ACCOUNTING FOR WORKABILITY:

AN EXAMINATION OF PRACTICE IN INFORMATION SYSTEMS

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ABSTRACT

The analysis in this dissertation was conducted in the tradition of literature that approaches organizations as socially constructed (Berger & Luckman, 1966) and examinable in the context of practice through social and political interactions, and the attribution and interpretation of meaning (e.g., Orlikowski, 1992; 2000; Suchman, 2000). As such, the investigation recognizes and relies upon the importance of practice in the linguistic and material sense (e.g., Everett, 2002; Oakes, Townley & Cooper, 1998) in applying scrutiny to the organization. Given the nature of the research focus, a longitudinal case study design is appropriate (Prasad, 2005; Eisenhardt, 1989), fostering the opportunity to examine the complex interaction between individuals and technology in context, in the emerging forms of use.

A longitudinal case study of an international financial services company was performed between May 2003 and January 2006. The study of Natbank (disguised for the purposes of confidentiality) operated in fifteen semi-autonomous territories, ranging from extensive operations in a given region to minimal operations in others. The case study consisted of site visits to two of the fifteen possible sites and noteworthy contact via phone and email with other sites. The study occurred during a period of organizational change in which the fifteen territories were being consolidated under a unified management strategy, and a standard operating platform was being deployed in order to facilitate the new organizational strategy. Where there had previously been four different information systems deployed across organizations, one system had been chosen to be deployed in the new organization, in part as a strategy of the consolidation.

The investigation of Natbank focused on features that might further inform the theoretical and practical understanding of the organization and the information system deployment, such as ordinary work practices and the organizational atmosphere, interaction, and communication within and between operational units of the organization; interaction and communication within and between various international units of the organization; and attitudes and perceptions of the use of the information system. Members of the organization were interviewed to gain an understanding of their past experiences, perceptions, and use of information systems, and their ordinary work practices. Additionally observations and interviews were conducted during the final stages of the information system implementation and throughout the IS audit procedure to a gain a rich and immersive sense of emergent organizational processes and patterns of use. Observations and interviews related to direct impressions of the implementation of the information system and also to the operational work procedures of the organization.

Data was collected through a variety of approaches. In-depth, or ethnographic, interviews (Prasad, 2005) were conducted, organizational and publicly available documents were reviewed, and direct observations were conducted. During the periods of observation, the experiences were intense and immersive. Typically they would last several weeks, during which time I would meet members at the beginning of the work day, or sometimes earlier for coffee, and spend the day with them and their operational units of the bank (e.g.,

international banking, retail banking, information technology and operations, administration) and I would often socialize with members of the organization outside of working hours. Detailed notes were taken during conversations and interviews (when possible interviews were taped). In instances of informal conversations or field observations, field notes were taken as soon as possible – in some cases immediately, in some cases several hours later. Data analysis proceeded in an iterative fashion, alternating between collection, review of theory, and analysis and coding. The analysis and theoretical understanding evolved over the course of the study, as did the questions I sought to ask during interviews and the work functions I sought to observe.

A theoretical perspective of practice was employed to examine the emergent processes of the organization. A practice perspective is predicated on propositions such as the linkage between dispositions and objective structures. In other words, the materiality of social structures is related to cognition; social structures influence perception and in turn are also reinforced, or can be restructured, through alternate perception and action (or practice). These mentally constituted social structures are symbolic systems inhabited by individuals, subject to the modes of classification consistent with the system itself. This perspective provides a powerful lens for the examination of how a workable information system emerged at Natbank.

The research approach adopted is characterized by a bricolage of techniques including observation, text analysis, and interviews. In such a vein, the triangulated nature approach to data collection engaged in this study attempted to provide a holistic examination of Natbank, consistent with the tradition of qualitative research. The approach was one of deplation "a description and explanation simultaneously – a way of seeing" (Quattrone & Hopper, 2005, 744). It adheres to Quattrone & Hopper's (2005) claim that, in order to understand a technology and the organization in which it is embedded, a method of investigation is required that is "a fluid, adaptive model of investigation that follows trails revealed in the field" (744), thus following the people and technologies down the paths that emerge. In other words, it will be an approach of "lassier-faire sociology" (Latour, 1999, 170).

The analysis also examined the spiraling effect of improvisational practices and general enactments (Orlikowski, 2000) of the information system. In other words, as various user groups within the organization confronted the information system and appropriated forms of use, these situated practices came into contact with other enactments of the information system and fostered new, unintended, and unpredictable consequences for the overall deployment of the information infrastructure - the information system experiences alternate enactments through practices that are both situated and relational. The overall effects of these practices are dynamic and evolving implications for the organization.

The broad research question of this dissertation is, *What is the effect of practice on efforts to make information systems workable?* The concepts explored in answering this question were broken down into three integrated but distinct components. The first component is the case study, "Contradiction, Praxis and the Flexibility of Organizational Routines"

(Chapter 2). This paper uses the notion of praxis to examine individual actors' perceptions of contradiction in the enactment of organizational routines as a mechanism that initiates a moment of praxis – sometimes consciously, sometimes not. Individuals act to uphold or constrain the possibility for flexibility and change in the organization. Based on the analysis, the study concludes that factors of embeddedness and relational support are necessary in the maintenance of a routine over time; and that both may contribute to flexibility or rigidity of routines during periods of organizational change. The perception of contradiction and the ability to enroll others (explicitly or implicitly) in alternate/new practices is material in the durable instantiation of work practice. A further contribution is offered in the perspective of analysis, in that the extant literature has focused on the examination of routines that are "large" – organization wide, spanning multiple individuals and relations, and often long temporal periods, by contrast, this study focused on routines of everyday practice.

Chapter 3, "Practice, Adaptation and the Resolution of Technology Use," is a second case study based on the financial institution, Natbank. This paper asks questions such as, *how does identity impact information system use?* And, *how does the material knowledge of technology impact information system use?* In contrast to the previous paper, this examination focuses on individuals rather than relational networks engaged in routines. It provides a complementary analysis that examines how individual frames of reference emerge; which in turn impact the possibility of recognizing contradiction and informing possible reflective action. In addressing the primary research questions, the paper concludes that identity plays a metering role in the emergence of information system deployments – whether in line with design, or otherwise. Further, the paper suggests knowledge of the material aspects of technology and information systems is incorporated into the practices and sense of identity of individuals.

The fourth chapter, "Constituting Institutional Practice" is an essay proposing a theoretical lens developed through a synthesis of institutional theory and communities of practice theory. The previous two chapters provide synergistic forms of analysis that focus on different aspects of relations of practice – how it is that mechanisms of change might unfold in moments of reflective action, and how individual frames of reference might evolve such that the possibility of recognizing contradiction and the potential for reflective action emerges. The paper concludes suggesting the theoretical synthesis finds harmony in similar foci of practice. Additionally, both perspectives provide insight into the other perspectives "unlit passage ways." Communities of practice theory offers a robust technique to analyze the individual and the importance of the material aspects of technology, and institutional theory allows for the examination of practices and beliefs over time and across networks.

The broad question in which this dissertation is framed, *what is the effect of practice on efforts to make information systems workable?* is addressed in several ways. First, organizational change appears to emerge in instances where individuals are able to perceive a contradiction from the way things "should be" and are able to enact alternative practices to correct such contradictions. These enactments must be resilient such that, through explicit or implicit means, individuals are able to enroll the support of other

networks or communities in making the practice legitimate. Second, I suggest a method for analyzing individual frames of reference directed at how individuals perceive the possibility of change, and in turn deploy adaptive practices such that perceived needs are met.

In conclusion, the dissertation contributes to the field of management information systems, in both theory and practice, in the following ways. First, the tradition within IS literature that encompasses qualitative research and the interpretive discourse is enriched through a further elaboration of the contribution that a practice-based analysis might provide. Second, research is augmented through an examination with a particularly practice-based lens, focusing on the ways and means that individuals encounter the emerging evolutions of information systems in situated context. The study further contributes to the information systems academy through a deep analytic examination of the implications for material knowledge of information system artifacts (v. Orllikowski, 2002) and expands the concept of workability, examining the emergence of workable systems as ongoing constructions and relations between individuals and communities.

EPIGRAPH

"A dog will bark at strangers"

- Heraclitus

"All experience is an arch where through

gleams that untraveled world whose margin fades

Forever and forever when I move"

- Sir Alfred, Lord Tennyson

DEDICATION & ACKNOWLEDGEMENT

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CHAPTER 1: ACCOUNTING FOR WORKABILITY

INTRODUCTION

Organizations in the public and private sector – both those oriented for profit and non-profit – are dedicating escalating levels of focus on the deployment of information systems as the evolution of information and communication technologies unfolds, and more broad and profound applications for these technologies emerge. Information systems are increasingly being deployed in contexts in which they expand across contextual borders within and between organizations, and are implemented in more diverse contexts, some far removed from the original circumstance of their design. With the extension of information systems in this pantheon of different environments and ecologies, an expanding number of components, applications and technologies are incorporated into a broader context of what constitutes an information system. Accompanying these material additions is the growth in the number of organizations, communities and numbers of individuals who encounter these technologies; and they bring with them values, perceptions and practices associated with work and technology. The field of information systems has examined technology and systems in the context of large and small deployments, discrete technologies and expansive systems, and technologically and behaviorally centric positions in order to better understand the unfolding deployment and use of information systems. However, as Orlikowski & Yates (2006) point out, not enough attention has been paid to how information systems, in all its expansive and evolving nature, is made *workable* in the context of everyday practice and (work) life.

Within localized contexts, information systems are often diverted from intended use as different individuals in different contexts may enact the technology in unique fashions focused more on localized goals and perceptions, rather than any intended standard design or use that might be inscribed in the technology itself (Orlikowski, 2000). This concept of emergence of differing appropriations of technology and unintended consequences is not new (e.g., DeSanctis & Poole, 1994, Orlikowski, 1992; Suchman, 1987). The somewhat fluid nature of information systems is related to the recognition that information systems and technologies both influence, and are influenced by, the context and practices in which they are situated (Star & Ruhleder, 1996). Technology and information systems are fashioned and adapted to be *workable* but are not limitlessly malleable.

In the framework of recent work in the information systems academy, the notion of a *workable* information system is a pragmatic turn (Orlikowski & Yates, 2006) that focuses on the "workarounds and forms of articulation work that enable people to make dynamically complex systems work" (129). Following the trajectory of Gerson & Star (1986; see also, Orlikowski & Iacono, 2001) workarounds and articulation work consist of the "reconciliation of incommensurate assumptions and procedures" (257). In other words, compromise and reciprocity are involved in the emergence of a system that is able to achieve the required aims and functions and satisfy group or individual needs. Further, the system may involve modes of work that alter or avoid the use of the technology as intended. The emergence of a workable information system is a dynamic process, as

action and consequence are trialed, and form adaptations that are lasting or temporary. What makes a system *workable* is connoted by whether or not the system is able to achieve the aims and goals which are coupled to its use (though not necessarily those originally intended), or does the system cease to result in any useful output – designed or otherwise.

Within the context of information systems, there are multiple examples in academic literature in practice that recognize the notion of a workable information system. For example, in Rolland & Monteiro's study of ship surveyors adaptations were made to the system that made the technology more workable. Some of these adaptations included users leaving long commentary and additional measurements concerning an ongoing survey in fields designated for small notes. This involved surveyors using parts of the system in ways other than intended. However, it allowed them to communicate the information necessary to complete the survey. Rather than identifying this mis-use of the field for notes as a collapse of the system, the organization sought to adapt the technology such that the commentary and additional measurements would be included in the ordinary system protocol of a survey. Even if this redesign and accommodation had not been made, however, the system was a *workable* information system, in that users had found a technique to maintain the use of the system, but also to complete their goal: a ship survey.

The identification of a workable information system might be likened to the notion of continuous forward motion. In the rules of American Football, continuous forward motion is required for a ball to remain in play. When the ball ceases to be in motion in a

forward fashion, it is taken out of play – the play is no longer working, nor contributing to the goal of the team (a touchdown). Information systems that stay "in play" and have forward motion are those that are being engaged by users and are being used productively to achieve a goal(s) or are being trialed in various adapted fashions to achieve a goal(s). Given the constructed and variable use(s) for an information system, individuals and groups often have different and some times competing goals. A system may be "in play" and undergoing various adaptations for some groups within an organization, while having reached a degree of stabilized use for other groups. The purpose of this thesis is to examine the processes of how forms of workability emerge and become sedimented and durable enactments of an information system. In other words, thoe focus is on how an information system remains "in play" making continuous forward motion, and how do certain enactments reach stable states.

The day-to-day actions and perceptions of individuals in terms of how information systems are encountered and used is important in understanding how such workarounds and articulations occur to make the system workable. This focus on action and perception is consistent with the notion of *practice* discussed in the information systems academy. (e.g., Orlikowski, 2000; Suchman, 1986; Star & Rhudler, 1996). Following the calls for research from Wagner & Newell (2006; see also: Orlikowski & Yates, 2006) the focus of this thesis is to examine "what is and can be done to make information systems workable" (109). The central research question examined in this thesis is: *What is effect of practice on efforts to make information systems workable?*

The remainder of this chapter will continue with a brief discussion of information system implementation and use, with an emphasis on the impact of practice and how it informs our understanding of how information system use is taken up. The section that follows will discuss the three themes addressed in this dissertation with respect to the impact of how practice impacts the emergence of workability and information systems.

INFORMATION SYSTEM IMPLEMENTATION AND USE

Information systems have been examined from a wide variety of perspectives, from the very instrumental and technical views (e.g., Linthicum, 2000; Selig, 1982) to views that take into account the socio-technical and political aspects of deployment (e.g., Barley, 1986; Markus, 1983; Orlikowski, 1992). Common themes run across this latter perspective of information systems, such as, recognition that these technologies are part of a diverse organizational ecology. However, substantial differences in perspectives include variation in the perceived ability of the information systems to provide increased organizational effectiveness and efficiencies, management control, and coordination (e.g., Ives & Jarvenpaa, 1991), which contrasts views that stress the unpredictable nature of changes that might unfold in the deployment and use of information systems (e.g., Orlikowski, 1996).

The unpredictability of information system deployments is often equated with the intricate and complex nature of implementations in light of the influences of culture and context (Walsham, 2001). Star & Ruhleder (1996) have also suggested that unique and specific dynamics of information systems are often overlooked. Rather than examining

the unique elements of IS (such as individual practice and environment), the more easily

identifiable similarities (such as the particular hardware or software product) are relied on

as the basis for designing implementation and designating use. This more 'technical'

view is characterized by the perception of IS as resources that should be managed in

concert with, but secondary to, the evolving strategic goals of the organization (e.g.,

Davenport, 1998; Weill & Broadbent, 1998). In other words, technology is a component

of the organization that can be managed and adjusted as desired. Thus, the embedded

implication is that a troublesome deployment can be made unproblematic by the proper

management of the organizational portfolio of IT components in order to bring use back

into alignment with intention and strategy (Broadbent & Weill, 1999).

Luftman & Brier (1999) have argued in the event deviations from managerial intention

do begin to emerge following implementation, proper manipulation of the technology

assets will retain congruence with the overall governance of the information system. In

other words, if users operate within the system in a nonstandard fashion, such aberration

could be corrected by altering technology, such as permissions authorization, so that the

variant form of operation is no longer possible. Tallon (2003) further argues that

compliance with the designated use of the system is something that can be reinforced

through the development of a standardized system and mindset with regard to shared

meanings and organizational practices (see also Reich & Benbassat, 2000; Tan &

Gallupe, 2006).

Implementation of IS

The technical view of information systems conceives variations from the intended use as 'pathologies' (Sauer & Burn, 1997). In other words, it is a fault in the system that must be corrected and brought back into line with the interpretations of meanings and uses associated with a 'healthy' system. The emphasis in this perspective is that, through careful planning and assessment, information system deployments can take into account possible variations and correct for variations through proper application and design of business processes (e.g., Van Grembergen, 2004; Weill, 2004; Weill & Broadbent, 1999). In contrast, alternative views in the academy have suggested that variations in use are not fatal flaws of the implementation, and in fact reflect a situated perspective on how information systems might be employed in a given context (e.g., Rolland & Monteiro, 2002; Orlikowski, 1992; Leonard-Barton, 1988). A summary of research is presented in Table 1-1, representative of various foci of the academy on the issues of implementation and use, and of governance.

The summary of literature in Table 1 recognizes that information systems are an important aspect of the contemporary organization. Infrastructures support and extend organizational functions such as communication and knowledge sharing, and can engender the opportunity to realize new opportunities, manage a distributed institution, and effect required coordination across time and space. However, perspectives vary across and between technical views positing technology as neutral in contrast to standpoints that assert that technology has localized values and meanings inscribed into it. The implication of non-neutral technology suggests inserting elements of

Table 1-1: Perspectives on Implementation and Use[1]

Conclusions and Findings	Examples
Information systems are necessary components of coordination and control for contemporary organization, particularly in distributed and international contexts.	Bartlett & Ghoshal, 2002; Egelhof, 1991; Ives & Jarvenpaa, 1991
Information system deployments are technical exercises, focused on the implantation of technology in the effort to rationalize and reduce differences of time and space and exert control and coordination.	Selig, 1982; Ives & Jarvenpaa, 1991
Information system implementation is characterized by central control and the extension of standards from headquarters outward across extended operations of the organization.	Khalfan & Alshawaf, 2004; Kumar & Bjorn-Anderson, 1990
Information systems are used to enforce a standard environment and control and coordinate the organization radiating outward from HQ.	Boddewyn, 1988; Karini, Gupta, & Sommers, 1996; Klein & Sorra, 1996
Systems and technology are neutral; failures in implementation are related to the inability to properly assess and bridge the gaps between designated use and intention and context.	Tan et al, 1998; Hasan & Ditsa, 1999; Chan, 2002
Local accommodation, with a strong standardization of HQ/central processes. Differences in various contexts of deployment should be measured so that they might be accounted for or overcome.	Avgerou, 1993; Katz & Townsend, 2000; Anandarajan et al, 2000; Markus & Soh, 2002; Corbitt et al, 2004.
Systems are not neutral and should be adapted to context.	Dirksen, 2001; Shore & Venkatachalan, 1996
Rapid evolution of technology and information system makes it difficult to examine systems, thus complicating the ability to 'successfully' implement.	Tushman et al, 1997; Kumar & Basu, 2002; Evaristo, 2003
Systems are 'stable' entities that may go through periods of change but establish a fixed nature around which organizational processes should be	Sabherwal, Hirschiem, & Goles, 2001; Galliers, 2004

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[1] This summary does not propose to consolidate the volume of research on implementation and use within the management information systems academy. Rather, through a representative inclusion of past and current research in the area, this presentation attempts to characterize the various trajectories of research within the academy.

adjusted.

Description	References
A more nuanced view of technology and information systems is required beyond the 'technical' view, in order to understand implementation and use.	Tan & Gallupe, 2006; Myers & Tan 2002
Harmonization of organizational processes outward from HQ into distributed units provides benefits to the organization that facilitate organizational processes, communication, transactions, etc. However, a consistent and reliable method of operations is required to achieve benefit.	Markus, Tanis, & van Fenema, 2000; Neo, 1991
Over-attention to HQ or designated 'meaning' and use washes away the nuances of context.	Eastman, 1991; Straub, 1994
'New' systems are often inserted into environments that have existing technologies, practices, and established perceptions. Understanding these systems should be done in light of these contextual elements.	Goodman, et al 1994; Dirksen, 2001
Information systems are not neutral but are characterized by the inscribed values, practices, and meanings of designs and those designating intended use.	Sahay, 1998; Walsham & Sahay, 1999
Information systems are not neutral, and organizational processes must be examined to understand issues of implementation, use, and deviation from use.	Trauth, 1999; Soh, Tein, & Tay Yap, 2000
Implementation and use are ongoing processes of negotiation, adjustment, and governance.	Weill & Broadbent, 1998; Davenport, 1998; Weill & Broadbent, 1999; Tricker, 1999
Examining the structure in which systems are deployed and used makes it possible to witness variations in use.	Barley, 1986; Orlikowski, 1996; 1992; DeSanctis & Poole, 1994; Montealegre & Keil, 2000
Differing interpretations and perceptions of meaning are insights in various enactments of systems.	Montealegre, 2002; Walsham & Sahay, 1999; Walsham, 2001; Weisinger & Trauth, 2003
Systems must be understood in the context of situated use and practice. Variations in use occur, are not necessarily fatal for the deployment, and are based on local enactments of the technology.	Ciborra & Hanseth, 1998; Suchman, 2000; 1987; Hanseth, Ciborra, & Braa, 2001; Rolland & Monteiro, 2002; Orlikowski, 2002; 2000

infrastructures into an organization is coupled with the insertion of meanings, values, and practices. Dirksen (2001) asserts that such insertions are not unproblematic, as there is little certainty that 'local' individuals will interpret the values and meanings in the same fashion as the individuals who designated them. More often they perceive infrastructure elements, values, and practices through the lens of their own contextual experiences (Monteiro & Hepso, 2000). Thus, the potential exists for infrastructure to be reinterpreted and reinvented through use (Orlikowski, 2000).

Practice and Information Systems

Practice theory has been productively applied in management literature, focusing on the specific situated context in which phenomena occur (e.g., Oakes, Townley, & Cooper, 1998; Everett, 2002; Osterlund & Carlile, 2003; Cooper, Everett, & Neu, 2005). Carlile (2003; see also Carlile, 2002; Osterlund & Carlile, 2003) has suggested "relational theory lies at the heart of practice theory" and has found commonality among theories of practice in this regard. The authors have suggested that to differentiate theories of practice is to place emphasis on different types of relations. A theory of practice examines "recursive dynamics of a given relation and places everyday practice as the locus for the production and reproduction of relations" (Osterlund & Carlile, 2003, 3) and bridges the dichotomies of subject-object and global-local by "emphasizing the relational interdependencies between subject, object, person and world." Thus, practice theory is focused on the relations that surround information systems and the embedded relations. This focus fosters the examination of questions such as how the past schema of practices, perceptions, and meanings contributes to a momentum that collides with present and new

infrastructure and how the trajectory of existing work practices and the material aspects of technology and information systems might emerge as workable enactments (Orlikowski & Yates, 2006).

Empirical evidence (e.g., Hanseth, Ciborra, & Braa, 2002; Orlikowski, 2002; Pozzebon & Pinsonneault, 2005) suggests that information infrastructure deployments, whether deemed successful or problematic, have unintended consequences and deviate from designated usage and intended output. Star & Ruhleder (1996) have suggested that the emergence of these variations is related to the associated work practices that surround the information infrastructure and the context in which it is embedded. The act of mutual shaping has been examined in the implementation and deviation of these systems (e.g., Leonard-Barton, 1988; Ciborra & Hanseth, 1998; Rolland & Monteiro, 2002). However, Rolland (2003) has pointed out, "how these processes unfold in different local contexts of usage, across different user communities, cultures and institutional settings involving different types of infrastructure technologies, in close detail is scarcely documented" (19). Conclusions vary from prescriptive protocols for achieving success to commentaries on what occurs in deployments, such as the phenomenon of *drift* (*v.* Ciborra, 2000). However, little attention has been paid to how workable forms of practice and technology emerge (Wagner & Newell, 2006).

In summary, the implementation and use of information systems has been examined through a number of empirical investigations, with the benefit of numerous theoretical perspectives. Recent investigations (e.g., Wagner & Newell, 2006; Rolland & Monteiro,

2002) have stressed the importance of focusing on *how* use emerges in the context of information system deployment. A focus on the practice in which individuals engage has the potential to offer insight into the evolution of use – both in terms of individual action and the material capabilities of technology.

THEMES IN THE EXAMINATION OF WORKABILITY

It is rare to find an information system that is an unmitigated success, or one that did not require some articulation between initial design and ultimate use. Rather than conceiving variations from the intended use as 'pathologies' (Sauer & Burn, 1997), Orlikowski & Yates (2006; see also Wagner & Newell, 2006) point out it is important to understand not only how these systems are enacted, but *how* such enactments contribute to a workable and working state of an information system. In other words, this perspective suggests we should not conceive of a deviation from design in a specific aspect/component of the system as a fatal flaw. Rather, re-inventions might be seen as ways to revitalize the system and allow the information system, in terms of the complete infrastructure, to function in a fashion that is positive for the organization – to work for the organization.

In order to examine the implications of practice on the possible emergence of workable information systems, three themes were examined in this dissertation. The first two themes are discussed in Chapters 2 and 3, and are empirical papers that examine (1) the flexibility and rigidity of routine practice and the implication on information system and organizational change; and, (2) the formation and expression of material knowledge of technology with relation to notions of identity and practice. Both papers were based on a

30-month case-study that concluded in January of 2006. These papers together provide a complimentary examination of practice with respect to information use. The first paper focuses on perceptions of incongruities in organizational (work) life and the emergence of reflective action as a mechanism of concretizing information use throughout organizational networks – either as designed or re-invented. The second paper provides a sympathetic examination of the relations of practice, focusing on how perceptions of "who we are" are coupled and interwoven with perceptions of "what we (should) do", which is constitutive of individual frames of reference that contribute to how we become aware of contradictions in our environment, and how we might seek to resolve them through creative or improvisational action. The third and final paper is a conceptual essay, that develops a theoretical lens and vocabulary to more thoroughly explore how individual frames of reference are formed and are manifest in reflective action, and how that action reverberates through relational networks. Thus, the paper posits a synthesis of communities of practice theory and institutional theory as a technique to provide better insight into the durability of situated practices across place and time.

Contradiction, Praxis and the Flexibility of Organizational Routines

The study contained in Chapter 2 adopts a perspective of praxis as articulated by Seo & Creed (2002) based on Benson's (1977) dialectical perspective of organizations to examine the large-scale deployment of an information system. Recent work in the academy has focused on the importance of organizational routines (e.g., Feldman & Pentland, 2003; Howard-Grenville, 2005) in understanding the mechanisms by which change, particularly information systems related organizational change, occurs in

organizations. In an effort to extend theory, this paper uses the notion of praxis to examine individual actors' perceptions of contradiction as a mechanism that initiates a moment of praxis – sometimes consciously, sometimes not – in which action is taken to uphold or constrain the possibility for flexibility and change in the organization. A further contribution is offered in the perspective of analysis, in that the extant literature has focused on the examination of routines that are "large" – organization wide, spanning multiple individuals and relations, and often long temporal periods while, by contrast, this study focused on small routines of everyday practice. Based on this analysis, the study aims to provide a ready approach to examine organizational change, and gain insight upon the mechanisms by which it unfolds.

Practice, Adaptation and the Resolution of Technology Use

Orlikowski (2007; 2004) contends the material aspects of technology, and the fashion in which individuals know in practice of the material aspects of technology is constitutive in how information systems are enacted. The potential constraint or enablement of action, associated with the use of technology is, after all, not solely a function of how a technology is perceived, but also by what it is physically capable of being accomplished. However, how we come to be aware of such possible constraints or facilitations offered by technology is related to how we come to know that technology in practice. Continuing the trajectory of recent work in the information systems academy focused on the notions of identity and practice (e.g., Carlile, 2004) Chapter 3 examines the implications of the practice and identity as mechanisms by which knowledge of technology is (re)shaped and

thereby affects how the material aspects of technology are *known*. This focus offers

insight on the emergent use of information systems and how individual action unfolds.

Constituting Institutional Practice

The debate inside the information systems academy on the impact of the material

influence of technology, and the impact of past experience and situated use is a robust

discussion that offers a broad approach to answering questions revolving around

information systems in organizations. Chapter 4 is focused on an effort to develop a

theoretical perspective that offers an approach to examine situated practice in light of the

material aspects of technology, and unify such analysis with an acknowledgement of the

potent influence and durability of instantiated values and meanings of practice,

perception, and technology. The chapter draws upon communities of practice theory

(COPT) as a technique to broaden the perspective of institutional theory and provide

insight into the processes surrounding information system related organizational change

and the deployment and management of information systems.

