informants through extensive quotes, presents themes that reflect words used by the informants, and advances evidence of different perspectives of each theme (Creswell, 1998).

The epistemology

The epistemological assumption addresses the relationship between the researcher and the researched subjects (also referred to as informants or participants). The interpretive philosophy emphasizes the continuous interaction between the researcher and the subjects, the interaction assuming one or more of several forms -- living with or observing the subjects over a prolonged period of time, or actual collaboration (Creswell, 1998). "Social process is not captured in hypothetical deductions, covariances and degrees of freedom. Instead, understanding social process involves getting inside the world of those generating it" (Orlikowski and Baroudi, 1991; Rosen, 1991). To accomplish this, the researcher tries to minimize the "distance" or "objective separateness" between himself/herself and the subjects (Guba and Lincoln, 1988; Creswell, 1998).

In addition, the various interpretations of the IS development process can be obtained from the key players, drawing on their own subjective concepts, meanings and experiences. This is expected to yield richer interpretations of the actions, reactions, interactions, discourses, and the social processes in the organization, and in this study, a deeper understanding of the structures and roles of the information partnerships in the organization.

The present study has been an eighteen-month project. Of these eighteen months, I spent almost nine months in the field. Being on site for six days a week every week, I got to know the informants on a personal basis. This rapport with the informants in the organization yielded useful information not only about the IS development activities, but

also about the history of the organization and its several units, the history of the region, the organizational culture, and other information to set the context for the study.

This is in direct harmony with the practice of ethnography, which is the methodology used in this study. I will describe more details of my experiences in the organization in the section where I describe the research design, and in the chapters following this chapter.

The axiology

The axiological assumption addresses the role of values in the research study. This assumption gains significance because of the close relationships developed between the researcher and the subjects in an interpretive study. The researcher admits the value-laden nature of the study, and actively admits his or her values and biases as well as the value-laden nature of information gathered in the field (Creswell, 1998).

I intend that in researching as well as in providing my interpretations of the organizational realities, my own biases are made known. Being from India, I am a native of the culture that the organization and the key players come from. My value perspectives may have been affected by the twelve years I have spent studying and working in the United States. These may color my judgements of the various information partnerships formed and reformed in the organization during the IS development project. Also affected will be perspectives on other social phenomena, such as motivation, satisfaction, sources of conflict among individuals or groups involved in the IS development project, and the methods of conflict resolution, management involvement,

and methods of decision making in the organization. Of importance to this research project, which is expected to enrich it in a special way, is the fact that I am aware of the possible sources of bias and value judgements during interpretations of the local cultural and social realities.

Garcia and Quek (1997) argue that the subjectivity of the researcher is not a weakness, but rather a strength to the research efforts. They state that using qualitative methods in the research process is a reflexive activity, constantly informing the researcher's actions. A researcher's subjectivity enables penetration of the fronts individuals and groups represent which, in turn, permits a deeper understanding of the actors' perspectives and ways of living. Within the qualitative research tradition, there is an acceptance of the inherent subjectivity of the research endeavor (Bryman, 1988).

The rhetoric

The rhetorical assumption addresses the language of research. The interpretive research tradition emphasizes the literary forms of writing, such as the use of metaphors (Miles and Huberman, 1994), the use of the first person "I" and a focus on stories (Creswell, 1998). The language of the study is personal, literary, and based on definitions that evolve during the study rather than being defined by the researcher at the beginning of the study. This is due to the fact that the terms, as defined and described by the informants, gain primary importance (Creswell, 1998). At the same time, however, in keeping up with general traditions of writing, the third person may still be used to write the text.

Instead of using terms such as *internal validity*, *external validity*, *generalizability*, and *objectivity*, the researcher uses terms such as *credibility*, *transferability*, *dependability* and *confirmability* (Lincoln and Guba, 1985). Words such as *understanding*, *discover* and *meaning* form the glossary of emerging qualitative terms and are important rhetorical markers in writing the qualitative report (Creswell, 1998).

The methodology

The methodological assumption addresses the conceptualization of the entire research process. The methodology has its origins in the above-mentioned four philosophical assumptions of ontology, epistemology, axiology and rhetoric.

Given the ontology that reality is socially constructed, the researcher avoids imposing externally constructed categories on the phenomenon of interest. Instead, the researcher derives the constructs, categories and themes by repeatedly examining the data very closely. Given the interpretive epistemology that there is continuous interaction between the researcher and the participants over an extended period of time resulting in shared meanings, the researcher allows the participants to describe the phenomenon in their own words and images, drawing on their own concepts and experiences. Given the axiology that the study is value-laden, the researcher admits his or her biases, and even uses them to generate the categories and themes. Given the literary rhetoric, the researcher attempts to understand, interpret and portray the social world from the participants' perspective (Denzin and Lincoln, 1994; Glaser and Strauss, 1967; Orlikowski and Baroudi, 1991).

The ethnographic methodology is consistent with all the assumptions as described above, and is the one chosen for this study. Prasad (1997) argues that ethnography is more than just a method (a set of techniques and procedures used to collect and analyze data). Rather ethnography is a methodology (the intricate set of ontological and epistemological commitments, along with the axiology and rhetoric, that the researcher brings to his/her work) for the study of IS (Harvey, 1997; Prasad, 1997, Schwandt, 2001). A description of the ethnographic methodology is given in the following section.

Ethnography

Ethnography has been emerging as an accepted approach to interpretive qualitative research in the IS discipline. After early ground-breaking work by Barley (1988), Pfaffenberger (1988), Suchman (1987), Wynn (1979) and Zuboff (1988), ethnography has now become widely used in IS research. In recent years, a number of IS researchers have recognized the value of the ethnographic methodology for IS research (Harvey, 1997; Harvey and Myers, 1995; Lee, 1991; Myers, 1997a, b; Myers, 1999; Pettigrew, 1985; Prasad, 1993, 1995; Wynn, 1991). Several researchers have noted that ethnography has the potential for contributing to the exploration of several IS research issues (Avison and Myers, 1995; Harvey and Myers, 1995; Lee, 1991; Orlikowski, 1991, 1992; Prasad, 1997; Zuboff, 1988). These research issues include the development of IS (Myers and Young, 1997; Orlikowski, 1991; Preston, 1991; Suchman, 1995), the management of IS (Davies, 1991; Davies and Nielson, 1992) and their impact on the organization (Randall et al., 1999).

What is ethnography?

It is important to understand the ethnographic methodology before employing it in a research study.

An ethnography is a description and interpretation of a cultural or social group or system with respect to a phenomenon (Creswell, 1998). The basic unit of analysis is the culture-sharing group, a group that shares learned and/or acquired behaviors, to understand how the group "works" (Creswell, 1998).

Ethnography is both a process and a product of describing and interpreting cultural behavior (Agar, 1980, 1996; Creswell, 1998; Schwandt, 2001). As a process, ethnography involves prolonged observation of the group, typically through participant observation, in which the researcher is immersed in the day-to-day lives of the people (Lewis, 1985) or through one-on-one interviews with members of the group. The researcher studies the meanings of behavior, language and interactions of the culture-sharing group (Creswell, 1998). As a product, ethnography involves the construction of written text where the researcher portrays the phenomenon in its social and cultural context (Creswell, 1998; Harvey and Myers, 1995; Schwandt, 2001).

Ethnography has its roots in cultural anthropology (also called symbolic anthropology) through early twentieth-century anthropologists such as Boas, Malinowski, Radcliffe-Brown and Mead, and their studies of comparative cultures. While many of these early anthropologists focused on studying "primitive" cultures in distant lands, the ethnographic approach has also been influential in several issues of interest to

contemporary social scientists, including political processes, organizational interactions, patterns of modern consumption, and more recently, issues in IS (Prasad, 1997).

More recently, Geertz's (1973) philosophy has been heavily incorporated into the ethnographic tradition. Geertz (1973) attempted to theoretically mingle and understanding of human meaning and social action. According to Geertz (1973), all human action is suspended in "webs of significance," which in turn are embedded in cultural codes and contexts. In other words, one can understand social situations only through appreciating the "meanings" (enacted through symbolic actions and artifacts such as ceremonies, rites and folklore) they hold for people in a given culture. Thus, for Geertz (1973), one can only comprehend social processes through a cultural-symbolic lens that is engaged in searching for the local meanings or interpretations of local actors (also called participants/informants) (Prasad, 1997).

Geertz (1973) called this type of analysis "thick description." Ethnographers believe in the use of thick description to uncover and analyze data. Thick description (Geertz, 1973) refers to the researcher's development of understanding out of the sense-making and schemas of the participants/informants. Uncovering the multiple complex layers of local meanings or sorting out the structures of signification is what yields a comprehensive and insightful picture of any social circumstance being studied. These meanings may be shared, or may be contradictory and contested. The ethnographer should uncover and present these multiple meanings and their complex connections with each other in the course of analyzing any social event (Geertz, 1973; Prasad, 1997).

Recently, there have been several approaches to ethnography, and researchers have started to categorize these approaches into "schools" or "sub-groups" of ethnography, each approach with different theoretical orientations and aims (Clifford and Marcus, 1986; Creswell, 1998; Van Maanen, 1988). Some of these include structural functionalism, symbolic interactionism, cultural and cognitive anthropology, feminism, Marxism, ethnomethodology, critical ethnography, cultural studies and postmodernism (Atkinson and Hammersley, 1994; Creswell, 1998; Harvey and Myers, 1995; Myers, 1999, Van Maanen, 1995).

In this study I follow Creswell (1998, 2003) who relies on the sociological approach of Hammersley and Atkinson (1995), the educational anthropology of Wolcott (1994) and Fetterman (1989). Creswell (1998, 2003) describes the ethnographer's job as looking at the people in interaction in ordinary settings and attempting to discern pervasive patterns such as life cycles, events and/or cultural themes (Creswell, 1998, 2003).

Creswell (1998, 2003) and Wolcott (1994) describe culture as an abstraction and as an amorphous term, something that one cannot study directly. Rather, culture is something that by observing and participating in the culture-sharing group the researcher sees and provides a suitable description and interpretation. Culture is inferred from the words and actions of the members of the group and is assigned to the group by the researcher. It consists of looking for what people do (behaviors), what they say (language) and some tension between what they really do and what they ought to do, as well as what they make and use (artifacts) (Spradley, 1980). So the ethnographer gathers

artifacts and physical trace evidence; finds stories, rituals and myths; and/or uncovers cultural themes (Creswell, 1998, 2003).

To achieve this, the ethnographer engages in extensive work in the field, called fieldwork, gathering information through observation, interviews and materials helpful in developing a portrait and establishing "cultural rules" of the culture-sharing group (Creswell, 1998). Hammersley and Atkinson (1995) note that the researcher should be sensitive to fieldwork issues, such as:

- gatekeepers – the people who provide entrance and access to the research site and the group,
- key informants **–** the individuals who provide useful insights into the group and can steer the researcher to information and contacts,
- reciprocity – something should be returned to the people in exchange for their information,
- reactivity – the impact of the researcher on the site and on the people being studied,
- deception – the ethnographer must make his/her presence known so that deception about the purpose or intent of the study is not practiced.

Procedures in ethnography call for the following, while being sensitive to the fieldwork issues (Wolcott, 1994):

- a detailed description of the culture-sharing group or individual,
- an analysis of the culture-sharing group by themes or perspectives,

- some interpretation of the culture-sharing group for meanings of social interaction and generalizations about human social life.

The final product of this research is a holistic cultural portrait of the social group that incorporates both the views of the actors in the group and the researcher's interpretation of the views about human social life in a social science perspective (Creswell, 1998, 2003). The researcher attempts to describe as much as possible about the cultural system or social group, including the history, religion, politics, economy and environment (holistic), and presents an overview of the entire cultural scene by pulling together all aspects learned about the group and showing its complexity (cultural portrait) (Creswell, 1998, 2003).

Central characteristics of ethnography

The central characteristics of the ethnographic methodology are presented in this section.

Prasad (1997), following Wolcott (1995) and Frake (1983) among others, notes that it is necessary to keep in mind that the methodology of ethnography refers simultaneously to a perspective, an approach, a set of procedures and a manner of presentation. According to Prasad (1997), some key characteristics of ethnography are:

- The use of thick description – ethnographers believe in the use of thick description to uncover and analyze data. Thick description (Geertz, 1973) refers to the researcher's development of understanding out of the sense-making and schemas of the participants/informants. A central concept in thick description is

meaning. Ethnographers try to understand any situation based on the meanings that it holds for relevant social actors. These meanings may be shared, or may be contradictory and contested. The ethnographer should uncover and present these multiple meanings and their complex connections with each other in the course of analyzing any social event.

- The cultural context – ethnographers attempt to understand events and social interactions within a specific cultural context. The key focus here is on how specific cultures and subcultures shape both the interpretation and interactions of the subjects being studied.
- Immersion and connection – The careful development of close connections with one's subjects is a key element of ethnography (Agar, 1980). Ethnographers spend extended periods of time with the culture-sharing group, immersing themselves in the day-to-day lives of the members of the group. Additionally, ethnographers attempt to understand the jargon and terminology of the people he/she is studying, and also uses this language in the writing of the research to convey a flavor of the situation to the readers. Golden-Biddle and Locke (1993) point out that ethnographies are evaluated favorably when they convey a sense of authenticity to the readers. Ethnographers insert "in vivo" or "live" quotes, phrases and comments made by the informants to illustrate key points in their analysis.
- The plausibility of accounts – many features contribute to the plausibility of the ethnographic research narrative, including the development of a strong story line,

evidence of the researcher's own involvement in the field, a sense of historical context, and a coherent weaving of disparate events in the field. The ethnography is also judged on its ability to provide convincing explanations of action in a particular culture or subculture (Frake, 1983; Golden-Biddle and Locke, 1993; Van Maanen, 1987; Wolcott, 1995).

- Privileging local knowledge – the purpose of ethnography is not the generalization of universalistic knowledge in the form of what social scientists refer to as grand theory. The epistemological position here is one that privileges "local knowledge", and therefore sees theory building as being engaged in the development of what Geertz (1973) refers to as "particular truths" regarding a situation or phenomenon. It is the belief that our understanding of microscopic interactions that we can ever understand any macro structures (Prasad, 1997).

RESEARCH DESIGN

In this section, the design of the research study is described.

The present study has been an eighteen-month project. Of these eighteen months, I spent the first four months corresponding (by mail and, later, by email) with the organization's top management in order to obtain permission for the research project. Later, I spent almost nine months in the field, collecting data. I started data analysis alongside data collection, and the process continued. After data collection was completed, I spent the next several months analyzing the data. During this period, I was

in constant contact with the informants (by email) to clarify issues or questions that I may have missed during the time I was on-site.

The following sections describe the research design –

- site selection,
- access and rapport building,
- selection of informants (purposeful sampling),
- data collection methods,
- recording procedures, and
- data analysis procedures.

Site Selection

Telecommunications Company (TC – a masked organizational name), a public sector telecommunications company in India, has been selected for this study. This follows from Glaser and Strauss' (1967) and Miles and Huberman's (1994) technique of purposeful sampling which requires paying attention to theoretical relevance and purpose.

One motivation for selecting this organization is that TC has several IS development projects going on at its various manufacturing units. In particular, the organization has implemented and routinized the integrated materials management system (IMMS). Also, the organization is implementing enterprise resource planning (ERP) packages in order to integrate its various functions. The IS projects at the different manufacturing units are at various stages of analysis, design and development, and

routinization. At the same time, there are other IS that have been developed and that are being used in the organization on a routine basis.

This presents a unique opportunity for a comprehensive study of the different stages of IS development and routinization, and the information partnerships formed and reformed at these various stages. This context is theoretically relevant to the topic of interest since the substantive area addressed – information partnerships among the key players in the organization – is a part of all the IS routinization projects being conducted at all the units of the organization.

Several qualitative research studies in the area of IS have concentrated on a single organization. In fact, Agar (1986) and Creswell (1998), among others, state that in an ethnographic study, a single site is important where an intact culture-sharing group has developed values, beliefs and assumptions. For example, Orlikowski (1991, 1993) conducted a field study of a single organization that implemented information technology in its production processes. A second study by Orlikowski (1996) examined the use of a new information technology within one organization. Walsham and Waema (1994) describe and analyze an in-depth case study of the formation and implementation of strategy with respect to computer-based IS in one organization in the U.K., and relate the strategy formation and implementation process to its organizational contexts. Myers (1993, 1994) used critical hermeneutics to analyze a failed IS project in a single organization, the New Zealand Education Department.

Brown (1997) studied one Fortune 500 firm in which a uniform decentralized solution for IS development in place for almost a decade had recently been replaced by a

hybrid solution. Keil and Robey (1999) studied one research project to investigate the deescalation of commitment to runaway software projects. Dube and Robey (1999) report insights into software development practices that were revealed through a cultural interpretation of organizational stories by members of one company engaged in software development. Trauth and Jessup (2000) conducted a study in one university to explore the use of group support systems to support employee discussions about gender equity.

In the current study, I had initially been given permission to visit two manufacturing units of the organization – one in the northern part of India and one in the south, where the corporate headquarters is also located. This was during the initial phase of correspondence with the company. After I arrived in India to start the data collection process, and after I explained my research objectives to the relevant gatekeepers in the organization, I was given permission to study six manufacturing units and the corporate office. The seventh manufacturing unit is located in the northernmost region of India, which has constantly been under attacks of terrorism. I, therefore, did not visit that unit. Three of the six manufacturing units I visited are located in different cities in one state in the northern part of India, and the remaining three manufacturing units are located in different cities in two states in the south, along with the corporate office.

This design is consistent with Yin's (1989) embedded case analysis, that is, analysis of multiple units of a single entity. Of interest in the study would also be the regional, social and cultural differences between the two regions of India, and among the organizational cultures and sub-cultures affected as a result of the difference in the locations (region, state and/or city). I have also looked at the nature and scope of the

systems development activities for any similarities as well as any subtle or gross differences among the different units. Creswell (1998, 2003) and Glaser and Strauss (1967) note that an advantage of the individuals being dispersed is that they can provide important contextual information useful for the research.

Access and Rapport Building

In this section of the description of the research design, access and rapport building concepts are discussed. According to Creswell (1998) access and rapport building are crucial elements of the research process. The following sections discuss access and rapport building.

Access

Hailing from the city where the organization's corporate office and the largest manufacturing unit are located has its own advantages. We can find a contact person in the organization through a network of friends, family and/or acquaintances, although this may prove to be quite difficult at times. Being away from the city and the country for more than a decade has its own disadvantages as well. We lose most of such contacts.

I was in India in the early part of 2001 searching for companies that I could study. Through a family friend who was a retired employee of TC, I met my first key informant, who was an IS developer in Unit1. Through him, I learned more about the types of IS at TC and the IS development that was underway in the organization. I concluded that TC was a good organization to study (as explained in the previous section).

Meanwhile, I had to return to the United States. I wrote directly to the chairman and managing director (the equivalent of the CEO) of the organization requesting permission to conduct the research study at the organization. I very clearly explained the purpose of the project (my doctoral dissertation), my research objectives, the methods I would use to collect and analyze my data, and how I would use the results from the data. This is consistent with Hammersley and Atkinson's (1995) and Creswell's (1998) note that the ethnographer be sensitive to fieldwork issues and not practice deception about the purpose or intent of the study. I also assured the chairman and managing director that the data collection would proceed in the most unobtrusive manner possible so as not to disturb the informants' routine activities. For all these purposes, I obtained a letter of introduction and purpose from my dissertation advisor.

The chairman and managing director approved my request, and a senior manager in the corporate human resources was set up to be my main contact (gatekeeper) in the organization for my research tenure. This gatekeeper monitored my visits to all the manufacturing units as well as to the corporate office over the nine-month period that I was on site. He provided reference letters to the concerned heads of the different units, so that I would have no problems in gaining access. In return for my visits to the different units of the organization, I would submit a report on my findings and my recommendations to the organization (reciprocity).

Before embarking on the field visit, I submitted an application to the institutional review board (IRB) of my university with all supporting materials in accordance with the human subjects' protection procedures. I also submitted the "Informed Consent Form"

(Appendix A) to the institutional review board for approval, and it was approved. I later presented the same form to the gatekeeper and to every interviewee (informant) in the organization. This form duly represents the purpose of the research, the procedures to be used in data collection, emphasis on confidentiality, and provision for consent signatures.

Surprisingly, most of the informants never bothered to read the informed consent form. They were more interested in hearing the same directly from me. I learned that it provided them some assurance to listen to me talk about my dissertation project and my research objectives rather than read a piece of paper.

Rapport building

Building rapport with the informants is extremely critical for the fieldwork to progress smoothly and eventually be successful. For example, Dube and Robey (1999) talk about how one researcher among the two maintained a "presence" at the research site, and how he always "wandered around" the site, having lunch, reading memos and bulletins, and in doing so, earned the trust needed to conduct interviews in more sensitive areas.

I must confess here that although I spent almost nine months in the field, I was visiting six manufacturing units. I, however, was able to establish a high level of intimacy with most of the informants where we not only spoke of company issues and IS development issues, but of personal issues as well.

For example, one informant discussed with me at length how he was planning the construction of his new house. Listening to him talk for more than forty-five minutes

about his plans for his new house and discussing various options for his house earned me more than seven hours of his time over three weeks and a wealth of information about the issues I was researching. It also earned me the trust of other informants, who were his "friends." I later learned that they used to discuss me among themselves, and this had a "snowball" effect in building the trust and rapport with them.

At another site, I participated in the "Ayudha Puja" celebrations, an autumn Hindu festival where all machines, tools and computers are consecrated and worshipped. All employees of the organization, regardless of rank, participate in this festival congratulating each other and distributing sweets and savories.

At yet another site, I went to a soccer game played by the children of the employees. As I cheered and lauded the players, the parents and the managers present there were all ears. Later, during dinner I congratulated the parents of the children for their game, as well as the management for arranging the game. Their elation at being recognized and appreciated was clearly visible. Thus the rapport strengthened.

On the day of the terrorist attacks on the Indian Parliament I witnessed the solidarity and team spirit of all the employees, regardless of rank. On that day and the days following, I became "the computer person" for many employees in non-IS departments to browse various news websites for the latest information. The simple task of browsing the websites, and translating (to Hindi – the national language of India) and explaining to the employees the events transpiring earned me much visibility and support than I could imagine.

There were several such incidents during the nine-month research tenure that built and fortified the rapport between the informants and me. At several units, I lived on campus, and so was highly visible to all the informants. Additionally, I was on site (in the company) for six days a week every week, and I got to know the informants on a personal basis. I went to lunch and for coffee with the informants, and we discussed all sorts of issues, ranging from my research, my work, and my life in the United States to the company matters, the department matters, the people, and the IS development, to politics, terrorism, and other such current issues.

It also helped that I knew the local languages. Except at one site, I could converse with the informants in the local languages as well. Many of the personal comments were uttered in the local language, and I could relate to these comments easily. This also helped in building rapport with the informants.

This rapport with the informants in the organization yielded rich results. I was able to observe the informants and interactions among them during working hours as well as later. I was able to glean useful information not only about the IS development activities, but also about the history of the company and its several units, the history of the region, the people, the organizational culture and subcultures, the inside politics going on in the organization and in the respective units, and other such information for the study. I learned about the problems that the informants were facing professionally, some of the reasons for the problems, and their plans for the future, both of themselves and of the organization in general.

Selection of Informants – Purposeful Sampling

This section discusses the issue of selection of informants, an important part of the research design.

Eisenhardt (1989), Creswell (1998), Glaser and Strauss (1967), and Miles and Huberman (1994), among others, note that selection of informants (also called interviewees, participants or subjects) should be based on theoretical, not statistical, reasons. The informants are chosen based on their ability to contribute to the researcher's gaining some perspective on the social life of the group, on people representative of the culture-sharing group in terms of demographics, and the contexts that lead to different forms of behavior (Hammersley and Atkinson, 1983).

Creswell (1998) notes that the ethnographers rely on their judgment to select members of the subculture or unit based on their research questions. Miles and Huberman (1994) refer to this sampling as "purposeful sampling," and also suggest that the researcher take advantage of opportunities (opportunistic sampling) that may arise, or establish criteria for studying select individuals (criterion sampling).

In this study, I used a combination of several purposeful sampling techniques. I started off with criterion sampling, and as opportunities arose to meet other people, I used opportunistic sampling to follow new leads and take advantage of the unexpected. I also used snowball sampling (Bernard, 1988), where I asked some informants to nominate other individuals that I could interview on a specific topic.

Data Collection Procedures

This section discusses the data collection procedures used in this study.

Yin (1989) refers to six forms of data collection methods – documents, archival records, interviews, direct observation, participant observation and physical artifacts. In an ethnographic study, the following data collections are employed:

- qualitative interviewing,
- observation,
- document research

(Creswell, 1998; Hammersley and Atkinson, 1995; Spradley, 1980).

Observations and interviewing play central roles in the data collection process (Creswell, 1998; Eisenhardt, 1989).

In the present study, the primary data collection methods were qualitative interviews and participant observations. Non-confidential document research and other artifacts were secondary.

Data collection focused on the information partnerships being formed and reformed among the key players involved in the IS development projects at TC. In addition, data collection focused on the key players' relative power or authority in the organization, and the change processes occurring in the division/unit/ organization as a result of the IS development. Contextual information included the mission of the organization, the history of the organization and the various units, the organizational structure, the organizational culture, the size, location, composition and relative power of

the various departments in the various units at TC, and the history of IS development at the firm (including any previous successful or failed projects).

Top management involvement, motivation, managerial commitment, user involvement in the systems development project, individual, group and department interactions and experiences with the systems development were other issues that I studied. Qualitative interviewing is the most ideal method of data collection that yields rich data on all the above-mentioned issues, along with the historical, cultural and contextual information of the organization.

A brief description of each of these data collection methods follows.

Qualitative interviewing

Rubin and Rubin (1995) note that qualitative interviewing is more than a set of skills, it is also a philosophy and an approach to learning. One element of this philosophy is that understanding is achieved by encouraging people to describe their worlds in their own terms. A second component of this philosophy is that interviewing involves a relationship between the interviewer and the interviewee that imposes obligations on both sides. Third, this philosophy helps define what is interesting and what is ethical, and helps provide standards to judge the quality of the research, the humanity of the interviewing relationship, and the completeness and accuracy of the write-up (Rubin and Rubin, 1995, p.2).

The qualitative interview model is consistent with the interpretive research tradition of qualitative research. Qualitative interviewing requires listening carefully

enough to hear the meanings, interpretations and understandings that give shape to the worlds (ontology) of the interviewees. The elaborate details, with specific incident recounting, clarification and discussion yield depth, detail and richness in the data, also referred to as "thick" description (Geertz, 1973).

In this study, a total of 146 interviews were conducted with 94 employees (informants) at all the units of TC and at the corporate office of the organization. Several informants were interviewed more than once or twice in follow-up interviews over the research tenure at the specific unit. The details are given in Table 3-3. A typical interview lasted between forty-five minutes and ninety minutes.

Table 3-3 shows only senior managers, middle managers, lower managers and officers as the informants for the qualitative interviewing process. This is because all non-officers at TC are production workers, that is, workers on the assembly line. All IS/IT professional workers are of officer grade and above.

Table 3-3 – Number of people interviewed and the number of interviews conducted at all six units of TC and at the corporate office

	Unit1		**Unit2**		**Unit3**		**Unit4**	
	Number of people interviewed	Number of interviews	Number of people interviewed	Number of interviews	Number of people interviewed	Number of interviews	Number of people interviewed	Number of interviews
Senior Managers	3	3	1	1	2	2	2	2
Middle Managers	4	8	3	3	2	4	9	10
Lower Managers	2	2	3	4	9	13	9	21
Officers	8	18	1	2	1	2		
Total	**17**	**31**	**8**	**10**	**14**	**21**	**20**	**33**

	Unit5		**Unit6**		**Corporate Office**		**Grand Total**	
	Number of people interviewed	Number of interviews	Number of people interviewed	Number of interviews	Number of people interviewed	Number of interviews	**Number of people interviewed**	**Number of interviews**
Senior Managers	2	2	2	2	2	5	**14**	**17**
Middle Managers	5	9	7	10	2	2	**32**	**46**
Lower Managers	9	12	5	7			**37**	**59**
Officers			1	2			**11**	**24**
Total	**16**	**23**	**15**	**21**	**4**	**7**	**94**	**146**

These informants were from all departments, including the IS department, the production department, the finance and accounting department, the materials management department, and the shipping and logistics department. Apart from these formal interviews, I had several informal talks with many of these informants as well as with other non-officers.

One dimension of qualitative interviewing is the format of the interview. Qualitative interviewing can follow an unstructured format or a semi- structured format. In an unstructured interview, the interviewer suggests the topic, but has few specific questions in mind. The interviewee has complete freedom to lead the interview. In this study, the initial interview questions were unstructured. For example, "Tell me about your division/function" or "Tell me about the information systems project going on in your division." On the other hand, when more specific information is required, a semi-structured (also called focused) format is used (Merton, Fiske, and Kendall, 1990), and the interviewer guides the interview. For example, "Please describe a typical meeting among your people, the people from other associated departments, and the IT people" or "What happened when you introduced your ideas at the meeting?"

There was a balance between the unstructured and the semi-structured formats in the interview protocol. There were, however, no ranking or rating scale questions in the interview protocol. The interview protocol is provided in Appendix B.

One other dimension of qualitative interviewing involves the kind of information sought. Researchers use cultural interviews and topical interviews in their data collection process. In cultural interviews, the researchers ask about shared understandings, taken-

for-granted rules of behavior and standards of value, and mutual expectations of entire groups, organizations or societies. Researchers use topical interviews to learn about particular events or processes and find out what happened, when and why (Rubin and Rubin, 1995).

In the present study, I conducted both cultural and topical interviews. Most of my informal talks with all levels of the employees and many of the interviews I conducted were cultural interviews. Cultural interviews provided detailed information about the regional/social and organizational cultures, and the various contexts involved in the study. Topical interviews provided information about the IS development project(s) and the various information partnerships that are formed and reformed during the entire process. Most interviews, however, had both components intimately intertwined.

The design of the qualitative interview model mirrors the design of the entire qualitative research study. The design is flexible, iterative and continuous (Rubin and Rubin, 1995). The design takes shape gradually as the researcher listens and hears the meaning with the data. At each stage of the interviewing process, new information is gathered, analyzed and tested. Each iteration focuses on the themes or patterns that start to emerge from the data, so that after several iterations, the themes or patterns are clearly visible. The design is continuous as well, as the researcher may have to redesign the interview based upon the previous interviews and the new or modified categories that emerge (Rubin and Rubin, 1995).

In this study, the interview protocol given in Appendix B served only as a general guide. The type of questions and the structure (format) of the interview were very

flexible to accommodate the different personalities of the individuals in the organization. The initial interviews were general and open-ended cultural interviews with sufficient room for the interviewees/informants to present their views and opinions about the organization, unit or department in general. Follow-up topical interviews were conducted at a later point in time (sometimes a day or two later, and sometimes a week or two later) with more specific and directed questions, follow-up questions, and probes (Rubin and Rubin, 1995).