CONCLUSION

This thesis is the integration of three papers. All three papers share a theme of examining

a different aspect of how information systems are made workable, and are the result of a

longitudinal case study lasting approximately 30 months. The first two papers are

empirical examinations of information system use. The first examines moments of praxis

– or reflective action – that occur at periods in the perception, even at lesser degrees of engagement and the potential for flexibility in the routinized practice of information system use. The second paper examines the relation between individuals' sense of identity and the process by which they come to know and understand the material artifacts of a technology, and how that might inform their ability to conceive of different enactments of the information other than those that have previously been in place or have been inscribed in the technology. The third paper is a conceptual essay that discusses a synthesis of the theoretical perspectives of communities of practice theory and institutional theory. This essay emerged, in parts and in the whole, over the course of the data collection, analysis and (re)writing of this thesis, as an expression of my efforts to try to develop an analytic framework and vocabulary that might provide additional insight into the phenomena observed and analyzed at the research site. The final chapter of this thesis offers a reflection on the synergy between these papers, and offers practical and academic implications for the future.

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CHAPTER 2: CONTRADICTION, PRAXIS AND THE FLEXIBILITY OF ORGANIZATIONAL ROUTINES

ABSTRACT

This paper adopts a perspective of praxis as articulated by Seo & Creed (2002) based on Benson's (1977) dialectical perspective of organizations to examine the large-scale deployment of an information system. Recent work in the academy has focused on the importance of organizational routines (e.g., Feldman & Pentland, 2003; Howard-Grenville, 2005) in understanding the mechanisms by which change, particularly information systems related organizational change, occurs in organizations. In an effort to extend theory this paper uses the notion of praxis to examine an individual's perception of contradiction as a mechanism that initiates a moment of praxis – sometimes consciously, sometimes not – in which action is taken to uphold or constrain the possibility for flexibility and change in the organization. A further contribution is offered in the perspective of analysis. The extant literature has focused on the examination of routines that are "large" – organization wide, spanning multiple users, and often long temporal periods, by contrast, this study focused on small routines of everyday practice. Based on this analysis, the study aims to provide a perspective to examine organizational change, and gain insight upon the mechanisms by which it unfolds.

INTRODUCTION

The formation, maintenance and alteration of organizational routines are topics that have been addressed by a breadth of academic inquiry. Feldman & Pentland (2003) point to

three dominant metaphors popular in the analysis of routines: Nelson & Winter (1982) discuss routines in the biological context of genes, as partial determinants of behavior (along with environment); Hodgson (1997) refers to routines as individual habits that permeate the organization; and, routines have also been constructed as heuristics of behavior (March & Simon, 1958; Levitt *et al*, 1999). While varying degrees of functionalism have been applied in these perspectives, common across them is a relatively fixed and rigid conception of a routine (Feldman & Pentland, 2003). Despite a persistent theme in the academy on the "inertial qualities" (*ibid*, 97) of routines, recent work in the academy has suggested that routines may contribute flexibility and dynamic change in organizations (*ibid*; Pentland, 2003; Howard-Grenville, 2005).

Following Latour's (1986) discussion of power as existing both in potential (ostentive) and practice (performative), Feldman & Pentland (2003) argue that routines also consist of inter-related and mutually reinforcing ostentive and performative aspects that correspond to social structure and agency. In this conception the authors suggest an analytic separation such that the performative aspect of a routine - how an individual actively engages the routine - is the possible source of change of the routine. However, in discussing the institutional aspects of routines, Seo & Creed (2002, 223 (quoting Holm, 1995, 398)) contend such theoretical ground must be carefully tread, as too easily a paradox might emerge: "How can actors change institutions if their actions, intentionality, and rationality are all conditioned by the very institution they wish to change?"

In this paper I seek to investigate the potential for change in organizational routines, and how change might emerge. By adopting Seo & Creed's (2002) dialectical perspective of praxis to examine "action embedded in a historical system of interconnected institutional arrangements" (*ibid*, 223) to unfold the dynamic processes involved in the maintenance and alteration of organizational routines. Empirical observations are based on a 30-month case study of a financial institution during the deployment of an enterprise-wide information system and the adoption of an integrated strategy of standard operating procedures. Conclusions contribute to our theoretical understanding of how organizational routines may be dynamic and flexible, extending recent work in the academy (e.g., Feldman & Pentland, 2003; Howard-Grenville, 2005).

ROUTINES AND THE DIALECTIC PERSPECTIVE

Routines have been characterized as the mindless performance of repetitive tasks (Cohen & Bacdayan, 1994) and have also been recognized as forms of organizational memory and knowledge (Nelson & Winter, 1982). More recently, Bogner & Barr (2000) suggest routines may not be the mere performance of actions themselves, but the cognitive frameworks that promote certain actions, and are not necessarily, "enacted habitually and with little discretion on the part of actors" (Howard-Grenville, 2006, 620).

Feldman & Pentland (2003) stipulate routines as outcomes of recursive and mutually constituting performative and ostentive aspects (*v.* Latour, 1986). The authors contend that the performative aspect of a routine is an individual's engagement of a set of perceptions and actions that is based on past experience and reflective evaluation of

present circumstance. The past knowledge that is brought to bear is knowledge and a cognitive framework that comprises the ostentive, (idealized or structuring) aspect of the routine. Thus, the ostentive aspect of a routine is argued to encourage the continued performance of certain actions as part of the routine, and the performative application of these actions maintains the structure of the ostentive aspect of the routine (or change it).

The ostentive aspects of routines are discussed in terms of *guiding* (normative influence), *accounting* (providing individuals with a sense of legitimacy), and *referring* (a frame of reference in ambiguous circumstance). The performative aspects of routines are broken down in similar frames: *creative* (the origination of routines through repetitive behavior, instantiated through social acceptance); *maintenance* (the continuation of a routine's form through action "following" the routine); and, the alteration of a routine through innovative or improvisational action, or *modification*. Feldman & Pentland (2003) further suggest the performative aspect of routines are flexible given the variability of present context - new interpretations and variables - may bring the possibility of change in the ostentive aspects of routines, but such change is not a certainty. Howard-Grenville (2005, 620, *emphasis added*) charges "missing from this view of routines is an empirically based elaboration of specific factors that link the performance of routines to *how* these factors contribute to both flexibility and change or persistence of routines over time."

Theoretical and empirical work in the academy suggests for individual action to promote a change in the structural aspect of routines it is necessary for: first, a critical mass of individuals to accept the alternate action, different from established pattern; and second,

that a substantial ecological or contextual change may be required to force individuals to

make such a choice (Barley & Tolbert, 1997; Feldman 2003). However, Seo & Creed

(2002, 224) point out, such perspectives still leave unresolved the question of *how* "actors

actually decide to revise behavioral scripts when their actions and thoughts are constantly

constrained by the existing institutional system."

To address what the authors feel is a gap in understanding larger institutional contexts,

Seo & Creed (2002) adopt a dialectal framework of praxis based on Benson's (1977)

dialectical perspective of organizations. The dialectical perspective "focuses on the long-

term ongoing processes through which organizational arrangements are produced,

maintained and transformed" (Seo & Creed, 2002, 224). This perspective addresses social

arrangements and patterns as repeated and recognizable sequences of action involving

multiple individuals in interdependent contexts.

The dialectical perspective maintains four analytic brackets through which the ongoing

and multi-level social arrangements continually reproduce and shape the organization:

social construction, totality, contradiction & praxis (see Figure 1). First, *social*

construction "focuses on the social processes through which orderly, predictable relations

are produced and reproduced," (Seo & Creed, 2002, 225). The performative aspect of

creation & maintenance in Feldman & Pentland's (2003) vocabulary of routines

Figure 2-1: Institutionalization and Change: A dialectical perspective
Adapted from Seo & Creed (2002)

New Social
Interaction

Praxis

Social
Construction

Conflicts &
Tension

Institutionalization

Contradiction

Contradictory
Routines & Practices
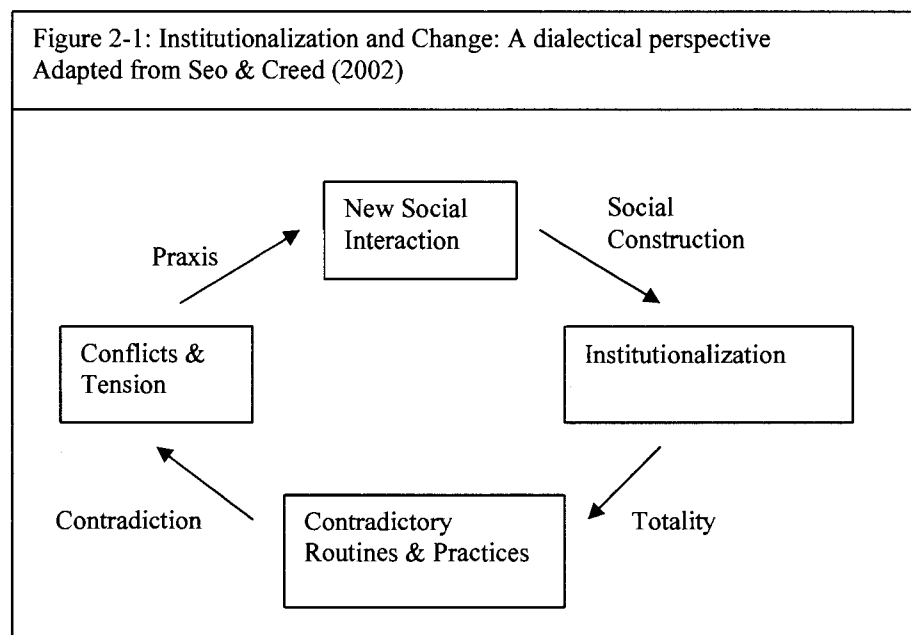
Totality

corresponds to social construction as the point in which the ostentive aspect of routines,

or institutional structures, are instantiated as legitimate and durable over time. *Totality,*

the second analytic bracket, refers to the interconnected nature of social structures and

patterns. In other words, totality is the diffusion of practice and meaning throughout a

network. In their definition, Feldman & Pentland (2003) establish the interconnected

nature of social patterns, structures and actions in the nature of routines, and it is in this

interconnected nature that acts of *guiding* and *accounting* establish organizational norms

and are legitimated through the linkage of action to an established practice.

Contradiction is articulated as the third analytic bracket of the dialectic perspective. It is

focused on the various ruptures that emerge in diverse contexts in which individuals

might find themselves. Seo & Creed (2002, 225) suggest that ongoing social construction

will "constantly confront a complex array of contradictions, continually generating

tensions and conflicts within and across social systems." In other words, each context of

operation for an organization or routine is an opportunity for ambiguity. As neither context of action, nor interpretation of the environment will be exactly the same, the possibility of variance exists. The degree of variance is related to the perceived difference of the context and the difference in summative experience and knowledge of the individual(s) forming the perception. *Referring* (Feldman & Pentland, 2003) is the aspect of routine where new context and the contradictions with expectations are evaluated against a framework of known social systems and patterns. It is the perception of the tension, against a framework of what is known and perceived to be correct.

The fourth analytic bracket of the dialectical perspective is *praxis*. Praxis is the "free and creative reconstruction of patterns on the basis of reasoned analysis" (Seo & Creed, 2002, 225). Seo & Creed (2002) argue that praxis is the "foundation" of a reconstruction process, as individuals are "active agents in constructing their own social relations, and ultimately, themselves" (Benson, 1977, 5). Such a perspective on praxis is consistent with Emirbayer & Mische's (1998) theory of agency, which conceives action as temporally oriented. The encounter with problematic or ambiguous situations requires individuals to take a reflective distance in order to evaluate past patterns and experience in light of anticipated or desired outcomes, and the present context. In doing so, the possibility for greater imagination and innovation emerges, which may formulate new practice in a given temporally situated instant, which may in turn be durable over time and material in the modification of routines of practice. (Emirbayer & Mische, 1998; Benson, 1977; Seo & Creed, 2002; Boudreau & Robey, 2005).

ROUTINES AND PRAXIS

The dialectical perspective proposed by Seo & Creed (2002) adopts the position that institutional contradictions are the "seeds" through which institutional change may emerge as a result of the "reasoned actions of individuals" (228). Contradictions are ruptures in the ordinary constructs of an individual's world. Ruptures may arise in a variety of fashions, such as inconsistencies with perceptions of what is legitimate with what is both efficient and/or effective; institutional structures that do not have the ability to meet the needs of the individual or organization; or, the possible emergence of incompatibilities with other aspects of the organization. Such ruptures are not mutually exclusive entities, but rather analytical notions that can, and often do overlap. For instance, organizational policy might require a certain depth and form of financial reporting that is time consuming and redundant; while being inefficient it is deemed to be legitimate. Individuals in the organization with responsibility for the maintenance of such reporting protocols would have interests at odds with those that desired a simple and streamlined system. Inconsistencies might also emerge as financial reporting requirements change, as a deeply entrenched system of reporting in the organization may not be able to meet the changing needs of the organization to satisfy financial regulators.

Praxis is thus an act of reconstruction of social arrangements where actors first realize that their needs in some form are unmet. Individuals must then be able to mobilize individual or collective action through creative action or the deployment of resources. Benson (1977) suggests contradictions in social arrangements and social structures will always emerge, and the present is composed of multiple latent outcomes. The variation of

outcomes is conceived as a spectrum, whereon one side is a resolution of a contradiction through reflective examination of the context and possibilities that results in new durable patterns of action; and the other side is the non-reflective repetition of existing patterns which at one time further instantiates the routine and creates the possibility for the future recognition of the same contradiction.

Seo & Creed (2002) extend this logic, suggesting that contradictions provide the possibility for creative re-imaginings and alternative logics that may or may not be taken up. The potential for the individual's or a collective group's awareness of a contradiction and the reconstructive praxis are thus argued to be related. The authors argue the degree of resonance which alternate constructions of practice might hold is related to the degree of misalignment between individual and institutional interests, the rigidity of organizational structures and patterns, the mass of perceived contradictions, and the dispersal of resources and influence. Seo & Creed (2002) argue this is a non-deterministic approach, suggesting change in institutions is the reflective historically-situated actions of individuals - *praxis*. The emergence of contradictions is not necessarily a material or external factor, to which individuals are responding, but also endogenous features. For example, as an individual grows older his perception of the value of his pension plan may increase relative to what it was when he was young. This in turn may give rise to perceived contradictions and reconstructive praxis. In sum, the potential and the ability to unfold *how* organizational routines are maintained or modified is resident in examining the connections that individuals and collectives draw between perceived contradictions in

routines and creative action, as well as the examination of the contradictions and practices themselves.

The understanding of routines as flexible and dynamic aspects of organizations, and the ostentive/performative aspects detailed by Feldman & Pentland (2003) can be expanded through the inclusion of the dialectical perspectives of contradiction and practice developed by Seo & Creed (2002). While the perspective of routines offered by Feldman & Pentland (2003) offers many insights into the possible malleability and flexibility of routines, little attention is paid to how the change or flexibility of the routine is accomplished by individuals (Howard-Grenville, 2005). In addition this paper attends to calls in the academy (*ibid*; Feldman 2004) to address routines at a closer level of practice, focusing on localized, task-based routines. Through the analysis offered in this paper, I show how the concepts of contradiction and praxis in the dialectical framework provide an insight into how the maintenance/modification of organizational routines emerge as the potential for new logics of action unfold during periods of perceived contradiction within the organization.

RESEARCH APPROACH: THE CASE OF NATBANK

Natbank is a large North American financial institution, the case study spanned 3 years, ending in January of 2006. Data collection was focused on the deployment of an enterprise system, occurring over a period in which Natbank chose to consolidate management and harmonize operations across 15 regional units, centralizing operations at headquarters. The organization employed approximately 3000 individuals across the

15 territories, with approximately 100 offices. Observation and analysis paid particular attention to activity at headquarters and two additional sites.

The Choice of Method: Case Study

The rationale for the adoption of a case study method for the analysis of Natbank is consistent with the perspective of Yin (1994; see also Prasad, 2005; Trauth, 2002; Klein & Myers, 1999) with respect to theoretical position and research questions being examined. This perspective suggests that theoretical positions framed with a constructivist standpoint are appropriately investigated by case study. Additionally research questions that are focused on "why" and "how much" are better addressed in methods such as interpretive case studies (Strauss & Corbin, 1998). Table 2-1 provides examples of how the study of Natbank fulfills Klein & Myers (1999) principles for an interpretive case study.

Table 2-1: Principles in Interpretive Case Studies – (Klein & Myers,1999)		
Principle of the Hermeneutic Circle	Understanding achieved through iterations between examining the "parts" and the "whole"	The study was undertaken examining multiple components of a larger organization; and the organization as a whole.
Principle of Contextualization	Reflection on the social / historical context.	Triangulation of data and researcher participant observation engendered sensitivity to the socio-historical context
Interaction between researcher and subjects	Reflection on the researchers part in constructing the data	Addressed as I attempted an effective balance between emic and etic readings of the case
Principle of Abstraction	Relating the idiomatic analysis of the specific case to broader contexts	Achieved in the analytic discussion of the extension of theoretical concepts beyond this case
Principle of Dialogic Reasoning	Questioning theoretical preconceptions	Discussed in the analysis section of the paper
Principle of Multiple Interpretations	Sensitivity to multiple interpretations of events	Examined and addressed through the triangulated nature of data
Principle of Suspicion	Awareness of possible biases in the accounts of participants	collection and analysis

Research Site Choice

The research site, Natbank, was chosen for a number of reasons. The primary rationale was because of the potential to observe and study the unfolding processes in the deployment and governance of information infrastructures. Katz & Jordan (1999) point out that the financial services sector is one in which advances in information and communication technologies have had a dramatic effect. While this was an interpretive case study, Natbank offered what might be referred to in positivist approaches as adequate variability. In other words, studying Natbank held the potential to observe phenomenon in the most stark and visible display by its unique nature. The organization was distributed across fifteen regional units; four different information systems had been run as independent 'enterprise systems' and the integration would reduce this number to one; the regions in which the bank operated ranged from wealthy (regional per capita GDP^2 of approximately US$ 27,000 p.a.) to poor (regional per capita GDP of US$ 800 p.a.); and the bank held varying market positions in the regions, in some cases substantial, in some cases minimal. Thus, the goal of integration and deployment of a universal information infrastructure was complicated by broad number of variant factors.

Due to an existing research project, I was able to leverage contact with the organization to achieve a substantial degree of organizational access. I also had an extensive network within the organization through this prior connection. Additionally, before returning to academic study I worked in the financial services industry, in particular, having dealings both with the organization in the study, and in the region. Knowledge, acquired over a

number of years in industry, and the ability to claim 'membership' to the community in which individuals with whom I interacted considered themselves allowed a degree of fluency that would have not have been possible in other circumstances. Garfinkel's (1967) notion of 'unique adequacy', or a familiarity with the context that might allow a researcher to 'walk the walk' and 'talk the talk' is at the heart of this familiarity.

While not a direct participant in the organization, Natbank, I was a participant in the industry. Similar to the notion of unique adequacy, participant observers possess an awareness of the operations of the organization that allow for rich examination of data, and often expands the potential for insightful findings from "knowing where to look." (Trauth, 2002). Such familiarity engenders the ability for the researcher to not make a solely etic reading of the organization - to view it from the outside – in Bourdieu's (1977) terms, the scholarly academic bias that examines 'from a distance' which "destroys part of the reality it tries to grasp" (Bourdieu & Wacquant, 1992, 10). However, certain challenges are raised by this position, in risking an *emic* reading, or one that is too close to the organization to be able to engage in meaningful analysis. In order to mitigate this concern, methodical actions were taken to distance myself from the context to reduce the possibility that I was placing my own assumptions upon what I was observing. One such action was to frequently question what was being said, or what action was being performed, despite that I either knew, or believed I knew, what was being said or done.

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[2] Gross Domestic Product

Data Collection

The research approach used in this study was an interpretive case study (Yin, 1994).

Observations and semi-structured and informal interviews comprised the bulk of data

collected. Twenty respondents were interviewed formally. Additionally, Twenty-two

other members of the organization were informally interviewed during immersive periods

of observation, when time was spent with employees in the workplace and socializing

after work. Interviews ranged in length between thirty-two minutes and ninety-six

minutes. Thirty individuals declined to be formally interviewed, twenty-two constituted

the informal interview pool. Interviewees work in both customer facing (e.g., customer

service representatives, bankers) and non-customer facing (e.g., internal auditors, IT

personnel) aspects of Natbank, and occupied both managerial and non-managerial roles.

Interview questions were broadly structured around the topics of the study, such as, "Can

you tell me what your work day is like?" and "How has [the system] changed how you

work?" A more detailed listing of interview protocol questions can be found in Appendix

2-A. In addition to observations and interviews, data was collected in the form of internal

documents (e.g., training manuals and memoranda), publicly available documents (e.g.,

year-end reports), press coverage, and consultant reports. Appendix 2-B provides a

summary of data sources collected during the study.

Interviews: formal conversations and informal chats

Twenty semi-structured interviews were conducted and transcribed. The ethnographic

interview (Prasad, 2005) technique was adopted to engender an in-depth understanding of

not only the organizational life of individuals, but of wider life in general. In other words,

the goal of the interviews was multi-fold to: 1.) develop an understanding of general or superficial understanding of what was involved in the 'normal' work day of individuals; the practices and perceptions that were apart of the everyday; 2.) develop a 'below the surface' understanding of the organizational and contextual practices, beyond the immediate rational explanation; and, 3.) explore the wider context of individuals' lives, in attempt to ascertain the frame of reference with which they encountered the world on an everyday basis (see also: Brewer, 2000).

The history of the organization and the regional context in which it operated, the sense of the industry and the nature of the specific business – challenges and opportunities - of the organization were core objectives of the initial semi-structured questions. Questions identifying an individual's unique position in the organization, work practices, and a general understanding 'placement and fit' in the organization included: "Can you tell me what your role here is?" and, "What do you do on a daily basis?" Such questions led to secondary questions such as, "What do you use [the system] for? How [do you make the system do that]?"

Subsequent questions in formal interviews were aimed at discovering the perceptions and meanings that individuals associate with the organization, the information infrastructure, and work as well as broader insights to a particular person's frame of reference both specific to the organization and with respect to the wider context. Many of these questions evolved from prior questions, and as such were specific to individual conversations. Examples of some questions include, "What do you like most /least [about

work in general]?", "How is that different [from the old system]?", "What are your

thoughts on [the new system]?", "How does that compare [to competitors]?", and "How

do customers react [to a change]?"

Interviews were conducted with managers and employees. The pool of interviewees was

constructed through a snowball technique that began initially with managers contacted

early in the study. Following initial conversations and prior to immersive visits several

potential interviewees in both customer-facing and non-customer-facing roles were

identified based on their job function and willingness to participate. Interviews

subsequent to the initial set were based on further exposure to the organization and my

identification of individuals with whom I wished to speak, the discussion of other

managers and employees during both formal and informal conversations, and direct

referrals during informal and formal conversations. Several potential interview candidates

declined to engage in formal interview conversations but offered to participate in

informal conversations during work, during work breaks, after work hours and over a

beer or coffee on weekends. While these discussions may not have followed a formal

protocol they proved an invaluable resource for understanding the phenomenon and the

organization. In these conversations the full cycle of the interview process evolved

including discussing an individual's place in the organization and their perceptions and

uses of information infrastructure and the meanings they associated with the organization.

The nature of informal conversations often took two distinct forms. The first, as

previously mentioned, occurred as a compensatory offer from employees and managers

that did not want to speak 'on the record'. However, the character of these discussions often began with a very formal request on the part of these individuals: "What is it you want to know?" In some cases these conversations followed a very formal 'question and answer' cadence; in other instances these conversations quickly evolved to a more informal banter. The second form of informal discussions that emerged were those that were unplanned. Such conversations occurred during periods of observation, my own trips to the break room, on several occasions when I was invited to outside-work functions, and one occasion, when I was being transported from one office to another, sitting on a mail bag in an organizational mail truck with a manager who was also 'hitching a ride.'

Observation

Observation occurred between May 2003 and January 2006 on four separate trips to the research site. The visits numbered 14, 12, 20, and 10 days respectively. I was able to observe the day-to-day work practices of individuals in both customer-facing and non-customer-facing operations at the organization including, international banking offices, multiple levels of retail and corporate banking (managers and customer service representatives), executive management offices, operations and central accounting unit operations (which included information technology management). As with the evolution of formal interviews, periods of observation evolved over the study, initial sites were identified during early conversations with organizational personnel. During the iterations between data collection and analysis and theory new sites were identified as I identified

new sites I wished to visit, and new sites were referred to me from organizational members.

Observations at the research site provide valuable contextualizing and primary data. With respect to the former, observations provide insight into the ecology in which individuals work. In such a fashion it is possible to evaluate what individuals do while performing ordinary work fashions, and helps to make clear idiomatic data. For example, if a subject suggests that doing a certain task requires them to spend "lots" of time sorting through files, an accurate understanding of "lots" can be arrived at through observation. With respect to primary data collected in this study, following on Suchman's (1986; see also Klein & Myers, 1999) suggestion that it is important to actually see "what people do", rather than just listen to their reportage of what they do, observational data was important for understanding what work actually was undertaken by subjects at Natbank.

Field notes are a valuable tool in the collection of observation-based data. During periods of immersive observation field notes were taken in as unobtrusive a fashion as possible, considering the context in which they were taken. These notes contained both personal observations and my theoretical perspectives about the observations, and aided in the iterative step between data collection and analysis and theoretical review. Notes also helped to provide context for interviews, as field observations occurred in all areas in which interviews were conducted.

Email and Phone Communications

The period of the study was long (approximately 30 months) and during the periods in between immersive periods email and phone conversations were used extensively to establish an initial rapport and basic understanding of the organization, verify information or seek follow-up information and clarification on suppositions that might have been gleaned during interviews, establish and adjust the schedule for immersive visits to the site, and to generally maintain contact. The email and phone contact became especially important as new events emerged in the life of the organization, such as alterations in business strategy, changes to the deployment schedule of the information infrastructure, and updates on the success of various initiatives. Email and phone conversations were primarily used in the context of follow-up information, clarification of answers provided, and maintenance of rapport and site visit schedules rather than primary data collection.

Text Documentation: Internal and External

Various forms of internal documentation were made available for review within the organization, such as internal reports and memoranda, training manuals and internal 'white' papers on strategy and marketing. As the company is publicly traded, additional information from the public realm was also acquired in terms of year-end financial reports, and documents filed for the satisfaction of annual regulation requirements. This data, alongside other secondary sources of data such as newspaper articles, financial analyst reports and general industry news helped to provide a holistic picture of the organization. Documents in the form of general economic and social texts on the industry and the localities in which the organization operated were also reviewed to help provide

an analysis for the general frame of reference and social network in which the organization operated.

Text and Document data is a source of contextualizing information and a primary source of information, as was the case with observations. Following Trauth's (2002; see also Trauth & Jessop, 2000; Brewer, 2000) argument, qualitative case-study research can be strengthened through triangulated data collection and analysis (see below for a further discussion). Text and documentary data provided a means to contextualize the forms of communication that occurred throughout the organization, as well as the frequency and tone. Additionally, text data included such elements as training protocols, implementation schedules and budgets that allowed comparison of individual subjective perceptions alongside independent representations of these events and facts.

Triangulation

Triangulation refers to synthesis and integrated analysis of data from multiple sources. Patton (2001) argues "triangulation strengthens a study by combining methods. This can mean using several kinds of methods or data" (p. 247). As such, the notion of triangulation is to provide a more rich and multifaceted understanding of the research site (Trauth, 2002). In the case of Natbank, both *within-method* triangulation and *between-method* triangulation techniques were adopted. Within-method triangulation refers to variations of technique within one approach of data collection and analysis. In this study, multiple questions during an interview might have been asked regarding the same theme or topic (e.g., what is your opinion of the banking information system (BIS)? Do you like

the BIS?). This is furthered in the analysis process as multiple rounds of coding were undertaken. Between-method triangulation refers to different methods adopted in the examination of phenomena. In the case of Natbank, multiple methods were used in data collection focused on textual data, interviews and observations.

Data Analysis

The collection of data and the analysis and review of theory proceeded in an iterative fashion over the course of the study. Theory was used extensively to develop a useful analytic bracket in which to house this study; to develop theoretical concepts; and to inform initial interview questions. Material in the popular press and industry (practitioner) publications was also reviewed to place the organization in deeper context, and to surface issues resident which the industry currently perceived as important, such as discussions of organizational change in the context of previous versus new information system usage, as well as more general concepts of integration strategies. This research approach allows for deeper theoretical exploration of concepts that evolve in the study during data collection and analysis (Prasad, 2005), and follows the general approach to case study as prescribed by Yin (1994).

The particular aspects of the organization in which the data collection occurred, and the forms of data utilized, evolved over the study as a result of reflexive iteration during the course of the study between data, analysis and theory in its second role, as a sensitizing tool. Data analysis was performed initially by aggregating and coding data. Interviews were transcribed, as were notes and any material not in digital forms. These data were

compiled in Hyper-Research and Filemaker databases with any digital material that could be encoded (emails, for instance). This aggregated set of data was then coded reflecting the presence of recurring themes, stated perceptions and meanings, practices, and other factors. Data were also coded to establish when multiple perspectives and data revolved around a single event, action, or other commonality. For instance, when different participants mentioned the same event, e.g., a training seminar; similar enactment, e.g., using the information system to enter new customer data; or similar perceptions, e.g., the meaning or value of system features. Data were re-sorted and re-analyzed through multiple phases involving processes of coding and re-examination of theory in order to develop robust theoretical concepts and surface the complex relations of users, practice, technology and context (Prasad, 2005; see also Cadili & Whitley, 2005). For a summary of data analysis, refer to Appendix 2-C.

Criteria for Evaluation

The mehtod to assess qualitative research and evaluate its quality is a matter that is often one of discussion (Markus & Lee, 2000). While what is commonly perceived in the academy as quantitative-positivist research tends to have relatively stable standards (e.g., measure of reliability and forms of validity). The variety of research that is contained in the rubric of qualitative research (for example, positivist, interpretive, or critical research) affords a diversity of approaches to effectively evaluate research based on the ontological and epistemological foundations of the researcher and research. This study adopts the evaluative schema developed by Golden-Biddle & Locke (1993) of authenticity, plausibility, and criticality. Though this schema was originally developed for

ethnographic studies, it has enjoyed a wider application in use, for example in interpretive case studies in general (Sandelowski & Barosso, 2002), and has been used fruitfully in a variety of contexts in information systems literature (e.g., Schultze, 2000; Trauth & Jessup, 2000).

The first concept in the evaluation schema is *authenticity*, and focuses on the researcher's time in the field and the course of the researcher's progress through the research process should be evident. An authentic rendering is one that conveys the ability of the researcher to communicate the details of the field: aspects of everyday life, the language of the field, and perceptions that members of the field express and convey. Schultze (2000) argues that concepts that are found in positivist research, reliability and validity, are matters that are bound up in the concept of authenticity.

The experiences that unfold in an interpretive case study cannot be replicated perfectly, nor can the researcher (or another researcher) be assumed to view new experiences as he or she (or as the original researcher) might have in the past. However, detailed descriptions of the research approach, observations and assessments on the part of the researcher can contribute to the evaluation of the reasonableness of the researchers interpretations and findings, "reliability refers to the degree of consistency with which instances are assigned to the same category by different observers, or by the same observer on different occasions" (Schultze, 2000, 29).

Validity relates to the ability for the researcher and the study to convey a believable and accurate account. In other words, it expresses, "the extent to which an account accurately represents a social phenomenon or event" (Schultze, 2000, 29). The process of collecting volumes of data from a variety of sources as part of the investigative and analytic process is thought of as an important aspect of developing such an authentic rendering of the phenomenon (Yin, 1994; Eisenhardt, 1989). Other strategies adopted to foster an accurate representation include periods of immersion in the field and respondent validation of fieldwork observations and interviews, though Czarniawska-Joerges (1992) points out that because of individuals' (participants') motivations, political or otherwise, recollections may purposefully change and lack consistency. This may not prove an accurate technique to develop the research quality. Depending on the nature of the research, some approaches to improving the quality of the research may not be possible (i.e., if there are no interviews, participants obviously cannot comment on their accuracy of a transcript), and therefore evaluative schema must be taken in context of the study.

Plausibility is a matter of the development of the artifact of the study (e.g., a thesis), as opposed to the evaluation of presence in the field associated with authenticity. Brewer (2000; see also van Mannen, 1995) stresses the importance of the rhetorical devices used in communicating the sense of the fieldwork and the conclusions the researcher draws. Thus, the researcher must be able to make the nature of the research site 'familiar' to the readers, such that they can understand the context in which the experiences of the research study occurred. Additionally the researcher must speak to the audience to

develop the theoretical arguments bound in the research, in a way that is relevant to that audience.

The notion of *criticality* is the ability for the researcher and the reader to pause in the construction and reading of the study to question the assumptions, process, practices and other aspects of the study participants. Through a thoughtful reading and the development of new ways of thinking about a specific situation (Golden-Biddle & Locke, 1993) readers may develop new ways to understand others and themselves. In other words, the 'lesson' that emerges from reading the ethnography might be taken and brought into the general conceptual framework of the readers, and contribute to a greater understanding of their own world, regardless of how different it might be from the world of the study. Table 2-2 (adapted from Schultze, 2000) details how the criteria of authenticity, plausibility and criticality were met in this study.

A note on generalizability, generalizations and generalities

Walsham (1995; 2002) addresses the issue of generalizability in qualitative research. He suggests that generalizability is a function of the ability of the discussion and analysis of a particular phenomenon to be a source of learning for other contexts and at other times. Eisenhardt (1989) in a positivist approach to case studies suggests that a large number of studies taken together has generalizability, which harkens to similarities of statistical generalizations based on sample size found in quantitative research. By contrast, interpretive research generates analytic generalizability. Interpretive case studies enrich

Table 2-2: Criteria for Evaluation	
Criteria	In this study ...
Authenticity	**The ability of the text to convey everyday life**
Everyday life	Detailed descriptions of how the members of Natbank lived in the work and out-side work environment are provided.
Vernacular of the field	As a member of the industry community (a banker) I included and explained where necessary the idiomatic language of banking (e.g., "BF-ing it" to procrastinate or put off, etymologically evolved by and old banking acronym and term (BF = bring forward), the practice of assigning later dates to transactions.
Members perceptions of 'life in the field'	The ways the various groups and individuals perceived themselves and others is presented in the study
Researcher interaction and study process	Details about interviews, discussions, observations, materials read, duration and timing of immersive experiences, etc., are provided in the study.
Researcher's relationship with participants	Through the various episodes discussed in the study the relationship of the researcher to individuals is detailed, as well as their relation to the researcher.
Data collection and analysis process	The study discusses various processes of data collection, theoretical development, and analysis and the iterative course of action that bound all three together
Plausibility	**The ability of the text to "connect the two worlds" and communicate with the audience**
Adhering to the Academic genre	The research is presented in the format of a traditional monograph form dissertation.
Justification of the research	Through a detailed exploration of the literature, focused on information infrastructures, implementation and use, and governance the theoretical basis for understanding the mechanism for *how* shifts in practice occur is shown to be needed, as well as a better understanding of the implications of shifts in practice.
Normalizing the research site	The organization is a large international financial services corporation (a bank). While the site is not markedly atypical as Golden-Biddle & Locke (1993) might discuss; it is within a specific industry. However, effort was made to discuss the ecology of the organization in context but also in broad concepts – e.g., customer-facing and customer-service representative roles held by organizational members, rather than specific terms such as bank tellers.
Criticality	**The ability of the text to encourage readers to reconsider taken-for-granted ideas and beliefs and provide insight into the phenomenon**
Juxtaposition	As an academic and former banker, I was able to contrast my own experiences and interpretations against those in the organization throughout the course of the analysis.
The challenge to think	Through the development of the research questions, and the literature and theory in sections 1 & 2 I hope to both make the questions relevant to the reader and give pause for individuals to question their own perception of how and why the phenomena occurs. By offering an explicitly practice perspective in my analysis I hope to engender a new way of interpreting the material that will enrich individuals understanding of organizations.
An interesting account	Well, you tell me.

exercises of theorizing beyond the context of the study (Lee & Baskerville, 2003), for example in this case, how use unfolds, and the associated implications.

Walsham (1995; 2002) develops four types of contributions to which the generalities of interpretive research can be directed: 1. Discuss specific implications, 2. Generation of theory, 3. Development of concepts, 4. Development of rich insight. Research need not fill all four of these forms of contribution; many may only address one, but multiple forms of contribution are possible. This study seeks to further develop the specific concept of praxis and relational action in light of perceived contradiction and how it occurs (contribution #2 and #3) and explain the implications as reflective action occurs in organizations, in terms of governance, and implementation and use (contribution #1) through a rich case study of an information infrastructure deployment and management (contribution #4).

Natbank and the EIS

Natbank embarked on a project to shift from a largely distributed organization to one with a centralized management. Executives at the bank suggested the project was a difficult one, but necessary to combat mounting competitive pressures. A plurality of operating procedures was in place in different divisions to accomplish similar tasks across regions. This was exemplified by the presence of four different information systems that operated in the organization. The development of a unified enterprise system, built upon a single standard operating platform was deemed to be a strategic

necessity, not only for competitive reasons but to foster the development of an integrated organizational form that Natbank sought.

The four information systems were analyzed. One of the four systems, the banking information system (BIS), utilized in nearly half of the territories (including the head quarters (HQ)) was deemed to be the best choice. It was more ubiquitous than two of the remaining three systems, and had recently undergone a sizeable upgrade placing it technologically ahead of all the systems. The official rationale was that the system was the most advanced and most deployed and therefore would require the least effort in terms of additional deployment, near-term upgrade costs, and training costs.

As part of the harmonization of the information systems at Natbank, the varied work processes in place in a number of territories were to be standardized. The perspective HQ adopted was of a singular set of practices that was aligned with the central office's notions of how the BIS and other core functions such as internal audits, internal, and external reporting should be performed. The presence of systems in use at Natbank, other than those found at HQ, was not insubstantial. For example, an alternate choice for the information system finally adopted had been in place in the same number (six) of territories as the BIS. The geographic footprint of the runner up was as sizable as the BIS and possessed a temporal footprint measurably larger (20 years as compared to 10). Thus, when new technologies such as the BIS and the practices were deployed in these nine territories, the routines that were part of organizational operation and operation life had considerable history and presence.

PRESENTATION OF DATA AND ANALYSIS

The integration of the BIS system at Natbank was not a uniform experience across the organization. Some individuals had a great deal of experience in the use of the BIS system, and others had very little. For certain individuals the BIS was a frequently relied on system, and the applications were constantly engaged. For others the system was less ubiquitous in ordinary tasks. There are innumerable routines of practices and procedures embedded in the ongoing operation of Natbank and the BIS. What were familiar routines to some individuals at Natbank were modifications to existing routines to others. In some cases such routines presented drastic changes to achieve the same results, in other cases the alterations were minimal. In other instances routines were entirely new, that is, sets of procedures to accomplish a goal that had not been present before. And finally, some routines were seemingly unmodified sets of practices to achieve an expected outcome. The flexibility and durability of these routines was material in the unfolding deployment of the information system and integration at Natbank, as these routines were how the BIS was engaged by users.

For this study, as noted earlier, routines were identified in concert with Feldman & Pentland's (2003, 96) definition as, "a recognizable pattern of interdependent actions." Following on Howard-Grenville's (2005) theorizing, the examination of routines is focused on practice as well as process, and identifies the everyday routines of organizational life, rather than solely focusing on the all-encompassing "big" routines that have been the focus of research in the discipline, thus far. Routines were identified

during the course of interviews, observations and the examination of organizational documents and materials. When an observable pattern of action was identified, the incident was explored within the context of observation. For example, if during observation of a unit of the bank a repeated and consistent set of practices was enacted to accomplish a goal, such as managing fraud claims in retail banking, further data collection was directed at uncovering the practices, technologies, associated meanings, perceptions, etc. If the identified episode upheld the definition of routine consistent with the theoretical perspective of the study, the narrative of the routine was traced through the organization (outside the initial context) in an attempt to examine the broader impacts of the episode, and inter-related routines. In the case of credit card fraud prevention, mentioned previously, this approach resulted in tracing the routine to the central accounting unit (CAU) to further explore data collection of routine(s) present. In cases such as credit card fraud prevention, tracing one routine led to the identification and exploration of another routine.

Routines were coded to reflect the extent of embeddedness of routine, individual associations to the routine and the socio/technical supportive of the maintenance or alteration of the routine. Appendix 2-C, parts A & B summarize the analysis and coding of illustrative routines as they were examined throughout Natbank. The following section will explore and discuss particular episodes at Natbank that were representative of themes found in the organization as a whole in order to demonstrate the emergence of the analytical conclusions derived in this study.

Episode: Contradictions emerge: international banking & the reorientation of use

The international banking division had been one that had operated with relative autonomy prior to the integration. Prior to the BIS integration, within this unit a secondary information system had been deployed, the *Credit Asset Reporting System* (CARS). The international banking division was the largest contributor to both revenues and profits compared to other functional units of the bank (such as retail banking, credit cards, etc.), and had a unique function of managing accounts of high-asset-value customers. It was on this basis that the initial justification for CARS was based, and accepted by executives and peers at Natbank.

The installation of the BIS was designed to perform many of the functions of the CARS system and integrate the information with the rest of Natbank's operations. This was perceived as a huge improvement by Natbank executives as the CARS system, as deployed, could not integrate with the BIS, but had partial integration capabilities with the previous information system in place in the unit[3]. However, the individuals at international banking did not have the same appreciation for the BIS. The system was generally interpreted as an intrusion into the unit's normal operations, and a deviation from, as one individual suggested, "our routine way of doing things." Table 2-3 details routines enacted in the international banking unit utilizing the CARS and those designed for use in the implementation of the BIS.

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[3] CARS was integrated with the previous banking enterprise system such that financial transaction information was integrated. However, specific customer information was not shared between the two systems. For example, the CARS system, like the BIS, had a fully developed customer relationship management function, the data for which was not shared.

The alternate routine inscribed in the BIS prescribed a different process of managing daily operations in the international banking unit. Executives at Natbank had indicated approval of the system as it integrated the operations of the international banking division into the standard operating platform of the larger bank. The perception among these executives was that international banking would appreciate the BIS as it would eliminate their need to operate two systems simultaneously. The system thereby offered an increased level of assurance through the reduction of possible mistakes in data entry (information was only entered once) and the decreased the potential for incomplete data (in some past instances, data had only been recorded in one of the two systems).

Individuals in international banking found the intended routine being enacted as a substantial difference from past patterns of work, and in many ways unacceptable. One manager suggested the BIS removed individual judgment from the adjudication of customer accounts. Another individual suggested that it created many inefficiencies, in that transaction data was only displayed if it occurred outside of stipulated parameters; and having to "mine the system" to have access to all transaction data was time-consuming. However, these same individuals did concede that some efficiencies were gained in working on one system, for instance, when a transaction was flagged as outside of normal parameters, the information provided to the individual was very robust, including material customer data (e.g., phone number) and financial data (e.g., account balance).

Table 2-3: Routine Actions in International Banking

Function	Steps in Practice	
	CARS	BIS
Monitor Accounts	1. CARS flags all accounts that indicate activity above a certain dollar value. (But displays all activity for all accounts).	1. The BIS flags account activity when such activity appears outside of expected parameters.
	CSR 1: "I don't like the way that I cannot see everything that is going on anymore. I only get to see what [the BIS] thinks I need to see. I used to be able to look at everything that happened with all [my accounts]. Now I have to spend my time looking at each account to make sure it's OK." CSR 2: "I like the way I can see the balances right up front."	
	2. CSR reviews nature of activity (i.e., withdrawal, deposit, etc.). 3. CSR reviews the information system [4] (IS) to ensure the transaction is possible (e.g., sufficient funds). 4. CSR reviews CARS to determine if the transaction is "out of the ordinary", in other words, different from past behavior.	2. The CSR reviews case, if documented rationale for activity is known, the transaction is approved or denied (based on documentation).
	Comment in reference to perceived change in routines from customer facing staff: Manager 1: "The [CARS] allows for [CSR] to be able to review everything, and make a decision based on what they know about the client. After all, we are focused on individual care in [international banking], and who knows customers better than their account manager"	
	5. If the transaction appears valid, it is approved, if not it is referred to an international banking manager. The manager may review (CARS and IS), may contact customer, approve or deny.	3. If no documentation is on hand, the manager is involved in the review of the transaction. If the customer cannot be contacted, the default of the BIS is to deny the transaction.
	Manager 2: "The [BIS] has too much control. I don't always feel like I am making the decisions anymore."	
	6. The transaction is approved or denied and recorded on the CARS (integrated with the IS) along with any relevant notes for future transactions. The notes function was not integrated with the IS, and work had to be manually migrated over.	4. The status of the transaction is recorded in the BIS as the transaction is either executed or not.
	Comment in reference to perceived change in routines from customer facing staff: CSR 1: "Completing everything is a little easier on the [BIS]. I dont have to work on one system, rather than going back and forth with the [IS].	

[4] In this instance, the "Information System" also denoted as "IS" refers to the enterprise banking information system in place prior to the deployment of the BIS. Prior to the integration of the BIS none of the international banking units had any experience with the system.

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As the deployment of the BIS unfolded, the CARS system was used in parallel to the BIS so that customer relationship management data could be manually migrated to the new system, and service could be provided without interruption. However, the process of migrating the data did not proceed as planned, and "old" routines remained in place, relying on the CARS and replacing the previous information system with the BIS. Because there was no integration between these two systems initially, it resulted in more redundant and manual work performed in the international banking division. This departure from the mandated standard operating procedure was recognized at Natbank. Rather than enforcing the designed forms of use, considerable lobbying from the international banking division resulted in the integration of the CARS with the BIS in a fashion similar to the previous level of integration. This enactment maintained historical work routines, with a moderate adjustment to accommodate the functionality of the BIS.

Episode Analysis

The degree of embedding of the CARS is variant – within the international banking division the CARS there is a high degree of entrenchment, as the CARS is used in a substantial proportion of work procedures. However, within the larger organization of Natbank the embedding is quite minimal as CARS was only used in the international banking division, and in many cases individuals who did not interact with the division were not even aware of its existence. The general orientation of individuals at international banking was a referent on past experience and the value inscribed in the CARS as the right way to perform work, based on existing institutional structures. Setting

aside the use of the CARS in international banking was a blatant contradiction to what individuals perceived to be correct. This reliance on the ostentive aspect of routines fostered a practice of continued support of the CARS.

As the CARS technology was loosely coupled to the larger BIS infrastructure, and adaptable individuals were motivated toward continuing its use and not following organizational mandate and discontinuing the practice of CARS use. International banking was able to rely on their reputation and perceived authority as a substantial contributor to revenue and profit to account for the need of the CARS. Initially, through *ad hoc* invisible practices such as manual migration of information, and later through Natbank organized information technology projects, the international banking unit was able to re-create the perception and practices of the BIS and the CARS. This resulted in a modification of both past (CARS) and present (inscribed BIS) practices. This innovation of the CARS/BIS relationship enabled the continued use of both systems.

Similar patterns of maintenance of routines can be seen in other routines in the organization. For instance, in episodes that reflected procedures revolving around the prevention and management of credit card fraud. In the retail banking division the perception of the BIS prescribed practices was negative, as they were generally thought to be ineffective. In efforts to maintain a sense of what should be done, CSR continued to enact some past practices, which in some cases created duplications of work, as was the case with the CARS. However, in other instances effective work practices collapsed as CSR continued to utilize historical practices and those with whom they needed to

communicate no longer did. Effectively messages were sent but never received; causing a deterioration of some customer service. This contrast with the relative unvarnished success of the international banking divisions continued use of historical practices highlights a difference between the two divisions, which perhaps provides insight on the disparity in outcome. The international banking division had very little interaction with organizational units outside of the international banking division; whereas the CSR in retail banking constantly relied on the network of operational units in the organization – such as the CAU.

Routines in retail banking

In contrast to the privileged position that the international banking division held by virtue of its financial capital, and the perception that employees of the division were the best in the bank, CSR in retail banking could apply little influence throughout the organization. However, that did not mean these individuals were devoid of the potential to initiate action and alter routine in the face of perceived inconsistencies and contradictions. Table 2-4 details two enactments of routines of use of the BIS; first, no-fee accounts; and second, the recording of information perceived by CSR to be "material" and "immaterial" when opening customer accounts.

Episode: No-fee accounts

No-fee accounts are instances in which a customer is charged no service fees for the maintenance of the account or basic account operations (withdrawals, deposits, cheques, etc.). The prevalence of these accounts varied in different units of the organization. In

Table 2-4: CSR Routine Actions		
Function	*Steps in Practice*	
	Non-BIS systems	*BIS*
No-Fee Accounts	1. Customers are provided a no-fee account when balance is at a minimum level (i.e., US$5000 in chequing). 2. CSR can offer no-fee accounts to customers on a case basis, over-riding system.	1. Customers are rarely given no-fee accounts. Minimum balances are used as an incentive to acquire a no-fee account. All accounts follow this heuristic. 2. No over-rides of system are possible.
	CSR 1: *"Most people want to pay no [service fees]. Sometimes if they find out they have to pay fees now they want to close their accounts, because they never had to pay fees before. But, now I can't even change [their profile] so that they don't have fees.* CSR 2: *"Now there is no special treatment. Everyone is plays by the same rules. "* CSR 1: *"Under [the prior system] if a person had free banking, they had free-banking. Now, they have to have a certain minimum, and if you go below that amount in a month, you have to pay normal fees. So a olt of customers think they are getting no service charges, but they actually get [charged]. When they actually notice they are mad."*	
Account Openings	1. CSR ask customers to fill out forms recording pertinent information, such as name, address, etc. 2. CSR has an additional questionnaire in which the CSR asks the customer demographic questions. This questionnaire is sometimes foregone as a result of time limitations. 3. The CSR enters information into the information system during the customer appointment and following the appointment. 4. The account is fully activated when the CSR fully completes data entry of all non-demographic questions.	1. The CSR has an appointment with the customer in which the CSR asks the customer questions an enters responses into the BIS. The questions are both required information for reporting (e.g., name, tax ID) and demographic questions. Completing all demographic information fields is not necessary to complete the application. When the application is completed by the CSR at the end of the interview, paper work is generated immediately which the customer signs. The account is active as soon as the signed documents are submitted.
	CSR 3: *"There is so much more work in [the BIS]. We have to keep the customer there, ask them all these questions, and put it all in [the BIS].* Manager 1: *"Sometimes the [CSR] only enter what they want to [beyond the minimum]. Sometimes we know everything about [customers], and sometimes we know their name and that is pretty much it. "* CSR 4: *"It is so much easier on [the BIS] everything you have to do [to open an account] is right there. It takes no time and the customer doesn't have to do anything, just have a coffee, answer some questions and sign [two documents] and they are done. "*	
	5. Adjustments to account profiles are made directly into the information systems with the exception of change of name (for instance, in the case of a marriage) where information is recorded on paper first and then transcribed to the information system.	2. Any adjustments to the information system are made directly in the BIS.

many instances, CSR described the no-fee account as a marketing feature or, "nice

bonus" they could provide a customer. In some regions the commonality of no-fee

accounts at Natbank and its competitors meant most customers assumed their account

would have no fees associated with it, even without asking. The deployment of the BIS

initiated a standard organizational policy where no-fee accounts would not be offered,

except in rare occasions; the decision for which would be made by inscribed heuristics in

the BIS.

The provision of no-fee accounts in non-BIS environments was a routine of interaction

between CSR and customers and occurred most commonly when accounts were opened.

When confronted with the new policy, CSR perceived a contradiction. Many customers

expected no-fee accounts, and many CSR in such environments customarily made such

accommodations for clients as a customer service effort. However, the standard operating

procedures of the BIS were intended by executives to improve customer service. It was

not intended to harm client perceptions of customer service, as was the case CSR were

experiencing with customers, because they were no longer able to provide no-fee

accounts.

In order to ameliorate this contradiction, individuals modified routines and reconstructed

new sets of practices. For example, in one instance managers authorized monthly rebates

to customer accounts that would offset any fees charged for service. However, this

practice was quickly noticed and deemed unacceptable by executives, as detailed in one

explanation:

"In the first place, we should be charging fees for services we provide and they should be
[uniform across the bank]. But, this is worse than [other methods of avoiding the
restriction on no-fee accounts] because all fees are just being reimbursed without anyone
paying attention to what for. Some of those fees would still be charged even if no-fee
accounts were allowed."

A manager in the central accounting unit (CAU) of Natbank also indicated this process created distortions in expenditures and revenues within the bank that made it difficult to measure performance or apply consistent and effective methods of assurance. A second approach that emerged to provided no-fee accounts involved denoting customer accounts as employee accounts. As a benefit of employment, no employees of the bank were charged fees for banking; and additionally, were offered better than market rates on loans and mortgages. Another individual in the CAU explained this practice as problematic because, data on individual branches was distorted by having drastically too many "employees" based on data on accounts held. Additionally, the individual mused that it was possible that individuals who were purposely given employee account for the purposes of providing no-fee accounts, might mistakenly be granted other employee benefits, such as the aforementioned better than market rates on loans.

As the study unfolded and drew to its conclusion, the Natbank policy for no-fee accounts had not officially changed. The approach to influencing the acceptance of these routines was based in part on increased and repetitive training, and in part on adjustments to the system to prevent the work-arounds that had emerged in various branches.

Episode Analysis

The degree of entrenchment of the no-fee accounts in the institutional structures of Natbank operations was low. Although the process of applying a fee or no-fee structure to an account occurred in every instance an account was opened, it was a highly superficial act. The technological structure of the BIS was such that a fee had to be

applied to an account. However, the institutional structure of the Natbank allowed multiple forms of work-arounds to be present, and what is more, to be accepted. Individual perspectives of past practice as being correct enabled individuals to account for their actions, which were obvious avoidance of organizational protocols as "correct." The creative action to initiate new practices was countered through efforts to confine and further monitor an activity of organizational life at Natbank that was both mundane and occurring in high frequency. The emerging practices targeted at providing no-fee accounts despite the organizational prohibition fostered inconsistencies and inaccuracies in organizational data that further caused cost increases as Natbank attempted to both prevent the continuance of unauthorized activity and correct for unreliable information.

Observed practices in the human resources department (HR) and in the operation divisions also provided examples of creative alterations of what was perceived to be a stark deficiency. In the HR department, training programs were designed in concert with advice from consultants familiar with the BIS but completely unfamiliar with the unique context of Natbank. The success of the training programs was marginal at best, and HR was forced to innovate new methods of training, such as the rotation of experienced BIS users to regional units of Natbank that were not demonstrating success with the implementation. However, this accommodation differed from the enactment that altered the prescribed use of the system to generate no-fee accounts in that it had support from executive administration. Similarly, the operations divisions had executive administration support develop new protocols for systems maintenance and management to compensate for failing procedures that were intended for the organization.

Episode: New account information

The routines involved in the collection and recording of information at the opening of

accounts varied between units that were familiar with the BIS and those using alternate

systems. As Table 2-4 details the process in units not using the BIS relied on a process of

recording data on paper and manually coding information from paper forms. In contrast,

the BIS system was based on a process of direct data entry. In addition to these

differences, there were differences in the amount of data collected. The perception among

managers and CSR alike was that one set of data was required for legal and regulatory

reporting reasons, and the other set of data was used by the bank for demographic

analysis, marketing analysis, and other internal functions. In some cases the perception of

multiple sets of data was reinforced by the material technologies and practices associated

with the collection of data (in some cases two separate forms for each set of data), and in

other cases the division was more subtle - for instance, different emphasis and placement

of fields for data entry on online forms.