Observation

Observing the key players in the organization and their physical environments is another important data collection method in qualitative research in general, and in ethnography in particular. Kendall and Kendall (2005) suggest that the researcher observe both the key players' behaviors and activities as well as the physical environment in which they operate. Through observation, the researcher gains insight about what is actually done, not just what is documented or explained. Also, the researcher can observe the different behaviors and habits of the informants, as well as the various rituals that occur in the organization and its units. Additionally, through observation, the researcher attempts to see first-hand the information partnerships at work among the various key players involved in the IS project, from the analysis and design to the implementation and eventual routinization of the IS in the organization (Kendall and Kendall, 2002, 2005).

Observation can range from passive, direct observation to participant observation, where the researcher attempts to become an "insider" (Creswell, 1998; Rubin and Rubin, 1995). Participant observation offers possibilities for the researcher on a continuum from being a complete outsider to being a complete insider (Jorgensen, 1989). The researcher can change his/her roles from an outsider to an insider, and this has been well documented in ethnographic research (Creswell, 1998; Jorgensen, 1989).

In this study, the primary focus was on observing the information partnerships at work in the organization and in the multiple units. This included observation of the individual informants in their daily activities, noting their behaviors towards their superiors, peers and subordinates, including their spoken words, body language and gestures. I must confess that being from the same culture as the key players in this organization did give me a privileged view over the broad aspects of the cultural contexts. I was not accorded any such privileges while observing the information partnership nuances that are the heart of this study. Organizations, units, and even departments cultivate their own specific cultures, and I was cognizant of the fact that it was necessary to keep an open mind when attempting to see into their "world."

In addition, observation focuses on how information partnerships manifest themselves at meetings where key players from different departments, including the IS department, get together to discuss the specifics of any project that is going on or that is being proposed. Kendall and Kendall (1995, 2005) note that, ideally, the researcher observes entire events (such as a meeting using event sampling) as well as the daily activities (a few at a time using time sampling).

I was able to observe some IS development and design meetings, and at a few meetings, I was also asked to pitch in my ideas. This was an excellent opportunity for me to be a participant observer, where I could participate in the meeting and at the same time observe all the happenings during the meeting.

I requested the gatekeepers at a few units to allow me to observe (as a passive direct observer) high-level meetings, where the head of the unit (general manager) conducted the meetings with all the department/division heads. I was denied permission on the grounds that it was a confidential meeting.

Document research

Several qualitative researchers (for example, Creswell, 1998; Kendall and Kendall, 1995, 2005) suggest that the researcher examine "hard data" – the various documents in the organization. Documents can offer more than plain facts since they also portray the intentions of the author(s) of the document (s). For example, memos or reports written by or among the key players in an IS project can shed significant light on the information partnerships at work. Documents also reveal the hierarchy of control and authority in the organization, as well as the history of the organization, the present stature, and where the organization is planning to be in the future. Therefore, they become important data for research (Kendall and Kendall, 1995, 2005).

Hard data can be quantitative or qualitative in nature. Examples of quantitative documents include reports for decision making, such as performance reports and financial reports and records of business activities. Examples of qualitative documents include

inter-office memos, policy handbooks and manuals, the company's website, and bulletin boards. Archival documents also serve as important data since they help reconstruct an event, a project, or any other activity.

In the initial letter to the chairman and managing director of TC, I had requested permission to review non-confidential company documents. Ethical principles dictate that any confidential or proprietary information of the company should not be violated. The dissertation report uses a masked organizational name so that confidentiality is maintained.

Being on site six days of the week every week, I had the opportunity to read and review the memos, bulletins, and motivational quotations that had been displayed on the bulletin boards along the corridors and in the offices of several informants. The corporate website of TC also yielded useful background information about the organization.

At some units, I was also given several documents that I requested, such as annual reports, organization charts, manpower charts (human resource profiles), product brochures, some printed news bulletins, sample production and work-in-process reports, sample materials requirements planning reports, and some sample financial reports. Of these reports, I was given some reports to keep long-term, whereas in other cases, I had to return the reports before leaving the informant's office.

At some units, I never received the documents that I repeatedly requested. I was never refused the documents per se, but every time I requested them, there were excuses provided. A few informants later told me to give up my efforts in seeking those

documents and that I would never be able to obtain them. I had to finally give up on my requests.

Recording Procedures

This section discusses the different recording procedures used during data collection in the study.

For all data collection methods, recording procedures were adhered to in a systematic manner. Recording methods included audiotapes of interviews, transcriptions of the interview tapes, interview notes, field notes, field logs, memos, reflexive remarks or notes, and marginal remarks or notes as recommended by qualitative research methodology authorities (for example, Creswell, 1998; Miles and Huberman, 1994).

Kendall and Kendall (2002, 2005) and Rubin and Rubin (1995) note that recording interviews frees the researcher from hastily noting points during the interview, and allows the researcher to make adequate eye contact with the interviewee and establish rapport.

I expected to utilize audiotapes to record all the qualitative interviews. The actual situation, however, was quite different. At some units, I was given written permission to carry my audiotape recorder, cassettes and extra batteries inside the unit premises everyday during my tenure at that unit. At other units, I was denied permission completely.

Even when I had permission to take the audiotape recorder into the unit, I obtained explicit permission from every interviewee before using the tape recorder to

record the interviewee. Here again, there were difficulties. Some informants did not mind the tape recorder, while others strongly objected to its use. At such times, I had to rely only on note taking.

I recorded notes on paper during the interview. During informal talks, however, I did not use any note taking or other recording procedure.

Within hours after an interview or an informal talk, I wrote down field notes about recollections of what happened before, during and after the interview process or the informal talk. Sometimes, however, this was not possible. For example, one afternoon, I had informal talks with three informants during lunch in the unit's cafeteria. Immediately after lunch, I had an interview with another informant. By the time I was finished with that interview, a colleague of the interviewee came by to see him. I took advantage of this opportunity, and then talked to both of them for the next thirty minutes. By the time I was done for the day, there was a lot of information to be written down. That very evening I was invited to dinner by an informant, and I would not miss that opportunity. I had to wait until the next evening to write down the notes of two days of interviews and informal talks.

I made similar notes after other data collection processes as well, such as observation and document research.

As recommended by qualitative research methodologists, I maintained a running log of all the activities concerned with this entire project. I also prepared a special log for the interview and other data collection activities. These special logs combine to form a "field log" and it will represent "what I saw" (descriptive notes) and "what I felt"

(reflective notes) – my thoughts, observations and experiences during the data collection processes. The field log is critically important since it helps set the context within which a specific incident or event occurs.

Data Analysis Procedures

This section discusses the data analysis procedures adopted in this study.

Several qualitative researchers (for example, Miles and Huberman, 1994; Strauss and Corbin, 1990; Wolcott, 1994) have advanced specific systematic procedures for qualitative data analysis. Creswell (1998) also notes that there is no consensus in qualitative data analysis strategies among the researchers.

Of particular mention once again is that data collection and data analysis proceed simultaneously untilthe point of theoretical saturation (Glaser and Strauss, 1967; Strauss and Corbin, 1990). That means that the researcher has to follow a zigzag pattern (Creswell, 1998) of going to the field for data collection, coming back to the data for analysis, and going back to the field for more data, and continuing this process until the emergent categories are fully saturated. Although this process is more in line with the grounded theory methodology, it is also useful in ethnography.

There exist similarities and differences among the strategies for qualitative data analysis as advanced by different qualitative researchers, such as Miles and Huberman (1994), Strauss and Corbin (1990), and Wolcott (1994). In this study, the data analysis strategies put forth by Miles and Huberman (1994) for initial analysis and the strategies for data transformation as advanced by Wolcott (1994) for ethnography will be followed.

Following Miles and Huberman (1994), I transcribed all the interview tapes for analysis. I then started out by reviewing all the information (interview transcriptions, observational field notes, field notes about the document research, and field logs), and jotting down points in the margins of the text. I also noted reflexive (introspective) remarks (also called memos) on the bottom of the text on the same pages. As the reading continued, as per Miles and Huberman (1994), I made a summary of the field notes.

Data reduction then started. This process is also called coding. I first put the conceptual labels on the data and also on a separate piece of paper for later use. Patterns, also called "patterned regularities" (Wolcott, 1994), started to emerge from the different, but related concepts, and these were called "categories" of information. In this study, one hundred and twenty two (122) initial categories emerged. The categories were abstracted one level into "sub-themes" based on common and related characteristics/threads. Creswell (1998) notes that twenty to thirty such sub-themes are sufficient (although the number may vary depending on the research topic). In this study, twenty-four (24) sub-themes emerged. Some sub-themes retained the name of a particular category if it was appropriate. Creswell (1998) notes that the researcher then reduces these sub-themes to about five or six "themes" or "key constructs." In this study, the sub-themes were reduced to four (4) key constructs. The list of key constructs and their associated sub-themes are given in Chapter 4. A sample coded transcript and the emergent categories are given in Appendix C.

Following Wolcott (1994) for data analysis in an ethnography, the data analysis in this study proceeded in three steps as follows:

(1) Description of the culture sharing group

(2) Analysis of the culture sharing group

(3) Interpretation of the culture sharing group.

The description of the culture sharing group and the analysis of the findings are presented in Chapter 4. The discussion of the results using the interpretive theoretical lens of social identity theory is presented in Chapter 5. The contributions and implications for research and practice are given in Chapter 6.

Chapter 4

Analysis of the Findings

This chapter presents the analysis of the findings from the data. This study being an ethnographic study, the description and analysis are in accordance with –

- using "thick description,"
- using "immersion and connection,"
- understanding the cultural context,
- privileging local knowledge, and
- ushering in the plausibility of accounts

(Agar (1980), Frake, 1983; Geertz, 1973, Prasad, 1997; Wolcott, 1995).

The chapter is structured as follows – first, the four key constructs emerging from the data are presented in Table 4-1 along with their associated sub-themes. Then the organizational context, in which this study occurs, is described. The next section highlights the information systems (IS) context for the study.

The analysis of the findings from the data is framed around a discussion of two dominant IS routinization projects being undertaken in the different manufacturing units (will be referred to as 'units' in the rest of the discussion) in Telecommunications Company (will be referred to as 'TC' in the rest of the discussion). The thick description (Geertz, 1973) of the two IS routinization projects demonstrates the raw and detailed findings of the data that emerged in each of the four key construct areas identified in Table 4-1. Chapter 5 then discusses each of these key constructs through the theoretical lens of an established theory – social identity theory.

THE KEY CONSTRUCTS

Four key constructs emerged from the data. They are presented in Table 4-1 along with their associated sub-themes.

1. Types of information partnerships.
2. Positive antecedents impacting information partnerships.
3. Negative antecedents impacting information partnerships.
4. Empowering interventions impacting information partnerships.

Table 4-1 – Key constructs and their associated sub-themes

Key construct	Associated sub-themes
Types of information partnerships	• User-Analyst information partnerships. • User-User information partnerships.
Positive antecedents impacting information partnerships	• Size of the unit. • Location of the unit. • Age and educational background of the individuals in the information partnerships. • Personal relationships among the individuals in the information partnerships. • Faith of the information partners in the IS. • Faith of the information partners in top management. • Entrepreneurial spark of the individuals in the information partnerships.
Negative antecedents impacting information partnerships	• Complexity of the organizational structure. • Size of the unit. • Ego clashes among top managers. • Disintegration among IS departments, nomenclatures, IS projects and IS. • Competition among top management. • Passive sabotage by top managers. • Non-involvement of units in top-level IS decision making. • Lack of faith of the information partners in the IS. • Lack of faith of the information partners in the top management. • Multiple reporting relationships in the organization. • Lack of communication among the units and the corporate office. • Lack of communication among users from different departments, divisions and units. • Constant changes in composition of the information partnerships.

Empowering interventions impacting information partnerships	• Interventions by managers.
	  ▪ Facilitated interventions.
	  ▪ Forced interventions.
	• Interventions by individuals in the information partnerships.
	  ▪ Facilitated interventions.

The data reveals two types of information partnerships that can be seen across all the different IS routinization projects in TC. They are the User-Analyst partnerships and the User-User information partnerships.

The unit of analysis in this study is the information partnership. The following section analyzes the first key construct – the two types of information partnerships. Then the other three key constructs are analyzed with reference to the two dominant IS routinization projects at TC.

User-Analyst Information Partnerships

User-Analyst information partnerships are formed and reformed between the user groups and the analyst groups in the organization. User groups are workgroups from departments such as production planning, materials management or finance. Depending on the type of IS being developed and routinized in TC, the appropriate user group(s) become part of the information partnerships. For example, the finance user group became involved in the information partnership for IS projects such as the integrated finance management system and the finance module of the enterprise resource planning (ERP) system.

The analyst groups are workgroups of software developers and programmers, systems analysts, database programmers and administrators, and network administrators. They are referred to differently as developers, the information technology (IT) group, the management services department group, and the computer centre, etc. in different units of

TC. These analyst groups become part of the information partnership in every IS project, from the inception of the project, through development and routinization, and beyond.

For example, in the integrated materials management system (IMMS) project in Unit3, an information partnership was formed between the production planning group and the computer centre (the name of the analyst group in that unit). Another information partnership was also formed between the materials management group and the computer centre in the same unit. These information partnerships continued until and beyond the routinization of the IMMS.

User-User Information Partnerships

User-User information partnerships are formed and reformed among the different user groups themselves in the organization. Both managerial staff (also called 'managers') and non-managerial staff (also called 'worker groups') are users of an IS in an organization. Therefore, they become members of the respective user group in the organization.

The user-user information partnership is a complex partnership that can be studied under two major classifications. In the first classification, the user group is studied as a whole, where the user group includes both managers and the worker groups as an integral part of the user group. The second classification looks inside the user group and separates the managers from the worker groups.

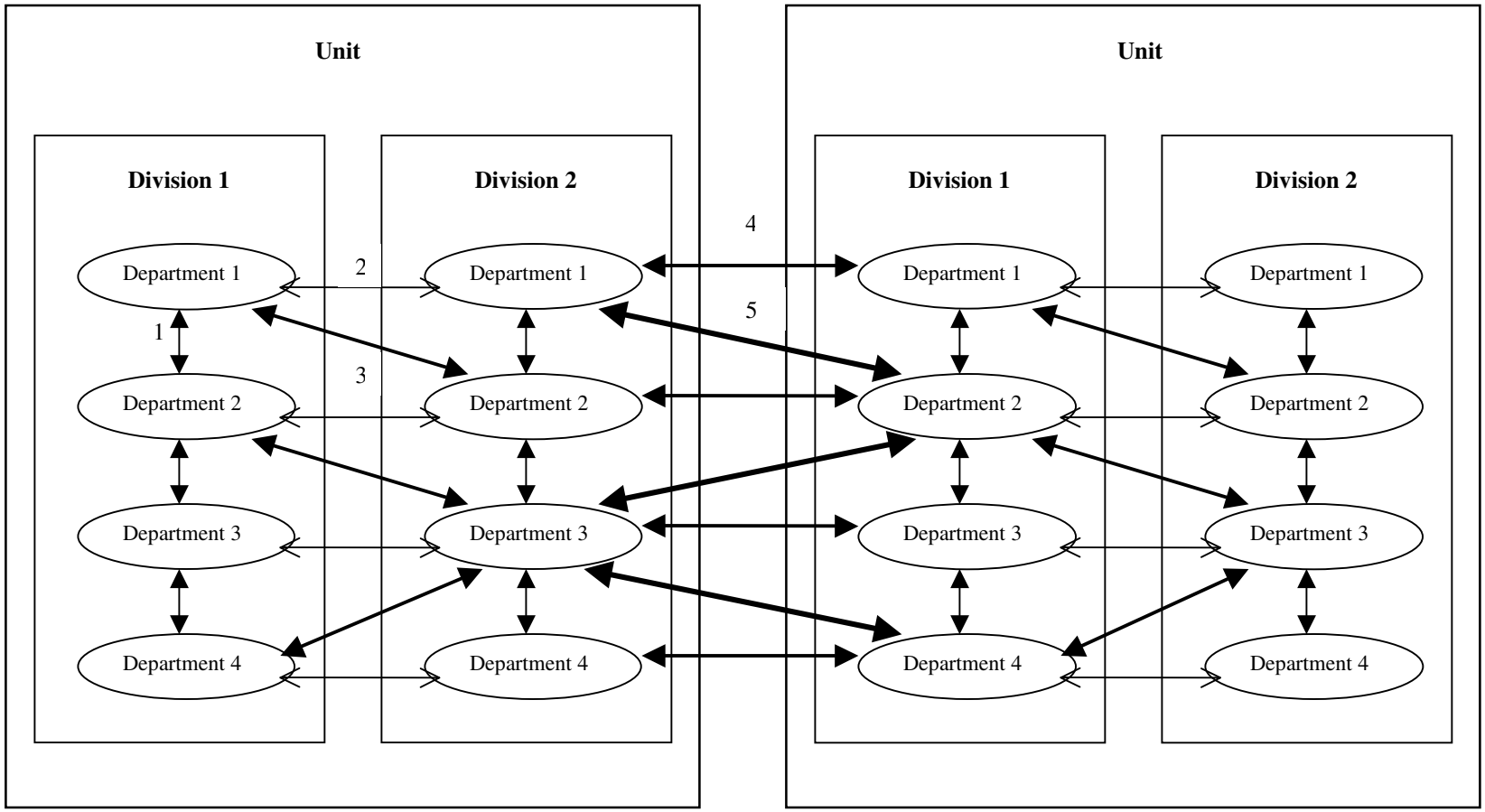
Under the first classification, where the user group is studied as a whole, the user-user information partnerships are formed and reformed along five different dimensions

depending on the respective IS project under consideration. These information partnerships are presented in Figure 4-1 and numbered as given below. At TC, the user-user information partnerships were formed and reformed among:

1. the user groups from different departments, such as production planning, materials management, or finance in a single division of a single unit,
2. the user groups from the same department (such as finance) in different divisions in a single unit,
3. the user groups from different departments in different divisions in a single unit,
4. the user groups from the same department (such as finance) in different units, and
5. the user groups from different departments in different units.

Figure 4-1: User-User information partnerships at TC: Viewing the user group as a whole
(user group includes both managers and worker groups)

Note 1: *The unit, division and department represented here are general terms. Some units at TC have a single department while some other units have several divisions. The departments are finance, production, information systems, etc. in any division.*
Note 2: *Every double-headed arrow denotes an information partnership. The numbers (1 – 5) indicate an example of the five dimensions that a user-user information partnership can take, and are as described in the text.*



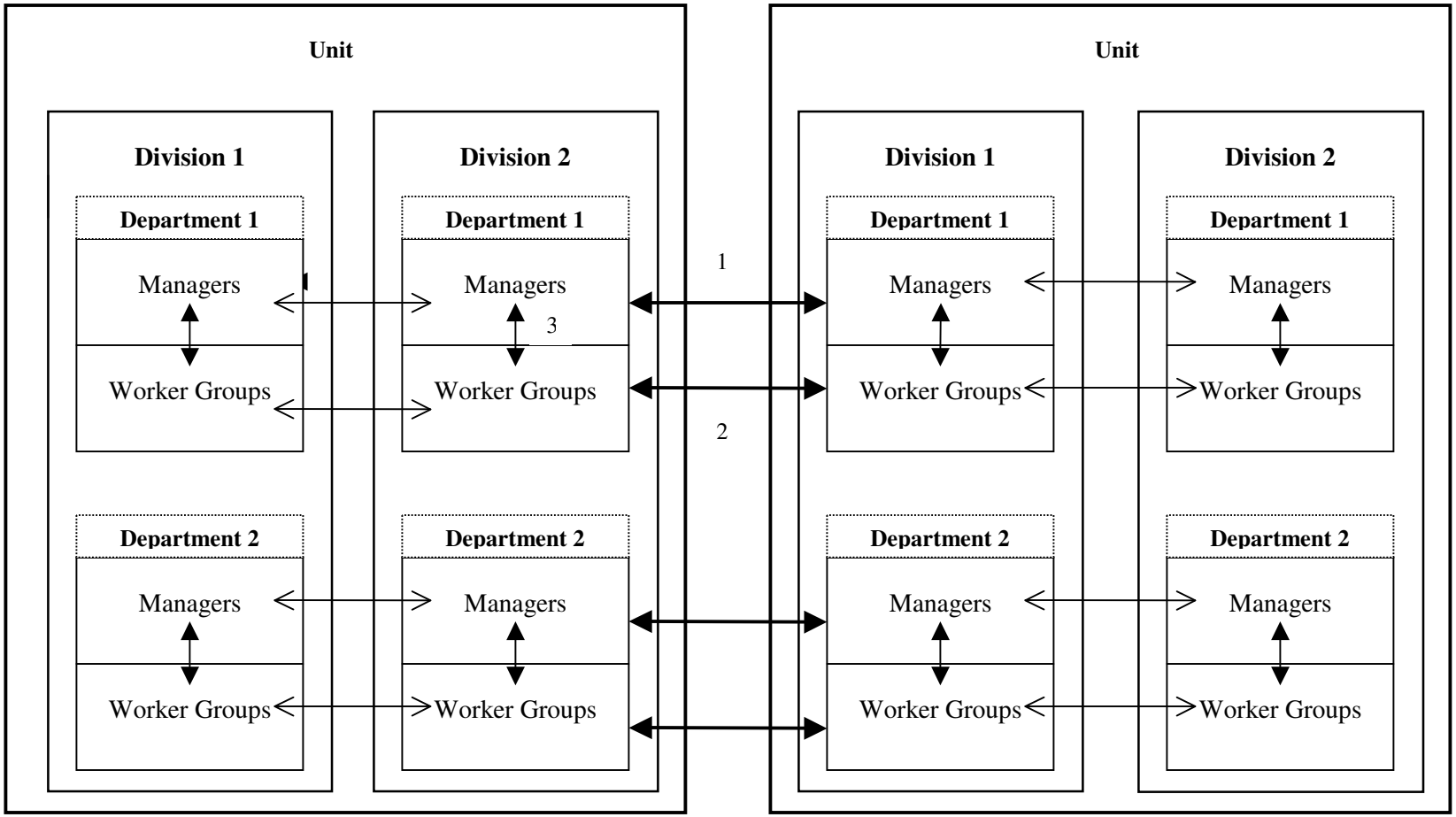
Under the second classification, which looks inside the user group and separates the managers from the worker groups, the user-user information partnerships can be formed and reformed along three major dimensions. These information partnerships are presented in Figure 4-2 and numbered as given below. At TC the user-user information partnerships were formed and reformed among:

1. the managers of different departments, divisions or units,
2. the worker groups of different departments, divisions or units, and
3. the managers and the worker groups.

These different combinations of user-user information partnerships under both classifications can be better understood with the description of TC's organizational structure, which is described in the next section.

Figure 4-2: User-User information partnerships at TC: An "inside the user group" perspective
(user group includes both managers and worker groups)

Note 1: *The unit, division and department represented here are general terms. Some units at TC have a single department while some other units have several divisions. The departments are finance, production, information systems, etc. in any division.*
Note 2: *Every double-headed arrow denotes an information partnership. The numbers (1 – 3) indicate an example of the three dimensions that a user-user information partnership can take, and are as numbered in the text.*



For example, in the IMMS project in Unit3, a user-user information partnership was formed between the production planning group and the materials management group. This information partnership was in addition to the user-analyst information partnerships formed between the different user groups and the analyst group in the unit. This user-user information partnership included several dimensions of the user-user partnerships as identified above and presented in Figures 4-1 and 4-2.

The user-user information partnership was as significant, if not more, than the information partnerships formed between the user and analyst groups. More on this is presented later under the description of the IMMS project of Unit3.

The other three key constructs identified in Table 4-1 will be discussed later in the chapter, along with the first key construct "types of information partnerships", framed around the discussion of the two dominant IS routinization projects.

It is important to understand the organizational context and the IS context at TC before attempting to understand the data (findings). This is particularly important in an ethnographic study. A brief description of the organizational context of TC is provided in the next section, followed by a brief description of the IS context of TC. The discussion in these sections is framed by the associated sub-themes of the key constructs identified in Table 4-1.

THE ORGANIZATIONAL CONTEXT

Telecommunications Company (TC) is a major public sector enterprise in India. The organization has emerged as a leading telecommunications company manufacturing

a wide range of telecommunications equipment, such as telephones, large digital switches, and transmission systems.

TC has seven ISO 9000 accredited manufacturing units (referred to as 'units' in the discussion) in India, distributed in the northern and southern regions of the country. The company's corporate office (referred to as 'corporate office' in the discussion) is located in a major metropolitan city in the southern part of India. TC had more than 21,500 employees as of late 2001.

TC's major products include telephones, Integrated Services Digital Network (ISDN) equipment, video-conferencing products, microwave, fiber optic and satellite transmission systems, large and medium-size digital switches, access equipment such as Wireless in Local Loop (WLL) and Digital Loop Carrier (DLC), and other products such as solar system products and computer telephony integration products. Additionally, TC provides value-added services such as network management services, shared hub Very Small Aperture Terminal (VSAT) services, Mobile Radio Trunked Services (MRTS) and turnkey solutions to its customers.

Understanding the history of the organization is important to understand the present conditions prevailing there. A very brief description of TC's history is provided here.

The primary objective for the establishment of TC and other such companies in the country by the Indian government after gaining independence from the British in 1947 was to provide employment and subsistence to the people who had been left deprived of even the basic needs under the British colonial rule, the freedom struggles,

and the ultimate partition of the country. Each company, including TC, employed tens of thousands of people, regardless of whether such numbers were required or not.

Over the years, other units of TC were established for political versus economic reasons. Some units were launched to provide employment to the underprivileged masses and garner votes for the politicians in upcoming elections. Some units were established to please a local, but powerful, king and win him and his followers over to the "party" (ruling or opposition).

Since the company's inception, the Indian government held a major (about 70 percent) portion of equity in TC and supported the company almost completely. The government provided TC with the required infrastructure, building, equipment, and funding resources to begin production. Over time, the company established collaborations with several large telecommunications companies in other countries, primarily Europe, for purposes of technology transfer and cooperative ventures.

General Environmental Context of TC

Table 4-2 summarizes the findings of general environmental context in which TC found itself in 2001-2002.

Table 4-2 – General environmental contextual findings at TC in 2001-2002

Abstracted context	Detailed findings
Government	• The Indian government, which had been supporting TC almost completely since its inception, had withdrawn all support since 1998. • The Indian government has threatened to shut down the company if it does not show consistent and sustained profits by 2008.
Competition	• Other telecommunications companies (from Europe, USA, etc.) have come into India. They form a threat to the survival of TC. • The foreign telecommunications companies have invested heavily in IS for competitive advantage – a major disadvantage for TC.
IS/IT products and technologies	• The number of IS/IT products entering into the Indian market has increased. • The number of hardware/software platforms and development environments in the market is increasing. • ERP appeared in the Indian market in the late 1990s.
Suppliers	• There are several suppliers. • Many of these suppliers are located in rural areas or in small towns. • Many of these suppliers are not computerized, or have very low standards of computerization. • Over 90 percent of TC's transactions with the suppliers (purchase orders, invoices, bill payments, etc.) are manual.
Customers	• There is one large customer (the Department of Telecommunications) and a few small customers. • The smaller customers have low levels of computerization. • Over 90 percent of the transactions with the smaller customers (customer orders, invoices, billings, etc.) are manual. • About 75 percent of the transactions with the single large customer are manual. • The single large customer favors TC's competition for goods and services.

In the early 1990s, the then Prime Minister of India formulated new policies of economic liberalization. This opened the Indian market for free competition. As a result,

several multinational companies, including companies from Europe and the United States, rushed in to capture the telecommunications products market, among others.

Several of TC's past collaborators now became its competitors, and the price wars began. The multinational companies had invested heavily in IS over the years, and they used it to gain competitive advantage over TC in India.

TC suddenly found itself in unchartered waters, since it had always enjoyed the protection of the government. TC could not compete with the low prices that the competition was offering, and so started to lose the contracts tendered by its primary customer, the Department of Telecommunications, a government agency. This resulted in severe losses for TC for several years. The other few customers of TC were small (in terms of product orders and profits to be garnered) when compared to the primary customer.

Over this period, TC's management realized the need to change their ways of doing business. They also realized the need for effective IS and IT in order to run their business successfully.

A large number of IS/IT products appeared in the Indian market in the 1990s. Enterprise resource planning (ERP) software arrived in the Indian market towards the end of the decade. TC's management encouraged the development of IS to suit their local requirements and local financial situations. The company was operating at a loss each year, and therefore could not invest heavily in an integrated, comprehensive IS until late in the decade.

Every division, and in some cases every department, developed IS to suit its specific needs. Some divisions did not venture into computerization at all, and handled all business operations manually. This led to multiple disintegrated islands of computerized information systems and manual systems spread across the organization.

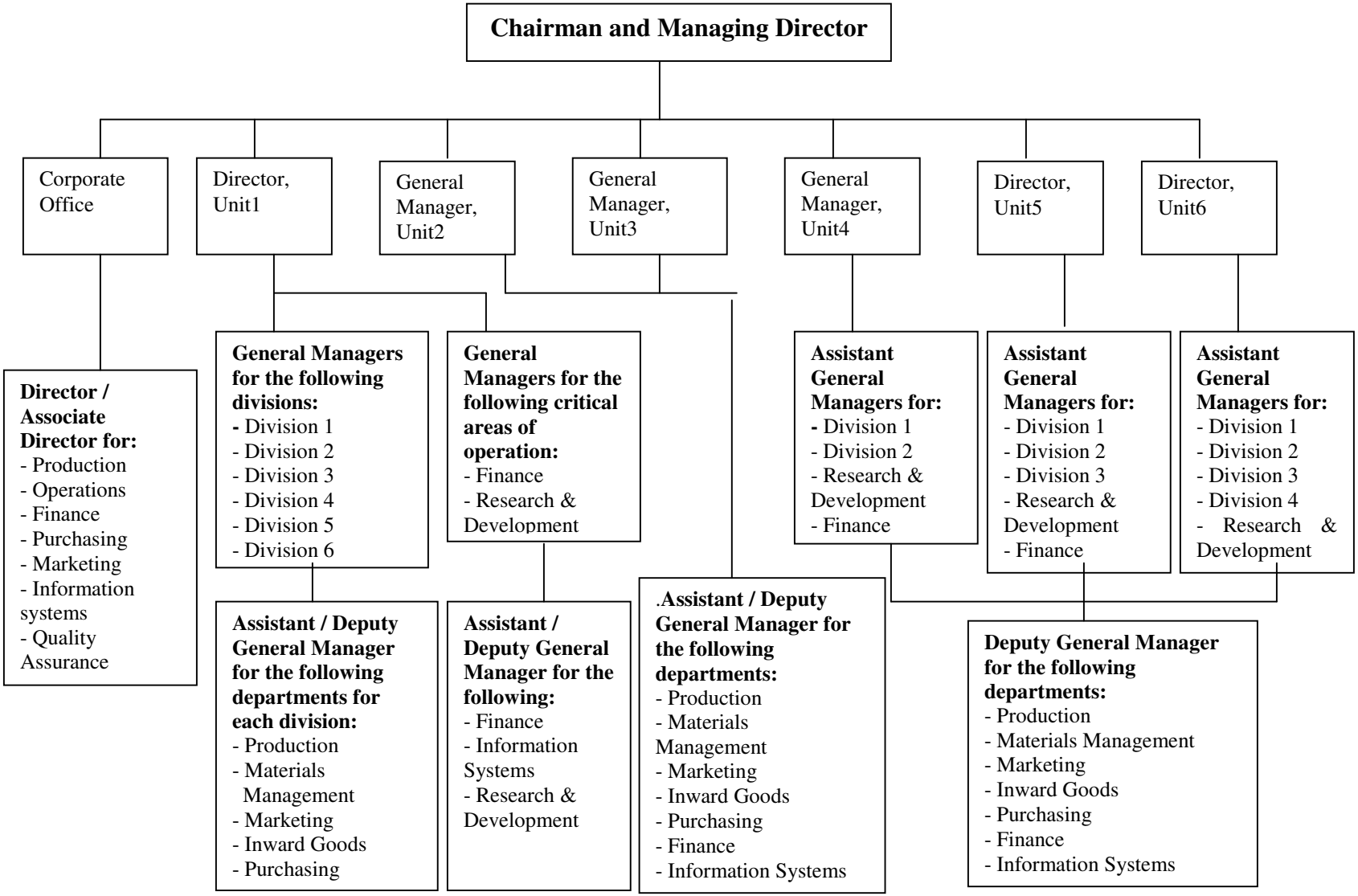
TC also realized that most of its small customers as well as many of its suppliers were either not computerized, or had extremely low levels of computerization. These small customers and suppliers were located in rural areas or small towns, and it was a huge undertaking to motivate these small customers and suppliers to computerize their operations in sync with those of TC.