The implications for deviation from expected data entry permeated many aspects of

Natbank. If incomplete information in terms of regulatory reporting was submitted, it

would immediately be flagged by the CAU. The CAU would de-activate the account until

full and necessary data requirements were met. By contrast, if demographic data was

incomplete, units of the bank such as marketing, which used the data for market models;

or, operations, which used the data for staffing and resource allocation, would not

necessarily immediately notice the inconsistency. The reason was in part due to how the

information was examined. The CAU reviewed information on an account-by-account basis, whereas the marketing and operations units reviewed information on an aggregated basis. Thus, practices that resulted in incomplete information for marketing and operations would result in skewed and unreliable data rather than visibly missing data.

When the new inscribed routine of the BIS was integrated with operations, alternative practices emerged in which individuals would choose to not enter data that they felt was irrelevant. The routines of other units of the bank were also modified as the fragmentation of their expected routines became evident. For instance, as individuals in marketing came to realize that the information they had anticipated to be regularly incorporated into the BIS by CSR in branches was not present, they found alternative procedures of collecting information. Thus, routines of marketing analysis on branches incorporated processes of in-branch surveys, data collection outside the bank and reliance on secondary sources. These routines became so commonplace that the BIS, as a source for data became a secondary choice, rather than a primary one. Individuals in marketing came to perceive their new routines as superior, as one individual argued the BIS was "always out of date," and the methods of data collection now employed provided more accurate data for timely decisions.

Episode Analysis

The narrative concerning new account information was traced through the organization and had material impacts on at least three departments of Natbank – and three routines. In the case of retail banking the perception of what was *actually required* for data entry was

ambiguous knowledge at best. Different regional units of Natbank had required different

sets of data to be included (all above the regulatory minimum), and the newly deployed

BIS allowed for semi-flexible data entry, meaning that only approximately one quarter (8

out of 32) fields had to be entered. When individuals confronted the BIS, they engaged a

practice of referring from past experience and organizational structures in terms of data

entry. In other words, social structures provided inconsistent reference to appropriate data

entry, as the conceptions of necessary data entry was not uniform across the organization.

As a result, existing practices were maintained as much as possible, and users entered

data consistent with their past experience, usually substantially below the 32 possible

points of entry. The nature of this routine was highly embedded in the organization, and

impacted both the CAU and marketing.

Within the CAU, the perception of this highly embedded routine was not one of

contradiction or ambiguity. The technological structures of the BIS were such that

practice was shaped to conform to CAU requirements for data (i.e., name, birth date,

citizenship, tax ID, etc.) that was required by regulators. The orientation beyond this

point, was one of inattention and indifference. The BIS automatically populated the

CAU's database as required, and from this perspective the organizational function

operated properly. By contrast, the marketing department identified a substantial

contradiction between what the BIS was expected to provide in terms of information, and

what it was actually providing. However, unlike the CAU and the retail banking unit, the

perceived contradiction was oriented toward the present orientation of what the BIS

should do, rather than what a system had done in the past. In order to resolve this

ambiguity the marketing department engaged in creative practices, referring on known routines for data collection and analysis. In doing so, in this point of praxis the marketing department created a new information infrastructure for its own purposes.

Episode: Audits at Natbank

Prior to the deployment of the BIS multiple procedures were in place for internal audits and assurance. While these routines were not completely homogeneous across all units of the bank, the major functions of the procedure were the same. Table 2-5 presents a comparison of the general model for audit/assurance routines in units unfamiliar with the BIS and the procedure consistent with the use of the BIS before and after the integration.

The routine inscribed in the BIS represents a shift in the amount of work that was required in the process of daily assurance and audit. It required frequent and, what some managers perceived to be a "needless repetition" of counts in ensuring that reported and actual transactions balanced. The routine involved the cooperation of a number of different individuals and units at the bank, including the CSR and managers at branches, the managers and individuals at the CAU, and the executives whose responsibility it was to oversee that assurance procedures were being followed correctly and that nothing occurred beyond the acceptable parameters of bank operations. While several individuals suggested the audit/assurance routine was inefficient and generated more work for marginal improvements in results, no modifications of the audit procedure were observed.

Table 2-5: Audit Routines

Function	Steps in Practice	
	Non-BIS systems in place prior to integration	*BIS*
Audit / Assurance	1. CSR makes a count of transactions at workstation based on financial instruments held (i.e. cancelled cheques, cash, etc.). 2. CSR compares count to the count registered in the information system.	1. CSR makes a count of transactions at workstation based on financial instruments held (i.e. cancelled cheques, cash, etc.). 2. CSR compares count to the count registered in the information system.
	3. Manager makes a count comparing aggregated branch activity as recorded by information system, against CSR count of financial instruments.	3. Manager makes a count comparing individual teller activity as recorded by BIS and financial instruments. 4. Manager makes a count comparing aggregated branch activity as recorded by information system, against CSR count of financial instruments.
	4. Manager records count on form, form is inserted with financial instruments into a transfer bag.	5. Manager records count and submits it to the CAU via internal mail and through a digital message on the BIS.
	Comments of a retail banking manager on the audit process: Manager 1: *"I could just assume that the count was correct when it was submitted. That was how we used to do it at [my old division]. I never once found anything wrong there, and I haven't found anything wrong here. The [BIS] doesn't know if I counted it or if I just read the number off [the branch tally]."*	
	5. Transfer bag is sent to the CAU via internal transport (not internal mail)	6. Transfer bag is sent to the CAU via internal transport (not internal mail)
	6. CAU relies on managers count detail form to ensure the financial instruments match the information system recorded transactions	7. The CAU performs a count of financial instruments. 8. The CAU compares count on a CSR-by-CSR basis to BIS count. 9. The CAU compares aggregated count as provided by manager and count detail form to actual and to BIS records.
	Comments of a audit manager on the audit process: Audit Manager: *"It was crazy. They would do the count. Sign a sheet, put the sheet in the bag with the deposits and then the deposits would get picked up and sent to the CAU. The next day the CAU would compare the written count in the bag to what was in the bag. Now, what is to stop you from opening the bag, taking out $10,000 and lowering the count by $10,000..."*	

Episode Analysis

The audit process is one that permeates the entire bank and is composed of multiple sets

of small routines that are inter-related, in such a fashion it is the routine with perhaps the

highest degree of embedding at Natbank. The orientation toward the audit process at both

the banking offices and the CAU offices was one that upheld the notion that audit

practices are sacrosanct. The guiding aspect of the routine was such that the

organizational norm dictated how the audit would be conducted. While disagreement

might have emerged in the combining of multiple regional orientations to what were

appropriate practices in an audit, once audit protocols for the organization were

established, they were accepted. In such a fashion the performance of audit practices was

both an act of *maintaining* – practice to uphold the ideal of the unalterable and

impervious audit; and *creativity* – developing new practices in concert with how Natabnk

executives had dictated the audit should be performed, and how the audit process had

been inscribed into the BIS. While some question may remain as to why one designated

audit procedure may appear more appropriate that another, the reverent attitude toward

the norm of the audit made it both acceptable and accepted.

Summary

The operations of Natbank and the ongoing use of the BIS involved numerous routines

that were implicated in various functions of the bank - managing customer relations,

conducting customer transactions, and completing back-office functions of the

organization. During the course of the integration various individuals and various

routines converged, and competing perceptions, values and practices were targeted at completing the same goals. Recent examinations (e.g., Feldman & Pentland, 2003) in the academy of the implications of routines in organizational flexibility and rigidity argue for duality of the ostensive and performative aspects of routines, and the possibility that routines might engender flexibility in organizations. Howard-Grenville (2005) focuses on the performative aspect of routines in examining the alteration of routines, extending the notion of flexibility, and calls for inquiry into how the mechanisms of modification or maintenance of routines might unfold. Through a dialectic perspective focusing on praxis (Seo & Creed, 2002), the analysis of Natbank will discuss the observations in this section in order to highlight how analytic moments of *contradiction* and *praxis* in routines may engender organizational flexibility.

DISCUSSION

The data presented in the study relates the performance of various task-oriented routines at Natbank. The routines themselves are consistent with the definition of involving multiple participants, and being composed of a recognizable set of interdependent practices that are repeated over time (Feldman & Pentland, 2003). The use of the BIS *per se* is a common feature of routines of work at Natbank, but in response to Howard-Grenville's (2005) suggestion for areas in need of further examination, this study approaches more specific task-oriented routines. The routines varied in terms of the degree of interconnectedness and embeddedness (*ibid*) throughout the organization, and the complexity of actions and goals. The routine that revolved around the provision of no-fee accounts was a simple routine in comparison to the audit/assurance routine or the

account monitoring routine, which involved a greater variety of actors and units of the organization.

At the time of the integration at Natbank, individuals encountered technological artifacts implicated in various routines (the BIS) and the inscribed actions associated with those routines. Feldman (2000) suggests engagement and reflection of routines in environments in which heterogeneous perceptions and perceived outcomes exist fosters the modification of routines over time. However, the observations at Natbank suggest varying degrees of flexibility and rigidity in routines emerge in the deployment of the BIS and the enactment of various task-oriented routines. Howard-Grenville (2005) concludes factors contributing to the degree of flexibility in organizational routines are related to the degree of embeddedness, or permeation of the interdependent links through the organization; the orientations of individuals enacting the routine; and, social and technological structures in which the routine is performed. The implication of these assertions is that routines having a lesser degree of fixity within the organization will have an increased potential for modification. Similarly, situations in which there is a greater variability in terms of individual's intentions and orientation toward the routine and its end result will foster greater variability. The question remains as to *how* these factors might unfold in the alteration or maintenance of routines.

Mechanisms of Flexibility and Rigidity

The observations of Natbank suggest the implications for embeddedness and orientation do provide some powerful insights into the malleability of routines. However, the

observations also point to some inconsistencies in the perspective that might be explained through an examination of contradiction and praxis. Both of the routines revolving around recording new-account information and the audit/assurance function are deeply embedded in the organization. The audit/assurance function occurs in every unit of the organization in which financial transactions occur, as well as the CAU. Similarly, the new-account information collection routine impacts not only the retail banking unit in which it occurs, but also the marketing and operations division, and the CAU. However, one routine was observed to be flexible to varying enactments of users, and the other routine was perceived by users as unchangeable from the BIS inscribed set of practices, as one manager indicated, "it might be [an inconvenience], but if that is how we have to [audit] the branch, that's how we have to [audit] the branch."

Seo & Creed (2002) suggest the "seed" for reflection, whether internally or externally (Zollo & Winter, 2002) generated, is the awareness of contradiction. It is the nature and awareness of this contradiction that promotes the consideration of new logics of action and the enactment of novel practices and routines. In the case of new-account information entry individuals perceived a contradiction in the BIS inscribed routine and the notions of efficiency and effectiveness. Despite a mandated legitimate procedure, CSR and managers found the process of recording customer details in excess of the legally required minimum as cumbersome, and an inconvenience in terms of providing a certain level of service to customers. The awareness of this contradiction provided the opportunity for reflection, in which the ostentive aspect of familiar routines was influential. Consistent with Emirbayer & Mische's (1998) notion of agency, individuals

relied on their iterative awareness of past experience, and the knowledge of what was

perceived to be *THE right* set of practices in which there was no apparent contradiction,

i.e., minimum information requirements were met, and the routine was both efficient and

effective. The performative aspect of the routine, or the action that is recursively related

to the idealized, or ostentive, aspect is the modification of the routine. The modification

is targeted such that future possible outcomes can be achieved through creative action

within the confines of the present circumstance. In other words, the routine of

information collection is altered from the mandated set of practices to a new set of

actions that aim to recreate familiar routines.

It is important to note, it is the perception of contradiction between institutional structures

and the ability for those structures to realize a goal that fosters reflexive examination. In

the case of account-information, the technological structures allowed for the flexibility

both in retail banking (non-fixed fields of data entry) and in marketing (creating new

information system infrastructures) when a contradiction emerged; in retail banking the

contradiction was an ambiguity of what data was required, and in the marketing

department revolved around unreliable and inconsistent sources of information.

Within Natbank the institution of the audit/assurance procedures in conformity with the

standards inscribed in the BIS was not uniformly popular. As the observations suggest,

while some users were non-plussed by the routine and others found it appropriate, a

substantial number of individuals found the routine to be cumbersome. A similar

perceived contradiction emerged in the instance of the audit/assurance procedure - the

routine's facade of legitimacy contradicted the interests of individuals who desired a more streamlined process for audit/assurance. However, different from the observations of the account-information collection, there were no observations, nor anecdotes, of attempts to alter this routine. The set of practices inscribe in the BIS remained rigid and durable from its implementation. While, some suggestions for alteration did surface, suggesting fewer "recounts," and redundant work, no work-arounds were implemented, or even trialed.

The observations of the BIS audit/assurance and account-information collection routines, like others routines at Natbank was familiar to some, and new to others. For those familiar with the BIS, the procedures and routines that were mandated at Natbank following the integration were the same, thus, if these routines were altered they were modified; and if they stayed the same the routine was maintained over time. However, for those familiar with systems other than BIS, the routines inscribed in the system were new. Accepting these routines as part of normal organizational function was a modification to their existing routines; and the alteration of some BIS routines was often an attempt to maintain past social structures and arrangements. The benefit offered by the agency perspective of organizational routines is, rather than focusing on whether it is a "new routine" or an "old routine" the point of analysis is directed toward whether these routines are flexible or rigid (Feldman & Pentland, 2003), i.e., the practices of individuals. The dialectic perspective offers an ability to examine not only how the mechanism of flexibility or rigidity might unfold, but as Howard-Grenville (2005, 618) asks, why "the actions of some individuals, but not others, can change routines."

The contradiction that emerged in the case of audit/assurance was similar to that of account-information collection: legitimacy versus efficiency. However, the two cases differ dramatically in other respects. The divergence in interests at Natbank over audit/assurance was relatively minimal beyond individual branches. While CSR and managers found the practice cumbersome, these perceptions were not present at the CAU or the executive offices of Natbank. Further, the demands for certain protocols for assurance services were reinforced by both the inscribed practices in the BIS technology and through reference to government and regulatory agency requirements (i.e., socio-technical structures): audit procedures had to meet certain externally mandated levels of consistency and assurance of control.

By contrast, in the case of account-information collection, the minimum information necessary to satisfy regulatory bodies was a common denominator across the inscribed routines of the BIS and multiple alternate routines that emerged. Thus, the minimum information requirement was satisfied by the emerging alternate logics and practices at Natbank. Additionally, other units within the bank, such as marketing and operations, were attending to unfolding contradictions (that were related to shifting account-information practices) in their own work practices through creative reconstruction of their own routines. For example, marketing was relying on collecting data from different primary and secondary sources, and rationalizing these new routines by suggesting this data was more current and generally better.

In one case a routine was perceived to be rigid, and in another case, flexible. However, the observance of contradiction and the praxial action of reflection and creative construction of practice was initiated in a similar position within the bank - CSR and managers in branches. Feldman (2004) suggests the ability for individuals to initiate change in organizational routines might be tied to their ability to mobilize relational resources, i.e., the connections to other individuals or groups. Howard-Grenville (2005) extends this logic suggesting, the network of individuals who compose a routine extends beyond those that directly use it, but those who have oversight of the routine itself, and points out routines involve multiple actors, and "their collective, not merely individual orientations are consequential" (627). Similarly, Carlile (2002) argues reorganization, or possible reorganization, of sets of practices and structures may threaten other, seemingly peripheral, individuals' positions, resources and interests. And further, that such embedded interests may prevent the ability of others with "weaker" relational resources to enact a change, thus making their ability to shape the collective use of a routine less effective.

Turning such logic on the analysis of Natbank, flexibility of the audit/assurance routine might engender inconsistency in the needs of the CAU and the executives of the bank, in terms of their ability to provide required information to government and regulatory agencies. Thus, individuals with markedly lesser control of relational resources (e.g., the CSR) might be unable to promote possible change. The idealized notion of the audit/assurance procedures at Natbank is one that purports to verify what executive administration would extort as the actual performance of the organization. Thus, as an

iterative bias – a disposition based on historically reified actions and structures – the form of the audit/assurance procedure, whatever it might be at the time of design, is perceived to be unalterable. To change the procedure is to risk losing sight of the truth it is believed to convey. This is consistent with Seo & Creed's (2002) notion that the more deeply embedded routines are, the more potent is the perception that the routine is legitimate. The greater degree in which a routine is reinforced from within (e.g., auditors at Natbank) and from without (e.g., financial services regulators), the greater is the perception of legitimacy. The Arthur Andersen/Enron case demonstrates this point well; accountants working at Enron that should have recognized the illegal reporting techniques indicated they believed the procedures were correct because the they were supported by senior auditors at Enron, Arthur Andersen, and more to the point, accepted by the IRS and SEC[5]. In such circumstances, the possibility of the identification of practice or structure as being a contradiction, and the recognition of inefficient or ineffective practices is diminished. Thus, there is a lesser chance that perceived contradictions would emerge such that a moment of praxis, in terms of reflexive consideration and attempts of alternative logic and practice, will emerge.

By contrast, in the case of account-information collection the routine appeared more flexible than in the latter case. Unlike audit/assurance, historical perceptions of the process were not concerned with defining the nature of organizational performance. The routine was focused on the collection, and implicitly, the dissemination of information.

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[5] An interesting recounting can be read in: Squires, SE, CJ Smith, L McDougall, & WR Yeack (2003) *Inside Arthur Andersen: Shifting Values, Unexpected Consequences*. NY: Prentice-Hall.

While some CSR were aware that, in addition to customer information being used by the CAU, account-information was also used by operations and marketing, most were not. Similar to the latter case, individuals perceived contradictions of Natbank-defined legitimate operations (collecting volumes of information) conflicted with notions of efficiency and the interests of individuals engaged in enacting the routine (simple work procedures; speedy and effective customer service). However, in this instance the CAU implicitly endorsed the flexible enactments of the routine as these modifications continued to satisfy their organizational needs.

Although the modified routine fostered a breach of intra-organizational connectivity and efficiency, the modified routines were accepted by operations and marketing units. Contrary to the BIS design that promoted the aggregation, normalization, and shared used of data and information; modifications in the account-information collection routine disrupted the collection and use of information by the marketing and operations units. The contradiction between prescription and preferred practice with CSR reverberated through Natbank. Fractures in work procedures emerged in marketing and operations units as these units realized they had insufficient information to complete their respective organizational functions. However, both units developed new sets of practices that, while creating more inefficiency in the system, such as redundant and isolated data and information, was deemed preferable. The praxial moment, the reflection on taken for granted prescriptions, admitted new possible logics of action in both units. The reconstruction of organizational procedures within these units was then also an implicit

acceptance of the modification of the account-information collection routine, as the new sets of practices no longer relied on this other routine - removing the contradiction.

Feldman (2004; see also: Howard-Grenville, 2005) conceives routines as ongoing accomplishments embedded in networks of relations. Consistent with the author's assertions, the observations as Natbank suggest that the relational aspect of routines is material in the ability for routines to be both flexible and rigid. In the case of account-information collection, an impact of the modification of the routine was the emergence of contradictions in other units within which the performance of the account-information collection routine was reliant. That these other units engaged in reflective reconstruction of their own sets of practices effectively supported the modification of the routine of account-information collection. In other words, it is a network of modifications of routines, each making accommodations and negotiations (often implicit), that allow for the routines themselves to be flexible, and the larger organizational context to adapt to accommodate the alteration of underlying structures. Corresponding to Seo & Creed's (2002) discussion of totality, or the network in which an institution is embedded, the observations at Natbank suggest that the flexibility of a routine is impacted by the ability for alternate logics to be considered and enacted by those "within" the routine, and those outside it.

Peripheral Routines and Praxis

Of the routines examined, the process of designating no-fee accounts is perhaps the simplest and shortest task-based routine. As Pentland & Feldman (2003) define it, this

routine is the most peripheral, in that it has the most limited amount of interrelated routines and individuals, and is non-complex. According to Seo & Creed's (2002) propositions this status would make the routine a likely candidate for alteration given sufficient reconsideration and enactment of alternate practices. The observations suggest that the BIS inscribed routine of dis-allowing no-fee accounts was a point of consternation with many CSR. However, in contrast to the augury of Seo & Creed (2002), the BIS inscribed routine was rigid and inflexible.

With respect to the operations of Natbank as a whole, the management of the international banking division, including the day-to-day monitoring of high value accounts was also quite peripheral. The accounts and clients were managed internally to the unit. If issues with the account arose, the international banking unit managed the situation internally, with the exception of any cases that might involve illegality. The marginal change in organizational routines that was promoted by the international banking division was substantially more divergent from the standard operating procedures as it involved incorporating a separate information system (i.e., CARS) into the BIS. Due in part to the peripheral nature of the operations of the international banking unit, and the material aspects of the technology made the inclusion of the CARS in normal operations possible with little disruption to other components of Natbank.

Yates & Orlikowski (2002) suggest it is in part the material aspects of technology and the implications of social expectations that make it possible for the enactment of routines to be durable. Whether it is the maintenance of an existing routine, or the modification of a

routine incorporating new logics of action, the social expectation that an individual or group can designate or enact a particular use is important. This observation was apparent in the study of Natbank. The social expectations surrounding the audit function were such that variation from the prescribed procedure was impossible. Similarly, the social expectations that are associated with the international banking unit are material to making its routines flexible. The international unit of the bank was, and continues to be, perceived as a "glamour" unit within the bank; holding considerable influence because of the unit's contribution to revenues and profits for Natbank. Thus, the notion that there might be an accommodation to information system for the benefit of the international banking unit was not novel; one had been made consistently in the past resulting in the unit's reliance on CARS.

By contrast, the ability to mobilize considerable resources (financial ones, in the case of the international banking unit) and the social perception of a special and unique circumstance did not exist with CSR and no-fee banking. Many different units of the bank had differing procedures and impressions of no-fee banking. The mantra quoted by executives for the denial of this benefit in the new system was, "we will treat everyone the same, and no one gets special treatment." The perception of value customer service at Natbank is a strong motivating factor in the retail division and the social expectations with how customers should be treated were in-line with the ideal of treating all clients in the same manner. Despite multiple enactments of alternate routines that involved finding new ways to provide customers the benefit of no-fee banking, the modifications were not durable over-time. The individualized nature of the treatment contrasting with the

"everyone gets the same treatment" notion, along with the inability of the CSR to mobilize resources, being without substantial political or economic position within the organization, and other interested individuals or groups to support the modification, the alternate routines were merely exceptions that over time diminished in number, and the BIS-inscribed routine was maintained.

Conclusions

The focus on contradiction and praxis adopted in the analysis of this study is the focus on the moment of enactment of the routine. In other words, the possibility for maintenance or modification of a routine is resident in the awareness of the contradiction and the consideration of alternative action. To address the issue of *how* routines might be made flexible it is necessary to examine what engenders an individual's consideration of inserting flexibility. Is a rupture in expectations compelling enough to engage that individual? And, is it possible to formulate an alternate logic that will compensate or remove the contraction? In such a moment of praxis, *how* the initial reshaping of the routine emerges – based on past experience, outside knowledge, or inspiration in another form. This alone is unlikely to result in the new enactment of a routine – for even simple routines involve the application of resources and the interaction with other individuals or groups. The logic of the contradiction and the possible solution as a *collective act* (mobilizing action and resources), is necessary for the culmination of new durable routines (Yates & Orlikowski, 2002).

Further, within the network in which the new enactments are considered, subsequent contradictions might emerge that may reinforce and maintain existing routines or may suggest additional new logics of modification. Such "negotiations" of maintenance or modification might be explicit or implicit, they may be a long and winding process of consideration and action, or they may be considerations that are nearly instantaneous and barely palpable. Regardless of the speed or stage, the linkage of awareness of contradiction and consideration of action and logic, is deeply embedded in *how* routines are flexible.

The study reflected in this paper is a single case study of a financial services organization undergoing a period of both organizational and technological change. As such, the study faces the restraint of limited empirical generalizability. As discussed earlier, generalization was not the purpose; rather it was the development of theoretical insights that might further aid in understanding practice in organizations. More diverse case studies as well as the development of empirical measures to examine the phenomenon on broader scale would help to establish the resilience of the theoretical concepts developed herein. Additionally, the study focuses on how change occurs in the realization of contradiction and the instant of moments of reflective action and praxis. An expansion of the theoretical lens such that an understanding of how practices and identities are formed such that individuals might perceive something as a contradiction or "not the way things should be" would make the theoretical explorations of this phenomenon more robust.

Workability and Routines

The conclusions that emerge from the case study of routine flexibility and rigidity provide insight into the research question concerning the effect of practice on efforts to make information systems workable. As detailed in the previous chapter, the notion of a workable information system revolves around the processes of negotiation and compromise (Gerson & Star, 1986) that may occur explicitly or implicitly in (work) life in which an information system is able to achieve required aims.

The practices that were involved in the maintenance and modifications of routines at Natbank served to make the system workable, in some cases in a durable form, while in others only in a temporary one. In contrast to prior examinations of organizational routines the embedded or peripheral nature of a routine was not the sole constitution of a routines flexibility or rigidity; its ability to facilitate or impede organizational change. The relational practices in which individuals engage in the performance of routines were also observed to be factors affecting the flexibility of organizational routines. Thus, relational practice in the enactment of routines is a material aspect in how information systems may become *workable*. In the context of this study of the recognition of contradiction and creative action (or praxis), the ability to recognize contradiction and enact compensatory creative practices in such a fashion as they become durable is material in the ability for an information system to be made *workable*.

IMPLICATIONS

The study of Natbank extends conclusions that have recently been explored in the

academy that discuss routines as ongoing accomplishments and sources of flexibility by

offering a view of routines that is consistent with the definition of routine (e.g., Feldman

& Pentland, 2003) yet focuses on routines that are less complex and more task-oriented

accomplishments than those examined in the extant literature. By focusing on situations

in which routines were new to some and not to others, where a change for some meant

modification and a change; while for another might mean maintenance, this study has

further shifted the attention away from views of deterministic structure and merely

reactionary individual agency. The focus is one that addresses the moment of praxis in

which individuals rely on their own unique iterative (historical knowledge) framework in

enacting maintained or modified social arrangements, structures and routines.

The trajectory of recent research is extended by focusing on the notions of contradiction

and praxis, developed from a dialectical perspective. The analysis of Natbank focuses on

the mechanisms of *how* flexibility and change might occur in routines, and conversely

how routines might be maintained and made rigid. The potential for routines to be either

flexible or rigid is not a mere "formulaic construction of stimuli and response" (Howard-

Grenville, 2005, 632). Rather, the enactment of routines as rigid or flexible is impacted

by the complex interaction of the awareness of inconsistency by the individual and the

creative reflection of alternate logics of practice.

In forming conclusions about the ability for routines to be flexible and change over time, Howard-Grenville (2005) relies on a definition of the degree of *embeddedness*, that incorporates notions of the perception of the "value" of the set of practices by individuals; the degree to which it is interrelated to other routines and structures within the organization; and the complexity of routine and existing competing practices. In the context of this definition Howard-Grenville (2005) suggests that the greater the degree of embeddedness, the less likely a routine might be flexible and experience change over time. The analysis of Natbank offers an opportunity to augment these conclusions, and suggests the possibility of parsing the definition of embeddedness in order to understand the potential for flexibility of routines, the organizational consequences and factors for which we must account in the resilience or reorganization of routines of practice.

The variety of routines examined at Natbank provides insight into the complex nature of a routine in an organization. The degree to which a routine is embedded in an organization should be closely examined in terms of the performative and ostentive aspects of the routine. Routines may appear similar in their degree of peripheral use, and non-integration with other routines in the organization, which might imply a high degree of flexibility in the performance of those routines. However, this notion of a routine's embeddedness might contradict with the degree of embeddedness with respect to the idealized perception of a routine (or what it accomplishes) i.e., the ostentive aspect of the routine. In other words, the data suggests that the notion of embeddedness, while useful, may be a more complex phenomenon than investigated thus far, and might benefit from a deeper examination of the components of which it is composed, and their interrelation.

For instance, one possible implication for research is *to understand the contrast between the embeddedness of a routine in individual practice versus organizational protocols.*

The implication of the mobilization of resources in the modification or maintenance of routines is of consequence. Whether accommodations for the flexibility of routines are explicitly arbitrated, as in the case of account-monitoring; or implicitly negotiated through various enactments of practice, as in the case of account-information collection, social arrangements and the support for a particular trajectory of enactments from network relations bears material impact on moments of praxis, in which alternate logics are trialed, and transformed (or not) to durable practices. Additionally, recent studies have focused on the performative aspect of routine rigidity and flexibility (e.g., Howard-Grenville, 2005; Feldman, 2004). Further attention to the ostentive aspect of routines in establishing the potency of an idealized form is useful in understanding the potential and consequences of the flexibility of routines, such as in the case of the practice of audit/assurance. The perception of a routine's value, regardless of the complexity or centrality of the routine, may contribute to the durable maintenance of a routine.

Further, with respect to implications in both industry and academe, the emergence of a *workable* information system is a noteworthy implication. The understanding of how organizational change occurs is extended through the recognition of multiple interwoven routines as constitutive of aggregate organizational practice. In other words, organizational "work" is constituted by multiple overlapping routines that can be mutually reinforcing or debilitating. As individuals encounter new information systems

and other forms of contradiction with their perception of what should be, re-inventions of designed work procedures may emerge in attempt to right a perceived wrong. The case of Natbank suggests that when these re-inventions find durable reinforcement in relational practice in the organization, they have the potential to be lasting adaptations of the system. Researchers may be well served in examining how these relational components might constitute reinforcement or the contrary. With respect to industry, understanding how adaptations might occur, and how reciprocal changes in the organization might emerge may allow a new means to assess and achieve success. Such a perspective might encourage management to examine the possibility of managed flexibility of information systems, where reciprocal adaptations of the information systems might be coordinated to ensure that a system remains "working." This may foster innovation and facilitate greater rates of success in system deployments. By contrast, this perspective might also allow enhanced means of monitoring - to discourage alteration of the system where management deems it to be harmful to the organization.

In conclusion, the case of Natbank demonstrates the nature of routines as ongoing enactments, rather than formulae of responses. The paper introduces concepts of contradiction and praxis as mechanisms of an individual's consideration of alternate logics of action, and creative practices enacted to satisfy various interests. Further, the totality of network relations and the ostentive aspects of routines - the idealized form of action and goal - is a potent factor in shaping the flexibility or rigidity of routines. Thus, the intricate web of individuals and social structures, in which routines operate can serve both as facility and impediment for flexibility.

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APPENDIX 2-A

Semi-structured interviews were conducted in the study of Natbank.

Terms in the interview protocol as described below have been disguised to maintain anonymity and confidentiality.

Interview Protocol:

1. You and the organization:
   a. Can you tell me about your role at Natbank?
   b. How long have you been at Natbank?
   c. Can you tell me about the unit(s) you have worked in?
   d. Can you tell me about working with other unit(s)?
   e. Can you tell me about the [information system] you used?
2. You and the integration and the BIS
   a. Can you tell if you had a role in the integration?
   b. Can you tell me about the integration process?
   c. Can you tell me about the BIS
   d. What functions of the BIS do you use?
   e. How was coordination handled in the integration?
   f. Were/are there any challenges in the integration?
   g. Are there any challenges in using the BIS?
   h. Have there been any changes in how you do work?
3. You and training
   a. Can you tell me about your training/education prior to coming to Natbank?
   b. Can you tell me about your training/education at Natbank
   c. Can you tell me about the training/education during/following integration?

APPENDIX 2-B

DATA

Data type	Case Definition	Collection	Example
Text	Organizational memos such as training manuals and mission statements; public documents such as government documents; newspaper and popular press articles	All material was collected digitally if possible so that it could be imported into Hyper-Research and Filemaker for analysis. If text could not be taken in any form, notes were utilized, in a fashion acceptable to the organization, and this was included in the digital database.	Articles from the popular press were included in the data, such as "Senior Corporate Banking Team Changes At [Natbank]" from December of 2004, discussing the change in organizational leadership. Internal documents such as Patriot Act Certification for [Natbank] in February 2004, signed by the General Counsel of FB (rather than a counsel from Natbank).
Observations	Observations at meetings of individuals during the course of their everyday work, and occasionally in social settings such as at dinner	During observations notes were taken. In all possible instances notes were taken *in situ*. When this proved inappropriate, notes were taken at the first possible instance.	Notes from day journals; *M-04-B-8*: Bill [pseudonym, a manager] mentioned today that things worked more smoothly using the previous system. He wants to get a certain 'set' of information on one report, the new system does not do that. He prints off multiple reports, literally cuts out the portions he wants, tapes them together, photocopies the form so it appears as a single sheet and then files that form. ?Don't know how the auditors can make sense of that?
Interviews	Semi-structured interviews were conducted in the workplace, typically in that individual's office. Several informal interviews or conversations also occurred during the period of my time spent at FB.	In all cases digital recording of interviews were sought. In the instances when the interviewee was made uncomfortable by the recording, notes were taken *in situ*. If notes were compromising to the conversation, they were taken immediately following the discussion.	Interview *J-06-TB-2* ... Q: And what was your opinion about the BIS1? A: Well, it was easier than XIS, something that takes one step in BIS1 would take two or three or more steps in XIS. Q: Was there any advantage in XIS then, why was it chosen? A: Money. FB had sent a lot of money updating the BIS2 which was essentially XIS, and it would cost more to update BIS1 – I mean it was the same as when it was put in ten; fifteen years ago. Basically, anyway. ....

Appendix 2-C

Notes on Coding:

+ Two letter codes at the beginning of routine titles identify organizational/departmental location of the routine: IB = international banking; RB = retail banking; EX = executive/administrative offices; CA = central accounting unit / internal audit department; IT = information technology and operations; MR = marketing, sales and promotions; LG = legal

° Code after the departmental reference code indicates a relation between two or more routines. These relations may have occurred within or across departments. For instance, IB-A-1 and IB-A-2 are two routines in the international business department that are related organizational functions. In the event of a cross-departmental code, such MR-B-1 and RB-B-1 the routine in marketing impacts/is impacted by the routine in retail banking.

Routines Identified at Natbank – Part A

Routine	Description	Extent of Embedding	Individual Orientation	Socio/Technical Structures	Dialectical Bracket
IB-A-1+	*Use of the CAR* in monitoring and subsequent reporting, on client accounts	Low	Drawing on past experience, maintenance of habitual forms of use	Supportive of Change: IB often held apart as unique	Contradiction: attempt to cancel "comfortable" work protocols.
IB-A°-2	*Use of the CAR* in performing transactions	Medium	Drawing on past experience, maintenance of habitual forms of use	Supportive of Change: IB often held apart as unique	Contradiction: attempt to cancel "comfortable" work protocols. Praxis: promoted integration of CAR/BIS
MR-B-1	*Marketing Data* collection from banking operations. The BIS design was intended to have routine banking operations (opening and account) automatically	High	Present/Forward looking orientation toward the intended use of the BIS. Practice did not unfold as anticipated.	Unsupportive: While IT structures existed to support this function; no coordination nor organizational practices reinforced attendance to IT structures.	Contradiction: the designed institutionalization of work practices failed, leaving Marketing Dept. unable to operate with existing data deficiencies

	Description	Level	Orientation	Structure	Praxis
RB-B-1	populate the database. *Account Information* in the BIS is designed to populate the marketing database and requires the entry of volumes of customer information in excess of data entry requirements for legal and regulatory requirements.	High	Orientation toward the past to define what is internally determined to be appropriate work practices.	Supportive: the IT structures in these applications allow deviation from prescribed practice; Socio-structures are weakly capable encouraging prescribed practice (i.e. hindering change).	Praxis: Individuals creatively reformed practices to maintain/establish "user acceptable" practices.
CA-B-1	*Account Information* CAU gets all the information is requires.	High	Orientation toward present/past –legally required for reporting	Supportive of BIS	No contradiction, practice unfolds per BIS
MR-B-2	*Marketing Analysis* is expected to be based on auto-populated data from banking transactions is found to be unreliable. To compensate, Marketing Dept. initiates new methods of data collection (e.g., branch surveys)	Medium	Multi-faceted orientation acknowledging known output requirements and corresponding inputs; recognition of present deficiencies and modes of compensation	Supportive: IT structures allow for ad hoc strategies of information management. Socio-structures positioned marketing department as independent – alterations went unnoticed as output requirements were met.	Praxis: Individuals creatively reformed practices to compensate for (internally perceived) deficiencies in related practices
RB-C-1	*No-fee Accounts* cannot be provided to customers under the BIS, as they had been under previous systems.	Low	Orientation toward the past; user-perceived proper use.	IT Structures allowed alteration: Supportive Socio-Structures reformed multiple times to confine and prevent behavior: Unsupportive	Contradiction: incorrect work practices in-place Praxis: innovative work-arounds to simulate perceived correct practices
RB-D-1	*The Audit* function in branches requires a CSR	High	Orientation toward the past/present that	Supportive	Work practices as per BIS were upheld

	count comparing transactions recorded by BIS to financial instruments; Followed by Manager making a count of individual CSR transactions, and additionally an aggregated branch count. In contrast previous systems required only one count (of aggregated transactions) to be made		audit functionality and operations as presented (in whatever form) are correct an unalterable		
CA-D-1	*The Audit* process begins with collecting sealed transport bags of financial instruments, and comparisons of submitted counts/instruments to the CAU / BIS count.	High	Orientation toward the past/present that audit functionality and operations as presented (in whatever form) are correct an unalterable	Supportive	Work practices as per BIS were upheld

HR-B-1	*IT training* routinely occurred in class-room settings, with short in-branch "reinforcement sessions." However, new system protocols were not accepted and HR had to adjust training program by instigating longer, more frequent training programs.	High	Orientation toward the past approaches to training were deployed.	Socio-structures were both supportive and unsupportive. Supportive: HR has the ability to institute, create and re-institute training programs. Unsupportive: Communities inside Natbank not always receptive	Contradiction: planned procedures were deemed ineffective, alternative practices (Praxis) were attempted.
IT-E-1	*System maintenance/ management* functions were centralized with the implementation of the BIS	Med-High	The BIS / BIS-related designs for system management were implemented as per intension	IT: Supportive: System was designed to be managed in a distributed format.	Praxis: new practices were shaped and evolved, as per the design of the BIS; re-evaluated and re-shaped
IT-E-2	*System maintenance/ management* efforts were enhanced with "roving" members of the IT staff.	Med-High	The BIS / BIS-related designs for system management were implemented as per intension; situated communities asserted orientation/preference for pre-BIS practices of "local"	IT: Supportive: System was designed to be managed in a distributed format. Socio: Unsupportive: situated communities required different orientation to management of IT	Contradiction: disconnect of local communities with involved management/decisions regarding IT. Praxis: new practices were shaped and evolved, as per the design of the BIS; re-evaluated and re-shaped

			involvement in management.		
IT-E-3	*System maintenance/ management* reviews for system improvement was managed by local sites prior to the BIS, the centralized system did not allow for IT individuals to be "local" and therefore complicated system.	Med-High	The BIS / BIS-related designs for system management were implemented as per intension; situated communities asserted orientation/preference for pre-BIS practices of "local" involvement in management.		Contradiction: disconnect of local communities with involved management/ decisions regarding IT. Praxis: new practices were shaped and evolved, as per the design of the BIS; re-evaluated and re-shaped
EX-E-1	*IT/IS Strategy* was delegated to local units prior to BIS. Following the system deployment, Administration initiated regular IT management meeting to consult with IT/Operations to discuss: functionality, system "weaknesses" and system.	Med-High	The BIS / BIS-related designs for system management were implemented as per intension; situated communities asserted orientation/preference for pre-BIS practices of "local" involvement in management.	IT: Supportive: System was designed to be managed in a distributed format. Socio: Unsupportive: situated communities required different orientation to management of IT	Contradiction: disconnect of local communities with involved management/ decisions regarding IT. Praxis: new practices were shaped and evolved, as per the design of the BIS; re-evaluated and re-shaped
EX-D-1	Executives review *Audit results* before filing occurred to ensure a third view as part of BIS procedures.	Med-High	Orientation toward the past/present that audit functionality and operations as presented (in whatever form) are correct an unalterable	Supportive	Work practices as per BIS were upheld; re-arrangement of previous practice (Praxis) as per BIS design
LG-D-1	*Audit results* were reviewed through the	Medium	Orientation toward the past/present that	Supportive	Work practices as per BIS were upheld; re-arrangement of

					previous practice (Praxis) as per BIS design
	BIS by executives before the Legal Dept. proceeded with filing.		audit functionality and operations as presented (in whatever form) are correct an unalterable		
RB-E-1	*IT/IS Planning* in local retail banking sites was performed on a ad hoc, situated basis, where decisions were made based on local perception of need and preference.	Medium	The BIS / BIS-related designs for system management were implemented as per intension; situated communities asserted orientation/preference for pre-BIS practices of "local" involvement in management.	IT: Supportive: System was designed to be managed in a distributed format. Socio: Unsupportive: situated communities required different orientation to management of IT	Contradiction: disconnect of local communities with involved management/decisions regarding IT. Praxis: new practices were shaped and evolved, as per the design of the BIS; re-evaluated and re-shaped
RB-F-1	*Credit Card* Fraud and theft were managed by individual local units following the claim of theft/fraud by customers. After the regional local restrictions were applied, the CAU was notified of the theft/fraud. After the BIS was initiated, CAU and operations managed all aspects of theft/fraud management, with the exception of initial customer contact.	Medium	Orientation towards the past/present: while acknowledging and using newly designed system; still performed and accepted work practices from "old" protocols.	IT: Unsupportive: the BIS routed functions through permissions to certain user groups (retail banking or CAU) Socio: Supportive: the creation of work-arounds invisible to the BIS were enacted, and accepted, by reciprocal users; e.g., retail banking would send a fax, CAU would reply by fax, rather than through BIS as designed.	Contradiction: retail banking staff perceived the change to be harmful to business and impact their ability to serve customers

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Code	Description	Rating	Orientation	IT/Socio	Praxis/Contradiction
RB-F-2	Retail banking operations continued to perform some functions; designed in the BIS to be performed by CAU staff.	Medium			Praxis: retail banking staff continued to perform some functions, creatively avoiding the BIS
CA-F-1	*Credit Card* issues (such as theft or fraud) were handled by the CAU/Operations Dept.s after the deployment of the BIS, in contrast to past practices which involved the CAU simply recording/ confirming the issue resolution performed by retail banking.	Medium	Orientation towards the past/present: while acknowledging and using newly designed system; still accepted work practices from "old" protocols.		Work practices as per BIS were upheld; re-arrangement of previous practice (Praxis) as per BIS design, however, some old practices were used in addition to the BIS
RB-G-1	*Loan Approval*, prior to the BIS, was handled by localized in-branch decisions, or regional decisions if the amount of loans exceeded in-branch authority. The loan-amount authority was based on the size of branches/regions. Following the BIS deployment, in-branch authorizations were standardized; all data on loans was immediately	High	Orientation towards the past/present: while acknowledging and using newly designed system; still performed and accepted work practices from "old" protocols.	IT: Unsupportive/ Supportive: Existing parameters cold not be ignored; but system could not distinguish work-arounds (supportive by lack of awareness to be unsupportive) Socio: Organizational fields within Natbank were aware of the practice of working around the parameters of Natbank, and supportive; or, unaware (officially) and not unsupportive.	Contradiction: system failed to be aware of situated/unique issues, and thus fostered bad decisions. Praxis: Innovative ways to work around existing rule parameters imposed by the system
IB-G-1		High	Orientation towards the past/present: while acknowledging and using newly designed system; still performed and		Contradiction: system failed to be aware of situated/unique issues, and thus fostered bad decisions. Praxis: Innovative ways to work around existing rule parameters imposed by the system

	uploaded to centralized databases. Loans in excess of in-branch		accepted work practices from "old" protocols.	
EX-G-1	authority were approved by regional offices (also standardized under following BIS deployment), however, data on the loan was concurrently sent for review to executives at	High	Orientation towards the present; habitual reactive practices were enacted – evaluation of loans was performed when the system submitted a loan for evaluation.	Supportive	Work practices as per BIS were upheld; re-arrangement of previous practice (Praxis) as per BIS design
CA-G-1	HQ. Loan applications in excess of regional limitations were routed to executives via the BIS for approval. The automatic referral of loans based on authority parameters was faster than pre-BIS practice in which referral were done via fax or internal mail.	Med-High	Orientation towards the present; habitual reactive practices were enacted – evaluation of loans was performed when the system submitted a loan for evaluation.	Supportive	Work practices as per BIS were upheld; re-arrangement of previous practice (Praxis) as per BIS design

Routines Identified at Natbank – Part B

Routine	Description	Performative Aspects	Ostentive Aspects	Implications
IB-A-1[+]	*Use of the CAR* in monitoring and subsequent reporting, on client accounts	Maintenance: work procedures based on existing technology maintained	Guiding: The CAR is held up as the "correct" method of work	The CAR is not dis-continued as planned at outset of BIS deployment
IB-A°-2	*Use of the CAR* in performing transactions	Modification: procedures on the CAR are modified to incorporate required applications of the BIS	Accounting: Variations from official practice are held as legitimate because of the authority associated with CAR use.	CAR is integrated into the BIS
MR-B-1	*Marketing Data* collection from banking operations. The BIS design was intended to have routine banking operations (opening and account) automatically populate the database.	Creative: Using the BIS as a tool to collect and sort data was a new application, even for those familiar with the BIS use.	Referring: expected increases in marketing department output, in contrast to historical practice.	Data procedures were initiated.
RB-B-1	*Account Information* in the BIS is designed to populate the marketing database	Maintenance/Modification: as completion of all fields is not required to execute application, users irregularly and independently enter inconsistent	Referring: new application for account initiation does not have consistent requirements. Users enter data consistent with their	Account entries continue as usual; meeting regulatory requirements. The marketing database is populated with inconsistent data entries.

	and requires the entry of volumes of customer information in excess of data entry requirements for legal and regulatory requirements.	amounts of data into application. Some only completing the minimum fields (8 of a possible 32).	experience in past systems.
CA-B-1	*Account Information* CAU gets all the information is requires.	Maintenance: consistent with requirements	CAU endorsed (aware/unaware) – implicitly the RB use of the BIS in account-info.
MR-B-2	*Marketing Analysis* is expected to be based on auto-populated data from banking transactions is found to be unreliable. To compensate, Marketing Dept. initiates new methods of data collection (e.g., branch surveys)	Creative: Users develop new methods.	A parallel and siloed information system is created, invisible to the BIS system, and used by Marketing Dept. to perform job functions.
		Referring: New methods of data collection are developed to deal with ambiguous lack of information; based on known requirements for data input/outputs and sources of data.	
RB-C-1	*No-fee Accounts* cannot be provided to customers under the BIS, as they had been under	Modified/Creative: Users create system work-arounds, such as denoting customers as "staff" in order to offer no-fee accounts.	Accounting: users actions are self-perceived to be legitimate based on past business practice.
			Alternative practices (to BIS use) emerge; creating inconsistent / low integrity information.

RB-D-1	previous systems. *The Audit* function in branches requires a CSR count comparing transactions recorded by BIS to financial instruments; Followed by Manager making a count of individual CSR transactions, and additionally an aggregated branch count. In contrast previous systems required only one count (of aggregated transactions) to be made	Maintenance/Creative: The organizational routine that audits are unalterable functions resonates with users. The inscribed BIS approach is adopted, enacting a new work routine.	Guiding: The norm of the organization of the importance and intractability of the audit function.	The BIS inscribed audit process is accepted.
CA-D-1	*The Audit* process begins with collecting sealed transport bags of financial instruments, and comparisons of submitted counts/instruments	Maintenance/Creative: The organizational routine that audits are unalterable functions resonates with users. The inscribed BIS approach is adopted, enacting a new work routine.	Guiding: The norm of the organization of the importance and intractability of the audit function.	The BIS inscribed audit process is accepted.

		Modification/Creative	Referring/Guiding	
	to the CAU / BIS count.			
HR-B-1	*IT training* routinely occurred in class-room settings, with short in-branch "reinforcement sessions." However, new system protocols were not accepted and HR had to adjust training program by instigating longer, more frequent training programs.	Modification: Existing routines of training are altered.	Referring: Alteration in routines to accommodate "unexplained" deficiencies in training success.	Training programs were developed trying to reinforce the inscribed work processes in the BIS.
IT-E-1	*System maintenance/ management* functions were centralized with the implementation of the BIS	Modification/Creative: new practices are developed – altering and creating new routines to effect management of IT functions in a distributed fashion.	Guiding/Referring: Past practices informed notions of standards of system maintenance, informing the creating of new routines, and the modification of old ones.	The shift to a distributed IT maintenance created new programs for: technical support for users, physical monitoring/repairing of technology
IT-E-2	*System maintenance/ management* efforts were enhanced with "roving" members of the IT staff.	Creative: New practices involved planned regular and unplanned emergency visits by technicians to handle maintenance issues and assess system performance.	Referring: Ambiguity was resolved in how particular on-site tasks would be accomplished (e.g., tech repair)	New staff members were hired, and added costs were incurred to the planned budget to manage distributed functions. However, planned budget was a decrease in overall IT costs

IT-E-3	*System maintenance/ management* reviews for system improvement was managed by local sites prior to the BIS, the centralized system did not allow for IT individuals to be "local" and therefore complicated system.	Creative: New practices involved planned regular and unplanned emergency visits by technicians to handle maintenance issues and assess system performance.	Referring: Ambiguity was resolved in how particular on-site tasks would be accomplished (e.g., evaluation of system parameters/evaluate performance, benchmarks and possible upgrades)	in the past due to levels of redundancy eliminated with BIS deployment.
EX-E-1	*IT/IS Strategy* was delegated to local units prior to BIS. Following the system deployment, Administration initiated regular IT management meeting to consult with IT/Operations to discuss: functionality, system "weaknesses" and system.	Creative: development of new management processes	Referring: the process of IT management on an enterprise level was largely foreign to the organization.	Regular procedures for the maintenance of IT structure sin the organization were developed.
EX-D-1	Executives review	Modification: The inscribed use of	Guiding: The norm of the	Audit function was adopted as

	Audit results before filing occurred to ensure a third view as part of BIS procedures.	the system required review as part of the process in completing an audit where executives reviewed audit before legal (rather to simultaneously).	organization of the importance and intractability of the audit function.	a "Best Practice"
LG-D-1	Audit results were reviewed through the BIS by executives before the Legal Dept. proceeded with filing.	Modification: The inscribed use of the system required review as part of the process in completing an audit where executives reviewed audit before legal (rather to simultaneously).	Guiding: The norm of the organization of the importance and intractability of the audit function.	Speed of documentation for audit filings increased.
RB-E-1	IT/IS Planning in local retail banking sites was performed on a ad hoc, situated basis, where decisions were made based on local perception of need and preference.	Modification/Creative: ad hoc groups were formalized to act as local advisory groups to make recommendations rather than decisions.	Referring: The loss of the loci of IS/IT planning in regional operations created an ambiguity in terms of individual concern as to how their unique concerns might be met.	The IT/Operations office created a forum to allow for input from regional units on issues of IT/IS choice, maintenance, and upgrades as a result of concern expressed by local units.
RB-F-1	Credit Card Fraud and theft were managed by individual local units following the claim of theft/fraud by customers. After regional local restrictions were	Maintenance/Modification: Retail banking ceded the ability to maintained the practice of canceling cards should that be a required step; but ceded other functions to Operations/CAU. Retail banking continue to contact CAU/Operation via fax (as per old practice) rather than BIS-	Guiding/Referring: retail bankers found difficulty in not being able to provide "closure" to customers concerning issues such as fraud resolution, without contacting operations. Yet retained some authority (e.g., canceling credit	Some duplication of work was created, for instance, CAU would attempt to cancel a credit card that has been reported stolen only to find it had already been cancelled by retail banking. Also, communication was worsened as CAU/Operations used BIS

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	applied, the CAU was notified of the theft/fraud. After the BIS was initiated, CAU and operations managed all aspects of theft/fraud management, with the exception of initial customer contact.	messaging.	cards) in order to satisfy these issues.	communication devices, and retail banking often communicated with fax – messages were missed, found late, or argued to "have never been sent"
CA-F-1	*Credit Card* issues (such as theft or fraud) were handled by the CAU/Operations Dept.s after the deployment of the BIS, in contrast to past practices which involved the CAU simply recording/confirming the issue resolution performed by retail banking.	Creative: the BIS offered the opportunity to initiate new work protocols for management.	Accounting: The inscribed practices of the BIS, shifting responsibility for these function to CAU/Operations gave legitimacy to the development of new routines of practice.	
RB-G-1	*Loan Approval*, prior to the BIS, was handled by	Creative/Modification: Branches asserted themselves under new protocols by attempting to justify	Guiding: Following the organizational norm of risk aversion and assurance of	The new protocols for loans were adopted. However, in many regions the level of

	localized in-branch decisions, or regional decisions if the amount of loans exceeded in-branch authority. The loan-amount authority was based on the size of branches/regions.	substantial increases in authority levels for approving loans. Regional groups followed a similar strategy.	safe protocols, the adaptation of BIS protocols was supported. Accounting: Branches/Regions claimed authority based on "local knowledge" to request alterations in parameters of loan approval/management authority	authority for loan approval increased 25%.
IB-G-1	Following the BIS deployment, in-branch authorizations were standardized; all data on loans was immediately uploaded to centralized databases. Loans in excess of in-branch	Creative/Modification: Similar to RB, IB requested higher authority parameters for loans. As chattel/security was less of a concern for their clients, many loans were divided so a client might be guided to apply for two loans under the authority limit rather than one above the limit.	Accounting: The international banking division relied on the perceived legitimate position of international banking being a part f business "outside the bounds" of ordinary banking. In other words, worthy of special treatment.	The international banking division appeared to have an upsurge of business activity as a result of external monitoring of, among other work-arounds, loan booking.
EX-G-1	authority were approved by regional offices (also standardized under following BIS deployment), however, data on	Creative: New monitoring procedures emerged as executive authority was applied to monitoring division and regional performance statistics.	Guiding: Following the organizational norm of risk aversion and assurance of safe protocols, the adaptation of BIS protocols was supported.	The loan process evolved as a intended.
CA-G-1	the loan was concurrently sent for review to	Creative: Physical work loads decreased as much of the loan recording function was automated	Guiding: Following the organizational norm of risk aversion and assurance of	CAU, a centralized unit, adopted an increasingly homogeneous view of different

executives at HQ. Loan applications in excess of regional limitations were routed to executives via the BIS for approval. The automatic referral of loans based on authority parameters was faster than pre-BIS practice in which referral were done via fax or internal mail.	by the BIS. Loan monitoring became second order – individuals monitored the system monitoring the loans, rather than the loans.	safe protocols, the adaptation of BIS protocols was supported.
		regions in which Natbank was operating.

CHAPTER 3: PRACTICE, ADAPTATION AND THE RESOLUTION OF

TECHNOLOGY USE

ABSTRACT

The study reflects a 30-month case study of a financial services company, Natbank,

following the deployment of a new information system. Attention is directed toward the

impact of the material knowledge of the information system and the influence of

individual identity on the emergence of enactments (intended and unintended) of the

information system.

INTRODUCTION

The deployment of information systems is often seen by firms as a tool to achieve

strategic advantage and organizational change (Sawyer & Southwick, 2002). However,

achieving the full promise of information systems is often hampered by the inability for

organizations to reliably implement these systems successfully, or at least, as intended

(Lee & Myers, 2004), as information systems are "shaped by interests, commitments,

capabilities and preoccupations of situated actors," (Kallinikos, 2002, 287). A variety of

theoretical perspectives have been used to examine the use of technology in

organizations, including, but not limited to, power and politics (Markus, 1983),

structuration theory (Orlikowski, 1992; DeSanctis & Poole, 1994), actor-network theory

(Harrison & LaBerge, 2002) and the practice lens (Orlikowski, 2002; 2000). Common

across these interpretations is the examination of the interaction between human agency and the social context in which it operates.