In 2001-2002, TC was operating at less than 30 percent of its manufacturing capacity. At the same time, the Indian government had withdrawn all financial support to TC since 1998. In addition, the Indian government had threatened TC that it would shut down the company if it did not show consistent and sustained profits by 2008. Left all alone to fend for itself or shut down operations, the company was struggling.

Organizational Structure of TC

The organizational structure at TC is complex. There is one corporate office and seven manufacturing units (called Units). Figure 4-3 gives the organizational structure at TC. Only six units are considered for this study. The seventh unit is located in a region that is torn by terrorist activities. It was too dangerous to go to that region for data collection. Additionally, not much IS activity was going on in that unit at the time of data collection.

Figure 4-3: Organizational structure of TC
(by units, divisions, and departments)
Note: Only generic department/division names are given. Specific/identifying division names are not presented to preserve anonymity



There are several divisions in a unit. Some divisions are based on product lines, and some divisions cater to services that are common for all the other divisions in the unit. For example, Unit1 has six divisions. Four divisions are based on product lines, such as telephone products, digital exchanges, switching and new products, and transmissions. Two divisions cater to all services common to the entire unit. Of these two, one division caters to services such as the hospital, canteen, transportation and sports activities. The other division caters to all personnel and administration activities.

Every division in a unit is headed by a general manager (GM). These GMs report to a Director of the unit. They also report to the Corporate Office. In smaller units (such as Unit2 and Unit3) where there is a single division, there is no Director of the unit. Instead, the GM of the division heads the entire unit.

Each division in a unit has its own set of departments, such as production planning, inward goods, finance, materials management, research and development, and IS. As a result, in larger units with multiple divisions, such as Unit1, there are several IS departments and several production planning departments. In smaller units with a single division, there is only one set of departments, such as one IS and one finance department.

Each of these departments is headed by a manager. So there are several finance managers and several IS managers in a large unit, such as Unit1.

There is a multiple-reporting scheme in the organization which leads to confusion and power struggles among the different GMs and the directors of the units. Some operations of a unit, such as research and development, quality assurance and finance,

have been designated as critical operations. Though such operations overlap across several divisions they are headed by a single GM. As a result, managers in the different finance departments have to report to the GM of finance as well as to the GMs of their respective divisions.

Similarly, IS department managers report to both the GM of their respective division as well as to the GM of research and development, because IS comes under this area of operation. In some units, the IS department managers additionally report to the GM of finance, because the GM of finance makes final decisions on financing the different IS projects in the unit. In Unit1, the IS department managers have to also report to the director of the unit.

This multiple-reporting scheme leads to major confusion and power struggles among the GMs and the directors in a unit. Every GM has his own set of objectives for the division or the critical area of operation. These objectives clash with the objectives set up by another GM in the unit, and this leads to a power struggle. The same situation results when different GMs make different decisions affecting a single division, or even a single IS project.

The GMs constantly compete with each other and with the directors of the units for the attention of the chairman and managing director. This is another cause for the power struggle among the top managers, as evidenced by a comment from an analyst from Unit1:

> "You see, we have these six (6) big groups (referring to the six divisions), each headed by one general manager. They are 'warring groups' just like the Shias and the Sunnis (referring to the two major sects of Muslims who, since time immemorial, have been constantly at war with each other).

> They are ready to cut each other's throats any moment. It is pretty much the same thing in other units as well" (Analyst 1, Unit1).

A similar power struggle is found among lower levels of management as well. Every manager tries to catch the attention of the GM or the director of the unit, sometimes even bypassing his/her immediate supervisor. Surprisingly, several informants used the same term "passive sabotage / silent sabotage". One manager is pleased when another manager's work, including an IS application, is foiled due to the fault of one or more persons.

One informant spoke on the condition of complete anonymity.

> "I am going to get into trouble for saying this, but it is the truth. I have seen it numerous times. When his (referring to another manager from another department) work is ruined by his workers, and the GM is screaming at him, my manager comes back that day with a big smile on his face and tells all of us what happened. Then he says, "He deserves it. I am glad that the GM shouted at him today. What does he think of himself?" My manager thinks that he is better than him (the manager who was shouted at) because the GM criticized him" (Unit1).

If problems are found during normal operations, they are not brought to the attention of the concerned manager. Instead they are allowed to fester so that the complexity and the magnitude of the problems increase and this thwarts the entire project.

> "If I am the manager, do you think I will ever accept that I am doing this? I will always deny this. But it is definitely going on, and I can prove it to you" (User 4 and User 8, Unit1).

The multiple reporting schemes and the power struggles do not exist only at the units. They are present at the corporate office as well. The corporate office has its own

set of departments such as IS, finance, operations, quality assurance and marketing. Each department (for example, finance) in the corporate office is responsible for consolidating all the information of that respective department (for example, finance) from all the units and their divisions.

Each department in the corporate office is headed by an associate director who reports directly to the chairman and managing director of TC. The GMs of the smaller units and the directors of the other units also report to the chairman and managing director of TC. At the same time, these GMs and directors are obliged to report to the associate directors of the respective departments in the corporate office, when needed. This again leads to the problems associated with multiple reporting schemes as well as power struggles.

THE INFORMATION SYSTEMS CONTEXT AT TC

The following overview of the information systems (IS) context at TC will help to understand the different dimensions of the user-analyst and user-user information partnerships, as identified earlier in Figure 4-1 and Figure 4-2, and their impacts on the routinization of the several IS in the organization. This is particularly important in an ethnographic study, where the findings from the data should be contextualized.

The critical findings are presented in the text of this section, and Table 4-3 characterizes more detail about the IS context at TC.

Table 4-3 – IS contextual findings at TC

Abstracted context	Detailed findings
Role of IS in the organization	• IS play a moderate role in the organization. IS are not ubiquitous at TC, and many transactions are still manual. • Few new applications, like materials resource planning (MRP) or the integrated materials management system (IMMS), are being encouraged. • Enterprise resource planning (ERP) is a recent feature in the organization. • Existing IS are all disintegrated. • In many units, and in many divisions in the same unit, the same IS (for example, the IMMS / MRP) are developed from scratch without communicating with other divisions/units who have already developed a similar IS, or seeking help/advice from them.
IS platforms	• There is no common hardware platform that is being used in the organization. • Some applications reside on a mainframe computer, some on client-server systems, and some on stand-alone computers. • There is a shift now towards client-server systems throughout the organization. • There is no uniformity in the software platforms as well. Some applications have been implemented using dBase, others using COBOL, etc. • Some of the new IMMS have been implemented using SQL Server as the backend and Visual Basic as the front end. Other IMMS have been implemented using Oracle as the backend and Visual Basic as the front end. • The new Baan ERP has been implemented on a Win NT – Oracle platform.
IS policies and practices	• IS policies and procedures exist, if only on paper. • IS policies and procedures are not effectively communicated to the different units. None of the managers interviewed had any knowledge of what the actual policies were. They only knew that the policies existed somewhere. • Managers and employees at different units do not attempt to understand, discuss or debate the policies and procedures. • There is lack of clear and well-defined objectives and guidelines from the corporate office for IS development activities in different units. • The corporate office keeps the unit managers at a distance when it comes to decision-making about critical issues regarding IS projects, for example, the ERP implementation project.

Table 4-3 – IS contextual findings at TC (continued)

Abstracted context	Detailed findings
Lack of uniformity in IS structures and nomenclatures	• There is lack of uniformity in names of the IS departments or workgroups at the units. Examples are computer centre, the IT group, etc. • There is lack of uniformity in names of the IS at the units. For example, the same IS is referred to as the IMMS, the MRP, etc. in different units. • There is lack of uniformity in the ERP implementation objectives and procedures. For example, all the modules of the ERP were implemented in Unit4 while only the finance module was implemented in the other units even though all units required all the modules.
IS staffing and environment	• New graduates with computer science degrees from universities are hired for both entry-level and higher IS positions at TC. • Many of the new graduates entering the organization have no functional experience, but they are put on IS development activities right away, without any proper or adequate training. • The outsourcing of IS-related jobs from overseas into India has created a booming high-tech economy. As a result, there is high turnover among young IS professionals at TC. Many of them leave TC for better jobs in the middle of IS projects.
Management attitudes towards IS	• Top management is now learning to use computers and some simple applications like email. • Top management depends entirely on youngsters with computer science degrees (most of them recent graduates) for computer guidance. The problem is that these youngsters have no functional experience. • Some managers lack an understanding of the potential of new software applications like ERP. Others, on the other hand, take the time and effort to understand the potential of such technologies and implement them in their respective units. • Managers strongly believe that their own authority and power status will increase if they have an IS developed in their unit/ division from scratch without the help of other units/divisions that have already developed the IS. • Managers state that they would rather consult with external consultants for help regarding the IS than consult with their counterparts at other units/divisions. • The chairman and managing director, according to several managers at different units, does not consider IS a significant function when compared with finance or production in the organization. They state that the chairman views IS development as money-draining activities rather than money-producing or money-saving activities.

The discussion in this section is framed around the associated sub-themes of the key constructs identified in Table 4-1, including the positive antecedents, negative antecedents and the empowering interventions that impact on the user-user and user-analyst information partnerships.

There is an IS department at the corporate office of TC that is in charge of formulating IS and IT policies and communicating them throughout the organization. The policies exist on paper, and perhaps were communicated to all the units, but, when questioned by the researcher, no one at any of the units knew what they were.

> "You see, the IT policies are there. They have to be there, because this company has an ISO 9001 certification. And for that, you need the policies to be in place. But we never know what the policies are. Nor do we really care. We are 2000 km away (from the corporate office), and nobody helps us if we have problems. We solve our own problems. We design and develop our own systems" (Analyst 3, Unit4).

The senior manager of the IS department at the corporate office, however, had this to say:

> "I have no time for spoon-feeding. They (meaning the senior managers at the units) have to understand what the policies are, and they have to abide by the policies. But as far as I know, no one follows the policies. Nor do they bother to read and understand those policies. You have seen the different kinds of IS at these places when you visited them. And there are more in the pipeline. If there is so much chaos and disintegration, what can I do? And to top it all, our chairman and managing director does not pay enough attention to IT" (IS top manager, Corporate Office).

At the same time, the units do not communicate their problems or other information on the IS they are developing at the particular units. It was clearly evident

that many worker groups and even managers had no faith in the top management at the corporate office.

> "There is no point in communicating our problems to the corporate office. It is a waste of time. We report our problems to our bosses here and sometimes even they cannot solve our problems. And the corporate office has never once enquired about the state of the IS at our unit. Once a year we have to send them a report and we do that. And there ends our responsibility" (Analyst 1, Unit5).

> "How can we build long-lasting relationships with someone who clearly does not care about what is happening to us? Some of us are aware that this affects the way we develop IS and the way we use them, but what can we do?" (User3, Unit1).

There was general agreement at many units as well as at the corporate office that the chairman and managing director did not provide enough attention to the IS departments or to the development of new IS across the organization.

> "The chairman is more concerned with finance and production. He is not concerned with IT issues at all. I am not even invited to the meetings which involve the chairman, the finance people, the production people, etc. You see, we don't make money that they can see immediately, like the production people do. We always take the backseat. Wonder when they will ever understand the importance of IT" (IS top manager, Corporate Office).

> "The chairman is supposed to be the key business driver for the entire organization. When he does not show interest in a key function of the organization, such as IS, what are we supposed to do?" (Top manager 1, Unit3)

Even other top managers did not show keen interest in the incorporation of new IS and IT into their business operations. Many top managers are unaware of the potential of the IS. Some informants stated outright that they had no faith in the decision making

ability or the leadership ability of some top managers when it came to new IS/IT and decisions regarding IS and the routinization of IS.

One IS analyst had this to say:

> "Many of these top managers have no idea what ERP can do. They hardly know what it stands for. All they want is that their unit should have the latest computer technologies. That will bring them a good name and earn them prestige in front of the other unit managers" (Analyst 1, Unit1).

Another IS analyst disagreed:

> "Not every manager is like that. Our assistant general manager of production, for example, is up-to-date on all the latest information technologies. He even sends us on several training workshops and seminars so that we learn about the most appropriate information technologies for our requirements" (Analyst 1, Unit3).

One of the primary reasons why the top managers, such as the GMs and the directors of the units, did not seem to show much interest in any strategic or critical IS activities of the units was that they had short tenure in their positions. They would be transferred from one position to another and from unit to another without cause. The moves were more political than strategic.

> "The ministry (of telecommunications) still has a strong hold over the organization. So the senior managers have to agree to what the ministers say. As a result, sometimes we get brand new people at high-level positions in the unit. We cannot do anything about it. And sometimes these people take over control of the project team and start to dictate their own terms. That is when the problems start, and the team falls apart. Other times, they do not involve themselves in the project at all. In a way, that is better for us" (User 8, Unit1).

These changes in the composition of the information partnerships, particularly at the higher levels of management, had significant effects on the information partnership. It took the managers significant time to overcome the

inertia of the information partnership and build momentum to work towards a successful implementation or routinization of an IS. Before they could achieve success they would be transferred out of that unit or division.

> "These top managers are like bus drivers. They should know how to drive the bus from the first day itself. But they take at least one year to figure out whether this is a bus or a car or something else. Then they have to learn to drive the bus. By the time the bus moves, it is time for a shift change. And they blame us if things go wrong. Strange, isn't it?" (User 5, Unit1).

When questioned by the researcher, one top manager had this to say:

> "We try to coordinate the activities of the unit as much as we can. But sometimes our hands are tied. We need complete freedom and time if we have to implement certain critical activities in the unit. We do need the time to gain our employees' trust. I can dictate terms on some activities, such as production. But I cannot dictate terms about every activity as soon as I come to power here" (Top manager 1, Unit4).

One of the primary reasons for the disintegration of working information partnerships at TC is that every unit, and in some units every division, has a department concerned with IS development. These departments have no uniformity in their names. Some are called electronic data processing (EDP) departments or groups. Others are called computer centre. A few departments refer to themselves as the IT group, and some as the software group. At the corporate office, the department is referred to as the IS department. When questioned by the researcher as to why there were so many different names at the different units, informants answered as follows:

> "Well, each unit has a different history, different product lines and different collaborators. We use the names like EDP, computer centre, etc. that our collaborators use so that it is easy for us to communicate with

> them. And we have been using them for so long. If you want to change the name suddenly, it becomes difficult and confusing" (IS top manager, Corporate Office).
>
> "The IT departments were formulated in the respective units at different times by different divisions for different purposes. It is a very complicated situation. At the time they were formed, I guess the name for a particular department was appropriate. But then it is difficult to keep changing department names always. When new departments were formed, they were given new names, such as the computer centre or the IS department. The older departments refused to change their name and also refused to cooperate with the newer departments" (Analyst 1, Unit1).

Additionally, the IS themselves are named differently in different divisions/units. For example, the same IS is referred to as the materials requirements planning (MRP) system in some units and as the integrated materials management system (IMMS) in other units. When questioned by the researcher, the informants had this to say:

> "There are no uniform guidelines for naming the IS. We give it a name that we think is appropriate for the IS. Sometimes we use the name that our collaborators use for their IS, so that we can be consistent when dealing with them. And sometimes we want to distinguish ourselves from the other units, as we have spent considerable amount of time and effort on the IS" (Analyst 1, Unit3).

There are several kinds of IS in use at various units, and each unit claims sole ownership and responsibility of the IS developed at the unit. The IS have been developed using different hardware and software platforms, and in many cases, they are not compatible with one another. Some of the IMMS/MRP have been developed using SQL Server while others have been developed using Oracle. Some other IS have been developed using dBase, and yet others using COBOL.

Every unit, and in some units every division, has developed these systems independently according to the unit's/division's specific requirements.

> "Every unit manager wants to say – we developed the system on our own, without any help from anybody – be it technical or managerial. So, we develop from scratch the same system that the other unit has already developed and is using. Surprisingly, it does not seem like a waste of time or money, unlike what you may think" (Analyst 2, Unit5)

> "At least they (the IS developers) are from different units, several thousand of kilometers away from us. That is understandable if they cannot work with us or with others to develop the IMMS. Here, in our own unit, people do not want to work together. Each division wants to build the system independently. Imagine!!" (Analyst 3, Unit1).

> "We have people in our unit (referring to Unit6) who can build this system (referring to the IMMS). Why should we beg and borrow this system from another unit? After all, what do they have that we don't? We can build our own system from scratch and do it better than them (referring to another unit). If I need help, I will call upon the external IS consultants. We pay them money anyway. So they will come and help my people if required" (Top manager 1, Unit6).

These multiple nomenclatures of the departments and IS, combined with the existing complex organizational structure of the organization and the management attitudes, have brought about complete disintegration of IS at TC.

> "Ultimately, what do we have? Disintegrated teams, disintegrated systems. And we have to work with these things here. He (referring to the senior manager of the division) knows how to shout at us for not doing the work. But does he care about these problems? No!!" (Analyst 4, Unit1).

> "We only have islands of systems, no integration. In this unit itself (referring to Unit1) we have about three or four MRP systems. Each system has been developed in the respective division. Isn't it ridiculous that two or three sets of development activities for practically the same system are taking place about two hundred yards apart in two different buildings? ….. None of the systems work efficiently. No one has the relevant experience or training for effective development, and they are fumbling around in the dark. In spite of it, they will not work together to

> develop one common system. Rather, they are not allowed by the senior managers to work together. …. If there is just one system, then only one person gets the primary credit for that project. Who should get the credit, when four or five managers are vying for that golden spot?" (Analyst 1, Unit1)

INFORMATION PARTNERSHIPS IN THE CONTEXT OF INFORMATION SYSTEMS ROUTINIZATION PROJECTS AT TC

Information partnerships, both user-user and user-analyst information partnerships, are at the heart of every IS project undertaken at TC. This section analyzes these information partnerships in the context of two dominant IS routinization projects.

Table 4-4 gives a brief overview of the major IS projects at TC. These projects are in different stages of development and routinization. For purposes of this study, only two dominant IS routinization projects are considered. These IS projects are representative of the other IS projects being undertaken at TC, and the information partnerships discussed in these two projects are representative of the information partnerships in the other IS projects. The two dominant IS routinization projects are:

a) Integrated Materials Management System (IMMS2) at Unit3,
b) Enterprise Resource Planning (ERP) system at all the units, with particular emphasis on Unit4 since it is the only unit that has implemented all the modules of the ERP.

Table 4-4: IS Projects at TC in 2001-2002
(sorted by business function)
(* indicates that the IS project has been selected for a detailed discussion in this chapter)

Name of IS project	Unit in which IS project undertaken	Business function for which IS project undertaken	User groups involved (in addition to the local IS analyst group)	Year IS project started	Status of IS project in 2001-2002
Enterprise resource planning (ERP) project*	Across all the six units and the corporate office	All functions (manufacturing, distribution, services and finance) in Unit4;	Production planning, central planning, sales, materials management, finance, services, distribution, and Baan developer D2	1999	ERP system being used successfully; on the way to routinization
		Only finance in all other units.	Finance departments in all the units, the local IS departments, and the Baan developers D1, D2	2000	ERP system not being used successfully; major operations are conducted using other systems, and ERP is used only for the end-reports
Integrated materials management system (IMMS1)	Unit2	Materials management	Production planning, purchase, materials management, inward goods department	1993	IS not successful; has multiple problems; other user groups and the EDP blame each other constantly
Integrated materials management system (IMMS2)*	Unit3	Materials management	Production planning, purchase, materials management, inward goods department	1997	IS was routinized and integrated into the normal operations of the unit; Later, Unit1 requested IMMS2 for installation and use at Unit1

Table 4-4: IS Projects at TC in 2001-2002
(sorted by business function)

Name of IS project	Unit in which IS project undertaken	Business function for which IS project undertaken	User groups involved (in addition to the local IS analyst group)	Year IS Project started	Status of IS Project in 2001-2002
Integrated materials management system (IMMS3)	Unit5	Materials management	Production planning, purchasing, materials management, stores, inward goods department	1996	IS still not being used completely. Other systems (dBase based) are being used and data transferred to the IMMS3 to produce reports.
Materials resource planning system (MRP)	Unit6	Materials management	Production planning, purchasing, materials management, inward goods department	2000	Implementation completed; IS was being used and was on its way to routinization.
Integrated finance management system (IFMS)	Unit1	Finance	Finance, IS/IT group	1995	IS was routinized and integrated into the unit's business operations. Discontinued in 2001 because of ERP arrival.
Integrated sales management system (ISMS)	Unit5	Sales	Sales, engineering, quality control, shipping, billing	1998	Implementation had been completed; IS was being used as a normal routine application in the unit

The discussion of each IS routinization project will be framed around the first key construct – types of information partnerships, and the other three key constructs – positive antecedents, negative antecedents and empowering interventions impacting the first key construct. The key constructs and their associated sub-themes have been identified in Table 4-1.

The analysis in this chapter, however, will only include the "thick description" of the raw and detailed findings from the data and will not directly focus on interpreting the key constructs or any of the associated sub-themes. Chapter 5 will abstract the key constructs and interpret and discuss them in light of an established theory – social identity theory.

Each IS routinization project will be discussed under the following topic headings:

- Context of the IS project.
- Formation of the information partnerships.
- Development of the information partnerships.
- Strengthening of the information partnerships.
- Impact of the information partnerships on the routinization of the IS.

While the primary focus of every IS project in this discussion is on information partnerships and their impact on the successful routinization of the IS in the unit, it has to be noted that routinization is only one stage of the entire IS development process. The six stages of the IS development and implementation process, as identified by Cooper and Zmud (1990) are initiation, adoption, adaptation, acceptance, routinization and infusion.

Therefore, the discussion of information partnerships proceeds right from the inception of the IS project and continues throughout the life of the IS project until routinization.

Information Partnerships in the Integrated Materials Management System Project at Unit3

The Integrated Materials Management System Project at Unit3 (IMMS2) was a prime example of information partnerships impacting the successful routinization of an information system (IS) in the organization. This project will be referred to as IMMS2 in this discussion to distinguish it from the other IMMS projects at other units, as presented in Table 4-4.

As mentioned earlier, the discussion in this section is framed around the key constructs and their associated sub-themes as identified in Table 4-1.

Context of the IMMS2 project

Understanding the context of the IS project is an integral part of understanding the information partnerships and their impact on the routinization of the IS in the unit. This is particularly important in an ethnographic study. A brief description of the context of the IMMS2 project is presented below.

Unit3 was established in 1976 to manufacture very small-sized (less than 100 lines) and small-sized (up to 2000 lines) electronic telephone exchanges for usage in rural and suburban areas. This unit was set up in a small town in a southern state of India, far

away from any major metropolitan city. Under collaboration with a French telecommunications company, the production of the telephone exchanges started.

The unit has a single division (single product line) with a single set of all the required departments for its regular business operations.

> "In a smaller unit, you are not overwhelmed by the number of people. It is manageable. Look at Unit1. It is difficult to manage 5000+ people. But in our unit we have less than 800 people, and that is better any day. Just because they have more people does not mean that they are better. We are actually more efficient than they are. With fewer department heads there are lesser number of fights and decisions get done faster" (Top Manager 1, Unit3).

In 1988, the French collaborator also helped set up a mainframe-based manufacturing management package called POSITEL. This system did not cover many of the requirements of TC, but the unit had no choice at that time but to use POSITEL. At the same time, there was some in-house development for simple systems for purchasing and finance that were interfaced with the POSITEL system.

In 1997 a strategic decision was made to implement a client-server based Integrated Materials Management System (IMMS2) that satisfied all the requirements and specifications of the unit.

The IMMS2 is a comprehensive IS application that covers all the major functionalities of materials management. These include:

- purchase planning (such as determination of work in progress, materials in stock, materials to be ordered, materials on order, etc.),
- purchase ordering,
- inward goods advice and inward goods inspection,

- inventory control (called ‘stores’),
- preparation of production schedules, including stock positions,
- inspection, certification and shipping of finished products, and their requirements, and
- billing to customers.

Some functions, such as supplier (vendor) advice and accounts payable were left out of the system design by choice.

The IMMS2 included the major user groups from production planning, materials management, inward goods, shipping, quality assurance, finance and the IS analyst group from the computer centre (the name of the local IS department in the unit). The entire process would require stable and successful information partnerships among all these departments and the computer centre.

Formation of the information partnerships

This section describes the formation of the different information partnerships, both user-analyst and user-user information partnerships, in Unit3 for the purposes of the IMMS2 project.

The first activity undertaken in the IMMS2 project was to formulate the information partnerships. The assistant general manager of production (AGM-P), a senior manager in the unit, as well as the manager of the IS department in the unit saw the need for user-user information partnerships early on in the project.

> “That is the most logical way to go about the project. I should not make all the decisions and prepare all the specifications, and then select the

> members of the project team. That defeats the whole purpose of team working. In this way, all the team members are brought together right at the beginning of the project" (Top Manager 1, Unit3).
>
> "The users have to be briefed about the system we will develop for them. After all, they supply us the raw materials so that we can develop a working system for them. We also have to know how they communicate with each other so that we can streamline the processes, if required, and implement the most efficient system for them. We should bring all of the users into the picture early on so that they will have more faith in the benefits of the new system" (Analyst1, Unit3).

The AGM-P was a powerful person who was in charge of production, materials management and the computer centre. The AGM-P was second-in-command at the unit and exercised strong influence and authority. The topmost person at the unit, the general manager, was a political appointee. He was appointed by the chairman and managing director of TC and, therefore, would change every four years. On the other hand, the AGM-P had been in the unit for more than fifteen years in the same position.

At the same time, the AGM-P had earned the faith and respect of many of the user groups involved in the IMMS2 project.

> "The AGM-P of our unit (Unit3) is one of the most stable and powerful people that I have seen. The general managers come and go, but the AGM-P stays. He has been here for a long time and knows the unit very well. He has been instrumental in getting our IMMS2 accepted and running successfully throughout the unit" (Analyst 1, Analyst 3, User 2, User 3, and User 4, all in Unit3).
>
> "He (referring to the AGM-P) is very powerful. Although he heads only production and materials management in this unit, he knows every operation in the unit, including marketing, finance, shipping, and IS. In fact, no one ever says no to him. He has been instrumental in getting our IMMS2 system so widely accepted and used by everyone in this unit. Now, seeing our success, Unit1 has even borrowed our IMMS2 system and installed it at that unit" (Analyst 1, Unit3).

Ever since the manager in charge of the computer centre had retired in 1996, the AGM-P had taken direct control over that department. He also wielded strong influence with other departments, such as finance and marketing, and with the respective department heads and other senior managers.

The AGM-P was in charge of formulating the initial information partnerships. The primary user groups selected for the IMMS2 development team came from the production planning, materials management, purchase, and inward goods departments. The three IS analysts for the information partnership came from the computer centre, the local IS department in the unit. There were no external IS developers or analysts involved in this IS project.

> "We were confident that we could develop the IMMS2 ourselves, given sufficient and proper training. One, it is expensive to hire external consultants for the development of this IMMS2. Second, we have our own IS group (computer centre) here, and we are capable to doing this job ourselves. Third, we did not to seek any help from any of our counterparts in any other unit. …You ask why, we are far more capable than any of them. Fourth, we are 500 km away from two units and 2000 km away from three other units. We cannot work effectively when we are that far apart" (Analyst 1, Unit3).

The individuals on the IMMS2 development team were carefully selected by the AGM-P based on their age, education, experience and personal relationships. Most of these individuals were from the same small town or nearby rural areas. They had gone to the same college in the town and had graduated at approximately the same time. So, they were also of the same age group. Because TC was the only major company in that town, many of these individuals had sought employment at the organization.

> "We know each other personally. We were batchmates in college (meaning that they were in the same batch of students who were admitted to the college and who graduated) and we have developed an affinity for one another. We are from the same age group as well. We respect each other, and so we can discuss issues and problems without anybody being offended or taking it personally. It would be difficult for us to do this if we are from different educational backgrounds. Here we are a 'well-adjusted family' and so we have better results" (User 4, Unit3).

At the same time, the individuals from the different user departments, such as production planning and materials management, came from similar positions (grade levels in the organization) at TC. Even the primary IS analyst in the analyst group was in the same position as the other members of the other user groups. The other two IS analysts were subordinates of the primary IS analyst. As a result, there was no initial tension among the information partners regarding status in the organization.

> "This was a good move from our AGM-P. It is very uncomfortable to work with people from several grade levels and produce good results. Most of the time, the senior persons are trying to wield their influence and boss us around. There is more ego and power-play than anything else. We never get productive work done. In this project most of us are on the same grade level. So no one is superior and no one is inferior" (User 4, Unit3).

The AGM-P capitalized on the long-term personal relationships that existed among the individuals as well as other attributes, such as the common vernacular (native) language spoken by all the members of the team. His strategy paid off well in the long run. It helped move the initial group interactions smoothly without much friction or tension. The information partnerships moved past the initial inertia without much problem.

> "Nearly all of us speak our native language here. Yes, we know English as well, but sometimes we connect better when we speak our mother (native) tongue" (User 4, Unit3).

> "You don't feel that it is a big deal when you are helping out a friend. And we have developed very close bonds by working closely with one another and helping each other in times of need, whether it is a work situation or a family situation. We did this in college as well when we worked on college projects. Also, I have seen that it is easy to bring across an idea or a solution to a problem and have it accepted when you know the people well rather than to a complete stranger or to just an acquaintance" (User 2, Unit3).