Wagner & Newell (2006) charge the success of information system enabled organizational change is metered by the resolution of conflicts concerning the meanings, values and ultimate uses for which technology will be employed in the organization. Recent investigations in the academy (e.g., Pozzebon & Pinsonneault, 2005; Rolland & Montiero, 2002) have examined processes of deployment and interaction that lead to (sometimes) successful implementation and adaptation of technology, and also instances of deliberate resistance (e.g., Scott & Wagner, 2003). Heracleous & Barrett (2001) argue the process of implementation of information systems is interwoven in the efforts of organizational members in the expression of their identity to attain particular goals, and marginalize other efforts; the emergent forms of information systems and their use are reflected as a "consequence of multiple and diverse interests" (Constantinides & Barrett, 2006, 77).

Orlikowski (2006; see also Orlikowski & Yates, 2006; Orlikowski & Iacono, 2001) asserts that attention must be paid to the material aspects of technology in addition to the efforts of organizational actors to instantiate particular perceptions, meanings, and uses of technology. Drawing on the concepts of communities of practice theory (Lave & Wenger, 1991; Wenger, 1998; Brown & Duguid, 2001) and Orlikowski's (2006; 2002) perspective of knowledge in practice, this study will contribute to recent work in the academy by

investigating *the impact of material aspects of technology, identity*[6] *and practice on the deployment and employment of information systems.* Based on a 30-month case study of a financial institution during the deployment of an enterprise-wide information system, conclusions in this study suggest identity coupled with reflective knowledge of the material aspects of technology impacts the emergence of information system use.

INFLUENCE, IDENTITY AND INFORMATION SYSTEM USE

The outcome resulting from the deployment and use of information systems in the academy is examined through numerous theoretical positions that seek to balance the influence of individual action and social and technological structure, such as structuration theory (e.g., Orlikowski, 1992; DeSanctis & Poole, 1994), actor-network theory (e.g., Harrison & LaBerge, 2002), communities of practice (e.g., Brown & Duguid, 1991), the interaction of practice and institutions (e.g., Oakes, Townley & Cooper, 1998), and the practice lens (Orlikowski, 2000; 2002) among others. Perspectives in the broad trajectory research on information system use attempts to address organizational context, as well as the technological and practice-related factors that unfold in the deployment and use of information systems, and associated organizational change.

Considerable debate exists in the academy concerning how use emerges and expands from one locus of application to another; and how influence is exerted in the formation and alteration of individual identities in adopting such use. Equivocal findings in the academy suggest there is still much to understand about how the meanings and use of

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[6] Consistent with discussion such as Handley *et al* (2006) the term "identity" is used to refer to a sense of meaning of what might alternatively be called an organizational culture or organizational sub-culture.

technology are negotiated; and how one set of meanings might be more resilient than others. This section will discuss how, rather than conceptualizing technology use solely as a result of action, or individual action solely as a result of the social and technological structures in which it occurs, these perspectives seek to strike a balance. This results in the question: how is the frame through which we understand the implications of individual and group perceptions in light of social and technological structures constituted. In other words, that social and technological structures, as well as use, are envisioned as mutually constitutive and emergent; resulting from the interplay between action and technology, agency and structure (Jones, 1999).

The agency perspective "within organization studies is reflected in theoretical statements about the actions taken by individuals to change organizational roles, structures, and processes," (Boudreau & Robey, 2005, 5). Emirbayer & Mische (1998) conceive of human action as a technique of maintaining social and technological structures, and as a way of altering them. The authors charge that even the most mundane, habitual and unquestioned actions are a function of agency in that it requires at least a minimal level of attention and effort, regardless of how unreflective or autonomic that might be. Boudreau & Robey (2005) point out this argument generates a new view of the agency/structure distinction. It is one that is removed from the historical view of "institutional structures as the cause of routines and habits," (ibid, 4); and is focused on individuals' identity and acknowledgment of the past (structure), and the parallel ability to evaluate variables in the present and imagine the future creatively. Thus, individual identity and practice can uphold existing social structures, and also be a force that engenders change through the

enactments of particular uses of technology and exertion of influence to promote broader adoption of such use.

Influence and Use

Constantinides & Barrett (2006) point out organizations are "political spaces for negotiating meaning and action" (79), and this perspective has long been held in the information systems academy (see: Jasperson, Carte, Butler, Croes & Zheng (2002)). The use of information systems in organizations is thus, often conceptualized as the consequences of intention and design; unanticipated consequences from within or without; and, interactions between differing groups, and their competing interests (Constantinides & Barrett, 2006). For instance, Bowker & Star (1999) examine the World Health Organization's system for the international classification of diseases (ICD), and argue that the various communities and networks that are stakeholders in the ICD construction, deployment and use have varying and competing interests that shape how the system is conceived and ultimately put into use.

The negotiation of meaning and use of information systems in organizations can occur as implicit and subtle forms of use, and as overt and open acts. For instance, in their study of ship surveyors and ICT use, Rolland & Monteiro (2002) discuss the practices and actions of individuals in shaping how survey technology would be used. This occurred both in subtle appropriations of the technology to accommodate work practices that individuals wished to retain from previous work procedures, and overt modifications (or requests for modifications) to technology that would adapt the form in which the information system

operated to a process more comfortable to the surveyors. While the adaptation of technology is a focus of the study, it should be noted that individual practice also adapts to accommodate elements of the materiality of the technology. In other words, despite an individual's intent to enact technology in a particular fashion, the limits of the technology would not accommodate such an enactment.

Pozzebon & Pinsonneault's (2005) study of the form and use of ICT during a deployment focuses more on explicit negotiation as executives, consultants and users engage in efforts to assert their interests in shaping the ultimate form of the ICT. In this instance the embedded interests of different stakeholder groups of the organization complicates negotiations, resulting in ambiguous agreements on meaning and practice related to ICT. The various communities involved in the deployment of information systems are intertwined with one another in the production of emergent use as some individuals may hope to instantiate a particular form of use which will impact another group's practices and ability to enact the technology in their desired fashion. Whether it is subtle negotiation through the altered practice of ship surveyors, or the explicit confrontations between users and consultants, the expression of the interests of these communities and their ability to mobilize resources, such as social and economic capital, solidifies one form of meaning and interpretation in their favor. This in turn enables the constitution and concretization of a particular set of practices.

The practices and meaning involved in the use of information systems emerge from individual orientations to past, present and future and only become functional in terms of

reliable information system use over time, as they become "agreed-upon practices of a collective whole, a community" (Constantinides & Barrett, 2006, 80; see also: Boudreau & Robey, 2005; Brown & Duguid, 2001; Blackler & MacDonald, 2000). These agree-upon practices are neither necessarily collaborative nor gratifying to all parties, but they are solidified as the norm (Contu & Willmott, 2003). The community is upheld in part by its sustained, cohesive and contextual action and agreement; which in turn continues to instantiate agreed-upon practices and meanings as correct. However, communities are not static, they gain and lose members, interact with outside other communities and are impacted by external events. Brown & Duguid (2001; Bowker & Star, 1999) argue through these mechanisms new meanings and practices may emerge in communities and foster change. It is the negotiation within and between these communities from which practice and meaning emerge – changed or not, as a result of the forceful expression of the interests and identities that constitute the community. This engenders questions such as, *how does identity impact information system use?*

Communities, Identities, Technologies and Use

Communities of practice theory (COPT) is a perspective of situated learning in which individuals participate in a community, joining as new comers (partial participants) and potentially progressing to masters (full participants) of the community. An important distinction from cognitive perspectives in COPT is the concept that learning, knowledge and practice are more than a mechanical sum of acquired symbolic representations. They are embedded in context and expressed and maintained through distinctly social and tacit fashions. Wenger (1998) points out practice and knowledge are embedded "in a historical

and social context of what we do" (47). Wenger (1998) further argues that participation

in a community or network is not just physical action, it is the ability to connect to a

larger network, and it offers the potential to engage in the negotiation of meaning. This

participatory membership does not ensure influence, equality or respect, only the

"possibility of mutual recognition" (56). Handley *et al*, (2006, 645) summarize concisely

saying, "by participating in a community, a newcomer develops an awareness of the

community's practice and thus comes to understand and engage with (or adapt and

transform) various actions, tools, languages and role-definitions and other explicit

artifacts, as well as implicit relations, tacit conventions and underlying assumptions and

values."

COPT are not homogeneous organizational entities (Dyck et al, 2005), and the

negotiation of meaning is a mechanism by which conflict (Lave, 2004; Lave & Wenger,

1991) and change (Brown & Duguid, 2001) might emerge, and may surface the dynamics

of power and power relations within a community or network of communities (Huzzard,

2004). In such instances, participation can vary amongst notions of peripheral or full

participation, typically associated with positions of the new member and the master (Lave

& Wenger, 1991), as constraints may be placed on members if the potential for

transformation of the knowledge and practices of the community constitute a perceived

threat (Carlile, 2004).

While some early interpretations of situated learning have neglected to address broad

issues of power relations (Contu & Wilmmott, 2003), recent work in communities of

practice theory has placed renewed focus on the reflective individual and concepts of power relations (e.g., Huzzard, 2004; Blackler & MacDonald, 2000; Fox, 2000). Particular attention has been paid to the concept of identity in relation to knowledge, practice, and relations of power (e.g., Handley, Sturdy, Finchman, & Clark, 2006; Carlile, 2004). Communities and networks of practice are argued as contexts in which individuals develop knowledge and practice, and are loci of "processes of understanding who we are and in which communities we belong and are accepted" (Hardy *et al*, 2006, 644), in other words, the formation of identity. Thus, perceptions of "who we are" are coupled to notions of "what we (should) do."

Alvesson & Willmott (2002) discuss two interwoven aspects of identity construction in the context of communities of practice. The first is *identity-regulation*, which refers to the regulation from the community or organization, such as processes of induction and promotion through the organization; as well as the individuals' enactments – whether acceptance or resistance – of these norms. The second aspect of identity formation is *identity-work*, which refers to the individual's efforts to maintain, modify, mend or manifest their own perceptions of self. Handley et al (2006, 643) assert, "it is through participation that identities and practice develop." In other words, it is the ability to express or fulfill the interests of one's identity that meter how fully an individual might participate in a community, how one might influence (or be influenced by the community), and to what extent a community may remain viable and resilient.

Mutch (2003), in a framework that acknowledges Bourdieu's (1997) notion of disposition to action, suggests that individuals' adoption and adaptation of certain practices and forms of identity is an expression of the agency of individuals. Thus, an individual's efforts to balance the influence of socio-technical structure of the community and organization, alongside their own sense of identity may cause internal tensions that engender particular practices – either in concert, or in contrast, to the community norm. Thus, an individual may enact different modes of participation and practice in concert with their sense of integrity and 'fittingness' with their identity (Handley, *et al*, 2006; Wenger *et al*, 2001; Wenger, 1998). In addition to full or peripheral participation individuals may limit themselves (or be limited by others) to modes of participation such as *marginal participation*, a form of participation that is purposefully distanced from the (re)constituting practices of the community; and, *contingent participation*, in which the individual adapts their practices such that, notionally, the community's norms are satisfied; but, the individual expression of interests may also be realized.

Handley *et al* (2006) point out that knowledge and learning are "integral and inseparable aspects of social practice which involves the construction of identity through communities of practice" (643). Thus, identity as a concept of self, of "who we are" is irretrievable intertwined with what we do (see also: Wenger, 1998). Orlikowski's (2007; 2004; 2002) perspective of knowledge in practice is offered as a perspective to augment communities of practice theory, to provide a focus on both the social and material aspects of knowledge that has arguably been lacking in a majority of empirical examinations in the academy (Orlikowski & Yates, 2006).

The notions of knowledge in practice, an extension of Orlikowski's (2000) discussion of the practice lens as a perspective for understanding technology and organizations focuses on knowledge and practice as ongoing social accomplishments. This perspective shares analytic harmony with COPT in the conception of the ongoing (re)construction of knowledge and practice as a social action that emerges in context. Orlikowski (2004) argues that everyday practices and knowledge are "deeply bound up in the material forms, artifacts, spaces through which humans act" (460). Orlikowski (2007; 2004) further argues that materiality, or the physical, technological and substantial aspects of artifacts, is necessarily bound up with our understanding of practice. And so, in exploring practice, Orlikowski (2007; 2004; 2002) suggests four forms of knowing: *emergent*, arising from everyday practice; *embodied*, tacit and unquestioned knowledge; *embedded*, grounded in the socio-historic context of life; and, *material*, the substantive physical characteristics of the 'stuff' used in everyday (work) life – buildings, machines, desks, cars, pens, and so on.

The perspective of *knowing in practice* as articulated by Orlikowski (2007; 2002) provides the ability to reorient the focus of COPT to provide new insight on the implications of identity in the deployment of information systems and the associated organizational change. Much of the work on practice related information system implementation has addressed issues focused on the mechanisms by which practice might facilitate change. For instance, as Boudreau & Robey (2005) discuss inertia and mechanisms of *re-invention* as a process by which information systems implementations

might unfurl. In the first paper of this thesis I address the notion that the perception of a contradiction in organizational life may be a form of instigation of reflective action that alters or maintains the intended use of information systems during deployments. While such approaches provide valuable insight into how the mechanism of deployment might unfold, little focus has been paid to how individual *frames of reference,* or notions of identity and knowledge emerge. This is an important means to augment existing perspectives, as it will allow reflection on the underlying vehicle through which individuals have the potential to perceive contradiction, to find comfort in inertial practices or to be creative in *re-inventing* new process of going about (work) life. COPT offers an analytic lens to examine how change in communities and networks occurs in organizations, including how individual and shared meanings and values might be expressed in the engagement of practice. However, how knowledge, particularly of the material forms of technology, is incorporated into evolving individual identities and thereby expressed in practice might not be clearly understood without the ability to parse temporally and contextually situated forms of knowledge, which emerge in communities. In other words, *what* we know of something is as important as *how* we come to know it.

In summary, the outcome of information system deployments is metered by the ability for an effective and negotiated use to emerge in the organization in which the technology was implemented. Equivocal findings in the academy suggest there is still much to understand about how the meanings and use of technology are negotiated; and how one perspective might be more resilient than others. In an effort to extend knowledge in this area, this study seeks to augment the perspective of COPT with Orlikowski's (2007;

2002) notion of knowing in practice to investigate the implication of incorporation of various forms of knowledge into individual identity, and the resulting expression of identity, and impact on practice and the use of information systems. Such examination will augment existing perspectives, by focusing on a different aspect of relations of practice (Carlile, 2004) in order to examine not only the mechanism through which change unfolds, but how the possibility of perceiving contradictions and the creative re-invention emerges.

RESEARCH APPROACH: THE CASE OF NATBANK

Natbank is a large North American financial institution, the case study spanned 3 years, ending in January of 2006. Data collection was focused on the deployment of an enterprise system, occurring over a period in which Natbank chose to consolidate management and harmonize operations across 15 regional units, centralizing operations at headquarters. The organization employed approximately 3000 individuals across the 15 territories, with approximately 100 offices. Observation and analysis paid particular attention to activity at headquarters and two additional sites.

The Choice of Method: Case Study

The rationale for the adoption of a case study method for the analysis of Natbank is consistent with the perspective of Yin (1994; see also Prasad, 2005; Trauth, 2002; Klein & Myers, 1999) with respect to theoretical position and research questions being examined. This perspective suggests that theoretical positions framed with a constructivist standpoint are appropriately investigated by case study. Additionally

research questions that are focused on "why" and "how much" are better addressed in

methods such as interpretive case studies (Strauss & Corbin, 1998). Table 3-1 provides

examples of how the study of Natbank fulfills Klein & Myers (1999) principles for an

interpretive case study.

Table 3-1: Principles in Interpretive Case Studies – (Klein & Myers,1999)		
Principle of the Hermeneutic Circle	Understanding achieved through iterations between examining the "parts" and the "whole"	The study was undertaken examining multiple components of a larger organization; and the organization as a whole.
Principle of Contextualization	Reflection on the social / historical context.	Triangulation of data and researcher participant observation engendered sensitivity to the socio-historical context
Interaction between researcher and subjects	Reflection on the researchers part in constructing the data	Addressed as I attempted an effective balance between emic and etic readings of the case
Principle of Abstraction	Relating the idiomatic analysis of the specific case to broader contexts	Achieved in the analytic discussion of the extension of theoretical concepts beyond this case
Principle of Dialogic Reasoning	Questioning theoretical preconceptions	Discussed in the analysis section of the paper
Principle of Multiple Interpretations	Sensitivity to multiple interpretations of events	Examined and addressed through the triangulated nature of data
Principle of Suspicion	Awareness of possible biases in the accounts of participants	collection and analysis

Research Site Choice

The research site, Natbank, was chosen for a number of reasons. The primary rationale

was because of the potential to observe and study the unfolding processes in the

deployment and governance of information infrastructures. Katz & Jordan (1999) point

out that the financial services sector is one in which advances in information and

communication technologies have had a dramatic effect. While this was an interpretive

case study, Natbank offered what might be referred to in positivist approaches as

adequate variability. In other words, studying Natbank held the potential to observe phenomenon in the most stark and visible display by its unique nature. The organization was distributed across fifteen regional units; four different information systems had been run as independent 'enterprise systems' and the integration would reduce this number to one; the regions in which the bank operated ranged from wealthy (regional per capita GDP[7] of approximately US$ 27,000 p.a.) to poor (regional per capita GDP of US$ 800 p.a.); and the bank held varying market positions in the regions, in some cases substantial, in some cases minimal. Thus, the goal of integration and deployment of a universal information infrastructure was complicated by broad number of variant factors.

Due to an existing research project, I was able to leverage contact with the organization to achieve a substantial degree of organizational access. I also had an extensive network within the organization through this prior connection. Additionally, before returning to academic study I worked in the financial services industry, in particular, having dealings both with the organization in the study, and in the region. Knowledge, acquired over a number of years in industry, and the ability to claim 'membership' to the community in which individuals with whom I interacted considered themselves allowed a degree of fluency that would have not have been possible in other circumstances. Garfinkel's (1967) notion of 'unique adequacy', or a familiarity with the context that might allow a researcher to 'walk the walk' and 'talk the talk' is at the heart of this familiarity.

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[7] Gross Domestic Product

While not a direct participant in the organization, Natbank, I was a participant in the industry. Similar to the notion of unique adequacy, participant observers possess an awareness of the operations of the organization that allow for rich examination of data, and often expands the potential for insightful findings from "knowing where to look." (Trauth, 2002). Such familiarity engenders the ability for the researcher to not make a solely etic reading of the organization - to view it from the outside – in Bourdieu's (1977) terms, the scholarly academic bias that examines 'from a distance' which "destroys part of the reality it tries to grasp" (Bourdieu & Wacquant, 1992, 10). However, certain challenges are raised by this position, in risking an *emic* reading, or one that is too close to the organization to be able to engage in meaningful analysis. In order to mitigate this concern, methodical actions were taken to distance myself from the context to reduce the possibility that I was placing my own assumptions upon what I was observing. One such action was to frequently question what was being said, or what action was being performed, despite that I either knew, or believed I knew, what was being said or done.

Data Collection

The research approach used in this study was an interpretive case study (Yin, 1994). Observations and semi-structured and informal interviews comprised the bulk of data collected. Twenty respondents were interviewed formally. Additionally, Twenty-two other members of the organization were informally interviewed during immersive periods of observation, when time was spent with employees in the workplace and socializing after work. Interviews ranged in length between thirty-two minutes and ninety-six minutes. Thirty individuals declined to be formally interviewed, twenty-two constituted

the informal interview pool. Interviewees work in both customer facing (e.g., customer service representatives, bankers) and non-customer facing (e.g., internal auditors, IT personnel) aspects of Natbank, and occupied both managerial and non-managerial roles. Interview questions were broadly structured around the topics of the study, such as, "Can you tell me what your work day is like?" and "How has [the system] changed how you work?" A more detailed listing of interview protocol questions can be found in Appendix 2-A. In addition to observations and interviews, data was collected in the form of internal documents (e.g., training manuals and memoranda), publicly available documents (e.g., year-end reports), press coverage, and consultant reports. Appendix 2-B provides a summary of data sources collected during the study.

Interviews: formal conversations and informal chats

Twenty semi-structured interviews were conducted and transcribed. The ethnographic interview (Prasad, 2005) technique was adopted to engender an in-depth understanding of not only the organizational life of individuals, but of wider life in general. In other words, the goal of the interviews was multi-fold to: 1.) develop an understanding of general or superficial understanding of what was involved in the 'normal' work day of individuals; the practices and perceptions that were apart of the everyday; 2.) develop a 'below the surface' understanding of the organizational and contextual practices, beyond the immediate rational explanation; and, 3.) explore the wider context of individuals' lives, in attempt to ascertain the frame of reference with which they encountered the world on an everyday basis (see also: Brewer, 2000).

The history of the organization and the regional context in which it operated, the sense of the industry and the nature of the specific business – challenges and opportunities - of the organization were core objectives of the initial semi-structured questions. Questions identifying an individual's unique position in the organization, work practices, and a general understanding 'placement and fit' in the organization included: "Can you tell me what your role here is?" and, "What do you do on a daily basis?" Such questions led to secondary questions such as, "What do you use [the system] for? How [do you make the system do that]?"

Subsequent questions in formal interviews were aimed at discovering the perceptions and meanings that individuals associate with the organization, the information infrastructure, and work as well as broader insights to a particular person's frame of reference both specific to the organization and with respect to the wider context. Many of these questions evolved from prior questions, and as such were specific to individual conversations. Examples of some questions include, "What do you like most /least [about work in general]?", "How is that different [from the old system]?", "What are your thoughts on [the new system]?", "How does that compare [to competitors]?", and "How do customers react [to a change]?"

Interviews were conducted with managers and employees. The pool of interviewees was constructed through a snowball technique that began initially with managers contacted early in the study. Following initial conversations and prior to immersive visits several potential interviewees in both customer-facing and non-customer-facing roles were

identified based on their job function and willingness to participate. Interviews

subsequent to the initial set were based on further exposure to the organization and my

identification of individuals with whom I wished to speak, the discussion of other

managers and employees during both formal and informal conversations, and direct

referrals during informal and formal conversations. Several potential interview candidates

declined to engage in formal interview conversations but offered to participate in

informal conversations during work, during work breaks, after work hours and over a

beer or coffee on weekends. While these discussions may not have followed a formal

protocol they proved an invaluable resource for understanding the phenomenon and the

organization. In these conversations the full cycle of the interview process evolved

including discussing an individual's place in the organization and their perceptions and

uses of information infrastructure and the meanings they associated with the organization.

The nature of informal conversations often took two distinct forms. The first, as

previously mentioned, occurred as a compensatory offer from employees and managers

that did not want to speak 'on the record'. However, the character of these discussions

often began with a very formal request on the part of these individuals: "What is it you

want to know?" In some cases these conversations followed a very formal 'question and

answer' cadence; in other instances these conversations quickly evolved to a more

informal banter. The second form of informal discussions that emerged were those that

were unplanned. Such conversations occurred during periods of observation, my own

trips to the break room, on several occasions when I was invited to outside-work

functions, and one occasion, when I was being transported from one office to another,

sitting on a mail bag in an organizational mail truck with a manager who was also 'hitching a ride.'

Observation

Observation occurred between May 2003 and January 2006 on four separate trips to the research site. The visits numbered 14, 12, 20, and 10 days respectively. I was able to observe the day-to-day work practices of individuals in both customer-facing and non-customer-facing operations at the organization including, international banking offices, multiple levels of retail and corporate banking (managers and customer service representatives), executive management offices, operations and central accounting unit operations (which included information technology management). As with the evolution of formal interviews, periods of observation evolved over the study, initial sites were identified during early conversations with organizational personnel. During the iterations between data collection and analysis and theory new sites were identified as I identified new sites I wished to visit, and new sites were referred to me from organizational members.

Observations at the research site provide valuable contextualizing and primary data. With respect to the former, observations provide insight into the ecology in which individuals work. In such a fashion it is possible to evaluate what individuals do while performing ordinary work fashions, and helps to make clear idiomatic data. For example, if a subject suggests that doing a certain task requires them to spend "lots" of time sorting through files, an accurate understanding of "lots" can be arrived at through observation. With

respect to primary data collected in this study, following on Suchman's (1986; see also Klein & Myers, 1999) suggestion that it is important to actually see "what people do", rather than just listen to their reportage of what they do, observational data was important for understanding what work actually was undertaken by subjects at Natbank.

Field notes are a valuable tool in the collection of observation-based data. During periods of immersive observation field notes were taken in as unobtrusive a fashion as possible, considering the context in which they were taken. These notes contained both personal observations and my theoretical perspectives about the observations, and aided in the iterative step between data collection and analysis and theoretical review. Notes also helped to provide context for interviews, as field observations occurred in all areas in which interviews were conducted.

Email and Phone Communications

The period of the study was long (approximately 30 months) and during the periods in between immersive periods email and phone conversations were used extensively to establish an initial rapport and basic understanding of the organization, verify information or seek follow-up information and clarification on suppositions that might have been gleaned during interviews, establish and adjust the schedule for immersive visits to the site, and to generally maintain contact. The email and phone contact became especially important as new events emerged in the life of the organization, such as alterations in business strategy, changes to the deployment schedule of the information infrastructure, and updates on the success of various initiatives. Email and phone conversations were

primarily used in the context of follow-up information, clarification of answers provided, and maintenance of rapport and site visit schedules rather than primary data collection.

Text Documentation: Internal and External

Various forms of internal documentation were made available for review within the organization, such as internal reports and memoranda, training manuals and internal 'white' papers on strategy and marketing. As the company is publicly traded, additional information from the public realm was also acquired in terms of year-end financial reports, and documents filed for the satisfaction of annual regulation requirements. This data, alongside other secondary sources of data such as newspaper articles, financial analyst reports and general industry news helped to provide a holistic picture of the organization. Documents in the form of general economic and social texts on the industry and the localities in which the organization operated were also reviewed to help provide an analysis for the general frame of reference and social network in which the organization operated.

Text and Document data is a source of contextualizing information and a primary source of information, as was the case with observations. Following Trauth's (2002; see also Trauth & Jessop, 2000; Brewer, 2000) argument, qualitative case-study research can be strengthened through triangulated data collection and analysis (see below for a further discussion). Text and documentary data provided a means to contextualize the forms of communication that occurred throughout the organization, as well as the frequency and tone. Additionally, text data included such elements as training protocols, implementation

schedules and budgets that allowed comparison of individual subjective perceptions alongside independent representations of these events and facts.

Triangulation

Triangulation refers to synthesis and integrated analysis of data from multiple sources. Patton (2001) argues "triangulation strengthens a study by combining methods. This can mean using several kinds of methods or data" (p. 247). As such, the notion of triangulation is to provide a more rich and multifaceted understanding of the research site (Trauth, 2002). In the case of Natbank, both *within-method* triangulation and *between-method* triangulation techniques were adopted. Within-method triangulation refers to variations of technique within one approach of data collection and analysis. In this study, multiple questions during an interview might have been asked regarding the same theme or topic (e.g., what is your opinion of the banking information system (BIS)? Do you like the BIS?). This is furthered in the analysis process as multiple rounds of coding were undertaken. Between-method triangulation refers to different methods adopted in the examination of phenomena. In the case of Natbank, multiple methods were used in data collection focused on textual data, interviews and observations.

Data Analysis

The collection of data and the analysis and review of theory proceeded in an iterative fashion over the course of the study. Theory was used extensively to develop a useful analytic bracket in which to house this study; to develop theoretical concepts; and to inform initial interview questions. Material in the popular press and industry

(practitioner) publications was also reviewed to place the organization in deeper context, and to surface issues resident which the industry currently perceived as important, such as discussions of organizational change in the context of previous versus new information system usage, as well as more general concepts of integration strategies. This research approach allows for deeper theoretical exploration of concepts that evolve in the study during data collection and analysis (Prasad, 2005), and follows the general approach to case study as prescribed by Yin (1994).