Each individual in the information partnership, or in some cases a few individuals, became the liaison between the newly formed information partnership and their respective departments.

> "The team was called the "Project Execution Task Team." Each of us represented our own departments so that the computer centre people (the IS analysts) could ask us questions about our work. Of course, they could go and ask any of our department people. We have no objection to that. But since I am the manager of this department (production planning), they would talk to me normally" (User 3, Unit3).

Development of the information partnerships

This section discusses the development of the information partnerships, both user-user and user-analyst information partnerships, at Unit3 for the IMMS2 project. As mentioned earlier, this discussion is framed around the key constructs, as identified in Table 4-1, and their associated sub-themes.

The AGM-P involved all the newly formed information partners in the initial discussions for the IMMS2 project.

> "This was not a foreign concept to us. We had been working with the POSITEL for many years and we knew what was going on. We had two major problems. One, the maintenance of the mainframe was going down and this was a threat to the whole unit. Second, POSITEL kept crashing regularly and the support for POSITEL was no longer available (from the

> French collaborator). We knew it was time for our own system that was not mainframe-based. The AGM-P also convinced us of the benefits of having our own system. We knew that we had the capability to build our own IMMS based on a client-server model" (Analyst 1, Unit3).

All the members of the information partnership were aware of the problems they were having with POSITEL. The AGM-P acted as the project manager of the IMMS2 project. He sent the IS analysts on several training programs for the development platforms used for the IMMS2, particularly for Windows NT, MS SQL Server and Visual Basic. These training programs aided in the development of the information partnerships.

> "These training programs helped. We cannot do everything just by reading books, though it is not impossible. But you see, we are the only unit where there have been no budget cuts for training. We attend seminars and workshops on a regular basis. We know what is going on in the outside world, even what is going on in Europe and America regarding the latest technologies, software development issues and other systems. Moreover, our confidence level increased, and we were better able to work with each other because of the training programs" (Analyst 2, Unit3).

The topmost person in the unit, the general manager (GM), also played a very active role in the initial development of the information partnerships, although he was transferred out of the unit in 1998, one year after the IMMS2 project started. The GM intervened in the project directly and forced the members of the information partnerships to really work and produce results.

> "The GM has a production review meeting every Tuesday at 2:30 pm. Although it is called the production review meeting, all subjects relating to the whole unit are discussed. Project review, financial review, process review, quality review and delivery review for all departments take place at this meeting. Even lower-level people come to the meeting. Also, all concerned executives, such as the assistant general manager (AGM), deputy general manager and other managers of all the departments are there at the meeting. Every department gets a time slot of 15 minutes for discussion of its problems. The GM hears everyone's concerns. Then a

> larger "nuts and bolts" meeting is called within the next two days if there is a serious problem" (User 4, Unit3).

The information partners, that is, the members of the information partnerships for the IMMS2 project, had to answer questions every Tuesday to the highest-ranking official of the unit. Therefore it became mandatory that they work to show progress every week, with the result that many of the initial interactions among the user groups and between the IS analysts and the user groups were forced.

The different information partners (production planning, materials management, purchase, accounting, etc.) had to meet with one another to streamline the work processes so that the resulting IS would be efficient and meet all their requirements. At the same time, the users would meet with the IS analysts to discuss their system requirements and specifications, and modify them if need be. Additionally, the AGM-P held weekly meetings with all the information partners to resolve any differences of opinion or other problems arising in the team. All these factors helped in the rapid development of the information partnerships.

> "Of course we had problems. Who doesn't? We tried to resolve our problems among ourselves first. If things did not proceed ahead soon, we would go to the AGM-P for advice. He always listened to us, even though it was already 6 pm and he had to go home" (Analyst 1, Unit3).

> "It is not just that the AGM-P is powerful, he is very kind as well. We have complete faith in his leadership. He does not boss us around. He sets up meetings and gives us complete freedom to discuss among ourselves (IS, production planning, materials planning, finance, marketing etc.) Then he listens to our problems, whatever they may be. He is more of a facilitator. We can also approach him with our ideas and suggestions, and he will not dismiss us. And whatever problems there are, he follows it up with a 'nuts and bolts' meeting within the next two days. I guess that is why we have been so successful" (Analyst 1 and User 2, Unit3).

Strengthening of the information partnerships

This section continues from the previous section, which discussed development of the information partnerships, both user-user and user-analyst information partnerships. This section discusses the continued development and strengthening of the information partnerships over time.

In the IMMS2 project, the interactions among the different information partners soon became a regular feature of their work. Along with their duties in their respective departments, the information partners had to spend time with each other and with the IS analyst group discussing the project and issues related to it.

> "We (the production planning user group) had a one-to-one interaction between our department and the IS analysts (the computer centre). We also had a one-to-one interaction with the head of the R&D (research and development) department. We had to do several modules on a "trial-and-error" basis and so we had to meet daily to discuss the module and see how it worked. We did this for a whole month on a daily basis. Similarly I had another meeting with the manager of the materials management. That is actually easy, since she works on the same floor as I do and we meet each other several times a day for several other discussions as well" (User 3, Unit3).

> "We (the IS analysts) discussed Y2K problems, codification schemes, enhancements to the modules, etc. During the initial prototyping stages, we communicated with the production planning, materials management and the purchase departments every day. We only implemented a few modules initially. The other modules came later" (Analyst 1 and Analyst 3, Unit3).

> "We (the materials management user group) faced problems with the accounting department as to how they costed the different items. We need a complete costing of all the items for the racks (digital exchange racks), cards (PCB – printed circuit boards), transistors, etc. We (materials management) liked the way the IMMS costed the items. There was no change in how the process worked. The difference was only how the costs were presented. The accounting people quarreled with us for a long time,

> but finally we were able to work things out smoothly with them" (User 3, Unit3).

Over a period of time, the interactions among the different information partners became voluntary and self-guided, though the AGM-P was always on top of every development that occurred regarding the project.

> "I am not sure when this happened, but it did. Somewhere we crossed over a threshold. We did not need the AGM-P or anyone else supervising our workings and communication with the other users. It became such a regular feature that we would not think twice about having to meet with the required persons to complete the project" (Analyst 1, Unit3).

Over this period of time, the information partners became not just members of one information partnership as it had started out. Many of these individuals developed strong relationships with the people they worked with everyday. They learned about each other's work processes. Some learned about each other's personal life as well.

In April 1999, the first few modules of the IMMS were implemented.

> "Yes, we (the IS analyst group) took a long time. But our AGM-P said that it was ok. He said that it is better to do it slowly and correctly rather than do a hurried and bad job of it. We were all new to the client-server technologies. There were limitations in the knowledge of the development process. The user requirements were enormous and kept changing. We could not cope with that. So first we concentrated on the core system" (Analyst 2, Unit3).

> "The users needed several changes in the features as well as in the layouts. They had problems in the way the tables were linked and the way the data was being extracted. They need all the data presented on one screen itself which was quite difficult. And we had to customize several reports. Sometimes they (the user groups) would get involved in ways that annoyed us. But we were there to do a job. So as we discussed, we were not annoyed anymore but were doing the job together" (Analyst 3, Unit3).

The composition of the information partnerships, both the user groups and the IS analyst group, had not changed in all this time. The same individuals that had started out in the information partnerships still belonged to these information partnerships. They knew each other well, and they knew the problems that they were facing in the project. They were also aware of the time and effort they were all putting into the IMMS2. As a result, the relationships among the individuals in the information partnerships grew stronger.

> "We were working together and bringing our skills together for a common purpose. That created synergy and added to the motivation that our AGM-P was already giving us. We felt proud that we were working on this project together" (User 4, Unit3).

Another significant common problem that all the members of the information partnerships faced was that the primary collaborator for Unit3 had stopped all support for the mainframe. The IS analysts at Unit3 were maintaining POSITEL on their own. They found it extremely difficult to do so, and this was propagated throughout the other departments that were dependent on POSITEL for their daily operations. Therefore the different user groups, in addition to the IS analysts, had a common vested interest in seeing the IMMS2 project become successful. This, again, contributed to the positive interactions among the information partners and strengthened the information partnerships.

All the members of the information partnerships reported to the AGM-P, who was in complete charge of the project. Therefore project objectives did not change from time to time. This further strengthened the information partnerships.

> "We report to just one person, and that is our AGM-P. If anyone else gives us any specific instructions, we can follow them and do the work, or we sometimes we just forward it to our boss and he takes care of it. In that way, we are free to pursue our project without any undue hindrances" (Analyst 1 and User 2, Unit3).

> "The more important thing here is that the top management trusts us in the same way we trust them. That builds confidence in us" (Analyst 2 and Analyst 4, Unit3).

Finally, after two and a half years after the IMMS2 project started, all the modules were fully implemented.

> "We used a phased manner to implement the modules. And we did a good job. It was a dedicated effort on all our part" (Analyst 1, Unit3).

The members of the information partnerships, including the IS analysts and some users, had been sent to several training sessions for Windows NT, MS SQL Server, and Visual Basic. At the same time, they were delegated responsibility to train the other members of the user-user information partnerships in the use of the system as the newer versions of the prototype became available. These individuals went back to their respective departments and trained other members of their user group, such as production planning or materials management.

> "We had continuous training. Even after implementation, training continued so that we could evaluate ourselves. Self-evaluation is also important along with feedback from the senior managers and the other users" (User 3, Unit3).

> "We had to monitor the response time of the IMMS. We also had to look at the information relevance, accuracy of the data, information availability, flexibility, and user-friendliness. We also had to customize the different reports for the different user groups. In every case, we called the major users and demonstrated the system to them. They also experimented with the system. That gave us valuable feedback" (Analyst 1, Unit3).

In addition to the regular user training sessions, special training sessions were held for the managers of the different departments so that they would be aware of the capabilities, features and problems of the IMMS2. This reinforced the strength of the different information partnerships in the unit.

> "It is important that managers were trained as well. The AGM-P made sure of it. After all, the managers are the people who make decisions based on these data. They should know how the system functions" (Analyst 2, Unit3).

Impact of the information partnerships on the routinization of the IMMS2

This section discusses the impact of the information partnerships, both user-user and user-analyst information partnerships, on the routinization of the IMMS2 at Unit3.

It should be noted that the development and strengthening of the different information partnerships, as described above, are cumulative. The combined strengths of the different information partnerships significantly impacted the routinization of the IMMS2 in Unit3.

The primary impact of the information partnerships was that the IMMS2 did not face much resistance from the different user groups. It was readily accepted by all the user groups of the different departments.

> "They (meaning the different user groups) were involved in the project since day one. We have developed a strong work ethic. We trust each other completely as far as the IMMS2 is concerned. And we are there to fix any problems they may have. And we modified and revised many screen formats and report formats to suit them" (Analyst 4, Unit3).

> "We trained the users well. Apart from the regular training sessions, we also went to their offices anytime they called and helped them with both

> minor and major problems they had with running the system. Over time, the number of calls for help reduced" (Analyst 3, Unit3).
>
> "We had already experimented with some of the earlier versions of some modules. We knew the features of the system. And it was not a brand new application. We had done the same job earlier on POSITEL. And we knew that this system was ours, and we knew that this system was more efficient than POSITEL" (User 2, Unit3).
>
> "The cycle time of production was significantly reduced with the introduction of the IMMS2. We had to revise our entire way of doing our work and monitoring it because of the IMMS2. But it was not done in a day. Look at the benefits – earlier it would take us 3 days to run the materials resource planning application completely. Now it takes us just one-half to one hour to do the same job" (User 4, Unit3).

By 2001, four years after the project started and one and a half years after complete implementation, the IMMS2 had become an integral and routine part of the operations of Unit3. In time, several policies in materials management and production logistics were modified to run in accordance with the IMMS2. Work procedures were streamlined, and the IMMS2 was routinized in the organization.

> "We did not have to create any new department just because of the IMMS2. But we streamlined the operations and they are running more smoothly than before. That is a show of success for all of us. And we are very proud of it" (Top Manager 1, Unit3).
>
> "All the users are happy with the IMMS. We in the unit depend on it so much for everything we do every day. If the IMMS is down for just half an hour, we get so many phone calls from all over the unit asking thousands of questions" (Analyst 1, Unit3).

Another significant factor that impacted the routinization of the IMMS2 in Unit3 was that the information partnerships were not dismantled after the IMMS2 was implemented. The AGM-P still called for regular meetings of the different information

partners to discuss progress and problems in the working of the system. The same information partners continued to interact with one another, sharing the successes and problems of the system every week.

> "Nobody forgot the system after it was implemented. Many people think that maintaining the system is the analyst's job and not theirs. But here, everyone was responsible for their part in making sure the system was running smoothly. Our AGM-P made sure of it. That helped" (Analyst 2, Unit3).

In one and a half years after implementation, the IMMS2 did not seem like a novelty to the users. It enjoyed a sustained, routine use in the unit.

> "Every department (production planning, materials planning, purchase, etc.) depends on the IMMS2 completely for its job. You see, earlier we had to wait such a long time for the papers to come from production planning. Now we can access all the information from right here (meaning the person's office). I have even modified the working processes of my people to fit the IMMS2. So we send the required plans to the purchase department as quickly as possible" (User 4, Unit3).

> "We are so used to the system that we do not think twice about it. The only time we have to think about it is when it does not work. We have to call the computer center (the IS analysts) to fix it. Otherwise it is 'business as usual'" (User4, Unit3).

> "Of course there is always maintenance of the IMMS2. But the system is still young. We plan to keep it around for some more years. We have added some new features once, but only because they were necessary. Otherwise, we just maintain the system" (Analyst 2, Unit3).

The IMMS2 in Unit3 became so stable that groups from other units, which had never engaged in any communications with their counterparts in Unit3, contacted Unit3 for a demonstration of the IMMS2. This was a significant impact of the information partnerships on the success of the IMMS2.

> "You know we are so proud of our IMMS. We have had several exhibitions of our IMMS2 at the other units and at other companies in nearby towns and cities. That has been our incentive and our motivation to keep working on the system and make it better every day" (Analyst 1, Unit3).

One division in Unit1 eventually purchased the IMMS2 in late 2001, and the members of the different information partnerships (both IS analysts and some users) from Unit3 were deployed to train their counterparts from Unit1 in both technical and functional aspects of the IMMS2.

> "Imagine our surprise and happiness when we found out that they (meaning Unit1) are asking us for our IMMS2 system. All the divisions (production planning, materials planning, purchase, etc.) here (meaning Unit3) depend on it so much. The IMMS2 has become a part of their life. Now we are sharing our success with them (Unit1). Finally, they see our potential. They see the success of our product, and they ask for our help. We are happy to help" (Analyst 2, Unit3).

Unfortunately the IMMS2 was not allowed to reach its full potential (stage of infusion). There were no attempts made to integrate the IMMS2 into the operations of the other units.

> "Yes, it is true that there are so many systems lying around the company. But that is not our fault. We are not in charge of integrating all IS development activities of TC. We are working for our unit only. As long as the IMMS2 serves our purpose we are happy. And as a matter of fact, our IMMS2 is far better than any of the other systems the other units have developed. We have demonstrated the functioning of our IMMS2 to the top manager of IS at the corporate office as well as to some other units. If they want our system, all they have to do is ask for it" (Analyst 1, Unit3).

At the same time, there was no attempt to integrate the IMMS2 with other application domains, such as finance, and extend the capabilities of the system.

> "Initially we thought of integrating a finance module with the present IMMS2. But by that time, we were notified of the arrival of the ERP. So we decided against it" (Analyst 2, Unit3).

With the arrival of the ERP system in 2000-2001, a decision was made by the corporate office unilaterally to decommission the IMMS2 within three to five years and to use the ERP in its place.

> "This is such a shame. We have invested so much energy, dedication and time on this project, and it has become such a big part of our everyday lives. And now, for no apparent reason, they want to decommission the system. Just because they want to bring in the ERP they want us to abandon all our hard work" (Analyst 1, Unit3).

Information Partnerships in The Enterprise Resource Planning (ERP) System Project

Information partnerships played an extremely significant, but mixed, role in the enterprise resource planning (ERP) project at TC. The ERP system project was a complex project undertaken at TC in order to integrate all the business functions and operations across all the units of the organization.

Data from all the units will be used in the different sections of this discussion of information partnerships, including their formation, development, strengthening and impact on the routinization of the ERP. Emphasis, however, will be placed on Unit4 in all these sections of the discussion because it was only at this unit that all the modules of the ERP were implemented. Also, the ERP in Unit4 was on its way towards routinization in 2001-2002. In all the other units, only one module (finance) was implemented, and all these units were facing common problems, which will be discussed later in the section.

As mentioned earlier, the discussion in this section is framed around the key constructs and their associated sub-themes as identified in Table 4-1.

Context of the ERP project

Understanding the context of the IS project is an integral part of understanding the information partnerships and their impact on the routinization of the IS in the unit. This is particularly important in an ethnographic study. A brief description of the context of the ERP project is presented below.

In late 1998, a plan was made in the corporate office of TC to integrate the operations of all the units of TC using an ERP package.

> "We were aware of the numerous IS that were being developed at TC. None of these systems were integrated, and we could not even fathom how they could be integrated when they had been developed on multiple hardware and software platforms. With the ERP we would have one single platform for all our business operations" (IS top manager, Corporate Office).

The ERP is an enterprise-wide application that integrates all the major functions of an organization. The modules of the ERP are:

- Manufacturing – this includes all materials management activities, including bill of materials, production orders, production schedules, stores functions (inventory control), materials requirements planning, etc.
- Distribution/Logistics – this includes all the input and output logistics to the production process.

- Services – this includes all the pre-sales and after sales services, problems encountered, symptoms, diagnoses and fixes.
- Finance – this includes all financial transactions and consolidation activities leading to the formation of the balance sheet.

Unlike other IS projects, which involved one unit or one division within one unit, this ERP project was comprehensive in its character. For this project to be successful, all the different dimensions of information partnerships, as identified in Figures 4-1 and 4-2, at all levels of the organization, had to be successful. This was an extremely complex task.

Formation of the information partnerships

This section describes the formation of the different information partnerships, both user-analyst and user-user information partnerships, in TC for the purposes of the ERP project. It also describes the tribulations that the organization went through in the process of forming the information partnerships.

Information partnerships began to fail even before they were formed for the ERP project. There were several dimensions of the user-user information partnerships, as identified in Figures 4-1 and 4-2, in play in the ERP project. The initial tensions began at the topmost levels of management in all the units and in the corporate office of TC.

Almost every informant in every unit had the same complaint – no one in any of the units was consulted before a decision was made regarding the ERP system. The lack

of communication between the corporate office and the different units was clearly evident. Dysfunctionality in the information partnerships was clearly evident as well.

> "Someone in the corporate office thought, 'we have to go into the twenty-first century, and for that we need the most popular software', and they chose ERP. Nobody thought whether it was appropriate for our company, and nobody considered which type of ERP was suitable for our type of company. We don't even know whom they (in the corporate office) consulted. All we know is that they told us that they were going to implement this ERP and that we all had to do what they ordered us to do" (Top manager 1, Unit5).

> "We don't even know who was involved in the decision making process. It seemed so arbitrary. One fine day the corporate office announced that we would have an ERP package. At that time we didn't even know what ERP meant. No one consulted us or our IS analysts, at least as far as I know" (Top manager 1, Unit4).

Not only were the heads of the different units, their divisions and the different departments not consulted, even the senior manager of IS at the corporate office was not involved in many major meetings that were held with the chairman and managing director regarding the decisions to implement the ERP.

> "I was kept out of many meetings. The then-director of finance (who retired in late 1999) pushed for this software, but he did not realize that his decision would affect all our units and all our operations across these units. And my boss (referring to the former executive director of IS, who retired in 2000) said yes to everything. I do not disagree with them per se. The ERP decision is a good one, but if you don't involve the other people in some decision making at least, then how can you expect to get cooperation? Now both the director of finance and my boss are retired. I am left to pick up the pieces, and they are … really … pieces" (IS top manager, Corporate Office).

The former director of finance and the former executive director of IS at the corporate office consulted with the chairman and managing director of TC regarding the ERP implementation decision, and the chairman readily agreed with their decision.

The corporate office decided to go ahead with implementing an ERP package from Baan, an ERP developer from the Netherlands. Baan recommended two local (meaning in India) ERP developers D1 and D2 (both IS/IT consulting companies in India) to implement the software package at all the units and the corporate office.

Baan developer D1 was assigned to work with two units (Unit1 and Unit2) and the corporate office, and Baan developer D2 was assigned to work with the other four units. There were three to four IS analysts from each of these Baan ERP developing companies. These IS developers could not be reached for interviews as it was post-project at the units.

The units proceeded to work independently with the assigned developers with little or no involvement from the corporate office. There was no uniformity or consensus in the composition and the formation of the information partnerships at any level of the organization.

> "… This seemed like a mistake as well. Why do we need two different consulting companies to develop the systems? Each consulting company does its development work differently. And we are a single organization, a single entity, even though we have several units. So why do we need two different sets of development activities? You see, this is what I have been saying all along. Nobody there (at the corporate office) asks us anything. They make a decision and only expect us to blindly follow it" (Analyst 1, Unit5).

The initial plan included implementing all the modules in the ERP package (manufacturing, distribution, services and finance) at one unit (Unit4) only as a test

project (pilot). Subsequently, the plan was changed at the corporate office. It was decided to implement all the modules at Unit4, which was regarded as the pilot unit, and to implement only the finance module at all the other units and at the corporate office. This again caused friction in the information partnerships, even before they were fully formulated.

> "The former director of finance pushed for the implementation of the finance module at all the units. He was interested in integrating all the finance activities of all the units. So he decided to get the finance module implemented. It was such an arbitrary decision of his (referring to the former director of finance) part. And the former executive director of IS agreed to this decision. …. Well, he had to once the chairman said to do so…." (IS top manager, Corporate Office).

> "What they (referring to the senior managers at the corporate office) don't understand is that finance is actually the tail-end of the whole business process. All the other activities (referring to manufacturing, distribution, logistics and services) finally converge at finance. So if you implement finance first and forget about the other modules, what do you achieve? And later if we have to put in the other modules, imagine the problems we will face. You see, this was more a power play by the former director of finance than anything else" (Analyst 1, Unit1).

The ego clashes and competition among the senior managers at TC was evident. The information partnerships at the senior manager levels were failing miserably even before they had a chance to be well formulated and begin the development process. They were unable to get off the initial inertia because there was so much mistrust and trepidations among the senior managers, who formed the initial information partnerships.

When asked about why the other modules (manufacturing, distribution and services) were not implemented at all the units, the IS top manager at the corporate office said,

> "Well, the other directors and the heads of the other units did not put in a formal request for it. If the unit head does not take the initiative to have the modules implemented, what can we do? They just agreed to whatever was decided at the corporate office. If I wait for you to say something, and you wait for me to say something, then nothing gets done. You see?" (IS top manager, Corporate Office).

One top manager at a unit said:

> "It is easy to say that we did not put in a formal request. What request did they need from us? We were never consulted about any aspect of the ERP implementation, so why suddenly this question? First of all, we had no idea what the potential of ERP was. We did not know what it could do and what it could not do. Second, we did not know whether the ERP was right for our organization. Third, there are six units here. Who should have put in the request? All of us general managers? Or all the production heads? He (referring to the IS top manager at the corporate office) is speaking nonsense" (Top Manager 1, Unit6).

The corporate office conveyed the ERP implementation plan to all the units. All the units initially resisted the ERP, but they were given no choice but to begin implementation of the ERP immediately.

> "If I myself am not convinced of the merits of the ERP system, how can I convince my workers in the team that it is a good idea? All I know here is that I am following orders" (Top manager 1, Unit6).

Most of the informants had no faith in the ERP. One informant compared the physique of TC to that of the Hollywood star 'Danny DeVito'.

> "TC does not have a normal physique. It is very much like your Hollywood film actor, you know, Danny DeVito. You cannot take Danny DeVito to a regular clothing store and choose his suits or shirts. He is not your normal film star. He needs special 'tailor-made' suits to fit his physique. It is the same case with TC. We cannot just pick a software package and say 'it will work for you.' It will not, and these people (referring to the senior managers at the corporate office) do not understand it" (Analyst 1, Unit1).

Many of the informants did not believe that the ERP was actually good for them. They were not convinced of its usefulness and appropriateness either.

> "Baan ERP is highly generic. It is therefore not useful for us. Several operations are redundant, and it is a huge waste of time and energy to customize almost 75% of the system. What is the point of so much customization? Instead we can use our own IMMS which has proven to be highly effective. But it is corporate policy now that we use Baan for all the operations. And yet, only the finance module has been implemented in the unit" (Analyst 1, Unit3).

Several other informants at other units echoed the same sentiments.

> "There are so many unnecessary steps in Baan. I know it is a standardized package, but it is not useful for us. We have to simply go through the same data several times. We cannot customize it as we like because every operation affects several other operations in other modules. And it takes a lot of time to understand the relationships among the different operations. With our own IMMS system we know exactly what is going on where because we all worked for so long to build it" (Analyst 1, Unit5).

Some other informants were doubtful as to how the whole ERP would work since only the finance module was being implemented across all units. They also noted that this move by some of the senior managers made them lose faith in the decision making ability of those managers.

> "Think about it. They are thinking about the finance module so much. But they are neglecting the other modules. What if they have to undo everything when they decide to implement the manufacturing and logistics modules as well? Then they have to rework and spend more time and more money. And we have to suffer because all our operations will become messy" (Analyst 1, Unit5; Analyst 2, Unit6).

Instead, many informants were confident that the indigenously developed IMMS and other IS were better than the ERP system.

> "Our 'desi' (Hindi for local, meaning indigenously developed) system is much better. It may seem crude, but it works. The IMMS has been tested repeatedly, and it has proven to be effective each time. So much so that the

> production planning department and the materials management department have changed their procedures to accommodate and work with the system. And to top it, Unit1 has asked for our system to be installed at their Unit1. What more proof is required that the system works?" (Analyst 1, Analyst 2 and User 2 of Unit3).

Other informants were equally vocal about the Integrated Finance Management System (IFMS), an IS that was developed at Unit1 for the finance department.

> "We spent a lot of time working with the other finance people (referring to the finance departments of the other divisions at Unit1) and the computer people (the local IS analysts) to build this IFMS. We spent so many hours after office hours working on the system. And we are proud of it. It works so well. Yes, I know it has some problems. But which system does not have problems? Tell me. That is part of regular maintenance and growth. The IPA (Inland Purchase Accounting) module worked well. We were having some problems with the FPA (Foreign Purchase Accounting) module. Now we have to scrap the entire system and shift to Baan" (User 9, Unit1).

Some middle level managers had so little faith in the ERP system and the top management's handling of the entire issue that they started developing their own IS in parallel.

> "How long should I keep waiting for Baan to be completely implemented? Anyway they will not implement the manufacturing and logistics modules immediately. Who knows, they may even cancel the whole project after a few years. I am bypassing the corporate office orders, and my team has started to build our own MRP system. At least we will have a system in place for some work" (User 1, Unit6).

These struggles across all the units of TC were causing more inertia on the information partnerships even before they could be well formulated. No senior manager in any unit was prepared to start work on formulating the information partnerships for any module of the ERP project.

In addition, the plans for the ERP kept changing frequently. Finally, the former director of finance had his way and it was decided to go ahead with his ERP implementation plan – install all the modules of the ERP in Unit4, and only the finance module in all the other units.

> "You ask why? How do I know? We only know that a decision was made for the entire organization, and we have to follow it. So we will do it, in our own time" (Analyst 1, Unit1).

> "Everything was decided and then conveyed to us. Did we have any choice in this whole process? NO!! ….. We were happy nonetheless. At least we were having the complete ERP installed at our unit so that we could reap the benefits of the software application. The other units were just wasting their time with only the finance module" (Analyst 2, Unit4).

After the decision was made to implement the ERP system according to the wishes of the former director of finance, different user-user and user-analyst information partnerships were formally introduced for the purpose of the ERP project. A "steering committee" headed by the former director of finance was formed to coordinate the ERP implementation process. The different unit heads were assigned to be the other members of this committee.

Again, these information partnerships failed to move beyond the initial inertia. There were more ego clashes and more competition among the top managers.

> "This was most surprising to me. Why should the director of finance assume the leadership position instead of the head of the IS department at the corporate office? I was not asking for that job, but my boss, the executive director of IS, was better for that job. Again, it was a power play with the chairman and managing director" (IS top manager, Corporate Office).

A decision was also made to formulate information partnerships at the unit level for the ERP implementation process. An "implementation committee" was organized at every unit that included the head of the unit, the head of finance at the unit, the head of the IS department at the unit, and members of the Baan developing companies D1 or D2. Because all the ERP modules were being implemented at Unit4, the heads of the other departments, such as production planning, materials management, quality assurance, purchasing, etc., were included on the implementation committee as well for that unit.

The decision makers were unaware of the information partnerships that could have existed across the units at different levels. Only the information partnerships at the highest levels in the organization (steering committee) were across the units. The rest of the information partnerships at other levels were all within a particular unit. This again impeded in the successful formation of information partnerships across the organization as a whole for the ERP project.

The number of members in the information partnerships was also decided by the corporate office. "Key users" were selected from every unit to attend the initial training sessions with the Baan developers D1 and D2, and to begin work on the ERP project. The key users from every unit, except for Unit4, included two finance persons and one local IS analyst from the unit. Unit4, however, selected thirty six (36) key users for the ERP project, bypassing the guidelines from the corporate office.

> "You ask why we had so many key users. I realize that you think it was out of proportion when compared to the other units, but it was realistic and it was worth it. We did not listen to the corporate office on this aspect. We told our GM that we needed more key users on this project if it had to be successful. He agreed. The corporate office did not interfere in this matter because of two reasons. First, all the modules of the ERP were being

> implemented in our unit, in contrast to the other units and the corporate office. So we needed extra key users from the different departments. Second, the chairman and managing director had designated our unit as the flagship unit of the organization, and so we had extra latitude from the chairman's office" (Analyst 1, Unit4).
>
> "It was actually a good idea that we collectively decided to have so many key users. Our GM encouraged it, and so did the executive director of IS from the corporate office. I am not sure why the other units did not include more key users. What if one or more key users leave the organization? What happens to the project then?" (Analyst 3, Unit4).
>
> "This is exactly what happened. The key finance user of our unit (Unit2) got married and left the company to join her husband in another city. The other key finance user in the unit left for a better job at another multinational company. All the training they underwent was a waste, and the unit had no key users from the finance department" (Analyst 2, Unit2).

The steering committee, which had been formed at the strategic level at TC for purposes of implementing the ERP project, failed to discuss relevant issues and problems regarding the project. Soon there was a complete breakdown of the information partnerships at the strategic level. At the unit level, however, the information partnerships continued to develop, though they developed at different speeds at different units.

> "We should have had monthly meetings at least, so that we could have had effective discussions of issues, problems, solutions, ideas, etc. with the different unit heads and the corporate office. But that did not happen. You see, the director of finance holds a meeting regularly with his people. All the issues were raised in those meetings and resolved there itself. There were only finance meetings, no IT meetings at all. Also, there were no discussions at all with the Baan developers D1 or D2. There was no foresight from any of these senior people whatsoever" (IS top manager, Corporate Office).
>
> "The director of finance retired in late 1999. The executive director of IS retired in 2000. With that, the steering committee stopped interacting. As if there was any interaction earlier!! Whatever was done was done at the

> unit level. I was involved in only a few of these activities. ….As I said earlier, the chairman and managing director is more concerned with finance and production. The chairman is not concerned with IT issues at all. I am not even invited to the meetings which involve the chairman and managing director, the finance people, the production people, etc. It is all a political game" (IS top manager, Corporate Office).

Development of the information partnerships in Unit4

Several types of information partnerships had been formed at TC across many levels, such as the steering committee at the strategic or top management level and the implementation committee at the unit level. Unit4, however, was the only unit to have the complete ERP implemented in the unit. The rest of the units and the corporate office had only the finance module implemented.

Therefore, this section and the next few sections will concentrate on discussing the development and strengthening of the information partnerships and their impact on routinization of the ERP in Unit4. After this discussion, the information partnerships at the other units and at the corporate office will be described.

This section describes the development of the information partnerships, both user-user and user-analyst information partnerships, in Unit4.

The members of the information partnerships, that is, the key users from Unit4 were carefully selected by the top manager of IS in the unit in consultation with the different department heads. Each of the key users was an executive with a minimum of twelve (12) to fourteen (14) years of experience on the job. All the key users were in their forties and fifties, and had a good educational background. In contrast, some of the

key users, both finance and IS, from the other units were younger professionals with less than two years functional experience.

> "We were serious about the ERP project. We wanted the key users to have both a solid knowledge of the domain (that is, the functional department) and the business processes, and the capabilities of understanding new technologies and assimilating them into the business processes" (Analyst 1, Unit4).

> "Since we all came from approximately the same grade level (position in the organization), we respected each others' opinions and worked together. No one bossed others around. And that was a positive thing" (User 4, Unit4).

> "This unit (Unit4) is a relatively newer unit than the others. By the time this unit was established the senior managers had realized that it was critical for the unit's success to bring in college graduates. Many of us here have a Master's degree and we are able to conceptualize better when it comes to working on a project. Although we were brought in to this unit from different cities, we all knew that we had come for a specific purpose. And of course, there is nothing else to do here (as Unit4 is in a remote location). So we grew to liking each other and this has worked well" (User 2, Unit4).

The members of the information partnerships in Unit4 had one more attribute in common. They were all located in a remote area. Unit4 is located in a very remote area with the nearest small town located some 100 km away, and the nearest big city some 400 to 500 km away. All the employees, including senior managers, live in company housing on the unit premises. That attribute contributed to the rapid development of the information partnerships.

> "It is like a big college campus. The factory is here and we live here. The nearest village is 10 km away. There is absolutely nothing here. We see the same people during the day at work, and in the evening we see the same people out on the streets in the campus. We see the same people on the weekends and the same people on holidays. In a way this is good because we get to know the people very well, and we develop friendships

> and personal relationships with them over time. This influences how we work on the job as well. We become one big community and it is one big plus point towards our success" (User 3, Unit4).

One informant compared unit size to family size.

> "Our unit is small, and therefore efficient. …. If we have a small family, then we know all the members very well. We help out with problems and work better together. If there are too many people in the family, and if each person does different things, very soon people will move in their own directions without any regard for the family. This is what is happening in the larger units" (M3, Unit4).

All the meetings and discussions regarding the ERP project were held only at the unit level, with little or no support from the corporate office. The key users from Unit4 started work on the ERP project with Baan developer D2 in February 1999.

For four months the information partnerships continued to develop in Unit4. The information partners, locally called the "key users," met with Baan developer D2. They also met each other one-on-one and in groups to conduct the AS-IS study of the existing business processes. The study was complete with the development of reports, flow charts, write-ups of business processes, and the different stages in which the business operations took place.

At the onset of the project, there were numerable tensions among the information partners in Unit4, particularly among the different users from production planning, materials management, purchasing, finance, etc.

> "We insisted on being together during several of these meetings. We had to learn about the new technology, but more importantly, we realized that we had to learn about all the different business processes and how each process affected other processes. We were thirty six of us, and it was a grueling task to understand all the processes. Sometimes, the finance people would walk out saying that they did not need to know about certain issues regarding production or other departments. Sometimes the

> production people would not come to a meeting citing similar reasons. But we, as the local IS analysts, needed to know all the fine details so that we could implement and use the system efficiently" (Analyst 1, Unit4).
>
> "Some of the finance, production, and materials management people thought that it is the duty of the computer centre (the name of the local IS analyst group) to do all the work in the ERP implementation. They thought that their job was only to view the results on the screen and see the printouts. …. We were the flagship unit and all the ERP modules were being implemented only in our unit. So we thought we should all work together to prove that we can do novel things in our unit. We are a pretty close-knit community here and even we had a hard time convincing them that they had to get involved right from the initial data entry to all operations at every step. They simply would not understand it. …. But finally, after several discussions and disagreements, they got it. I am not sure how the other units handled this issue" (Analyst 3, Unit4).

Some top managers also contributed to the rapid development of these information partnerships using both forced and facilitated interventions. But only a few top managers were really interested and committed to the success of the ERP project at TC, particularly in Unit4. One such person was the executive director (EDR) of IS at the corporate office who retired in 2000, shortly after the start of the ERP implementation, and who was a major force in the ERP implementation process. The EDR contributed to the positive development of the information partnerships by forcing the initial interactions among the members of the information partnerships.

> "The EDR was a great man. Sad he retired so soon. He would come all the way from the corporate office 2000 km away every month to check on our progress. He would call meetings with all people from different divisions and departments, including the PCB (printed circuit board) production division, the switching division, etc. and from different departments, such as finance, manufacturing, materials management, services, and the IS analyst groups. There were many occasions when the production people from the switching division would disagree with the production people from the PCB division. The EDR would resolve the issues. He would talk with every person and make sure we knew what was going on. And it was

> important that we all knew what was going on because all the modules of the ERP were being implemented only in our unit" (Analyst 6, Unit4).

> "The EDR was a good 'catalyst'. Even when he was not here (referring to Unit4) he would call day and night to make sure things were working well. He called me at home in the middle of the night with questions, suggestions, etc. Sometimes I would get so angry because he was disturbing my family at night. But then I understood how important this was to him. So we did not mind the disturbance at all" (Analyst 2, Unit4).

It was not just the management support that was critical but also the fact that the information partners understood that the EDR knew what he was talking about. Their faith in the EDR increased with each interaction they had with him.

> "He (the EDR) was very demanding. But he knew the answers to many questions (not technical ones) even before we asked them. We were all impressed and ready to work" (User 8, Unit4).

Another senior manager who was dedicated to the ERP project and who enabled the positive development of the information partnerships in the unit was the director of Unit4. He had earned the title "dictator," although with respect, from his subordinates. This was in distinct contrast from other senior managers who were just authoritative but not understanding or sympathetic. This director contributed to the rapid development of the information partnerships by forcing initial interactions among the information partners.

> "The former director of our unit (Unit4) was a very dynamic man. Having served in the army he knew the value and the effects of discipline. He was the one who said 'Do or Die' and got the modules implemented in such a short period of time. But the problem is that he retired soon after that. If he had remained in this position for another year or so, we could have shown the whole company how good the ERP system is and how well it works. Yes, we had to customize it a lot, but at least we did it. The leader should not quit or retire in the middle of a significant and critical project like this.

> It affects all of us here" (Analyst 2, Analyst 4, User 7, and User 8, all of Unit4).
>
> "It was the same case with the EDR at the corporate office. He was so dynamic and he worked so well with all of us. He was a guiding force and he motivated all of us to do our best. But then again he retired. If he knew he was retiring soon he should not have gotten involved in the project. Otherwise he should stick on until the project reaches some kind of stability. This is the problem with such managers" (Analyst 2, Analyst 4, and Analyst 5, all of Unit4).

ERP training sessions also significantly contributed to the development of the information partnerships. All the thirty six key users underwent a complete training on the Baan ERP for sixty days. The training included:

- a broad overview of the ERP,
- different Baan ERP tools available for system administration,
- advanced tools for systems development, modification and administration,
- dynamic enterprise modeling,
- concepts on networking, database management with Oracle, database administration, and
- sessions specifically for finance, manufacturing, services, logistics, etc.

The training sessions also included training with Windows NT. Earlier it had been decided to use UNIX as the operating system, but later, with the recommendations of the Baan developers, it was changed to Windows NT.

> "The training sessions were exhausting. But we learnt a lot, and we realized that we could achieve success in our flagship project. And we are the flagship unit of our company. That adds another feather to our cap" (User 7, Unit4).

> "There was one more big advantage of us training together. We understood how our work affects each other. We learned how to assist each other and how to solve each other's problems. That brought us even closer to each other" (User6, Unit4).

Strengthening of the information partnerships

This section continues from the previous section, which discussed development of the information partnerships, both user-user and user-analyst information partnerships in the ERP project at Unit4. This section discusses the continued development and strengthening of the information partnerships over time.

By the time training on the Baan ERP was completed, the networking for all the required stations in Unit4 were completed. Then the information partners, with cooperation from Baan developer D2, started the process-mapping portion of the implementation. The business processes were mapped with the Baan ERP. This was soon followed by identification of the points of interest, with the deviations from the standard application, and identification of the final solutions. Customization on the ERP began along with the data migration and implementation of codifications schemes. These processes strengthened the information partnerships over time.

> "These were trying times. Although we had the training, this process was very tedious. We disagreed a lot, we fought a lot, we walked out many times, but in the end, we learned a lot. Also, we figured out ways to compromise without sacrificing efficiency" (User 6, Unit4).

The top managers were key instruments in fostering and strengthening the information partnerships. During this period, both the EDR at the corporate office and

the director of Unit4 actively led the information partners (the key users) through the stages of the ERP project and guided them towards complete implementation.

> "The EDR was extremely supportive of all of us. He was not just solving problems; he was also very sympathetic. He motivated all of us even at times when we were ready to give up on the project" (User 4, Unit4).

> "The EDR was there to provide guidance and arbitrate when we had disagreements. During the process mapping and simulation stages, we encountered several problems among ourselves (referring to the key users). Sometimes these problems escalated into dire arguments, particularly when it came to undermining someone's authority or power. At those times, the EDR would step in and smooth out the problems. All of us would accept his decisions" (Analyst 3 and User 5, Unit4).

In April 2000, the director of Unit4 decided that the ERP had to go 'live' at least in one test division by July 2000, when he would retire. The information partners told him that it was nearly impossible to do that, but the director did not listen to anything they said.

> "Our former director (of Unit4) was a man from the army. He never listened to any excuses. He was retiring in three (3) months and wanted to see the ERP implemented before he retired. A lot of people were tensed up because of this. We all had hesitation and doubts about the project. But our director did not listen. He said, 'Do (as I say) or Die (meaning get fired from the company).' Surprisingly, our people responded quickly. The EDR from the corporate office also supported our director. So we had our system running before he retired" (Analyst 5, Unit4).

Other informants were equally in praise of this senior manager and his commitment and dedication to the ERP project, which further strengthened the bonds among the information partners.

> "You know what our former director said? He said, 'most great inventions are made during wartime. This is wartime, and I want this system fully functional before I retire'. Nobody could say anything else, particularly since he gave us full moral support and complete freedom to experiment

> with the system and test it out. And also, he would sometimes spend up to sixteen (16) hours in the factory overseeing the production processes, solving problems, talking to the employees, and helping us in our ERP project. He set an excellent example for all of us" (Analyst 2, User 3, User 5, Unit4).

In July 2000, the ERP went 'live' for one division in Unit4. All the modules worked well except for the finance module. It was a significant achievement for the information partners for the ERP group and for the retiring director of the unit.

Over time, the information partnerships strengthened and did not require the constant interventions by the director of the unit or of the EDR from the corporate office.

> "Soon after our director (of Unit4) retired, the EDR of the corporate office retired as well. That did not matter, though we missed them and their excellent guidance. But we had established our objectives very clearly, had fought with each other, had reconciled, and our relationships (among the key users) were much stronger. We were confident that we could lead the rest of the project towards completion without major problems" (Analyst 1, Unit4).

Meanwhile, the implementation of the ERP modules continued in Unit4. The members of the information partnerships added new members into the extended information partnerships, extending the information partnerships into their respective departments. The information partners, known locally as key users, trained the other end-users in their respective departments. The information partners from the local IS analyst group at Unit4 also helped their counterparts in other departments in the training process.

> "We are really proud of our work. In about six months, we not only worked on the successful customization of the ERP, but we also trained nearly 450 end-users all over the unit. We conducted rigorous training, and these sessions were held nearly every day. It was a tremendous effort, only made possible by our strong, close relationships and cooperation" (Analyst 2, Unit4).

After training, nearly 300 of these end-users in Unit4 became involved in the customization efforts of the manufacturing and distribution modules. This further strengthened the existing and new information partnerships that were formed all across Unit4.

By February 2001, the ERP application went 'live' in all divisions across Unit4. There were still some minor problems, and modifications and customizations continued over the next few months.

> "Continuous training helped. Trust among the key users was a very important factor in our success. Disagreements come and go, but the relationships get stronger over time. And that translates into the effective ERP system that you see here" (User 4, Unit4).

Impact of information partnerships on the routinization of the ERP in Unit4

This section discusses the impact of the information partnerships, both user-user and user-analyst information partnerships, on the routinization of the ERP at Unit4.

It should be noted that the development and strengthening of the different information partnerships, as described above, are cumulative. The combined strengths of the different information partnerships significantly impacted the routinization of the ERP in Unit4.

The primary impact of the strong and effective information partnerships in Unit4 was that by the end of 2001, the ERP had been readily accepted by the end-users in the unit. It was, however, not an easy task in spite of the prolonged development and strengthening of the information partnerships among the different user groups and the local IS analyst groups in Unit4.

> "The finance people were not involved in any data entry in the old IS that we had. Now, with the new ERP system, they had to do it. There was initial resistance, but the key users from the finance departments did a good job of convincing the end users of what needed to be done to get the system running smoothly. …. The fact that many of the end users were also involved in the later customization stages helped. They became aware of the complexity of the ERP system and were willing to cooperate" (Analyst 2, Unit4).

The senior managers, however, were still reluctant to use the ERP effectively. Many of the senior managers were used to getting reports from the IS analysts and reviewing the reports to make decisions. With the implementation of the ERP, the senior managers had to mine most of the data themselves.

> "These senior managers find it difficult to operate the system. But they have to learn and accept it. We cannot do their work and hand-deliver reports to them, as we did earlier. That is a situation they still have not come to accept fully" (Analyst 4, Unit4).

By December 2001, the ERP in Unit4 was almost stable. There was still some fine-tuning of the system required, but the ERP system was being effectively used by all the divisions of Unit4.

> "There are still some problems that occur periodically. For example, if a component returns from the shop (production floor) in a rejected state, it causes a big problem. Up to seven (7) departments get involved in the system at this stage. The ERP cannot handle this rejection in the system. Right now, we are doing it manually. The IS analysts are working on adding this feature to the ERP" (User 9, Unit4).

In January 2002, the information partners, particularly the local IS analysts, at Unit4 were confident of routinizing the system within six months to one year.

> "The system is almost stable. It is used in some departments as a regular feature, but in some departments they are still facing problems everyday. We are confident of solving those problems and optimizing the ERP very

> soon, perhaps in six months. We have been through several interactive sessions to realize that we can indeed solve any problem without any breakdown of communication" (Analyst 2, Unit4).

When questioned whether any administrative or governance structures had been changed as a result of the ERP, one user said:

> "We already have done that. For example, earlier we had three localized planning for three production departments. But the ERP needs a centralized planning and cannot handle multiple planning areas. So we had to create a new department called 'Central Planning' that consolidates all the materials planning for all the production departments. It was approved by the GM of the unit. We have achieved some success in the implementation of the consolidations. We should be able to stabilize this in the next few months as people get more comfortable in the business process" (User 6 and User 8, Unit4).

As part of a follow up process, the informants at Unit4 were questioned by the researcher in mid-2004 on the status of the ERP system. The response was positive. The ERP system had become a routine application in Unit4, though the IS analysts had to constantly maintain and fine-tune the system. When asked for the reasons for the positive results, the informant had this to say:

> "This has been made possible only by the continued cooperation and the work that all of us did together. Otherwise we would not have been able to do this. We went through several tensions and fights. At many times, we wanted to give up. But during the initial stages of the project, the director of our unit and the EDR from the (corporate office) made sure we kept on track. Finally, we transcended those tensions and misunderstandings and our relationships became much stronger. Today we are proud to say that we have kept our name and image as the flagship unit of TC" (Analyst 1, Unit4).

Information partnerships in the other units of TC for the ERP project

The information partnerships had a completely different story in the other units of TC. While the information partnerships developed and strengthened at Unit4, they failed miserably in the other units for several reasons:

(a) One reason was that the members of the information partnerships did not have faith in the ERP project. They believed that an indigenously developed and tailored system would better satisfy their requirements than a highly generic ERP. While the information partners at Unit4 also believed in this, they soon transcended this attitude and successfully developed and routinized the ERP in the unit. The information partnerships at the other units, however, never had a chance to develop.

(b) Another reason was that the senior managers, particularly from the corporate office, paid all their attention to Unit4 as it was the flagship unit and ignored the other units. They did not foster the information partnerships at these other units. At the same time, many senior managers at the units were involved in developing parallel systems, thereby ignoring the directives of the corporate office.

(c) A third reason for the early breakdown of the information partnerships was that it did not make sense to the information partners to only have the finance module implemented in all the units. It was at the whim of the director of finance that it happened. Therefore, the information partners were not motivated to go ahead with the implementation and routinization of the ERP.

(d) A fourth reason was that only three persons from every unit, two finance persons and one local IS analyst, attended the ERP training. This was in stark contrast to

the thirty-six key users from Unit4 who underwent training separately for the ERP modules.

> "This is not fair. Many of the key users were new people who had just finished their degrees and had joined the company. They had no real experience in the finance function (the domain). But the senior managers did not listen to our woes" (Analyst 1, Unit5).

Also, many initial members of the information partnerships (the key users) left the organization in search of better jobs without having trained other users in their respective units. Other key users soon gave up on training the other end-users. The composition of the information partnerships was changing constantly, and so the information partnerships had a difficult time crossing the initial inertia.

(e) Another reason for the breakdown of the information partnerships was that the information partners (the key users) from Unit1, Unit2 and the corporate office were trained by Baan developer D1, while the key users from Unit3, Unit5 and Unit6 were trained by Baan developer D2.

> "This did not make sense to any of us. After all, we are all facing the same problem. Why not train us all together? At least we could communicate among ourselves in case of problems if we get to know each other better during these training and work sessions. But the senior managers kept us apart. It defeats the whole purpose of good teamwork" (Analyst 1, Unit3).

During the course of the ERP implementation, all the units faced similar problems of customization. Since there were two Baan developers D1 and D2 involved in the implementation, all the units relied heavily on them. The units never communicated their problems either to the corporate office or to other units. This resulted in disparate events

and more tensions among the members of the information partnerships, sometimes leading to a breakdown of the information partnerships.

One example of such a problem was with the pricing of the inward goods.

> "The pricing of the IGA (inward goods advice) is very simple. Why those people (at Unit1) are having problems, I don't know. You are telling me that they told you they are having problems. They did not tell us. No, they will not ask us for help. And why should we help them unless they ask us? If they want to pay money to D1 for this work, let them" (Analyst 3, Unit4).

> "They (Unit1) need not ask us (the IS analysts) for help. Our finance people know how to do this (referring of the pricing of the IGA in the ERP system). At least let them (Unit1) ask for help with our finance people. We at our unit will definitely help, but you see, that is below their dignity to ask for help. That is the main problem here" (Analyst 1, Unit4).

> "We solved the IGA problem very easily with our developer D2. But Unit1 could not, and neither could their developer D1. They are still trying to solve the problem. If they had asked us, we could have helped them. But they did not ask us. Why should we volunteer? Anyway they have the consultant (D1)" (User 4, Unit4).

Even with the same Baan developer D2, the information partners at the other units were not being able to communicate among themselves or with the corporate office.

> "We (Unit3, Unit4, Unit5, and Unit6) use the same Baan developer D2, but we are unable to solve the problems with the finance module. Even the developers are cunning. They solve a problem at one unit. Don't they know that the same problem will occur at the other units? They will not report it and will wait for us or someone else to stumble. Then we have to ask for their help to solve the problem. No wonder everything is being delayed so much. We are ready to communicate, but the others have to make an effort as well. You cannot clap with one hand" (User 3, Unit6).

> "We are ready to ask Unit4 for help. But our top manager does not like it. He tells us to work with the Baan developer and solve the problem. He even criticizes saying 'when Unit4 can solve it, why can't you? Are you less competent than they are?' … Everything becomes a competition and a power struggle" (User 2, Unit5).

By the end of 2001, most of the end users in all the units of TC, except Unit4, were still fumbling around in the dark. Many of the information partnerships had deteriorated from lack of cooperation, lack of communications, and lack of adequate top management intervention. They were still in the same state of inertia that they had started out with.

> "We did not receive adequate training. Since we only have the finance module in place, we have to do most of the data entry with the data from the production, materials management, purchase, stores and other departments and print out reports. That is not the way we envisioned ERP to work" (User 6, Unit3).

> "Just the finance module will not work until the modules are fully implemented. All the data from all the business processes converge in finance. The senior managers at the corporate office should realize this and implement the other modules as quickly as possible. Otherwise it is a waste of time and money. No one is going to effectively use the system until then" (User 4, Unit6).

> "We want to be able to extract our balance sheet and profit and loss statement (income statement) from Baan at this year end closing (March 31). From the next fiscal year onwards (2002-2003), the corporate office wants all our activities to be completely on Baan, or so we think. Let us see what happens" (User 3, Unit1).

In a follow up with informants from Unit1 and Unit3 in mid-2004, it was learned that only the finance module had been implemented in all the units of TC, except Unit4, which had routinized the ERP. Senior management at TC had not made any decision regarding the other ERP modules. Some of the information partnerships were functional in some units, and the information partnerships had completely broken down in other units. The senior managers were still struggling with alternative solutions. In spite of it,

the units were still reluctant to seek help from Unit4, which was using the ERP as a routine application in that unit.

SUMMARY OF FINDINGS

The data shows that routinization of IS is a complex process that evolves over time. It also reveals specific findings that are significant in any organization involved in IS routinization projects.

The first finding is that there are two types of information partnerships in any organization that is undertaking IS routinization project(s). They are the User-Analyst and the User-User partnerships. Both of these information partnerships and the myriad of relationships among them significantly influence the success of failure of the routinization of the information system.

Secondly, the profile of an information partnership is very complex. The information partnership is made up of several dimensions with individuals coming from several backgrounds, both organizational and cultural, and this can seriously impact the very existence and functioning of the information partnership.

Thirdly, there are several positive and negative antecedent factors impacting the information partnerships. At the same time there are empowering interventions that have a significant impact on the information partnerships.

Finally, information partnerships evolve over time. As they grow stronger their impact on the routinization of the IS in the organization becomes stronger as well.

Chapter 5 discusses and interprets these findings using the theoretical interpretive lens of an established theory, social identity theory, and provides a deeper understanding of information partnerships and their impact on the routinization of IS in organizations.

Chapter 5

Discussion

The general purpose of this study is to develop an understanding of the information partnerships in organizations, their characteristics, and the processes through which they influence the routinization of information systems (IS) in organizations. The purpose of the study is also to provide strategies to foster the positive factors impacting information partnerships while attempting to minimize the negative factors impacting the information partnerships. Using this understanding of information partnerships in organizations, the IS practitioner is able to formulate policies to develop, facilitate and foster information partnerships leading to successful routinization of IS in the organization. Such strategies for developing, facilitating and fostering information partnerships in organizations have been presented all along in Chapters 4, 5 and 6.

In the following discussion, the findings from the data in Chapter 4 are interpreted and discussed. As explained in Chapter 2, social identity theory is used as a theoretical interpretive lens through which the findings from the data are interpreted in order to understand information partnerships in TC and the subsequent impact on the routinization of IS. It is natural in ethnography to go back and forth among the data, the theory and the interpretation, make inferences from the information, extend the analysis, refocus the interpretation as required, connect with personal experience, analyze or interpret the interpretive process, or explore alternative formats (Creswell, 1998, 2003).

The influence of the key constructs and their associated sub-themes, as identified in Table 4-1 of Chapter 4, on information partnerships and the routinization of IS in the

organization are interpreted. Social identity theory helps us understand the dynamics of the information partnerships in organizations in order to develop a strategy for developing, facilitating and fostering information partnerships in organizations leading to successful routinization of information systems.

The interpretation is potentially relevant beyond Telecommunications Company (TC), the organization considered for this study, and its particular organizational culture. While TC's culture may be unique in many respects, it is also representative of contemporary IS development in other domains.

In the next section, the findings from the data are presented. Then the findings from the data are then interpreted using the theoretical lens of social identity theory.

FINDINGS FROM THE DATA

The data shows that routinization of IS is a complex process that evolves over time. It also reveals specific findings that are significant in any organization involved in IS routinization projects.

The first finding is that there are two types of information partnerships in any organization that is undertaking IS routinization projects. They are the User-Analyst and the User-User information partnerships. Both types of information partnerships and the myriad of relationships among the individuals in these information partnerships significantly influence the success or failure of the routinization of the IS.

The second finding is that the profile of an information partnership is very complex. The information partnership is made up of several individuals coming from

several backgrounds, both organizational and cultural, and this can seriously impact the very existence and functioning of the information partnership.

The third finding is that there are several positive and negative antecedent factors impacting the information partnerships. At the same time there are empowering interventions that have a significant impact on these information partnerships.

The fourth finding is that information partnerships evolve over time. As they grow stronger their impact on the routinization of the IS in the organization becomes stronger and leads to a successful routinization of the IS in the organization.

The following section discusses and interprets the findings from the data using the theoretical lens of social identity theory.

INTERPRETATION OF THE FINDINGS FROM THE DATA USING THE THEORETICAL LENS OF SOCIAL IDENTITY THEORY

The first finding from the data is that there are two types of information partnerships in any organization that is undertaking IS routinization projects. They are the User-Analyst and the User-User information partnerships. This finding appears as an integral part of the following discussion on the other three major abstracted findings from the data, as given below:

- Information partnerships are complex and can be profiled.
- Information partnerships are impacted by positive antecedents, negative antecedents and empowering interventions.

- Information partnerships evolve over time and impact the routinization of the IS.

Each finding from the data is discussed and interpreted using the theoretical lens of social identity theory and its three central ideas as described earlier.

Complex Profile of the Information Partnerships

This finding states that the profile of information partnerships that are formed among the individuals in an IS project is very complex. The information partnerships are made up of several individuals coming from several backgrounds, both organizational and cultural, and this can seriously impact the very existence and functioning of the information partnership.

A lack of congruence between the objectives, behavioral patterns and expectations from different individuals coming from different levels of the organization may impede joint identification (Ashforth and Mael, 1989) of common objectives for the IS routinization project. This further distances one group from another, and individuals tend to favor their own in-group against the out-groups, creating more complexity in the information partnerships. Individuals in the information partnerships can very soon find themselves in a vicious circle of complexity and conflicting objectives and procedures in the IS routinization project. This, in turn, negatively impacts upon the routinization of the IS in the organization.

Complexity of the information partnerships is caused by several factors. The primary factors are as follows:

- Numerous information partnerships in the organization.
- Multiple identities and nested organizational roles which conflict with one another.

Complexity arising from numerous information partnerships in the organization

One cause for the complexity of information partnerships in organizations is the sheer number of information partnerships that are formed and reformed during the course of an IS routinization project.

First, there are two types of information partnerships that are formed in the organization for any IS routinization project – user-analyst and user-user information partnerships.

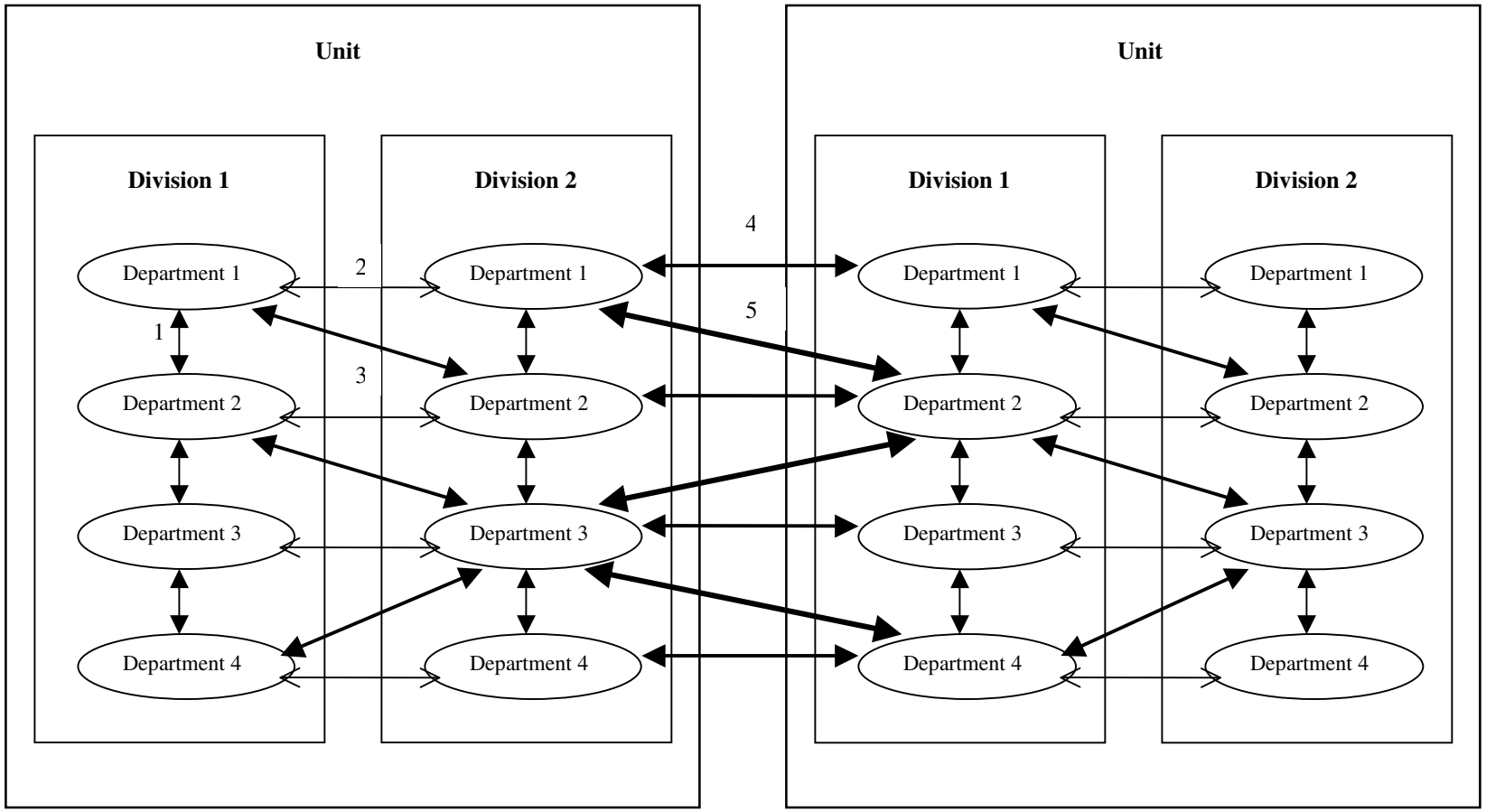
Second, numerous user-analyst and user-user information partnerships are formed during the course of an IS routinization project. Each of these information partnerships adds a new level of complexity to the existing information partnerships.