The particular aspects of the organization in which the data collection occurred, and the forms of data utilized, evolved over the study as a result of reflexive iteration during the course of the study between data, analysis and theory in its second role, as a sensitizing tool. Data analysis was performed initially by aggregating and coding data. Interviews were transcribed, as were notes and any material not in digital forms. These data were compiled in Hyper-Research and Filemaker databases with any digital material that could be encoded (emails, for instance). This aggregated set of data was then coded reflecting the presence of recurring themes, stated perceptions and meanings, practices, and other factors. Data were also coded to establish when multiple perspectives and data revolved around a single event, action, or other commonality. For instance, when different participants mentioned the same event, e.g., a training seminar; similar enactment, e.g., using the information system to enter new customer data; or similar perceptions, e.g., the meaning or value of system features. Data were re-sorted and re-analyzed through multiple phases involving processes of coding and re-examination of theory in order to develop robust theoretical concepts and surface the complex relations of users, practice,

technology and context (Prasad, 2005; see also Cadili & Whitley, 2005). For a summary of data analysis, refer to Appendix 2-C.

Criteria for Evaluation

The mehtod to assess qualitative research and evaluate its quality is a matter that is often one of discussion (Markus & Lee, 2000). While what is commonly perceived in the academy as quantitative-positivist research tends to have relatively stable standards (e.g., measure of reliability and forms of validity). The variety of research that is contained in the rubric of qualitative research (for example, positivist, interpretive, or critical research) affords a diversity of approaches to effectively evaluate research based on the ontological and epistemological foundations of the researcher and research. This study adopts the evaluative schema developed by Golden-Biddle & Locke (1993) of authenticity, plausibility, and criticality. Though this schema was originally developed for ethnographic studies, it has enjoyed a wider application in use, for example in interpretive case studies in general (Sandelowski & Barosso, 2002), and has been used fruitfully in a variety of contexts in information systems literature (e.g., Schultze, 2000; Trauth & Jessup, 2000).

The first concept in the evaluation schema is *authenticity*, and focuses on the researcher's time in the field and the course of the researcher's progress through the research process should be evident. An authentic rendering is one that conveys the ability of the researcher to communicate the details of the field: aspects of everyday life, the language of the field, and perceptions that members of the field express and convey. Schultze (2000) argues

that concepts that are found in positivist research, reliability and validity, are matters that are bound up in the concept of authenticity.

The experiences that unfold in an interpretive case study cannot be replicated perfectly, nor can the researcher (or another researcher) be assumed to view new experiences as he or she (or as the original researcher) might have in the past. However, detailed descriptions of the research approach, observations and assessments on the part of the researcher can contribute to the evaluation of the reasonableness of the researchers interpretations and findings, "reliability refers to the degree of consistency with which instances are assigned to the same category by different observers, or by the same observer on different occasions" (Schultze, 2000, 29).

Validity relates to the ability for the researcher and the study to convey a believable and accurate account. In other words, it expresses, "the extent to which an account accurately represents a social phenomenon or event" (Schultze, 2000, 29). The process of collecting volumes of data from a variety of sources as part of the investigative and analytic process is thought of as an important aspect of developing such an authentic rendering of the phenomenon (Yin, 1994; Eisenhardt, 1989). Other strategies adopted to foster an accurate representation include periods of immersion in the field and respondent validation of fieldwork observations and interviews, though Czarniawska-Joerges (1992) points out that because of individuals' (participants') motivations, political or otherwise, recollections may purposefully change and lack consistency. This may not prove an accurate technique to develop the research quality. Depending on the nature of the

research, some approaches to improving the quality of the research may not be possible (i.e., if there are no interviews, participants obviously cannot comment on their accuracy of a transcript), and therefore evaluative schema must be taken in context of the study.

Plausibility is a matter of the development of the artifact of the study (e.g., a thesis), as opposed to the evaluation of presence in the field associated with authenticity. Brewer (2000; see also van Mannen, 1995) stresses the importance of the rhetorical devices used in communicating the sense of the fieldwork and the conclusions the researcher draws. Thus, the researcher must be able to make the nature of the research site 'familiar' to the readers, such that they can understand the context in which the experiences of the research study occurred. Additionally the researcher must speak to the audience to develop the theoretical arguments bound in the research, in a way that is relevant to that audience.

The notion of *criticality* is the ability for the researcher and the reader to pause in the construction and reading of the study to question the assumptions, process, practices and other aspects of the study participants. Through a thoughtful reading and the development of new ways of thinking about a specific situation (Golden-Biddle & Locke, 1993) readers may develop new ways to understand others and themselves. In other words, the 'lesson' that emerges from reading the ethnography might be taken and brought into the general conceptual framework of the readers, and contribute to a greater understanding of their own world, regardless of how different it might be from the world of the study.

Table 3-2 (adapted from Schultze, 2000) details how the criteria of authenticity,

plausibility and criticality were met in this study.

Table 3-2: Criteria for Evaluation	
Criteria	**In this study …**
Authenticity	**The ability of the text to convey everyday life**
Everyday life	Detailed descriptions of how the members of Natbank lived in the work and out-side work environment are provided.
Vernacular of the field	As a member of the industry community (a banker) I included and explained where necessary the idiomatic language of banking (e.g., "BF-ing it" to procrastinate or put off, etymologically evolved by and old banking acronym and term (BF = bring forward), the practice of assigning later dates to transactions.
Members perceptions of 'life in the field'	The ways the various groups and individuals perceived themselves and others is presented in the study
Researcher interaction and study process	Details about interviews, discussions, observations, materials read, duration and timing of immersive experiences, etc., are provided in the study.
Researcher's relationship with participants	Through the various episodes discussed in the study the relationship of the researcher to individuals is detailed, as well as their relation to the researcher.
Data collection and analysis process	The study discusses various processes of data collection, theoretical development, and analysis and the iterative course of action that bound all three together
Plausibility	**The ability of the text to "connect the two worlds" and communicate with the audience**
Adhering to the Academic genre	The research is presented in the format of a traditional monograph form dissertation.
Justification of the research	Through a detailed exploration of the literature, focused on information infrastructures, implementation and use, and governance the theoretical basis for understanding the mechanism for *how* shifts in practice occur is shown to be needed, as well as a better understanding of the implications of shifts in practice.
Normalizing the research site	The organization is a large international financial services corporation (a bank). While the site is not markedly atypical as Golden-Biddle & Locke (1993) might discuss; it is within a specific industry. However, effort was made to discuss the ecology of the organization in context but also in broad concepts – e.g., customer-facing and customer-service representative roles held by organizational members, rather than specific terms such as bank tellers.
Criticality	**The ability of the text to encourage readers to reconsider taken-for-granted ideas and beliefs and provide insight into the phenomenon**
Juxtaposition	As an academic and former banker, I was able to contrast my own experiences and interpretations against those in the organization throughout the course of the analysis.
The challenge to think	Through the development of the research questions, and the literature and theory in sections 1 & 2 I hope to both make the questions relevant to the reader and give pause for individuals to question their own perception of how and why the phenomena occurs. By offering an explicitly practice perspective in my analysis I hope to engender a new way of interpreting the material that will enrich individuals understanding of organizations.
An interesting account	Well, you tell me.

A note on generalizability, generalizations and generalities

Walsham (1995; 2002) addresses the issue of generalizability in qualitative research. He suggests that generalizability is a function of the ability of the discussion and analysis of a particular phenomenon to be a source of learning for other contexts and at other times. Eisenhardt (1989) in a positivist approach to case studies suggests that a large number of studies taken together has generalizability, which harkens to similarities of statistical generalizations based on sample size found in quantitative research. By contrast, interpretive research generates analytic generalizability. Interpretive case studies enrich exercises of theorizing beyond the context of the study (Lee & Baskerville, 2003), for example in this case, how use unfolds, and the associated implications.

Walsham (1995; 2002) develops four types of contributions to which the generalities of interpretive research can be directed: 1. Discuss specific implications, 2. Generation of theory, 3. Development of concepts, 4. Development of rich insight. Research need not fill all four of these forms of contribution; many may only address one, but multiple forms of contribution are possible. This study seeks to further develop the specific concept of durable practice in light of individual sense of identity and material knowledge of technology (contribution #2 and #3) and explain the implications as reflective action occurs in organizations, in terms of governance, and implementation and use (contribution #1) through a rich case study of an information infrastructure deployment and management (contribution #4).

Natbank and the EIS

Natbank embarked on a project to shift from a largely distributed organization to one with a centralized management. Executives at the bank suggested the project was a difficult one, but necessary to combat mounting competitive pressures. A plurality of operating procedures was in place in different divisions to accomplish similar tasks across regions. This was exemplified by the presence of four different information systems that operated in the organization. The development of a unified enterprise system, built upon a single standard operating platform was deemed to be a strategic necessity, not only for competitive reasons but to foster the development of an integrated organizational form that Natbank sought.

The four information systems were analyzed. One of the four systems, the banking information system (BIS), utilized in nearly half of the territories (including the HQ) was deemed to be the best choice. It was more ubiquitous than two of the remaining three systems, and had recently undergone a substantial upgrade placing it technologically ahead of all the systems. The official rationale was that the system was the most advanced and most deployed and therefore would require the least effort in terms of additional deployment, near-term upgrade costs, and training costs.

As part of the harmonization of the information systems at Natbank, the varied work processes in place in a number of territories were to be standardized. The perspective HQ adopted was of a singular set of practices that was aligned with the central office's notions of how the BIS and other core functions such as internal audits, internal, and

external reporting should be performed. The presence of systems in use at Natbank, other than those found at HQ, was not insubstantial. For example, an alternate choice for the information system finally adopted had been in place in the same number (six) of territories as the BIS. The geographic footprint of the runner up was as sizable as the BIS and possessed a temporal footprint appreciably larger (20 years as compared to 10). Thus, when new technologies such as the BIS and the practices were deployed in these nine territories, the routines that were part of organizational operation and operation life had considerable history and presence.

PRESENTATION OF DATA AND ANALYSIS

Following the articulation of the constitution of a community of practice (COP), COP at Natbank were defined as individuals in shared activity, and (re)creating knowledge, meaning, practice and both an individual and shared identity (Lave & Wenger, 1991; Wenger, 1998). Further, multiple communities can exist within the boundary of a larger community, these communities can overlap with one another and cross over organizational boundaries; be of formal or informal construction; be geographically close or dispersed, and be of varying lifespan (Brown & Duguid, 2001; Wenger, 1998). As such, Natbank itself was a community of practice that had within it multiple overlapping communities. For example, the Operations and IT division (OIT) in a particular region is a member of both the OIT community and the community of the particular region. As this study was focused on the impact of identity and associated power relations, and the material aspects of technology on information system use, data collection was initially encapsulated within a community and traced as an episode of the enactment of

technology through the proximate community of practice. In many cases, this tracing led

to the interaction between COP, at which point a second but related episode was coded.

For instance, if in the "CSR" (customer service representatives) community an episode

was identified, focused on the method of seeking approval for loans, data was traced

within the community. In addition this tracing identified other communities (for example,

the central accounting unit), which engaged the same technology and was involved in the

approval of customer loans. In some instances, as will be detailed in the following

section, there was agreement within and between communities on meaning and use, in

other cases there was conflict and sometimes resolution between what would be accepted

meaning and use. Appendix 3-D, parts A & B summarize the analysis and coding of

illustrative routines as they were examined throughout Natbank. The following section

will explore and discuss particular incidents at Natbank in order to demonstrate the

emergence of the analytical conclusions derived in this study.

Episode: EIT

Extraordinary Item Transactions (EIT) were instances in which an irregular or

unexpected variable was introduced into normal work operations. An EIT requires special

attention, such as a disputed charge to a customer account, a late loan payment, or a

charge of fraud. Divisions of the organization using the BIS prior to the integration

operated a standardized procedure, the focus of which was control and assurance. In

simple cases, such as a customer disputing a charge to their account, the system could (in

some cases) render an automatic decision. For instance, if a customer was deemed a

"good customer" and they disputed a small charge (such as a over-draft fee) the system

would automatically waive the charge after the CSR had entered all relevant information and executed the transaction. The manager would see the waiver on the end-of-day report. In more complicated cases, such as a customer claiming fraud had been committed on their account (e.g., fraudulent withdrawals by criminals) unfolded differently. When the customer information was entered into the screen and the application executed, the system would flag the transaction for immediate attention and initiate new input screens for more collection of data. The CSR would be required to engage a manager in the process at multiple stages to get authorization at the CSR's work station in order to proceed to the a subsequent stage of the application to complete the transaction. Depending on the nature of the transaction, the manager may or may not interact directly with the customer.

Individuals not familiar with the standard BIS procedure of EIT processing generally found the procedure cumbersome. One manager explained: "The [CSR] used to perform most of the transaction and we [managers] would approve the complete transaction, at the end. Now, it takes up more of my time, because I have to walk through it with the [CSR]. It also takes up more of the customer's time. We have to make the [BIS] work right."

While not uniform in units of Natbank that did not use the BIS prior to the integration, there was some commonality to the procedures for handling EIT. For instance, in the six divisions that shared an alternate system, whenever an EIT was initiated, information entered at the CSR terminal, would appear in summary form at whichever terminal a manager was currently logged-in. The manager could remotely review and approve the

transaction. Many individuals suggested this was a superior approach as it was a far faster

process and resulted in better customer service. Additionally, proponents of this

alternative procedure suggested this method still provided proper controls and assurance

over the approval of EIT.

However, the BIS inscribed protocols for EIT were not always followed. Alternative

practices emerged with individuals who sought to find an alternative to a work process

they found cumbersome. Individuals seeking a work-around for the authorization of a

transaction sometimes engaged in alternate practices; one manager described a work-

around: "The [CSR] would enter as much information as they could into the [BIS] and

then record the rest of the information on [a sheet of paper]. Then they would come find

[a manager] and give them all the details. Sometimes [the manager] would need to go see

the customer and ask some more questions, sometimes they would just say "OK" and the

give [the CSR] her authorization, and [the CSR] would go enter the code. Done. We had

it, why change it."

A number of varying alterations to the EIT resolution process emerged. In some instances

these alterations were a lesser deviation from the intended process, in other cases the

deviations occurred to a similar degree. For instance, in one alteration managers provided

CSR with authorization codes. This allowed CSR to enter all the information required by

the BIS, which did not generate work off the system. Yet the approval process was

different than intended. Rather than a manager reviewing information at multiple stages

of the transaction, the CSR would request the manager review the final step of the

process before executing the application to approve/deny the transaction. The ultimate judgment still resided with the manager, but the decision was made based on a short summary of information input into the system, rather than the full set of data the BIS recorded. Other alterations of the process involved varying degrees of inclusion of the manager in the procedure, relying to greater or lesser extent on the CSR's judgment for approval/denial depending on the degree of manager involvement.

For individuals who had been using the BIS prior to integration, the EIT resolution process was not new. There were few attempts to initiate alterations of practice, as many CSR were comfortable with the work procedure as intended. However, during and following the integration of the different units of Natbank, branch staff was intermingled. Individuals whose past experience was with the BIS were now witnessing new procedures as they worked with individuals as peers, superiors, or subordinates that were employing different work practices. In some instances, these individuals accepted the alternate work practices. One CSR reported:

"It seemed like a reasonable way to [go about the EIT resolution]. You get these [EIT] so rarely, and I usually don't need [a manager] to look at it anyway."

However, some CSR found the process, "Wrong. Somebody is going to get in a lot of trouble when [executives] find out." While the majority of individuals (that had been BIS users in the past) enrolled in the alternate procedure were CSR, and the majority of those that rejected it were branch mangers, there were instances where subordinates convinced managers the alternate practice was acceptable because, "it is so much easier for

everyone." Over the course of the deployment and ongoing use, the BIS protocols were reinforced with training and the system was modified in an attempt to dissuade system work-arounds.

Episode Analysis

The material focus of the EIT is the BIS application itself. Specifically, it is an application that allows individual CSR, with the approval of a manager to override the established parameters of the BIS system. Within the CSR and manager network competing modes of identity formation unfolded. In one instance, managers and CSR ascribed a particular lack of value to the inscribed BIS process for EIT resolution. The perception of individuals largely from the network of individuals who did not possess pre-standardization experience with the BIS was that the new form of EIT resolution was unnecessarily cumbersome and past approaches provided a better path (embedded and embodied knowledge – what they knew from experience and did not question as "right"). Their engagement with the system was to enact the BIS in such contingent practice as to maintain their sense of themselves acting in an idealized form of the CSR behavior – efficient, effective and providing excellent customer service. Variant practices emerged as a means to allow such goals to be met – to maintain the self-perception "who they were" and "what they (should) do" (identity-work).

By contrast, individuals, which tended to be full participants in the larger BIS community, such as executives and senior managers, enacted or sought the enactment of the BIS in concert with the inscribed protocols for EIT resolution. These practices were

consistent with reinforcing the organizational norms of Natbank (identity-regulation) and

were focused on adhering to the designed work practices in the BIS (material knowing).

In other words, it was part of the identity of the executives to carry the organizational

banner and to follow and implement strategy. They had made the decision to implement

the BIS as the best solution; to question its efficacy was to question whether the correct

decision was made, and to destabilize the notion of the success of the new strategy.

Adjustments made to the system to reinforce EIT resolution in this manner were

constructed to enhance the need to follow the BIS protocols, i.e., more frequent need for

managers to enter pass-codes, and multiple pass-codes required. Managers were

impactful in how the BIS use would unfold in that they contributed to work-arounds by

virtue of their authority (full-contingent). Yet managers were also responsible for

upholding the effectiveness of operations of the bank and for the proper behavior of the

CSR they supervised (emergent-embedded).

Table 3-3: Analysis Summary of Episode: EIT				
Community	Preponderant mode of knowing in practice	Preponderant mode of identity formation	Participation	Actions/ Implications
CSR w/ BIS experience	Material / Embodied	Identity-Regulation	Peripheral	CSR operated in concert with policy and inscribed BIS practice
CSR w/o BIS experience	Emergent / Embedded	Identity-Work	Peripheral / Contingent	CSR attempted to re-form work practices
Bank managers w/ BIS exp.	Embodied	Identity-Regulation	Full	Managers operated in concert with policy and inscribed BIS practice
Bank managers w/o BIS exp.	Emergent / Embedded	Identity-Work	Full / contingent	CSR attempted to work re-form work practices

In such a fashion, managers often contributed to the re-invention and unanticipated actions but were also responsible enforcing the designed protocols. Table 3-3 summarizes observations and analysis of the EIT episode.

Episode: Loan Approvals

The process for loan approvals was handled in a localized approach prior to the implementation of the BIS. Each branch had authority to authorize loans to a certain amount, dependent upon the financial resources of the branch. If the amount exceeded branch maximums the loan was referred to the regional office for approval. On rare occasions where the loan amount requested represented a commitment of financial resources of a region that was in excess of local norms the matter was referred to the head office for approval.

Executive management mandated that with the introduction of the BIS included a change to the loan process, whereby loan approvals were standardized and to a large amount automated. When the application for a loan was made, an algorithm adjudicated on whether a loan would be allowed and calculated the rate for which the loan would be offered. In cases where the limit exceeded branch maximums, the loan application could be referred to the regional level, where a decision was again rendered via an algorithm. As part of the standardization effort branches and regions were grouped together, usually based on geography and market share, and given the same parameters for loan allowance authorizations.

Managers in many retail branches complained the new process of loan approval was detrimental to the bank. They suggested it did not take into account the unique nature of some regional operations, and made decisions the managers did not agree with – disallowing loan applications made by good customers. Executives at Natbank countered saying the BIS provided greater assurance processes and protection from bad loans. They claimed a standard approach to loan authorizations would be better for overall customer service, as the bank would be more efficient and less burdened by unwarranted risk.

The BIS was designed such that an override was possible at the branch or regional level, if there were extenuating circumstances. The override was intended to be a rarely used option for approving a loan. However, managers found this to be a tool to allow them to override the BIS and authorize loans they judged to be acceptable. Thus, managers began the practice of routinely authorizing loans that satisfied their judgment of acceptability. The BIS loan analysis was treated as a necessary step, often ignored. However, if a loan request was too large to be adjudicated in the branch, it would be deferred to the region, where it would again be subject to BIS analysis. In order to retain the loan adjudication process in local branches, some managers encouraged applicants to apply for two small loans, thus under the authorization ceiling, rather than one large loan.

Episode Analysis

The retention of the ability to adjudicate loans was important to most managers, and was reflective of an identity-work mode of identity formation – seeking to maintain a sense of the proper practice of work at Natbank. Managers that chose to adapt the system operated

in a contingent/full mode of practice within the community of practice, creating the appearance the system was operating as intended. Individuals circumvented the use of the BIS, and in fact contributed to increasing levels of risk borne by the bank – contrary to the purpose of the new protocols. Managers were able to accomplish this based on their knowledge and perception of how the loan function worked (material/embedded). Rather than complying with new normative pressures within the organization, the BIS was engaged creatively on what its material capabilities were. Regardless of what purpose these capabilities were intended to achieve, the emergent approach of managers was to apply existing knowledge of how loans have been processed/approved in the past (a skill which is an important part of a retail bank manager's identity), to create new protocols of work out of existing material capabilities of the BIS. In a similar fashion, managers unwilling to allow alteration from BIS-prescribed practices operated as full participants with embodied material knowledge not only of what the BIS should do, but also the rigid steps by which it should be done. Thus, these managers upheld what was the stated norm (identity-regulation) of the organization through practice.

The executive administration had mandated the new policies for Natbank, including the policy that encompassed the loan approval process. While, these executives had authority consistent with full participants in the community (Wenger, 1998), they were disengaged with the everyday practice of loan approvals, and were concerned with the maintenance of stated organizational procedures and standards (identity-regulation). Executives only participated in a functional peripheral fashion with respect to the network of practice surrounding the daily adjudication of loans. By contrast, managers, which performed the

adjudication process held middling positions with respect to the power-relations of the

organization of Natbank, but were fully engaged in the practice of monitoring the process

of a loan from application to judgment and had greater familiarity than executives whose

material knowledge (embodied) was more associated with the intended outputs of the

BIS. Table 3-4 provides a summary of the analysis of this episode.

Table 3-4: Analysis Summary of Episode: Loan Analysis				
Community	Preponderant mode of knowing in practice	Preponderant mode of identity formation	Participation	Actions/ Implications
Managers (altering practice)	Material / Embedded	Identity-Work	Full / Contingent	Managers (re)-created a mode of managing loans
Managers (no alteration to practice)	Material / Embodied	Identity-Regulation	Full	Managers followed the BIS
Executives	Material / Embodied	Identity-Regulation	Full / Peripheral	Executives followed the BIS – recognizing concerns when identified by the BIS

A similar pattern emerged in the case of the international banking unit and the training

programs for the BIS. The international banking managers were at one time full

participants within their own unit, but peripheral participants within the larger

organization of Natbank. The international banking division's perception of the training

program was negative, as they did not feel it upheld their perception of what international

bankers did, nor who they were (embodied), and as such operated in a contingent fashion

in order to circumvent, avoid or devalue the training for, and use of, the BIS.

Episode: Audits at Natbank

In the case of the process of internal audits, there was similar variety across different units of the organization. In some regions, the branch audit was a simple process involving a count by the CSR of transactions, a secondary count by a branch manager, and then submission of all transaction records and financial instruments (loans, cash, cheques, etc.) to the central accounting unit (CAU) where a final count was made. The CSR compared the individual workstation count to a count the information system registered; and, the branch manager compared the aggregated branch counts to the aggregated count by the information system; and, CAU compared the count of actual instruments to the submitted count (by managers and CSR). The count information came on a daily basis by way of a note in the internal mail bag (closed but unsealed), which also was the same mechanism for transport of the financial instruments (including non-branch held cash).

The audit function was restructured with the integration of the BIS. Individual CSR compared their individual financial instrument count to the count the BIS recorded. If correct, it would go to the manager, who would count the aggregated financial instruments and compare to the BIS count, and additionally check each individual CSR count. The CSR count would be checked against the BIS count which the manager could access directly. The financial instruments and counts would be sent to the CAU (via separate sealed bags), where the CAU would do a count on a individual CSR count, and compare it to the BIS count as written down by the CSR. The BIS count was also accessed by the CAU directly. Then the CAU would aggregate their own count, compare

it to the submitted counts and check this against the branch count as accessed directly from the BIS. The CAU would then compile an aggregated regional count.

The amended process following the integration was progressively more work-intense as the audit process culminated, which was in contrast to the prior system, where intensity decreased as the process culminated at the CAU. The work done by CSR was marginally affected, however, managers and individuals at the CAU had progressively more information to check. One individual stated: "I thought it [the BIS] was supposed to make things easier. But, I find it a lot more inconvenient, but this is [the BIS]..."

Despite commentary offered by many individuals in different units; e.g., retail banking and audit, and at different levels; e.g., managers and non-managers, suggesting the inconvenience and lack of preference for the BIS audit/assurance system, many of these individuals made comments such as: "But, it [the audit/assurance procedure] has to go this way. I like the [old way] better, but we can't change it." And, "The [audit process] has to be followed. We have to make sure that there are no errors."

Episode Analysis

The material-knowledge of the BIS is a focal point of the audit process, as it substantially altered the work practices of individuals in CSR, manager and CAU roles. However, despite a flexibility of the system similar to that in both EIT and Loan Approvals, the work procedures inscribed for the audit process were malleable and could be altered. However, no alteration occurred. The embodied knowledge of users – peripheral or full

participants of the network of practice – was that the audit procedure was near sacrosanct and could not be altered. The mode of identity formation most dominant in this instance was one of identity-regulation, were individuals were ascribing to the embedded notion of the importance and inalterability of the decreed process of audit.

In both instances of the larger community of Natbank, and in the smaller communities within the organization such as the branches, and the functional divisions of retail banking CSR and managers and the CAU there is reference to the notion of audit functions as unquestioned programs of action (embodied knowledge). In the instance of audit procedure there was no attribution of authority to the system, nor any individual. Rather, opinion on why the audit was performed in whatever fashion was inscribed in the BIS – regardless of its difference from past practice –was, "This is how *we* do it."

Table 3-5: Analysis Summary of Episode: Audit Process				
Community	Preponderant mode of knowing in practice	Preponderant mode of identity formation	Participation	Actions/ Implications
Managers	Embodied / Embedded	Identity-Regulation	Peripheral and Full	The inscribed practice of the BIS was followed
CSR	Embodied / Embedded	Identity-Regulation	Peripheral	The inscribed practice of the BIS was followed
CAU	Embodied / Embedded	Identity-Regulation	Full	The inscribed practice of the BIS was followed

Episode: New Account Information

In the case of requirements for information entry for new accounts, Natbank units differed widely both because of internal choices of policy, but also because of external regulations and legal requirements for the observance of certain levels of depth with

respect to client records. Differences in internal policies were motivated largely by what was defined as primary uses of the information, i.e., servicing the client; and, secondary uses of information, such as using aggregated customer information in the formulation of marketing programs.

In some units, a minimum amount of customer information was required, such as customer name, address, tax identification number (the equivalent of a social security number (SSN) in the United States, or Social Insurance number (SIN) in Canada). In other units a much wider set of data was sought (though not always required) such as household income, whether one owned or rented a residence, etc. During the process of integration, two parameters were used in standardizing the required data inputs for customer data collection: what was the lowest common denominator of data that satisfied all legal requirements for all regions in which the organization operated, and what was the set of data that was ideal for secondary uses of data, as defined earlier, for Natbank.

Despite the required fields for data entry being defined and mandated as part of the procedure inscribed in the BIS, users found the fields were not "locked" fields, and could enter as much or little information as they wished and the entry would be accepted. In other words, information fields that were used for "secondary purposes" (e.g., marketing demographics) could be left empty and the application would compile the information and initiate the account. One manager stated that this led to an inconsistency in customer information:

"Sometimes the [CSR] only enter what they want to [beyond the minimum]. Sometimes we know everything about [customers], and sometimes we know their name and that is pretty much it."