Figures 4-1 and 4-2 depict the complexity of the user-user information partnerships. Figure 4-1, which is repeated here as Figure 5-1, shows that when the user group is studied as a whole, user-user information partnerships are formed along the five following dimensions:

a. among the user groups from different departments, such as production planning, materials management, or finance in a single division of a single unit,

Figure 5-1: User-User information partnerships at TC: Viewing the user group as a whole
(user group includes both managers and worker groups)

Note 1: *The unit, division and department represented here are general terms. Some units at TC have a single department while some other units have several divisions. The departments are finance, production, information systems, etc. in any division.*
Note 2: *Every double-headed arrow denotes an information partnership. The numbers (1 – 5) indicate an example of the five dimensions that a user-user information partnership can take, and are as described in the text.*



b. among the user groups from the same department (such as finance) in different divisions in a single unit,
c. among the user groups from different departments in different divisions in a single unit,
d. among the user groups from the same department (such as finance) in different units, and
e. among the user groups from different departments in different units.

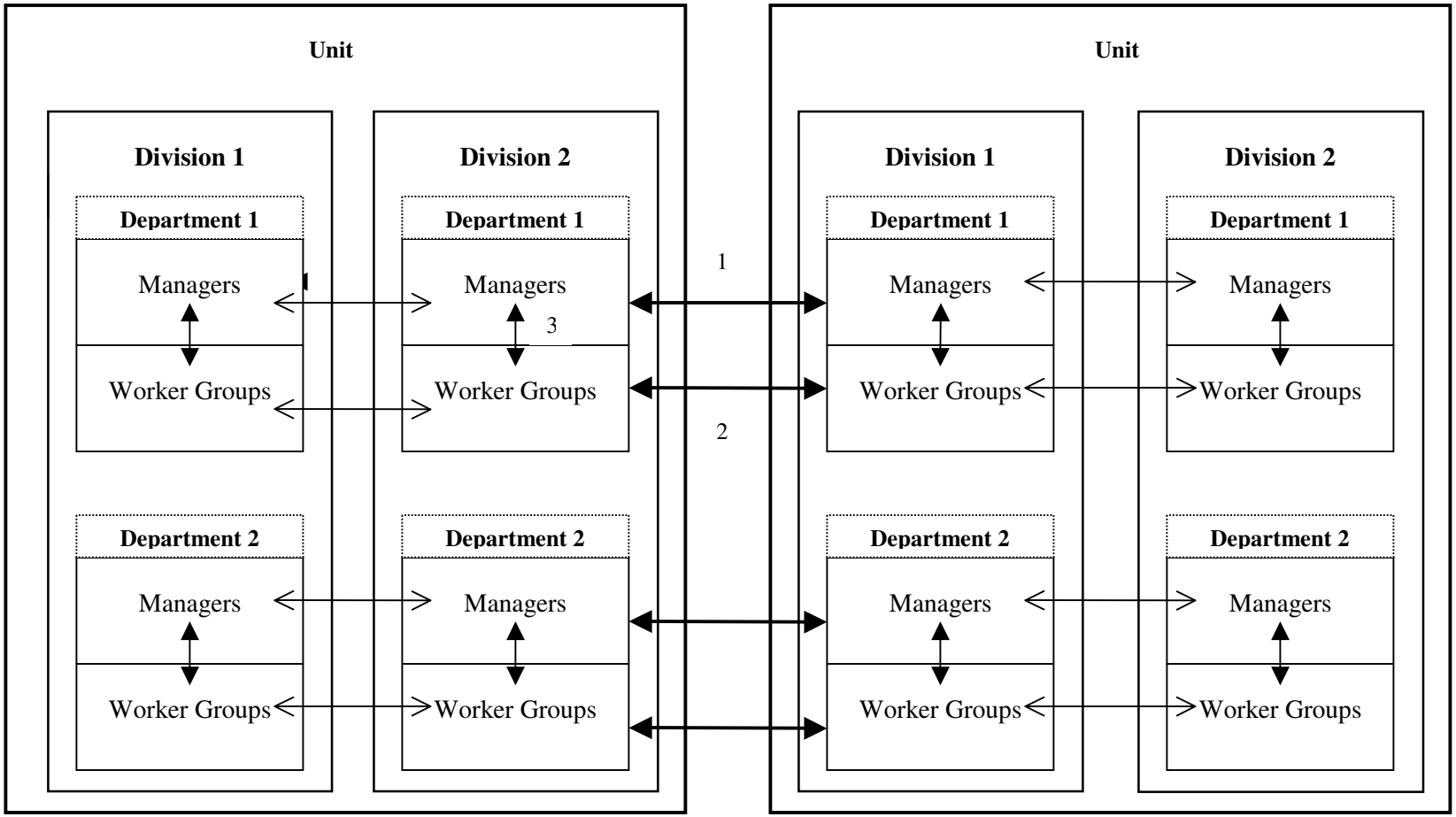
Figure 4-2, which is repeated here as Figure 5-2, shows that when one looks inside the user group, one can see the user-user information partnerships formed along three additional dimensions as follows:

a. among the managers of different departments, divisions or units,
b. among the worker groups of different departments, divisions or units, and
c. between the managers and the worker groups.

The user-analyst information partnerships are similarly complex. The user-analyst information partnerships may also be formed along one or more of the dimensions that user-user information partnerships are formed.

Figure 5-2: User-User information partnerships at TC: An "inside the user group" perspective
(user group includes both managers and worker groups)

Note 1: *The unit, division and department represented here are general terms. Some units at TC have a single department while some other units have several divisions. The departments are finance, production, information systems, etc. in any division.*
Note 2: *Every double-headed arrow denotes an information partnership. The numbers (1 – 3) indicate an example of the three dimensions that a user-user information partnership can take, and are as numbered in the text.*



In any IS routinization project, there will be several information partnerships formed along one or more of the dimensions mentioned above. Whether they are user-user or user-analyst information partnerships, the multiple players forming these information partnerships bring with them conflicting objectives, vested interests, and antagonistic behavioral patterns. These factors impede the development and strengthening of the information partnerships, and lead to the breakdown of the information partnerships and failure of the routinization of the IS. This was evidenced in the enterprise resource planning (ERP) project at TC, particularly in the beginning stages of the project, at both the Corporate Office and the different units of TC.

Complexity arising from multiple identities and nested organizational roles

A second cause for the complexity of information partnerships in organizations comes from multiple identities of individuals and the nesting of organizational roles of individuals in the information partnerships in the IS routinization project.

Social identity theory states that given the number of groups to which an individual might belong, his/her social identity is likely to consist of an amalgam of identities that could impose inconsistent demands upon that person. Further, these demands may also conflict with those of the individual's personal identity, also called "self" (Cheeks and Briggs, 1982; Leary et al., 1986).

An individual in an information partnership, be it a user-analyst information partnership or a user-user information partnership, belongs to several groups. For

example, the individual may be an older person, a male, a Master's degree holder, an IS analyst, a manager, and a decision-maker, which adds up to six groups. This is in addition to the individual's personal identity or "self," which includes his personality, interests, and other psychological and social attributes.

Some individuals in the information partnerships have a defined organizational role, whereas other individuals have multiple organizational roles or roles that are not well-defined. For example, some individuals are IS analysts and they belong only to the IS analyst workgroup. So they come into the information partnership with a defined organizational role. Other individuals have multiple organizational roles. For example, the manager of the IS department in a particular division of a particular unit in the organization has multiple organizational roles. He/she is an IS analyst for the "IS analyst workgroup" with one defined set of objectives. He/she interacts in a specific way with other IS analysts in the information partnership discussing technical issues and focusing on the IS project on hand.

At the same time, he/she is also a manager belonging to the "manager group" with another set of defined objectives. He/she interacts in a different way with other managers who are members of the same user-analyst information partnership. Although he/she is in the user-analyst information partnership with other users for a specific IS project, he/she is also representing his/her IS department and constantly lobbying for his/her department. At the same time, every other manager in the information partnerships performs similar representation and lobbying activities for his/her specific user department/workgroup.

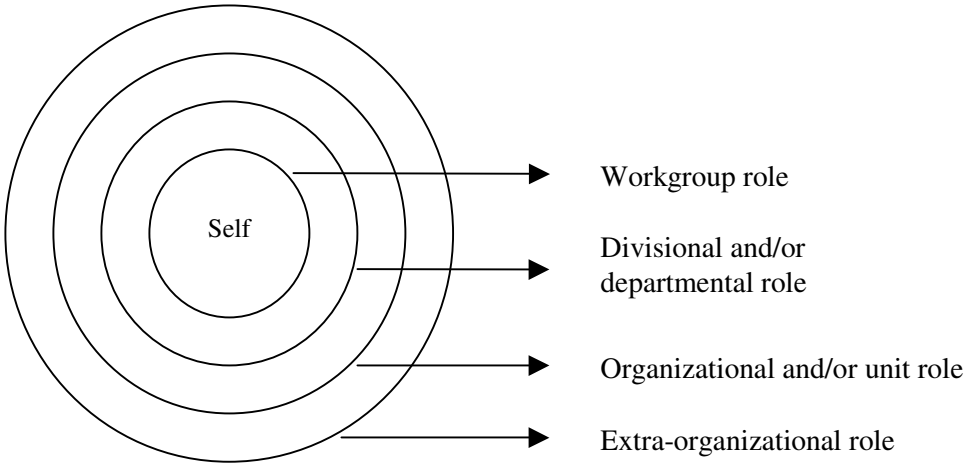
This can lead to a conflict of project objectives and a complex role that the manager has to play in the information partnerships. To add to the complexity, the IS manager has to interact with other top managers at the divisional level and also at the unit level. Along with the IS project discussions, there is always a representation of and lobbying for one's workgroup, one's department, and one's division. This leads to several conflicts of objectives, ideas and roles that several information partners play in the myriad of information partnerships. Many times this leads to a breakdown of the information partnerships and negatively impacts upon the routinization of the IS, as evidenced by the data in the ERP project in chapter 4.

For example, the senior manager of IS at the Corporate Office of TC failed miserably in maintaining the ERP project goals and effective initial communications with the heads of the IS departments at the different units. Most of his time was spent lobbying against the director of finance who wielded strong influence and authority. The result was that there was no consensus in the ERP project, particularly regarding the modules that had to be developed and the timeframes that had to be adhered in the ERP project.

In organizations, conflicts among workgroup, departmental, divisional and organizational roles are somewhat constrained by the nested character of these roles, as shown in Figure 5-3. The concept of nested organizational roles has been adapted from March and Simon (1958). The workgroup (also called subgroup, according to March and Simon, 1958) role is contained in the departmental/divisional role (also called task role by March and Simon, 1958), which is in turn contained in the organizational role. The

Figure 5-3: Nested organizational roles of individuals in a user group

(adapted from March and Simon (1958))



outermost ring, which is the extra-organizational role, is not considered in this discussion since all the discussion is centered on information partnerships within the organization.

The individual's personal identity or "self" is the central focus of all the organizational roles that surround it. This is because the personal identity of the individual plays a significant role affecting his/her other organizational roles.

This nested character of organizational roles can be seen in several instances of individuals in information partnerships at TC. One such example, as described in the data in chapter 4, was the senior manager of the Computer Centre (the local IS department) in Unit3 who belonged to an IS workgroup (the integrated materials management project - IMMS), the particular department (the IS department, also called Computer Centre), and the particular unit (Unit3). Another example, as evidenced in the data in chapter 4, was that of the director of finance who played a workgroup role in the enterprise resource planning (ERP) project as well as an organizational role.

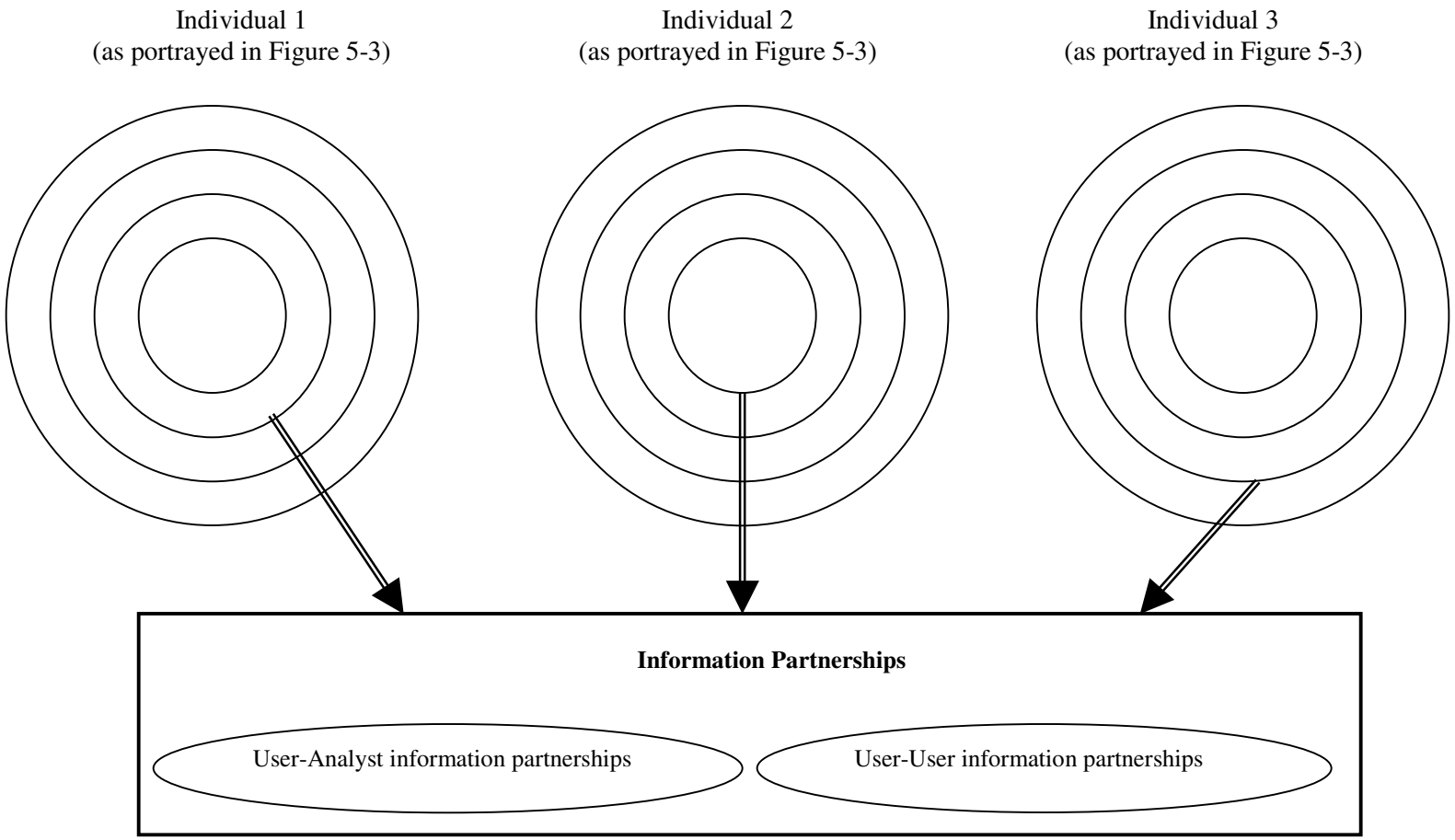
These nested identities add to the existing complexity of the information partnerships, as described earlier. The nested roles are always somewhat at odds with one another (Rotondi, 1975; Turner, 1985; Van Maanen, 1976). The organizational objectives for different organizational roles for the same individual in an information partnership will be different and, sometimes, conflicting. For example, as described in the data in chapter 4, one role of the IS manager in a workgroup in the information partnership for the IMMS project was to foster close interactions and discussions about the IMMS project among his team members and, possibly other user groups involved in the information partnership. At the same time, another role for this IS manager at the

divisional level involved lobbying for his IS department where he was competing against his counterparts from other departments. This conflicted with his first role with the same counterparts who were in the same information partnership for the same project. A third role was at the unit level where he was competing against his counterparts (other IS managers) in other units.

The information partnerships for any IS project will, therefore, have several individuals from different workgroups coming together for an extended period of time for a common purpose. The complex profile of the information partnerships is depicted in Figure 5-4. Each of these individuals will become part of one or more information partnerships, be it a user-analyst or a user-user information partnership. Each individual will bring with him/her a complex set of organizational roles and behavioral patterns which affect the different information partnerships, causing the information partnerships to assume a very complex profile.

Figure 5-4: Complex profile of information partnerships

Note: each individual in the information partnerships may play similar or different organizational roles, as given in Figure 5-3



Positive Antecedents, Negative Antecedents and Empowering Interventions Impacting Information Partnerships

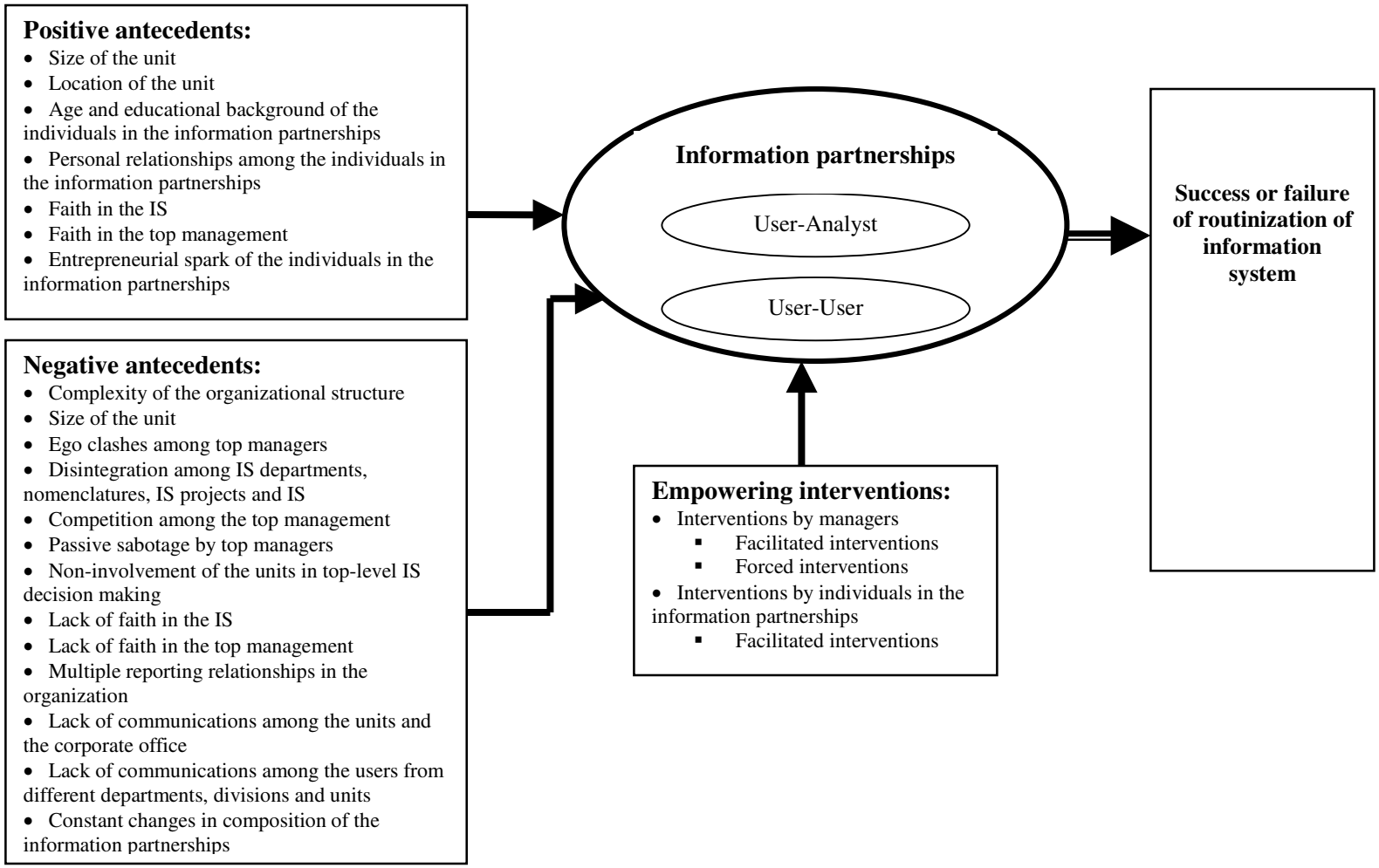
A major finding from the study is that there are positive antecedent factors, negative antecedent factors and empowering interventions that impact information partnerships and, ultimately, the successful routinization of the IS in the organization. A framework for understanding information partnerships in organizations and their impact on the routinization of information systems (IS) is presented in Figure 5-5. It focuses on the positive antecedents, negative antecedents and empowering interventions that impact information partnerships. The following discussion considers these factors in light of social identity theory.

These factors are also presented in Table 4-1 at the beginning of chapter 4 and are illustrated in the analysis of the findings.

Positive antecedents impacting information partnerships

Several positive antecedent factors impact information partnerships from the early formation of the information partnerships for the IS project until the routinization of the IS and beyond. The positive antecedent factors that emerged from this study are presented in Figure 5-5. These positive antecedents play an important role in the development and strengthening of the information partnerships and in the successful routinization of the IS in the organization.

Figure 5-5: A framework for understanding information partnerships in organizations and their impact on the routinization of information systems



Size and location of the unit are significant positive antecedents. This has been demonstrated in the case of Unit3 and Unit4 in the IMMS and ERP projects respectively in chapter 4. The smaller the size of the unit, the more it functions as one workgroup. At the same time, many units in remote locations also serve as a single workgroup. Individuals of the information partnerships, both user-user and user-analyst information partnerships, in such units get to know each other better than at large, multi-divisional units and at units located in large metropolitan cities. This leads to a significant change in thinking about "us" versus "them." All other factors held equal, more individuals in the information partnerships consider themselves as part of one group in a smaller and remote unit than otherwise. The information partnership becomes their ingroup, and the IS project groups in other larger units become the "outgroups." This leads to a stronger identification with the ingroup and against the outgroups. Once identification with a group occurs, social comparison follows.

According to the social comparison idea of "positive distinctiveness," people are motivated to see their own group as relatively better than similar, but inferior, groups. This leads the individuals in the information partnership to come together more closely and work towards becoming successful in the routinization of the IS in their particular unit.

At the same time, age and educational background are important positive antecedents impacting information partnerships. People coming into an information partnership from similar age groups or with similar educational backgrounds tend to think on similar lines. This was demonstrated by the success of the IMMS project in Unit3 and

the ERP project in Unit4, as illustrated in chapter 4. Even though the individuals may initially come from several workgroups, they soon form new ingroups based on their educational backgrounds and other common criteria.

Personal relationships form a critical positive antecedent which impacts information partnerships. This was again demonstrated by the data in chapter 4. Over a period of time, several people working in a department / division / unit form personal relationships that they even carry outside the organization into family relationships and friendships. These informal group relationships are then used in getting official work done as well. In such cases, individuals cross over from other ingroups to form new ingroups based on these relationships. These are powerful forces that bind individuals in a strong information partnership and impact the success of the routinization of the IS.

Factors such as personal interactions, similarity in education and language, liking, proximity, shared goals or threats, and common history affect the extent to which individuals identify themselves with a group and empower each other. Social identity theory states that these factors are not necessary for identification to occur and that just categorization is sufficient for identification to occur. Ashforth and Mael (1989) argue that the pervasiveness of formal and informal groups in organizations suggests that categorization is seldom the only factor in identification. The other factors, such as the positive antecedents identified in Figure 5-5, are equally important for social identification to occur. Once social identification occurs, the individuals in the information partnerships are more likely to strengthen the information partnerships, ultimately resulting in the successful routinization of the IS.

Faith in the IS and faith in the management cements the individuals to one another and to the managers and encourages social identification to occur leading to the strengthening of the information partnerships and impacting the success of routinization of the IS in the unit. The data in chapter 4 explicitly demonstrated both these antecedent factors. Faith in the IS was explicitly demonstrated in Unit3 in the case of the IMMS project and in Unit4 in the case of the ERP project. At the same time, the IMMS project team demonstrated faith in the assistant general manager of production while the ERP project team demonstrated faith in the executive director of information systems from the corporate office and in the former director of Unit4. In both instances the management proved to be critical for the success of the respective IS projects at the units.

Negative antecedents impacting information partnerships

Several negative antecedent factors impact information partnerships from the early formation of the information partnerships for the IS project and throughout the lifecycle of the IS project. The negative antecedent factors that emerged from this study are presented in Figure 5-5. These negative antecedents play an important role in hindering the process of development and strengthening of the information partnerships and attempt to destroy the information partnerships. In the process, they negatively impact on the successful routinization of the IS in the organization.

Social identity theory suggests that much intergroup conflict stems from the very fact that groups exist, providing a fairly pessimistic view of intergroup harmony (Tajfel, 1982). More specifically, it is argued that:

(a) given the relational and comparative nature of social identifications, social identities are maintained primarily by intergroup comparisons, and

(b) given the desire to enhance self-esteem groups seek positive differences between themselves and reference groups (Smith, 1983; Tajfel, 1978, 1982).

This was demonstrated in the data in chapter 4, particularly in the case of the ERP project. Right from the initial stages of this project, there were more conflicts than cooperation among the individuals in different information partnerships, both user-analyst and user-user information partnerships. There was intense competition among senior managers to influence the chairman and managing director and turn the ERP project around to meet their specific requirements so that they would get the entire credit for the project for themselves. At the same time, there were more conflicts between the Corporate Office and the units for several reasons, the primary one being lack of communication and lack of consultation with the units on the project. These conflicts negatively impacted the complete implementation process of the ERP, with the result that the finance module was unable to reach routinization.

The complexity of the organization structure at TC was a significant negative antecedent impacting the information partnerships as well. Every individual at TC identified himself/herself with different groups at different levels of the organization. Apart from the usual categorizations of gender, age, language and rank within the organization, many individuals identified and categorized themselves regressively with their immediate group, the department, the division, the unit and finally the organization.

This was demonstrated in the data in chapter 4, and was a basic cause for the problems occurring at TC. Individuals identified themselves more with their most immediate group, such as the IS groups or the production planning departments or the materials management departments than with the division or unit or even the organization. That most immediate group was their primary group, or ingroup, and everyone else belonged to the out-group. The senior managers held the same notion as well. Everyone identified with their ingroup and sought to promote their own ingroup against the outgroups without regard to what was needed for a successful routinization of the IS in the entire organization, including their specific unit. This resulted in more disintegration of the information partnerships and, sometimes, to the breakdown of the information partnerships.

This was illustrated in the ERP project at the highest levels of management. The senior managers, for example the director of finance, disregarded the "integrating nature of the ERP project" and sought to develop and implement specific modules of the ERP, which they thought would bring them credit. The senior managers were more interested in promoting their own department / unit instead of working for the organization as a whole.

Every group at TC sought to compare their own group, such as the department, division, or unit, with other groups in ways that they would stand out distinctly from the others in a more positive light. For example, Unit3 successfully developed and routinized the IMMS, and they held themselves to be superior to other IS departments at other units. The finance department at the corporate office considered itself better than

other departments at any of the units. Additionally, the director of finance convinced the chairman and managing director that finance was the most important function at TC and that the finance module should be the first module of the ERP to be implemented.

These identifications with their immediate groups (the ingroups) and comparisons with other outgroups lead to the breakdown of communications among the different workgroups that come together to form the information partnerships in the organization. For example, as demonstrated in the ERP project in chapter 4, the senior managers at the units were not consulted in the top-level decision making for the ERP project. This led to mistrust and animosity among the individuals in the senior-level information partnerships formulated for the ERP project.

The same occurred at the lower levels of TC as well. Most IS analysts identified themselves with their immediate IS workgroup, which was there is department in their specific unit. They did not engage in communications with the other IS analyst groups across the organization. This was seen in other user groups as well, such as production planning and finance. While Unit3 was able to routinize its IMMS, the other units were struggling to develop a similar IS from scratch. Many analysts were not aware that the IMMS had been routinized in Unit3, while others refused to cooperate with Unit3 and/or seek assistance in their development and routinization projects.

This was demonstrated even in the ERP implementation project, which was common across all the units in the organization. Ego clashes were rampant, arising from these narrow identifications and comparisons with other units. The managers at the different units were ready to pay the consulting companies D1 and D2 extra money to

solve the same problem (in the ERP implementation process) that had already been solved at another unit, thereby wasting time and money. But they refused to enquire with their counterparts at the other units regarding the problems and the possible solutions to the problems. These ego clashes and lack of communications were primary negative factors that resulted in the breakdown of many information partnerships that had been formed for the ERP project.

Constant changes in the composition of the information partnerships and reformulation of these information partnerships also form a significant negative antecedent. It takes time for the social categorizations and social identifications to occur and for the information partnership to assume the form of a new ingroup. When some individuals leave and break away from the information partnership and other individuals enter the information partnership, the dynamics of the information partnership change. This adds more complexity to the already complex profile of the information partnerships.

Empowering interventions impacting information partnerships

Along with the positive and negative antecedents impacting information partnerships, both user-analyst and user-user, there are empowering interventions by both managers and non-managers that significantly impact the information partnerships and, ultimately, impact the successful routinization of IS in the organization. The empowering interventions that emerged from this study are presented in Figure 5-5.

As evident from the data in chapter 4, empowering interventions can be of two types – forced interventions and facilitated interventions.

Senior managers sometimes prove strong leadership by ignoring boundaries of department, division and unit, and focus on the task at hand, which is the development, implementation and routinization of the IS. One example from the data in chapter 4 is the executive director of IS at the corporate office at TC. This individual took an active interest in the implementation of the ERP at Unit4. He formulated a new set of information partnerships and brought together the individuals from several workgroups, both IS analyst groups and user groups. In doing so, he changed the dynamics of these information partnerships at Unit4. Although loyalties and identifications with their primary ingroups were still present, individuals in Unit4 created new ingroups and new identifications. These identifications led to empowering their relationships, both by the senior managers as well as by the user groups themselves. This was evidenced in the data in chapter 4, where the former director of Unit4, in addition to the executive director of IS, actively led the analysts and users into successfully implementing the ERP in the unit.

The data in chapter 4 showed that some interventions are forced interventions, as particularly at the initial stages of the IS project when the information partnerships are formed. This was demonstrated by the assistant general manager of production in the IMMS project in Unit3. The executive director of IS and the former director of Unit4 performed similar forced interventions in the ERP project at Unit4.

These forced interventions by senior managers are needed at the initial stages when the information partnerships are still new and vulnerable to the negative antecedent factors that threaten to disintegrate the information partnerships. Forced interventions by senior managers give some structure and discipline to the information partnerships until the social identifications in the information partnerships become stronger.

The data in chapter 4 also demonstrated that facilitated interventions follow forced interventions in order to foster the information partnerships and help them reach their potential. These interventions promote and strengthen the identifications of the individuals with the information partnerships as the ingroups. This leads to strong and successful information partnerships over the life of the IS project, resulting in successful routinization of the IS, as explicitly demonstrated in the IMMS project in Unit3.

At the same time, several individuals in the information partnerships create timely facilitated interventions so that the developing identifications with the ingroup are not impeded and disintegrated. For example, as evidenced in the data in chapter 4, all the users and the analysts in the IMMS project at Unit3 were aware that all support for their existing legacy system had been completely stopped, and that the successful implementation of the new IMMS was imperative. Therefore, when there were problems with some user groups, such as accounting or materials management, some influential individuals in the information partnerships intervened and resolved the issues confronting the information partners. These interventions, combined with the entrepreneurial spark of the individuals in the information partnerships, further strengthened the information

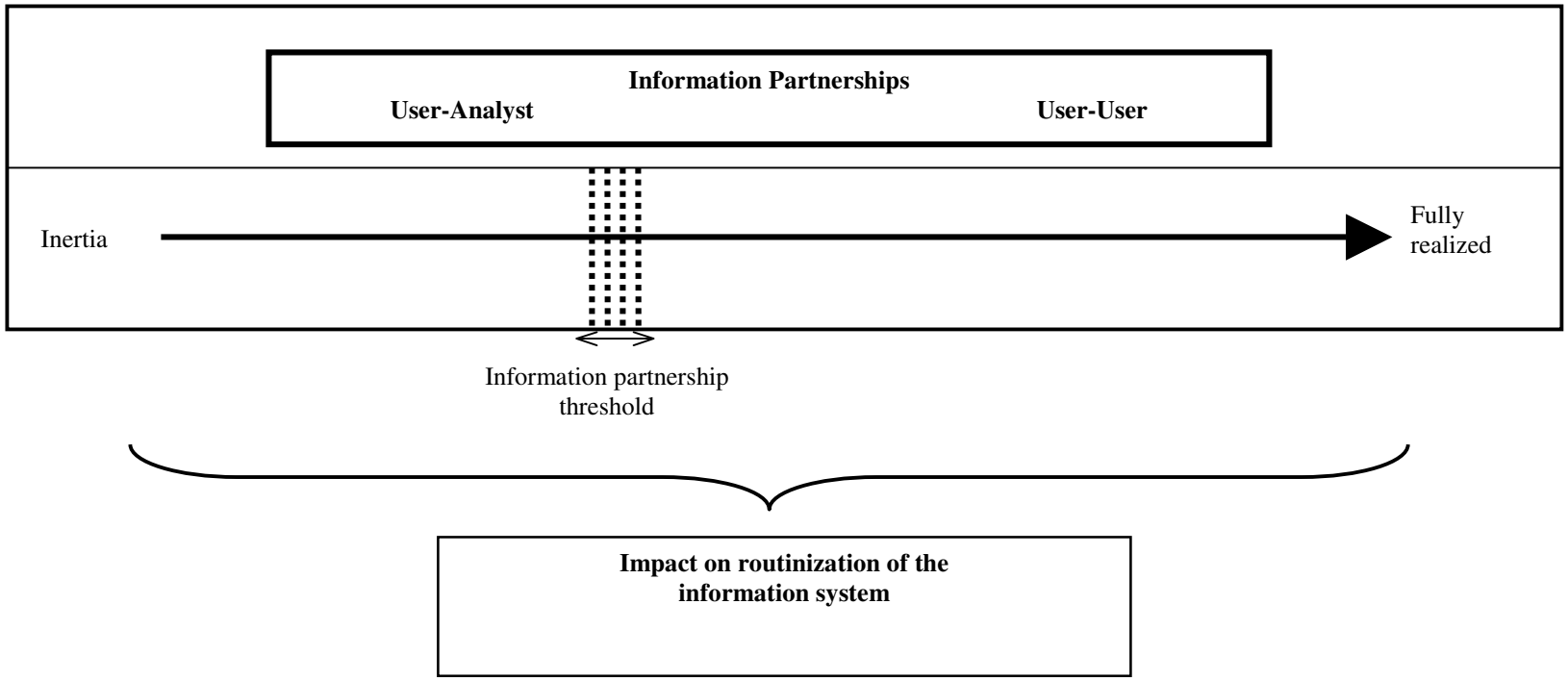
partnerships and impeded disintegration of the information partnerships, eventually leading to the successful routinization of the IMMS in the unit.

Evolution of the Information Partnerships Over Time

Another finding from the data in the study is that information partnerships, both user-analyst and user-user information partnerships, that are formed for an IS project, evolve over time. The evolution of the information partnerships is depicted in Figure 5-6.

When the information partnerships are initially formed for an IS project, the information partnerships are in a state of inertia, as shown in Figure 5-6. Individuals who come into the newly formed information partnership still identify themselves strongly with their original ingroups. These ingroups could be the IS analyst group, the production planning department, the materials management department, the quality assurance department, the finance department and/or the marketing department. The ingroups could be different divisions and units as well. The different individuals come into the information partnerships with different vested interests, different objectives for the IS routinization project and different conceptualizations on how to achieve those objectives.

Figure 5-6: Evolution of information partnerships over time impacting the routinization of information systems



At the same time, these information partnerships are being impacted by the different positive and negative antecedent factors and empowering interventions, as identified in Figure 5-5. Depending on which factors are most influential, these newly formed information partnerships are extremely vulnerable to breakdown at this stage.

Social identifications, in this case, identifications with the newly formed information partnerships, take time and effort (Tajfel, 1982; Turner, 1982). While positive antecedents influence the information partnerships and try to strengthen them, the negative antecedents play their roles and attempt to disintegrate the information partnerships. This results in the information partnerships remaining in inertia for some time. This is the time when different objectives of the information partners may clash with one another. At the same time, different social identities may clash with one another and with personal identities of the individuals in these information partnerships.

The initial interactions and communications among the different user groups and IS analyst groups are slow, as consistent with the state of inertia that they are in. There is a minimum amount of interactions and communications among the members of the user-user and user-analyst information partnerships required so that these partnerships do not get influenced by vulnerabilities and other dividing negative antecedent factors, as identified in Figure 5-5.

Empowering interventions, both by managers and some of the individuals in the information partnerships, will begin to strengthen the information partnerships at this stage and reinforce them along the way. During the initial stages, forced interventions by managers are necessary so as to bring the information partnerships out of inertia and into

life and get them moving along. At the same time, facilitated interventions by both managers and other individuals in the information partnerships will add to the forced interventions in developing and strengthening the information partnerships.

According to social identity theory, in-group favoritism, identification and loyalty tend to occur even in the absence of strong leadership or member interdependence, interaction or cohesion. While this may hold true for groups in general, this is not entirely the case with information partnerships. This was demonstrated in the data in chapter 4. A strong leadership played a significant role in the empowerment and strengthening of the information partnerships, both in the IMMS project at Unit3 and in the ERP project at Unit4. It was an important catalyst and a binding agent at the critical stages of the information partnership formation, when these information partnerships were still vulnerable to prejudices and conflicts.

Clear objectives of the IS project, accompanied by strong justification of how the IS project benefits the different individuals and the departments they come from are necessary to get the individuals in the information partnership to move forward. Over time, individual vested interests will begin to coalesce into vested interests for the entire set of information partnerships. Over this period of time, the information partnerships become the new ingroups, and with them come the associated social identifications and loyalties.

As these information partnerships develop their own identities, the individuals in the information partnership become the liaison between their original ingroup (the

department or division they came from) and the new ingroup, which is the information partnership.

There is a particular period of time during which the information partnerships become strong and assume an identity of their own. This period of time will be called the "information partnership threshold" and is depicted in Figure 5-6. This information partnership threshold is not a single point in time, but a period of time during which the positive antecedents and empowering interventions prevail over the negative antecedents. Also, forced interventions will be heavily replaced by facilitated interventions, and the information partnerships strengthen.

The "information partnership threshold" was demonstrated by the data in chapter 4, for example in the IMMS project in Unit3, where the interactions among the members in the information partnerships became voluntary and self-guided and did not need the constant forced interventions by the assistant general manager of production. The "information partnerships threshold" was also demonstrated by the data in the ERP project in Unit4. In this case, the threshold was achieved later than it was for the IMMS project in Unit3, but it was achieved nevertheless. Around the time when the ERP went 'live' in Unit4, the two major leaders of the project, the former director of the unit and the executive director of IS at the Corporate Office, retired. The information partnerships, however, did not disintegrate because these two critical people left the project. Instead, the project went ahead with facilitated interventions by the existing information partners and achieved routinization of the ERP.

Many times the information partnerships break down before they reach the information partnership threshold, as evidenced by the ERP project in all the units except Unit4. When this happens, there is a very slim chance of the IS being implemented successfully. Even if the IS is implemented, the user groups will not have built trust in the IS and experimented with its features. As a result, routinization of the IS will pose to be problematic. Timely interventions, both forced and facilitated, are required so as to avoid this break down of the information partnerships and bring the IS project back on track.

On the way to achieving this "information partnership threshold," the individuals in the information partnerships, both user-analyst and user-user, are working together to implement and routinize the IS. During this period and beyond, the initial mistrust and trepidations among the members of the information partnerships are replaced by trust and togetherness. Once the information partnership threshold is crossed, the user-user and user-analyst information partnerships are in momentum to reach the set IS project objectives and are no longer impeded by inertia or other vulnerabilities. Empowering interventions by senior managers, however, are still required so that the information partnerships do not break down for any reasons.

Over time, the user groups will form bonds among themselves and learn about the interrelationships and interdependencies among the business processes as well as the workings of the new IS, as demonstrated by the data in the IMMS and the ERP projects at Unit3 and Unit4 respectively. Similarly, the IS analyst groups will form bonds with the user groups and learn more about the user requirements and the ways in which the user

groups will use the IS. The user-user and user-analyst information partnerships will have achieved a new identity at this time. With social identifications come social comparisons and the need to achieve self-esteem and prevail over other outgroups. Therefore, the user groups will actively participate in the information partnerships by experimenting with the prototypes of the IS and by providing modifications in requirements and features, recommendations and suggestions for improvement of the IS. These strong information partnerships over time will lead to the successful implementation and usage of the IS, ultimately resulting in the successful routinization of the IS.

Given enough time and enough positive antecedents and empowering interventions, the information partnerships can grow and mature into "fully realized" information partnerships, as depicted in Figure 5-6. The members of the information partnerships will act as liaisons to affect the changes in administrative governance or other changes required for the routinization of the IS in the organization. This will lead to the successful routinization of the IS for which the information partnerships were initially formed, and in addition, will prove to be fertile ground for further IS projects in the organization.

The following chapter presents the contributions of the study and lessons learned for developing, facilitating and fostering information partnerships in organizations in order to successfully routinize the IS in the organization. It also presents implications of the study for both researchers and practitioners.

Chapter 6

Contributions and Implications

In chapter 5, the findings from the data presented in chapter 4 were discussed and interpreted using the theoretical lens of social identity theory. Strategies to develop and foster information partnerships in organizations leading to successful routinization of information systems (IS) have been presented throughout in the discussions in chapter 4 and chapter 5.

In the following discussion, the contributions of this study are first presented. Then the implications of these contributions for researchers are discussed. This is followed by a discussion of the implications of these contributions for practitioners. The limitations of this study are then presented, followed by the conclusions.

CONTRIBUTIONS OF THE STUDY

The present study offers several contributions, with implications for both researchers and practitioners. The contributions are as follows:

1. Two types of information partnerships have been identified in any organization that is undertaking IS development and routinization projects. They are the User-Analyst and the User-User information partnerships. Both types of information partnerships and the myriad of relationships among the individuals in these information partnerships significantly influence the success or failure of the routinization of the IS.

2. Information partnerships are complex and can be profiled. The information partnership is made up of several individuals coming from several backgrounds, both

organizational and cultural, and has a definite impact on the very existence and functioning of the information partnership.

3. Information partnerships are impacted by several positive and negative antecedent factors. At the same time, information partnerships are impacted by empowering interventions – both forced and facilitated empowering interventions.

4. Information partnerships evolve over time. As they mature and grow stronger their impact on the routinization of the IS in the organization becomes stronger and leads to a successful routinization of the IS in the organization. If the information partnerships do not evolve, they remain in inertia and soon disintegrate. Then their impact on the routinization of the IS becomes weaker and leads to a failure of the routinization of the IS in the organization.

5. As information partnerships evolve over time, there is a particular period of time, called the "information partnership threshold," during which positive antecedent factors and empowering interventions prevail over the negative antecedents. Also, forced interventions are heavily replaced by facilitated interventions, and the information partnerships strengthen, ultimately resulting in the successful routinization of the IS. If the information partnerships do not evolve, they disintegrate before reaching the "information partnership threshold" leading to the unsuccessful routinization of the IS in the organization.

6. This study has been conducted in a large-scale public-sector organization in a developing country (India). This is a significant contribution to the IS literature which

needs more IS research studies from developing countries, and from public-sector organizations.

7. Another significant contribution of this study concerns the methodology used in this study. As mentioned in chapter 3, ethnography has only recently being used as a methodology in IS research studies (for example, Beynon-Davies, 1997; Orlikowski, 1991, Walsham and Waema, 1994). Ethnography offers new and unique insights that other methodologies may not offer. For example, in an ethnographic study the researcher is in the field for an extended period of time (which is not the case with other methodologies). Therefore the researcher gains a deeper knowledge of the processes underlying many of the events occurring in the organization and their influence on the information partnerships. The researcher is then able to provide better and improved solutions to the business and research problems at hand, and, at the same time, to offer new insights to other, but related, IS problems in the organizations.

The implications of these contributions for researchers and practitioners are discussed in the next sections.

IMPLICATIONS FOR RESEARCHERS

Several researchers have stressed the importance and significance of the human factors involved in any IS development and routinization project (for example, Avison and Wood-Harper, 2003; Fisher, 2003). With so many packaged IS solutions in the market today, such as the enterprise resource planning system or the supply chain management system or the customer relationship management system, it becomes

important to incorporate the human and social elements into the implementation and post-implementation processes.

The results of this study have several implications for researchers. First, the term "information partnerships" has different connotations and is used in the literature from different perspectives.

In the extant IS literature, the term "information partnerships" refers to the partnerships or alliances formed among diverse corporations for the explicit purposes of sharing information, creating economies of scale, cross-selling, and in general, gaining strategic advantage (Konsynski and McFarlan, 1990). Konsynski and McFarlan (1990) identify four kinds of information partnerships among organizations – joint marketing, intra-industry, customer-supplier, and information technology vendor-driven. This connotation of information partnerships is along the lines of inter-organizational partnerships among corporations.

In the library and information science literature, the term "information partnerships" refers to the partnerships formed within an organization among the domain experts, the information experts and the information technology experts (Choo, 1996, 2002). Chapter 2 describes these different groups of experts in more detail. According to Choo (1996, 2002), these information partnerships are critical in:

(a) bringing together the organization's capabilities to create and use information and knowledge,

(b) organizing the information and knowledge in the organization, and

(c) building infrastructures that enable the effective management of information and the effective management of knowledge in the organization (Choo, 1996).

The general focus of these information partnerships is on establishing and maintaining an information infrastructure that models the flow and transaction of information, and accelerates the processing of data and communication of messages in the organization (Auster and Choo, 1996; Choo, 1995, 1996).

In the present study, the term "information partnerships" is used from a perspective different from the above two perspectives. In this study, information partnerships refer to the relationships formed and reformed among different groups of users and analysts in the organization coming together for the purposes of an IS development and routinization project. Within this perspective, two types of information partnerships have been identified in the present study – User-Analyst and User-User information partnerships. This study provides a major contribution to the IS literature by adding an understanding of the previously unexplored latter type of information partnerships – the user-user information partnerships.

The IS literature is replete with examples of User-Analyst interactions (called information partnerships in the study). There have been several IS research studies focusing on how user-analyst interactions and communications are important during the IS development process. Research has also been conducted on how important user involvement and user participation is in the IS development process. Chapter 2 has addressed these research streams.

The second type of information partnerships, which are the User-User information partnerships, has not been addressed in the IS literature to-date.

The first contribution of this study is the addressing of the user-user information partnerships in the IS projects in an organization. This is in addition to the user-analyst information partnerships in the organization.

All users cannot be clubbed together into one user category, which most IS research has done to-date. Greenbaum and Kyng (1991) have noted that "users are seen as not one homogenous group, but, rather as diverse groups of people who have competence in work practices" (p.3). This has been demonstrated in the data in chapter 4 in the discussion of the Integrated Materials Management System (IMMS) and the Enterprise Resource Planning (ERP) projects.

The user-user information partnerships and interactions become significant because each user, and each user group, is fundamentally interrelated and interdependent on other users and other user groups in the organization (Kendall and Kendall, 2002, 2005). To assume that all user groups would unite into a single entity for the cause of the organization without any vested interests, while ideal, would be naïve.

The user-user information partnerships form a critical factor in the successful routinization of IS in the organization, particularly since the user groups are the ones who use the IS regularly in their daily business operations and derive the benefits of the IS in the long term. The data in this study has shown how significant different user-user information partnerships are, for example, among materials management and production planning departments (in the case of the IMMS project) or among the different finance

departments (in the case of the ERP project), in addition to the different user-analyst information partnerships, in the successful routinization of IS in the organization.

We can ask ourselves the following research question –

"How do multiple participants who may belong to one or more of the involved groups, as mentioned above, influence each other and, ultimately, the development of an information system and its eventual routinization?"

This study has provided answers to this question by identifying and profiling the different types of information partnerships in the organization.

The second contribution of this study concerns the complex profile of information partnerships. As shown in the data in the previous chapters, the members of the user-user and user-analyst information partnerships come from several workgroups in the organization. They bring with them several identities, both social and personal identities, as well as organizational roles. These identities often are conflicting and antagonistic. As presented in chapter 5, the current study uses social identity theory to describe the complex profile of the information partnerships. The complexity is described from two perspectives:

a. the complexity arising from the existence of numerous information partnerships in the organization, and
b. the complexity arising from multiple identities of the information partners and nested organizational roles.

The complex profile of information partnerships warrants further investigation. The current organization under consideration in this study, Telecommunications

Company (TC), is a public sector, large-scale enterprise with several manufacturing units and multiple departments of a kind, for example, finance or production planning or materials management. Information partnerships can be profiled in IS projects in other types of organizations as well, such as

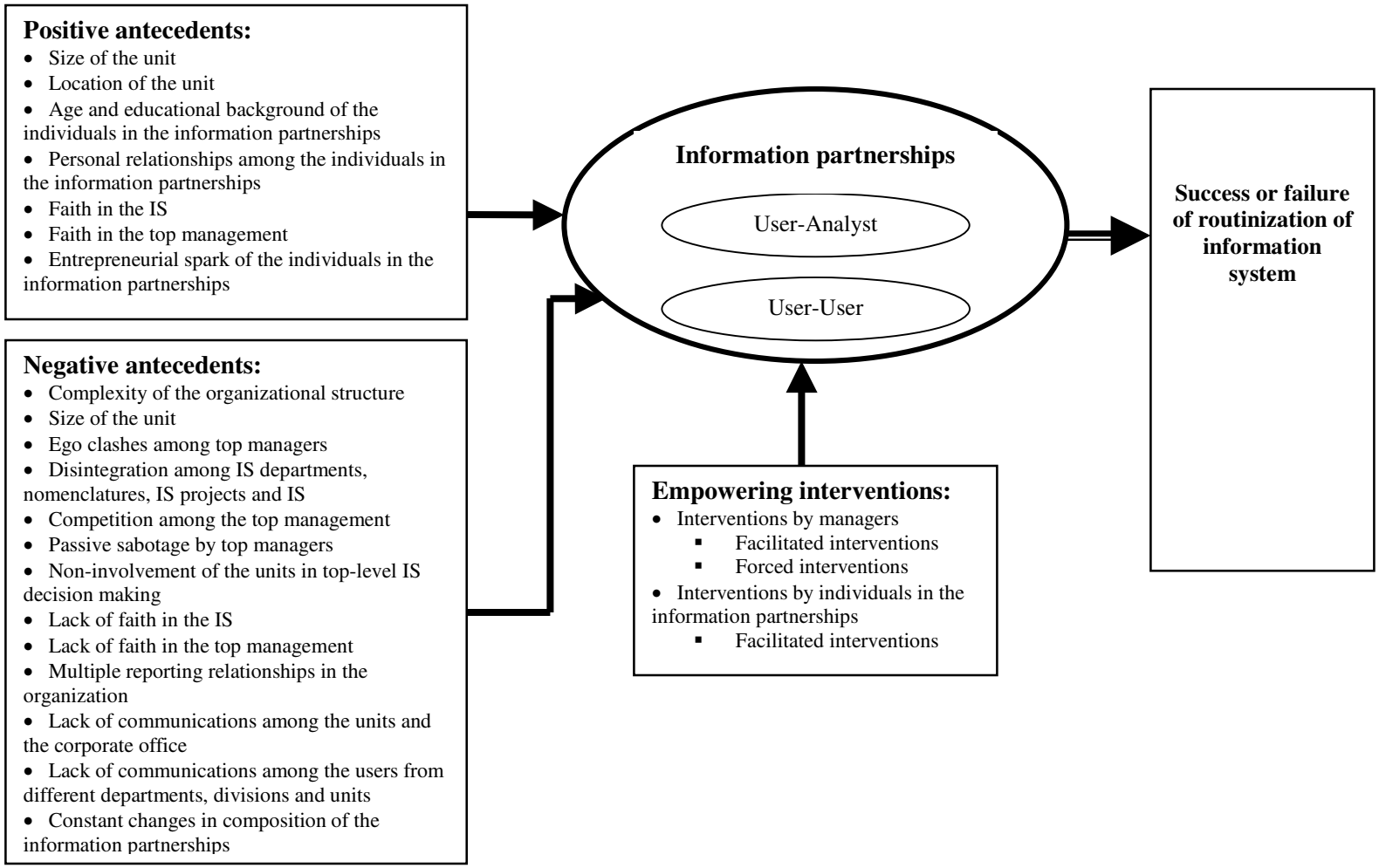
- other public-sector, large-scale organizations,
- public-sector, small-scale organizations,
- private-sector, large-scale organizations, and
- private-sector, small-scale organizations.

The third contribution of this study is the development of a comprehensive framework for understanding information partnerships in organizations and their impact on the routinization of IS in the organization. This comprehensive framework is presented in a series of models, of which Figure 5-5 is repeated here as Figure 6-1. There are positive antecedent factors, negative antecedent factors and empowering interventions which impact the information partnerships throughout the life of the IS project and which ultimately impact the routinization of IS in the organization.

While some previous IS research studies (for example, Guinan, 1988; Tan, 1989; and Guinan et al., 1998), as mentioned in Chapter 2, have focused on the factors affecting user-analyst communications and interactions, none has focused on the user-user information partnerships. This study fills that gap in the IS literature.

At the same time, this study enhances the understanding of one stage of the IS implementation process – routinization, which has been largely neglected by IS research.

Figure 6-1: A framework for understanding information partnerships in organizations and their impact on the routinization of information systems



Previous research has provided frameworks and models that have focused on information technology implementation. These frameworks have:

a. identified different stages of the information technology implementation process (Cooper and Zmud, 1990, Kwon and Zmud, 1987),
b. addressed the impact of several contextual factors on various stages of the information technology implementation process (Kwon and Zmud, 1987),
c. analyzed the characteristics of the technology that impact its adoption and use (Rogers, 2003, Tornatzky and Klein, 1982).

These frameworks and models have been described in detail in Chapter 2. These models and other literature, as documented in Chapter 2, have not focused on information partnerships, particularly user-user information partnerships, the factors impacting these information partnerships, and their impact on the successful routinization of IS.

The comprehensive framework developed in the current study, the first model of which is presented in Figure 6-1, incorporates past research and current findings into the framework, while focusing on one stage of the information technology implementation process - routinization. The framework accounts for several factors that impact the successful routinization of IS in organizations. More specifically,

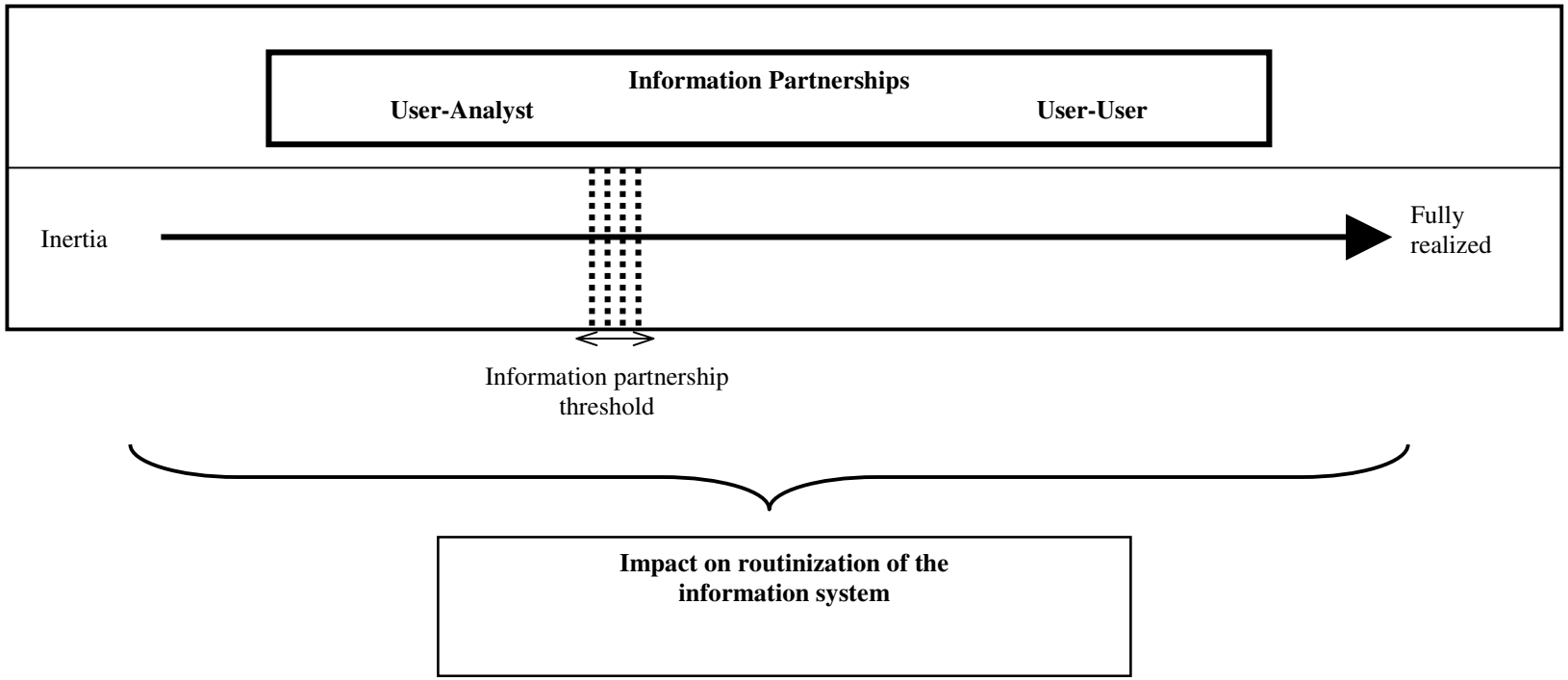
a. The framework focuses on one stage of the information technology implementation process – routinization – a stage largely neglected by past IS research. The routinization stage incorporates the other previous stages, as development of IS is cumulative.

b. The framework incorporates the two types of information partnerships – user-analyst and user-user information partnerships, addressing their complex profiles (as described in the earlier contributions).
c. The framework accounts for the different contextual factors affecting the information partnerships, including the positive antecedent factors, the negative antecedent factors and the empowering interventions.

The framework postulates that information partnerships, both user-analyst and user-user information partnerships, have to be addressed, studied, fostered and facilitated in order to enable successful routinization of IS in the organization. These information partnerships are not an isolated attribute of the organization. Rather, they are dynamic and omnipresent throughout the IS project, as demonstrated in the data in the study. This leads to the fourth contribution of the present study.

The fourth contribution of this study is an understanding of the evolution of the information partnerships over time. This is the second model in the comprehensive framework developed in this study. This model is depicted as Figure 5-6 and is repeated here as Figure 6-2, and has been discussed in detail in chapter 5. According to this model, information partnerships grow and mature over time.

Figure 6-2: Evolution of information partnerships over time impacting the routinization of information systems



Starting from a period of inertia where the information partnerships are replete with mistrust, vested interests and vulnerabilities, information partnerships have the potential to evolve into a period of full realization where they are replete with trust, common interests and togetherness. On the other hand, information partnerships may also disintegrate at any time during the lifetime of the IS project. This has been demonstrated in the data in chapter 4 and discussed and interpreted in light of social identity theory in chapter 5.

Therefore, both positive (successful) and negative (unsuccessful) cases of information partnerships and their impacts on the routinization of IS in the organizations become significant. The data in this study has demonstrated both successes and failures of information partnerships and their impact on the routinization of the IS. As Eisenhardt (1989) notes, "the juxtaposition of conflicting results forces researchers into a more creative, frame-breaking mode of thinking that they might otherwise be able to achieve. The result can be deeper insight into both the emergent theory and the conflicting literature, as well as sharpening of the limits to generalizability of the focal research."

As part of the comprehensive framework developed in this study and presented in Figures 6-1 and 6-2, a new concept has emerged, which is the fifth contribution of this study. This concept is the "information partnership threshold." Information partnership threshold is a very subtle concept. It is more of a qualitative concept rather than a quantitative one. It is a period of time during which positive antecedent factors and empowering interventions prevail over the negative antecedent factors. Also, forced interventions will be heavily replaced by facilitated interventions, and the information

partnerships strengthen, ultimately resulting in the successful routinization of the IS. On the other hand, if negative antecedent factors prevail over the positive antecedent factors, or if the empowering interventions are unsuccessful, the information partnerships have the potential to disintegrate. As demonstrated in the data in the study, information partnerships are more likely to disintegrate at the initial stages of evolution before reaching the information partnership threshold. Once the threshold is crossed, the information partnerships have more potential to mature towards full realization and impact the successful routinization of IS in the organization.

This concept of information partnership threshold warrants further investigation. It would benefit the IS field to study information partnership threshold in more detail and look for both qualitative and quantitative measures for this concept.

The frameworks developed in this study are not specific to any one organization, such as TC in this study. Many of the key constructs and their associated sub-themes, as identified in Table 4-1 in chapter 4 of the study, are theoretically generalizable to other organizations in other domains as well, in both manufacturing and service organizations. This leads to the sixth contribution of this study.

Heeks (2002), for example, states that "until very recently, the entire literature on IS and developing countries would struggle to fill a single bookshelf. The attention of writers – from researchers to consultants to journalists – has been focused elsewhere" (p. 102).

In this regard, this study makes a significant contribution to the IS literature by studying IS routinization in an organization in a developing country (India). This is the

sixth contribution of the study. This research offers several future research prospects for IS researchers interested in IS research in developing countries. While some of the aspects of the data in this study could be specific to TC (an Indian, public sector, large-scale organization), it would be interesting to see if the frameworks developed in this study still hold for studying information partnerships under the following dimensions:

- public-sector versus private-sector organizations,
- large-scale versus small- or medium-scale organizations,
- large scale versus small- or medium-scale IS projects, and
- developing versus developed countries.

More research studies such as this study could productively be conducted in both large and small organizations for both large-scale and small-scale IS development and routinization projects. Such studies might focus on whether there are any similarities or differences in the evolution of the information partnerships and how they impact the routinization of the IS. Conducting such studies would increase the generalizability of these research frameworks and increase the empirical research base of these studies.

These research frameworks have focused on one stage of IS implementation, that is the routinization of the IS in organizations. As mentioned earlier, the IS development stages of initiation, adoption, adaptation, acceptance, routinization and infusion (Cooper and Zmud, 1990) are cumulative. Also as information partnerships grow over time, identities and loyalties either disintegrate or solidify and strengthen over the life cycle of the IS, eventually impacting routinization of the information system. This would lead

one to assume that the research framework would apply to all the earlier stages of IS development leading to routinization. But, is it so?

Future research could study if the information partnership threshold needs to be crossed for every stage of the implementation process. When does the information partnership threshold prove to be more effective?

Routinization forms one of the last stages of the IS implementation process. It is not enough to only look at the role of human factors during the adoption of a particular IS of interest. Rather, it becomes even more significant to look at human and social factors impacting the post-implementation or routinization processes when the IS becomes a normal or routine artifact in the day-to-day business operations of the organization and when several groups of users are intimately involved with the IS.

Very few studies have focused on routinization of information systems. At the same time, the final stage in IS implementation, infusion, has not been studied widely as well. Both of these concepts need extensive longitudinal studies.

The seventh contribution of this study concerns the methodology used in this study. As mentioned earlier and in chapter 3, qualitative research traditions have recently been adopted in IS research. There are few research studies using the interpretive qualitative tradition, and the IS field would be enriched with more such studies. At the same time, as mentioned earlier and in chapter 3, researchers are just beginning to use ethnography as a methodology in IS research. Spending the extended length of time in the field, accompanied by the extensive recording procedures adopted for data gathering, makes the methodology difficult to adopt by IS researchers. On the other hand, this

methodology provides in-depth views of the context of the study as well as rich data on the information partnerships and on the IS development and routinization projects. At the same time, IS routinization projects, which are long-term IS projects warrant such a long-term immersion methodology.

An eighth contribution concerns the procedures used for the analysis of data. The methods prescribed by Miles and Huberman (1994) and Wolcott (1994) have been used for data analysis in this study. This is also referred to as "content analysis" (Krippendorf, 1980; Myers, 1997a), which is a form of semiotics, a mode of data analysis. Another relevant data analysis method is discourse analysis. Discourse analysis is another form of semiotics that builds upon content analysis and conversation analysis, but focuses on "language games." Language games refer to a well-defined unit of interaction consisting of a sequence of verbal moves in which turns of phrases, the use of metaphor and allegory all play an important part. Like content analysis, discourse analysis has been used in qualitative research in information systems (Klein and Truex, 1995; Liebenau and Backhouse, 1990; Myers, 1997a). This mode of data analysis could be utilized in future research on the data to see if there are any new findings from the data that emerge and add to the understanding of information partnerships and their impact on the routinization of IS.

A ninth contribution of this study has been the theory that has been used as the theoretical lens to interpret the data findings. Social identity theory has enabled an understanding and interpretation of the different aspects of information partnerships and their impact on the routinization of IS in the organization. At the same time, there are

other alternative theories that could be used instead of social identity theory to interpret the data. Examples of theories that could serve as a theoretical lens in this study include identity salience theory (for example, see Stryker, 1987; Stryker and Serpe, 1982, 1994), social network theory (for example, see Barnes, 1954; Ethier, 2005), structuration theory (Giddens, 1984), and adaptive structuration theory (DeSanctis and Poole, 1990, 1994). Each new theory will add a new perspective on the data findings and enrich the results obtained from the study.

A final contribution of this study has implications for researchers in other disciplines as well, not just IS. Information partnerships are formed and reformed in almost every project undertaken in any organization, even though it may not be an IS development and routinization project. The comprehensive frameworks developed in this study and presented in Figures 6-1 and 6-2 could be utilized and tested in other business disciplines. This would add to the generalizability of the results.

IMPLICATIONS FOR PRACTITIONERS

The results of this research study have several implications for practitioners as well, including all managers and senior associates involved in any IS routinization project. Chapters 4 and 5 have identified several strategies for IS practitioners who deal with IS development and routinization projects in their respective organizations. This section highlights the strategies, guidelines and "best practices" that could benefit the IS practitioners who need to facilitate and foster information partnerships in the organization and ultimately enable successful routinization of IS in the organization.

Practitioners could benefit from becoming aware of the different types of information partnerships that occur in their organizations. It would involve focusing on both user-analyst and user-user information partnerships and the myriad of relationships formed and reformed among the information partners.

As demonstrated in the data, it would be naïve of IS practitioners to assume that all users belong to one group, even if they belong to the same department, such as finance, in the organization. At the same time, the senior managers and/or the managers responsible for leading IS routinization projects in the organization should realize that the information partnerships formed for the IS project are complex. The members of these information partnerships come from several levels of the organization, from several backgrounds and with multiple nested organizational roles. This feature, combined with the sheer number of information partnerships formed among the different levels in the organization, leads to a very complex profile of the information partnerships. This has been demonstrated in the data in chapter 4 and discussed and interpreted in light of social identity theory in chapter 5.

Each workgroup, at a unit level, division level, or department level, has its own vested interests in the IS project. This leads to friction, power struggles, ego clashes, and tensions in working and reporting relationships, as demonstrated in the data in chapter 4. Many projects, particularly large-scale projects involving multiple business functions, multiple departments, divisions or units, have failed not because of lack of the technology or its effectiveness in the business processes, but because of the incapability of the people involved to compromise towards a working solution.

Understanding that these individuals and groups come from various cultural and social backgrounds, and that they behave in complex and diverse ways, is critical for IS practitioners to factor into their decision making when forming project teams for IS projects. This is where this study sheds light on the dynamics of the individual and group behavior using social identity theory.

The comprehensive frameworks developed in the study and presented in Figures 6-1 and 6-2 provide a foundational strategy for understanding and working with information partnerships in organizations. These frameworks aid IS practitioners in formulating relevant policies to enable successful routinization of IS in the organization. IS practitioners could benefit from a thorough understanding of the different positive and negative antecedent factors and empowering interventions that impact the user-analyst and user-user information partnerships. These positive and negative antecedent factors and empowering interventions can be found all across all levels of the organization. IS practitioners could focus on enabling the positive antecedent factors and minimizing the effects of the negative antecedent factors in order to avoid disintegration of the information partnerships. They also have to be aware of the evolution process of these information partnerships over time. By understanding the empowering interventions and their impacts on the user-analyst and user-user information partnerships, managers could effectively bring about a faster evolution of the information partnerships towards full realization.

During the course of an IS routinization project, it becomes the responsibility of the senior managers to foster good interactions and communications among the different

user groups that come into the information partnerships. Using both forced and facilitated interventions, as evidenced in the data from this study, they have some background on how to build and empower the relationships among the members of the different user-user and user-analyst information partnerships.

Whether it is in enabling effective communications across the different manufacturing units or different departments within a unit, or whether it is in instilling faith in the top management and the IS, it is the responsibility of senior management to facilitate the evolution of the information partnerships from the initial state of inertia and beyond the information partnership threshold.

This study demonstrates that IS managers have to play an extremely active role in the initial stages of the information partnership leading to the successful overcoming of the inertia of the new information partnerships. This was evident in the examples of the Assistant General Manager of production in the IMMS project in Unit3 and the Executive Director of IS in the ERP project in Unit4. Managers have to be on top of the information partnerships and the IS project until the information partnership threshold is overcome. It is important for managers to understand how to foster the information partnerships and keep the members active and motivated, and at the same time, realize when the information partnership threshold has been overcome. At that time, in successful cases, forced interventions should decrease and facilitated interventions should increase. Once successful information partnerships mature, they impact on the successful routinization of the IS. This has been demonstrated in the data in this study.

On the other hand, the data in this study also provides a good understanding of the causes for failures and disintegration of information partnerships and their impacts on the routinization of the IS in the organization. Managers could learn from the different examples in the data as to what should or should not be done in order to avoid such failures. For example, if the managers notice that the information partnerships tend to linger on in a state of inertia for an extended period of time without making any progress in the IS project, they could intervene to find out the different causes for the inertia and attempt to alleviate the negative antecedent factors responsible for the inertia. They could also informally appoint some influential and popular members of the information partnerships as empowering interveners so that the information partnerships could begin the evolution process. They could also effect a change in the composition of the information partnerships early on in the project so that the information partnerships could begin their evolution process without further impediments. If the causes for the inertia are more political and are at higher levels of the organization, then managers could devise alternative solutions to the problems. The primary concern of the managers would then be to avoid the disintegration of the information partnerships and to enable successful routinization of the IS.

Today an IS development lifecycle is a few months to several years. The data in this study affords IS practitioners the realization that information partnerships are not limited to the development and implementation stages alone. These information partnerships should continue to function well beyond implementation so that the IS can be successfully routinized in the organization. This warrants the empowering

interventions, particularly the facilitated interventions, to be in place throughout the IS routinization process.

The lessons learned from the understanding of information partnerships and their impact on the routinization of IS in the organization could be transferred to other domains and other projects in the organization. There are several projects being undertaken in any organization, such as marketing, production planning or materials management projects, and there are always several groups of people with vested interests in any of these projects. Other practitioners in organizations could use the lessons learned from this study to manage different kinds of information partnerships in their respective business domains.

LIMITATIONS OF THE STUDY

The study has a number of limitations that have to be considered. First, all the data collection for this study was conducted in one large multi-unit public-sector manufacturing organization in India. The study was based on extensive interviews with several groups of users and analysts from different units, different departments, different organizational levels and different workgroups. These users and analysts also included several senior managers responsible for the respective IS routinization projects in their units, with some senior managers responsible for these IS projects across the organization. In some units, the original IS analysts could not be interviewed because they had left the organization. It would have been more informative if these analysts could have been interviewed.

Precautions were taken against retrospective biases and errors as suggested by Golden (1992, 1997). Multiple informants were used and multiple data gathering techniques were used in order to triangulate the data results. The results were also presented to the senior level managers at the organizations both for error-checking and for the usage of the results by the different units in the organization.

A second limitation of the study concerns the longitudinal aspect of the IS routinization project. A longitudinal study is warranted when one studies long-term processes such as the routinization of IS in organizations. One should go back to the organization after a few years to study the routinization of the IS and see if any of the antecedent factors and empowering interventions have been modified, and what their effects have been on the user-user and user-analyst information partnerships. One should also find out if the information partnerships have indeed reached the stage of "fully realized," as given in Figure 6-2, or have disintegrated along the way, or have found some other means to become successful. That would help the researcher to validate the comprehensive frameworks, as depicted in Figures 6-1 and 6-2 or to revise them as necessary.

A third limitation of this study concerns the generalizability of the results. Any interpretive qualitative study is concerned with theoretical generalizability, not statistical or empirical generalizability to all organizations. The purpose of this study was not to provide empirical generalizability to all organizations, but rather to explore and understand information partnerships and their impact on the routinization of IS in the organization under consideration.

Therefore, as mentioned earlier in the implications for researchers, more research is warranted on studying information partnerships at other:

- small-, medium- and large-scale organizations,
- small-, medium- and large-scale IS projects,
- public-sector and private-sector organizations, and
- developing and developed countries.

It would be interesting to see if the same antecedent factors and empowering interventions work in organizations in developed countries and in the same way as they do in developing countries. Also, it would be interesting to see if the same factors hold in organizations in other developing countries or if they would change from country to country. These further studies would help in the generalizability of the results as well.

A fourth limitation of the study is that the data in the study was analyzed and interpreted using a theoretical lens developed in the United States. The emphasis of the study was not on understanding the data and the constructs in the study using the theoretical lens of India's specific culture and organizational and management thinking. This approach is justified as long as one believes that there may be universal principles of social identity theory – how people categorize themselves, identify themselves with a group and compare themselves to other individuals and groups (Earley and Singh, 1995).

A fifth limitation of this study concerns the methodology. Ethnography demands that the researcher spend extensive time in the organization studying all the aspects of the organization and of the IS development and routinization project. This includes studying and understanding the context of the organization and of the IS project, the national,

social, organizational, and group culture. While the researcher spent almost nine months in the field and kept in constant touch with some of the informants in the organization after data collection was completed, this does not seem to be sufficient. There are six manufacturing units and one corporate office at TC, and nine months may not seem enough time to spend at seven sites. Every day there is something new to learn about the organization or the information partners or the IS project. There, however, is a state of saturation that is reached after some time is spent at one site for data collection. Further data collection may not add value or anything new to the existing data and analysis. Therefore, a conscious decision has to be made regarding the time spent at any one unit.

CONCLUSIONS

This study has focused on understanding user-analyst and user-user information partnerships and their impact on the routinization of information systems (IS) in organizations. The findings of this research study have revealed several key constructs, the most important being user-user information partnerships which have not been addressed to-date in the IS literature.

The complex profiles of information partnerships have been highlighted. The different positive and negative antecedent factors as well as empowering interventions that impact these information partnerships have been presented as part of a comprehensive framework for understanding information partnerships and their impact on the successful routinization of IS in the organization. The comprehensive framework

also highlights the evolution process of the information partnerships ultimately impacting successful routinization of the IS.

Implications for researchers and IS practitioners have been identified. Strategies for fostering and facilitating information partnerships and ultimately enabling successful routinization of IS have been highlighted throughout the data in chapters 4 and 5 and also in the implications for practitioners.

Further research studies will help one understand the complex information partnerships and the different antecedent factors and empowering interventions impacting the information partnerships. These studies will help IS researchers see whether the information partnerships behave similarly across organizations in the public or private sectors, in developing or developed countries, or small-, medium- or large-scale organizations, or are specific to any particular kind of organizations.

Appendix A

Informed Consent Form

This research project is being conducted for purposes of a doctoral dissertation. The purpose of this project is to explore and understand the role of information partnerships among the vested parties in the analysis, design, development, implementation and routinization of information systems in business organizations.

My name is Narasimhaswamy (Narasim) Banavara, and I am a doctoral student at Baruch College, The City University of New York (CUNY), New York City, U.S.A.

Management at *name of company* Corporate Headquarters, Bangalore, India has granted permission to conduct and tape-record the interviews.

I hereby request your permission to tape-record the interview. If, at any time, you feel uncomfortable about the tape-recorder, please let me know, and I will switch off the tape-recorder. Please also note that you can stop this interview at any time. We could continue the interview at a later point in time if you wish so, or you could stop it completely on the spot.

Please be assured that the data collected will be used exclusively for academic research purposes. The tapes of the interview will be transcribed, and the transcribed text will be used for the data analysis. The only people who will have any access to the data will be me and the members of my dissertation committee.

Please also be assured that masked organizational names will be used in the dissertation report. In addition, all subjects will be identified using only coded labels. I

have made sure that no person can ever identify any interviewee from these coded labels. As such, the confidentiality and anonymity of all subjects will be duly protected.

If you have any questions about the research, you may contact my research advisor, Dr. Dorothy G. Dologite at Baruch College, The City University of New York at 00-1-212-802-6232, or email at: Dorothy_Dologite@baruch.cuny.edu. Or please write to:

CUNY Institutional Review Board

Office for Research
Baruch College
17 Lexington Avenue
New York, New York 10010, U.S.A.
Phone: 00-1-212-802-3028

Consent Statement: I have read and understood the information above. I consent to the interview process.

Name: _____ Title: _____

Signature: _____ Date: _____

Appendix B

Interview Protocol

Note: *Many of the questions presented here are unstructured interview questions. There is no particular order or structure to the questions. The number of questions asked and the order of the questions adopted during the interview depended on the interviewee, the time allocated for the interview, and the information systems (IS) project and topics of discussion.*

This interview protocol was only the initial document used. Many other questions, offshoots of the interview process, as appropriate, were presented during the interview.

1. Tell me about your division/department.

2. Tell me about your business function.

3. Tell me about the information systems project that is going on in your division/that has recently been completed in your division/that you are contemplating in your division.

4. Why are you undertaking / did you undertake this venture?

5. What are the objectives for this venture – organization-wide, unit wide, divisional, departmental, etc.?

6. What kind of a system do you currently / did you have before this new information system?

7. What, in your opinion, are/were the primary reasons for this new project?

8. Tell me about the role of the information system/proposed information system in your division. (Probe – is the system cross-functional? How? Why?)

9. How would you characterize the role of your division within the whole organization?

10. What, in your opinion, are the major opportunities for your organization with this new information system?

11. How do you think this information system will impact upon the performance of the (accounting, purchasing, marketing) function?

12. What is the expected timeframe for this project? Are there any constraints on the timeframe?

13. What is the expected budget for this project? Are there any constraints on the budget?

14. Since the inception of this project, have you faced any problems already? Elaborate.

15. Who are/were the principal players in the information systems project?

16. Please characterize the interactions among these players during the systems project.

17. Please describe a typical meeting among your people and the IS/IT people.

18. Please describe your experiences during this systems project.

19. What happened when you introduced your ideas at the IS meeting?

20. Explain the role of your supervisor / manager in the systems project.

21. What was the role of the key users in the systems project.

22. What, in your opinion, are your responsibilities concerning the changes required for the new system to be successfully implemented?

23. Have you ever been involved in any information systems project before this project? What have your experiences been there?

24. What kinds of problems did you face during the systems project? Please elaborate.

25. What, in your opinion, are/were the causes of these problems during the systems project?

26. How much training did/would you have to provide your employees to work with the new

27. What, in your opinion, are/were the reasons for the success/failure of the systems project?

28. What, in your opinion, are the characteristics of a successful systems project?

Appendix C

Sample Coded Transcripts

Note: *Portions of transcripts of only a few sample interviews are provided here with their respective coded categories. These categories are then abstracted to get sub-themes. The sub-themes are abstracted to get key constructs (see Table 4-1 for the key constructs and the associated sub-themes).*

Meeting No. 4
Code: Analyst 1
Name of Interviewee: Mr. ----------
Title: Deputy General Manager, Management Services Department, Unit1
Unit: Unit1
Place: Analyst 1's Office
Date: June 13, 2001
Time: 2:15 pm
Duration: 30 minutes

Tape Recorder: No
Notes: Some

Type of Interview: General

Related Topics: General IS structure in the organization, ERP, other IS

Impressions: Analyst 1 seems to be a very energetic, ambitious, sharp, and yet, a bitter person. He was very much to the point and did not seem to waste any time. Analyst 1 is a direct opposite of Analyst 2 in terms of knowledge base, ambitions and work ethics. Analyst1 seems to be "wanted" by many people and departments to help and advise them of happenings in and outside the company with regards to IT issues. He is also currently in charge of setting up an IT group. Nobody bothers to talk to Analyst 2. The descriptions of both these people were indirectly confirmed by IS top manager, Corporate Office and others (over several meetings).

Analyst 1 himself mentioned that although Analyst 2 and he are personally close to each other, they are professionally just the opposite. In fact, Analyst 1 worked under

Analyst 2 for several years, got disgusted with the way things worked in that department, and transferred to another (the present) department. *This is over a period of time when I met Analyst 1, Analyst 2 and others several times.*

Descriptive notes	**Associated categories - codes**
Q: Tell me about your department. A. The Management Services Department (MSD) is involved in software development (such as the software for the company hospital, etc) and hardware servicing for other departments at Unit1. Q. Tell me about the general structure of the information systems departments at the organization. There is a corporate IS Group at the corporate office. This group decides the IS policies of the company. They formulate policies without consulting any persons (including IS/IT persons) at any of the units. They think they are "superior" to everyone else because they sit in the corporate office. *(Note: Several other persons at different units have supported this statement, although they used different characterizations for the Corporate Office IS group).* At the same time, nobody listens to the Corporate IS group *(again the same opinion has been reflected by multiple persons at different units – refer to the appropriate interview notes).* What is there to listen? They don't know what they are doing. They don't ask us what we want, and we don't tell them what we want or what we are doing. We report to our boss, that's it. And some of us, we have more than one boss. That makes it more difficult for us to say anything.	Lack of communication; No consulting; Distancing; Feeling of superiority; Ego; Lack of communication; No respect for authority; Ego; No confidence; Lack of communication; Multiple bosses;

The Corporate IS group makes decisions on hardware and software platforms, and it was the one which "blindly" decided on the ERP purchase decision this time. According to BLM1, "development is a multi-point decision, but the 'morons, pardon my expression' don't think. They think it is a purchase and it is a single point decision, and they went with it."	Decision making authority; No faith / confidence; Lack of respect; No involvement of other units in IS decisions;
I am not convinced that the Baan ERP will work for this company. You know, "….. (the company) does not have a normal physique. [grin] It is very much like your Hollywood film actor, you know, Danny DeVito. Have you looked at him? You cannot take Danny DeVito to a regular clothing store and choose his suits or shirts. He is not your normal film star. He needs special 'tailor-made' suits to fit his physique. It is the same case with TC. We cannot just pick a software package and say 'it will work for you.' We need to find something which will fit our physique, and not go in for a standard XTL (extra tall and large) suit that will fit a 6'2" athlete. Baan will not succeed here. But who will listen to me? These people (referring to the senior managers at the corporate office) do not understand it.	No confidence in ERP; Suitability of ERP to organization; Helplessness; Lack of management understanding
Q. I was wondering about the many IS groups at … (the organization).	
A. You will notice it when you visit the other units. There are several individual IS groups in every unit. In some units there is one, whereas in other units, there are multiple IS groups. Also, they have multiple reporting relationships. For example, in …. (Unit1), EDP reports to R&D and also to the GM of Finance.	Multiple IS groups; Multiple reporting relationships;
Q. Why is that?	
A. Why? Nobody knows. The GM-Fin wanted it, so they report to him. Nobody else bothers with who is reporting to whom." At the same time, the production planning department wanted an MIS group to develop MRP I. Now they have a few people in an MIS group. Then there is the MSD group.	Use of authority; Ego; Lack of accountability; Multiple IS groups;
Q. Why are there so many names for the same IS department?	
Whenever any "big boss" wants to form a group, he forms one and gives it a name. The groups reports to him, and he now has more authority than before to present to the CMD (Chairman and Managing Director, like the CEO) and increase his own image.	Big boss; Multiple reporting: Authority grabbing; Image building;

To be fair, though, the IT departments were formulated in the different respective units at different times by different divisions for different purposes. It is a very complicated situation. At the time they were formed, I guess the name for a particular department was appropriate. But then it is difficult to keep changing department names always. When new departments were formed, they were given new names, such as the computer centre or the IS department. The older departments refused to change their name and also refused to cooperate with the newer departments.	Multiple IS nomenclatures; Multiple IS groups; No uniformity; No cooperation;
Q. What happens to the systems that are developed?	
A. Mostly the systems die out before they are born. There is no integration among any of the divisions out there. There is no integration among any of the systems present out there. And, of course, there is no integration among any of the IS groups present out there. Each group thinks they are superior to the others, and as superior as their boss is relative to other bosses. The current information is never shared. The only sharing you have is in production. Everything is local – the machines, the systems, the data and the people.	Lack of integration; Infighting; Superiority air; No sharing of information;
We developed a Financial Management package. It was a "desi" (local) version. It was called IFMS (Integrated Financial Management System). You speak to the people in Finance and our team of developers. You will see that it was very successful. It was tailor-made for … (the organization). It was based on Oracle 8i with NT O/S. But the management did not even come and see it operate. They said we should stop using IFMS and start using Baan. We are still using some parts of IFMS. Our people are more comfortable with IFMS than with Baan. For example, Baan cannot do the "pricing of an item" as well as "the after-pricing IGA" (Inner Goods Advice). We have to still use IFMS for that.	Ethnocentrism; Confidence of success; Lack of top management support; No confidence in ERP; Resistance to change;
Q. So, what happened?	
A. There was no documentation whatsoever. No one had asked for it, no one had prepared any documentation. So, once the original people were gone, there was nobody who could run the system. They are still trying to run the system by themselves [grin].	Lack of documentation; No guidelines;
Q. So, what about the EDP and MSD? Do they get involved in this?	
A. Why should we? They don't ask us. We have our own problems with the different software we are building.	Ego; Distancing;

Note: *The following set of coded transcripts (portions only) reflects several interviews with the analysts and user groups at Unit4.*

Meeting No. Several meetings with the analysts and users in Unit4

Code: Analyst 1, Analyst 2, User 2, User 4, etc.

Name of Interviewee: Mr./Ms. --------- **Title:** several

Unit: Unit4 **Place:** in the company Unit4
Date: October and November, 2001
Time: various **Duration:** 30 to 45 minutes per interview

Tape Recorder: No **Notes:** Some

Type of Interview: Topical

Related Topics: The Baan ERP at Unit4

Impressions: varied

Descriptive notes	**Associated categories - codes**
It was actually a good idea that we collectively decided to have so many key users. Our GM encouraged it, and so did the executive director of IS from the corporate office. I am not sure why the other units did not include more key users. What if one or more key users leave the organization? What happens to the project then?	Involvement; Collective decision making; Top management encouragement; Long term thinking;
Since we all came from approximately the same grade level (position in the organization), we respected each others' opinions and worked together. No one bossed others around. And that was a positive thing.	Positional similarities; Mutual respect;
There was one more big advantage of us training together. We understood how our work affects each other. We learned how to assist each other and how to solve each other's problems. That brought us even closer to each other.	Collective learning; Mutual help; Strengthening of relationships;

We insisted on being together during several of these meetings. We had to learn about the new technology, but more importantly, we realized that we had to learn about all the different business processes and how each process affected other processes. We were thirty six of us, and it was a grueling task to understand all the processes. Sometimes, the finance people would walk out saying that they did not need to know about certain issues regarding production or other departments. Sometimes the production people would not come to a meeting citing similar reasons.	Development of information partnerships; strengthening; Collective learning; Distancing;
The EDR was a good 'catalyst'. Even when he was not here (referring to Unit4) he would call day and night to make sure things were working well. He called me at home in the middle of the night with questions, suggestions, etc. Sometimes I would get so angry because he was disturbing my family at night. But then I understood how important this was to him. So we did not mind the disturbance at all. He (the EDR) was very demanding. But he knew the answers to many questions (not technical ones) even before we asked them. We were all impressed and ready to work.	Catalyst; Force; Pressure; Understanding; Force; Pressure; Faith/Confidence in management;
The former director of our unit (Unit4) was a very dynamic man. Having served in the army he knew the value and the effects of discipline. He was the one who said 'Do or Die' and got the modules implemented in such a short period of time. But the problem is that he retired soon after that.	Faith/Confidence in management; Force; Pressure;
There was one more big advantage of us training together. We understood how our work affects each other. We learned how to assist each other and how to solve each other's problems. That brought us even closer to each other.	Collective learning; Mutual learning; Facilitation for learning; Personal relationships strengthening;

Note: *The following set of coded transcripts (portions only) reflects several interviews with the analysts and user groups at Unit3.*

Meeting No. Several meetings with the analysts and users in Unit4

Code: Analyst 1, Analyst 2, Analyst 3, User 2, User 3, User 4, etc.

Name of Interviewee: Mr./Ms. ------- **Title:** several

Unit: Unit3
Date: July and August, 2001
Time: various

Place: in the company Unit3

Duration: 30 to 45 minutes per interview

Tape Recorder: Sometimes **Notes:** Some

Type of Interview: Topical

Related Topics: The Integrated Materials Management System at Unit3

Impressions: varied

Descriptive notes	Associated categories - codes
The AGM-P of our unit (Unit3) is one of the most stable and powerful people that I have seen. The general managers come and go, but the AGM-P stays. He has been here for a long time and knows the unit very well. He has been instrumental in getting our IMMS2 accepted and running successfully throughout the unit.	Stability of top management; Faith/Confidence
_____	_____
It is not just that the AGM-P is powerful, he is very kind as well. We have complete faith in his leadership. He does not boss us around. He sets up meetings and gives us complete freedom to discuss among ourselves (IS, production planning, materials planning, finance, marketing etc.) Then he listens to our problems, whatever they may be. He is more of a facilitator. We can also approach him with our ideas and suggestions, and he will not dismiss us. And whatever problems there are, he follows it up with a 'nuts and bolts' meeting within the next two days, without any delay. I guess that is why we have been so successful.	Faith and respect in management; Facilitation; Facilitation; Mutual respect; Prompt action; Forced action;

You ask why, we are far more capable than any of them. Fourth, we are 500 km away from two units and 2000 km away from three other units. We cannot work effectively when we are that far apart.	Ego clashes among units; Superior airs; Physical distance;
We know each other personally. We were batchmates in college and we have developed an affinity for one another. We are from the same age group as well. We respect each other, and so we can discuss issues and problems without anybody being offended or taking it personally. It would be difficult for us to do this if we are from different educational backgrounds. Here we are a 'well-adjusted family' and so we have better results. Most of the time, the senior persons are trying to wield their influence and boss us around. There is more ego and power-play than anything else. We never get productive work done. In this project most of us are on the same grade level. So no one is superior and no one is inferior.	Personal relationships; Common age group; Mutual respect; Family orientation; Authority; Ego; Positional equality;
Nearly all of us speak our native language here. Yes, we know English as well, but sometimes we connect better when we speak our mother (native) tongue.	Common language;
You don't feel that it is a big deal when you are helping out a friend. And we have developed very close bonds by working closely with one another and helping each other in times of need, whether it is a work situation or a family situation. We did this in college as well when we worked on college projects. Also, I have seen that it is easy to bring across an idea or a solution to a problem and have it accepted when you know the people well rather than to a complete stranger or to just an acquaintance.	Mutual help; Strengthening of relationships; Long-term personal relationships;
I am not sure when this happened, but it did. Somewhere we crossed over a threshold. We did not need the AGM-P or anyone else supervising our workings and communication with the other users. It became such a regular feature that we would not think twice about having to meet with the required persons to complete the project.	Threshold of information partnerships; Facilitation; Strengthening of information partnerships;

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