The practice of "voluntary" input of data was explained by a CSR: "It used to be that we had to get [8 different fields of information], and we could get people in and out fast. Now, we sit down and we have to go through everything and there is so much to enter. Customers get tired. I get tired. We don't need all this [information] and why should they [customers] have to give it. I enter what needs to go in, and [the BIS] is happy [referring to the execution of the application with incomplete fields]." This was further elaborated by another individual: "I like the way it [account openings] was before. I know that I am supposed to go through the whole [screen], but I usually don't. I get all this [indicates personal information such as name and address on top of screen], but I usually skip the rest."

Other CSR disagreed with the idea new account entry was cumbersome, for example: "[Natbank] needs everything. It is not just for the branch. But it goes to [HQ] and they use it to make the bank better. I used to work at [the CAU], and I know they need all this information to go to [the government]. I don't see how people can skip it. Besides its not that hard..."

With respect to the assurance functions of new account entry at Natbank, the information required to initiate a new customer account was operating within requirements: data necessary to meet regulatory and legal requirements was populating the database.

The additional data that was mandated for collection, as noted above, was not always reliably collected during account initiation. The lack of a consistently populated database was not immediately apparent within the organization. When this inconsistency did emerge, individuals, who were the intended end-users of the data, such as the marketing department, first noticed it. Rather than attempting to force compliance in the account-entry function at the bank, these end-users found alternate methods of completing their end goal without relying on the BIS. An individual in Natbank-Marketing stated: "I never expect to get [personal information on customers] here, but that is OK. I know where to go to find this out; I know where it is if I need it."

The approach as suggested above was not uncommon at Natbank. In the example of the marketing department, alternate sources of data were developed. An individual in marketing explained: "It wasn't [a brilliant idea] to send out surveys. Before [the BIS] we used to do all of that in the branch. I used to sit for days with a clipboard and pot of coffee and ask people to sit and answer a few questions after they did their banking. That's how we got what we needed to know. We asked them."

An additional example: Some customers may not have needed to provide household income to open a chequing account, but they would have had to provide this information

in an application for a credit card. These databases (bank accounts and credit cards) operate independently and separately from one another, although both are part of the BIS. In marketing one individual explained that he would read information from multiple screens and databases, record it on paper, collate the information by hand and enter the information separately in a third database for his own use.

Over time the marketing department evolved new practices as standard operating procedures. The idea of generating new databases from researched material and not relying on the BIS populated database became accepted wisdom. "The [BIS] is always out of date," one manager rationalized suggesting that it was too difficult to correct for differences in date / age of data when relying on account data for marketing purposes. The marketing department began initiating practices to research data from other sources outside the bank and gathering data using their own resources from bank customers (e.g., mailing out surveys, in-branch surveys, etc.). This data came to be perceived as the best approach for marketing to take. Thus, the data that was previously perceived to be inadequate and incomplete from the CSR was accepted as the norm.

Episode Analysis

The efforts of some CSR to maintain or repair their sense of their identity, in terms of the fashion in which work was carried out was in part constitutive of the effort to alter the inscribed procedures of the BIS. Acting in a fashion that nominally satisfied the BIS (in terms of the CAU needs) the CSR had the ability to alter the practices of information collection by virtue of their knowledge of how the BIS functioned (material/emergent).

Although their knowledge of *how* the system operated was potent, CSR were peripheral in the control of the account entry applications of the BIS in that they did not contribute to the design of the system, and were not noteworthy users of the outputs of the application, as compared to the CAU and marketing. In contrast to the contingent participative CSR that sought to adapt the BIS; some CSR assumed the identity role that suggested the BIS should not be altered (embodied/embedded).

When the marketing department identified the issues of data insufficiency their response (embodied/embedded) was initially to examine the technology for errors, and secondarily to inquire after a repair of the work procedure with the CSR. However, as the CSR efforts were deployed at maintaining their identity (identity-work) and associated practices opposite to the practices sought by marketing, and the CAU had implicitly endorsed the CSR by accepting the output of their newly modified procedure (although the CAU was unaware of the modification), the efforts to repair CSR practices were moot. By virtue of the relative peripheral position the CAU held in relation to the account information procedure, they believed the inscribed standards of the BIS were being upheld, and conducted themselves accordingly, enacting the BIS applications as intended (identity-regulation).

As a consequence, the marketing department sought to repair their own sense of identity of a community, and returned to familiar practices to compensate for the disparity in what the intended technology would provide, and what was actually provided (identity-work). The new enactments by marketing were successful to the point that the use of the BIS

was set aside in favor of the new practices, which were in concert with their sense of

identity, and the marketing department moved from contingent participation in which it

had little impact on the shape of the account information work procedures to one of full

participation in procedures of its own design.

Table 3-6: Analysis Summary of Episode: New Account Information				
Community	Preponderant mode of knowing in practice	Preponderant mode of identity formation	Participation	Actions/ Implications
CSR (adapters)	Material / Emergent	Identity-Work	Peripheral / Contingent	CSR adapted work practices to fit idealized notion of task
CSR (non-adapters)	Embodied / Embedded	Identity-Regulation	Peripheral	The inscribed practice of the BIS was followed
CAU	Embodied / Embedded	Identity-Regulation	Peripheral	The inscribed practice of the BIS was followed
Marketing	Embedded / Emergent	Identity-Work	Full / Contingent	

Summary

The analyses of the preceding episodes in this section traced the perceptions, practices

and enactments of technology in multiple examples of everyday (work) life at Natbank in

various communities. The communities themselves were not necessarily discrete entities,

but rather multiple, overlapping and nested. For instance, the CSR community examined

in the EIT episode was not homogeneous across the organization. The CSR were self-

divided along boundaries of those willing to adapt the procedures for EIT resolution, and

those making efforts to enforce the practices inscribed in the BIS. These two

communities approximately, though not completely, were overlaid the community

boundary between CSR with BIS-use experience and those without. Divisions such as

these were non-canonical, or non-official divisions. The CSR community was also

divided along lines of regional orientation. Thus, the orientation and sense of identity within communities was impacted by multiple relationships, and the membership in multiple formal and informal communities.

The enactment of the BIS was interlaced with the orientations of the various communities of practice that engaged the technology, the differing contexts in which it was engaged, the different aspects of the technology that were engaged. Both formal and informal networks of individuals were influential in shaping the form of use of technology. Bound into how use and enactment of the BIS unfolded was the way in which individuals knew and understood the technology, and how they incorporated that knowing into their identity. For some individuals, an important aspect of their identity was the regulated notion of conforming to the austerity and impermeability of the audit process, and the technological inscriptions were rigidly followed. In other instances, those same individuals exacted work to alter the designed function of the BIS to fulfill their ideal of how work should be accomplished. The impact of the material knowledge of the BIS – how the technology was and was not alterable – was substantial in the influence that shaped the enactment of the BIS.

DISCUSSION

Although the information system deployment examined in this study was designed to constrain use, users took up opportunities for alternate enactments, and unexpected appropriations of technology emerged. Over time, some modifications became stable practices, and others collapsed. However, adaptation and (re)invention did not occur in

every enactment of the BIS. The historically resident perception that some work procedures were untouchable engendered the acceptance of some protocols as designed.

When the BIS was deployed individuals encountered the myriad different applications and contexts in which the BIS was present. In the instance of EIT resolution an apparently cumbersome (at least to some individuals) procedure was an arena in which multiple appropriations of the technology occurred, many outside the bounds of intended restrictions. And, while these multiple consequences emerged as work practices for a time, none became stabilized practices within the organization. Over time, training programs, alteration of work practices, and alterations of the material aspects of the technology to narrow its use were introduced. Practices within the organization shifted, and procedures closer to the intended use became stable over time. By contrast, both the attempted restriction of new-account information entry and the process for loan approval saw the evolution of the information system as practices alternate from those intended became stable and accepted over time. The ability to alter the BIS in a lasting fashion was a result of individuals adopting practices that became commonplace, accepted and legitimate. Finally, the acceptance of the new procedures associated with internal audits and assurance procedures were nearly universally accepted by users, despite opportunities for alternate appropriations and a general dislike for the designed process. The perceived value and import associated with the audit function as an end, rather than the ease or inconvenience of the process, are incorporated into the *iterative cognitions* (Emirbayer & Mische, 1998) of individuals at Natbank. The concept that this function might be altered, whether or not material constraints would allow it, was foreign.

Emergence of Knowing Technology

These observations of inertia at Natbank are consistent with notions of practice,

enactment in use, and the practice lens. Orlikowski (2000) contends that the enactment of

use of technology gives shape and form to organizational practices with which it is

associated, and the ultimate consequences for the form and operation of an organization.

The formation and (re)constitution of organizational practices are obligatory points of

passage through community/network members must pass. Individual identity shapes the

community and network, and is in turn shaped by the community of which it is a part. In

such a fashion the potential for the ability to recognize, understand and evaluate variables

in the environment, such as the deployment of a new information system. This frame of

reference is coupled with, and constituted through, a sense of what one does and who one

is (Handley *et al*, 2006), in other words, identity. This does not suggest that material

aspects of technology will not constrain or enable particular enactments, nor that past

history will have no influence. Rather, the perspective is consistent with Emirbayer &

Mische's (1998) outlook that suggests agency is at the nexus of past knowledge

(iterative), present context (practical-evaluative) and future imagination (projective).

The notion of practice and enactment suggests that as individuals encounter technology,

with their knowledge of past experience and imagined notions of what *should be* intact,

coupled with the emerging present context, and any ambiguities and certainties that might

exist, individuals will enact the use of technology in a fashion that is most consistent with

these influences. In other words, action will resound to meet the needs of past frames of

reference and values and achieve perceived *correct* end-states through enacted use of technology as individuals come to *know technology in practice* as a technique of navigating present circumstance.

At Natbank, various enactments can be associated with the divergent and manifold effect of inertia. Carlile (2003) argues different foci of practice are concerned with differing relations in networks and communities. In the first paper, by examining how praxial moments and reflective action might emerge, the focus was on the nature of enactments of technology and how those enactments might unfold in an organization or network. By contrast, the perspective offered here suggests an examination of how identities and individual frames of reference might be constituted such that an individual could recognize the possibility for improvisational action or (re)invention. Within the context of the research question of the thesis addressing the effect of practice on efforts to make information systems workable, the notion of frame of reference provides valuable insight. The notion of a workable information system is coupled to the individual assessments of goals and the appropriate methods to achieve them. Thus, understanding individual frames of reference facilitates knowledge of how individuals might define a "workable information system," and more to the point, what parameters might be placed on action to make a system workable. In the previous paper, an implicit assumption was made that a contradiction *could* be recognized; this paper seeks to discuss how the possibility of such recognition might emerge.

In the cases of EIT resolutions and new-account information the inertial influence promoted engagement with the technology in such a fashion as to re-create and maintain familiar and historical fashions of work - technology and procedure were perceived as flexible. However, these enactments of the information system did not follow along a similar trajectory. None of the various enactments that emerged to effect EIT resolution became stable work practices. Alternate practices of EIT resolution remained underground, even with individuals practicing them admitting they were somehow "wrong." The overt reinforcement of mandated practices through repetitive training programs and alterations to the technology promoting more rigid use of the system within prescribed confines, over an extended period, resulted in a narrowing of appropriations of the information system, that eventually resulted in the prescribed use of the system being adopted in nearly all instances. By contrast, the enactments that altered the prescribed process of new-account information entry contributed to a shift and alteration of organizational practice, and an adaptation of the system. Individuals enacted various forms of use, which in turn resulted in corresponding enactments by other individuals in the organization. CSR that created outputs of less data than expected motivated individuals in marketing to develop alternate practices and enact the BIS in new forms of use to compensate for the "missing information." These new enactments became stable over time as marketers found their new practices to be superior to those that were previously inscribed in the BIS. This was consistent with their historical notions of various processes and end-states should unfold. Thus, by their enactment, the marketers reinforced the enactments by the CSR by accepting their enactment as legitimate.

These observations are consistent with Brown & Duguid's (2001; 1991; see also Pozzebon & Pinsonneault, 2005) discussion of communities of practice and the emergence of negotiated practice as a result of two communities' convergence. By focusing on practice it is possible to examine how individual action can be constitutive of social influence in a network, and addresses Fuch's (2001) concern that an adherence to perspectives of agency and practice might diminish our understanding of the importance of the influence of networks and social behavior in organizations. At Natbank it is the coupling of knowing-in-practice social, and network interaction that shape the trajectory of how use is incorporated into everyday life as part of identity, and how possible conceptions of re-invention might form given and individual frame of reference.

Identity in Communities

The formation of identity is interwoven with the development of knowledge and practice, which emerges in communities as individuals, "heedfully inter-relate" (Blacker & MacDonald, 2000, 838) in the effort to achieve a common goal and achieve common understanding. As articulated earlier, this notion of identity corresponds with Handley *et al's* (2006) use of the term, suggesting identity is a form of organizational culure. Individuals at Natbank are members of multiple networks and communities of practice, and as such maintain multiple identities (Handley *et al*, 2006). The practice of engaging and enacting information systems (re)constitutes networks or communities of practice concurrent with the features of (work) life to which such technology is coupled. In other words, the knowledge of what a technological artifact is, and how it should be used, is incorporated in the identity of individuals within a community. And the expression of

identity in technology use may foster appropriation of technology in fashion that is consistent, or inconsistent, with intention. In the case of Natbank, the use of the BIS was upheld with respect to the inscribed design within some communities in particular contexts, and altered in other contexts.

Blackler & MacDonald (2000) argue how people act is an expression of relations of power, and it is an ongoing accomplishment within networks or communities of practice. The ability to designate appropriate action and behavior is tied to the centrality of individuals within communities, and their ability to mobilize resources, such as social or economic capital (perceptions of a position in society or economic wealth), in favor of a particular vision of what is correct (Lave, 1998; Fox, 2000; Blackler & MacDonald, 2000). Handley *et al* (2006; see also Carlile, 2004) points out such perceptions of what is correct and *how* it is perceived to be correct are incorporated into identity and engender particular dispositions to action and perceptions (Emirbayer & Mische, 1998; Mutch, 2003). Thus, the formation of identities in communities of practice contributes to how individuals will come to understand new technologies, not only in their material sense, but also in an idealized sense of what they *should* be able to do.

In the case of Natbank individuals were able to adapt the BIS in concert with their efforts to foster the ability for action in a fashion, which they thought, was consistent with idealized concepts of their own, and their community's identity. The observations at Natbank suggest that the unfolding nature of use is influenced by a complex inter-relation between identity and the material aspects of the technology. For example, in the case of

the loan applications and the entry of new account information, identity-work appeared more potent a force than the normative pressures of conforming to an organizational identity in choosing to adapt technology. The idealized goal of effective and fast customer service fostered the possibility, in terms of a disposition to interpretation and action that the BIS could be altered in order to meet this goal. However, merely this effort to maintain and create a sense of identity consistent with idealized goals is insufficient to manifest these changes. Sufficient knowledge in terms of the material aspects of the technology was necessary in order to allow the capability of circumventing the technology to emerge. In other words, the disposition to action (or the disposition to adaptation) incorporated in the individual sense of identity can contribute to the possibility of the enactments of technology in fashions other than intended.

In various cases at Natbank, the potential to enact technology in various incarnations was present, but not always manifest, or at least manifest in a durable fashion. For instance, in the case of the audit / assurance function the perception that the process was cumbersome existed, similar to the perception of EIT transactions. Yet, in the case of audit / assurance no attempted alteration to the system was attempted, as was the case with EIT, despite the awareness the system was malleable. In the case of EIT, the alteration of practice was short-lived despite concerted effort by a group of users to circumvent the system. However, arguably more noteworthy alterations, such as the alteration of new-account information entry protocols, the inclusion of the CARS as an augmentation to the BIS in the international banking unit, and the alteration of the loan approval process were more durable.

The durability of the alteration once made is metered not only by the incorporation of the *possibility* of the alteration in the identity of individuals as a possible action, but also as an aspect of the declaration of the new process as legitimate by those in positions of knowledge mastery (Blacker & MacDonald, 2000). In other words, those individuals who were able to mobilize sufficient resources across one or multiple communities to reinforce the notion that one practice was legitimate despite it not being prescribed was necessary. Further, the mobilization of these resources requires engagement with the practices and technology that individuals seek to institutionalize. Practices that are mandated but following the declaration of legitimacy are ignored fail to attain resiliency over time that is necessary to continue to (re)create them over time. For instance, practices prescribed by executive management (but later ignored) following a prescribed use, such as the loan approval process, were altered almost immediately following deployment. However, practices in which the executive administration was involved, such as the audit / assurance process, were continually exposed to the normative pressures of the assertion of the appropriate practice, and the unacceptable deviation.

The observations at Natbank also suggest that contingent participation engenders the possibility for particular practices to be established as legitimate. The potency of contingent participation is related to its ability to satisfy both aspects of identity formation and maintenance – the normative aspects of identity-regulation, and the efforts to form and maintain an individual's perception of self – as contingent participation nominally meets the requirements of organizational protocols while enacting new

practices to meet those aims. Instances where sufficient engagement is applied in the enactment of these new practices, become institutionalized as acceptable and foster new forms of use. For example, in the case of loan approvals, the focused action of bank managers satisfied the requirements for in-branch loan authorizations to be maintained below a particular loan amount. While nominally satisfying the parameters inscribed in the BIS, per customer aggregate loan approvals were larger than would be permitted by the BIS. This practice emerged through active engagement with the material knowledge of the BIS's parameters, and its capabilities. This practice became durable over time as individuals in the executive division did actively engage the system, and were not aware of the invisible and alternate practices that were occurring circumventing the inscriptions of the BIS. By contrast the active engagement of managers continually reinforced the practice of loan splitting as a "workable solution."

In summary, the observations at Natbank address the question of *the impact of material aspects of technology, identity and practice on the deployment and employment of information systems* by suggesting identity and material knowledge are interwoven aspects of the reflexive engagement of information systems. Use emerges in the encounter with information systems as individuals form perceptions and enact action that is consistent with the dispositions that constitute an individual's identity. Individual identity is (re)formed and maintained in the social networks and communities of practice which an individual inhabits, and coupled with how individuals come to know the material (and non-material) components of that technology and context. Individuals must understand (or come to understand through use and improvisation) the capabilities,

outcomes and possibilities of a system as well as its limitations in order to understand how an adaptation might be enacted, if at all. The variation of enactment of information systems, and instantiation of that enactment as legitimate, is made possible by participating members of the community that are sufficiently central in their participation so as to mobilize resources to enable particular practices, and imbue them with durability. Meanwhile these individuals must have sufficiently flexible and peripheral forms of participation that they can vary from the prescribed set of practices, while at the same time appear to maintain consistency in outputs and results.

The analysis of Natbank in this paper is a single case study and as such offers limited empirical generalizability. However, as discussed in Chapter 2 and earlier in this paper, the purpose of this analysis was to foster further theoretical insights to examine how identity plays a part in shaping how possible adaptations are recognized, conceived and ultimately enacted. Given the focus on individual identity in this paper, a limitation is also manifest in that it the larger implications for an organization over time can only be thinly discussed. The theoretical notions introduced herein might benefit from further case studies in alternate contexts.

Implications

The implementation of new information systems in organizations is frequently cited in practice and academic literature as upheavals in organizations (Gilbert, 2005). Many approaches have been undertaken to examine the process of deployment and acceptance that range from highly cognitive, to technologically determinant, to views promoting

practice, social influence and learning. There have been equivocal findings concerning these deployments, and frequent efforts are made to uncover the "essential variables", such as the influence of past systems and practice, on how a deployment might unfold and ultimately succeed (Gilbert, 2005, Boudreau & Robey, 2005, Dirksen, 2001).

The analysis in this study offers a perspective that suggests an expanded view of the practices and perceptions and identity of users, in examining information system deployments. The study of Natbank suggests that identity has a variable influence, in some cases encouraging enactments maintaining old organizational structures, and in some cases engendering support for new technologies and systems. The impact of social networks in the examination of how the influence of identity might be enhanced or diminished is signaled in the observed practices and enactments at Natbank. From an organizational perspective, there are indications that focused attention rather than apparent champions; and the ability to focus on the individual's sense of their own identity, as well as the normative identity of the organization are important variables in metering the success of information system deployments.

Direct implications for theory and practice suggest a broader understanding of the importance of notions of identity as a depiction of organizational/network/community culture in interactions with technology. What individuals "take into their hands, they take into their hearts.[8]" In other words, as individuals take up the use of technology in a particular fashion it becomes incorporated into their identity and frame of reference. For

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[8] From the 1985 Paramount Pictures movie "Witness," written by William Kelly & Earl Wallace

researchers this is a call to understand how individuals come to incorporate technology into their identity, and how that use changes over time. With respect to the concerns of industry, the implications of a full understanding of how technology is incorporated into identity and in what forms, is the ability to more appropriately design technology such that its form is consistent with organizational identity and thereby more likely to be accepted and taken into use.

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APPENDIX 3-A

Semi-structured interviews were conducted in the study of Natbank.

Terms in the interview protocol as described below have been disguised to maintain anonymity and confidentiality.

Interview Protocol:

4. You and the organization:
   a. Can you tell me about your role at Natbank?
   b. How long have you been at Natbank?
   c. Can you tell me about the unit(s) you have worked in?
   d. Can you tell me about working with other unit(s)?
   e. Can you tell me about the [information system] you used?
5. You and the integration and the BIS
   a. Can you tell if you had a role in the integration?
   b. Can you tell me about the integration process?
   c. Can you tell me about the BIS
   d. What functions of the BIS do you use?
   e. How was coordination handled in the integration?
   f. Were/are there any challenges in the integration?
   g. Are there any challenges in using the BIS?
   h. Have there been any changes in how you do work?
6. You and training
   a. Can you tell me about your training/education prior to coming to Natbank?
   b. Can you tell me about your training/education at Natbank
   c. Can you tell me about the training/education during/following integration?

APPENDIX 3-B

DATA			
Data type	*Case Definition*	*Collection*	*Example*
Text	Organizational memos such as training manuals and mission statements; public documents such as government documents; newspaper and popular press articles	All material was collected digitally if possible so that it could be imported into Hyper-Research and Filemaker for analysis. If text could not be taken in any form, notes were utilized, in a fashion acceptable to the organization, and this was included in the digital database.	Articles from the popular press were included in the data, such as "Senior Corporate Banking Team Changes At [RB]" from December of 2004, discussing the change in organizational leadership. Internal documents such as Patriot Act Certification for [RB] in February 2004, signed by the General Counsel of FB (rather than a counsel from RB).
Observations	Observations at meetings of individuals during the course of their everyday work, and occasionally in social settings such as at dinner	During observations notes were taken. In all possible instances notes were taken *in situ*. When this proved inappropriate, notes were taken at the first possible instance.	Notes from day journals; *M-04-B-8*: Bill [pseudonym, a manager] mentioned today that things worked more smoothly using the previous system. He wants to get a certain 'set' of information on one report, the new system does not do that. He prints off multiple reports, literally cuts out the portions he wants, tapes them together, photocopies the form so it appears as a single sheet and then files that form. ?Don't know how the auditors can make sense of that?
Interviews	Semi-structured interviews were conducted in the workplace, typically in that individual's office. Several informal interviews or conversations also occurred during the period of my time spent at FB.	In all cases digital recording of interviews were sought. In the instances when the interviewee was made uncomfortable by the recording, notes were taken *in situ*. If notes were compromising to the conversation, they were taken immediately following the discussion. 20 formal interviews were recorded.	Interview *J-06-TB-2* ... Q: And what was your opinion about the BIS1? A: Well, it was easier than XIS, something that takes one step in BIS1 would take two or three or more steps in XIS. Q: Was there any advantage in XIS then, why was it chosen? A: Money. FB had sent a lot of money updating the BIS2 which was essentially XIS, and it would cost more to update BIS1 – I mean it was the same as when it was put in ten; fifteen years ago. Basically, anyway. ....

APPENDIX 3-C

Categories	Themes	Example
Corporate	Organizational	The BIS is articulated by some managers as a method to unify the entire organization. One executive stated "we are one bank...' Repeated frequently.
Corporate	Financial	Manager references the BIS: "the most cost effective means" to have an integration information system at the bank.
Corporate	Financial	Manager (IT): "so much money had already been spent [in the BIS]" which eluded to the appreciable sunk costs that were associated with the BIS
Corporate	Financial	The BIS was designed as a way to provide regular and timely reports on performance across the organization. Manager: "This sort of analysis was not practical in the past. It was not possible to bring the information together [to perform the analysis]. We used [multiple other processes]"
Corporate	Organizational	Manager: "One thing that was important, was the [BIS] was able to satisfy the regional (legal) reporting requirements for the [multiple different regions in which Natbank operated]."
System	Training	Manager: "The [BIS] was a 'proven system' both in terms of within the Natbank organization, and as a software package used by other financial institutions. The training programs should be well developed and should make [our] job easier."
System	Training	CSR: "The [BIS] was easy enough to learn. I can all the same things I could before. I don't see why it is better"
System	Standard Operating Platform (SOP)	Manager: "The goal of the integration project was to unify [the bank]. A big part of that is a standard operating system."
System	SOP	HR: "It has been our approach to maintain as much of our procedures as possible, within using the BIS," they further noted, "We have been required to alter what we do."
System	Technology	Manager: [on the BIS] "It is *the* standard."
System	Technology	Manager: "If [the same amount of money] was put into [an alternate system], I have no doubt it would have been fine."
Culture	Identity	CSR: "It's important that we coordinate with [HQ], but it is important that we stay [local]. What good is it if we can't do business better. Just... you know... "
Culture	Identity	Manager: "The decisions were made, and we were told what they were. For a month they asked everyone in [our department] for input, but no one listened"
Culture	Future	CSR (opinion) - The BIS will make the bank a successful competitor vs. the integration will make the bank unable to respond to local needs
Culture	Future	IT Worker (opinion) - The BIS created a strong network upon which the bank could operate.
Culture	Future	CAU worker (opinion) - The BIS was too rigid / not properly configured.

Appendix 3-D: Summary of Analysis

Data coded in these tables use the following conventions:

Organizational Units (communities and networks of practice) are identified by the following acronyms: CSR (customer service representative (retail banking)); RBM (retail banking managers); OP (operations and information technology); EX (executive administration; CAU (central accounting unit); IB (international banking division).

In the event that coding relates to an overlapping community, the acronyms for both will be shown as such (OP/EX). Any coding for non-canonical communities or communities that extend beyond the border of the organization will be noted in the analysis, or in this table within individual text with the suffix (O), for example: Consultants (O).

Appendix D (Part B): Data Analysis Summary

Description	Embedded	Embodied	Emergent	Material
CSR: training on the new information system, BIS	Divergence within the community between those familiar with the BIS, and those not (used different system)	Portion of the community believed the CSR was better without question; reasons stated include: "new" ; "it's the best"	Comparison to how the system operated relative to old systems in place.	Using the BIS involved a substantially different interface than past systems. In many cases requiring more input.
CSR: training on new sales/service program	Accepted as "a new way to do better"	The opinion was that competition in the industry was considerable and sales program changes / evolutions were an important part of success	Divergence in the community on opinions of customer reaction to BIS/standardized approach to customers v. personal touch	Sales program specifically connected to what functionality the BIS offered
HR: delivering training program for	The HR function related to training IT	The majority of the COP believed the	Relied on learning Consultant (O)	The technology different for some; training

system, BIS	was minimal in the past – evolving to be noteworthy	system to be superior.	training.	program designed by consultants (O)
HR: delivering training on new sales program	Accepted as "a new way to do better"	The majority of the COP believed the system to be excellent – it was in part designed by HR	Unified opinion on the value of the program	Sales program specifically connected to what functionality the BIS offered
Executives: introduction of the new system, BIS	Designed/Believed to be a way to do better	Technology, and specifically the BIS is perceived to improve business	Unified opinion on the value of the program	Minimal engagement with the material aspects of technology
IB: training and implementing the new system	Split amongst group, many perceived the system to be a non-event, others believed it to be a detriment	The service to the customer must supercede the adherence to a "tool"	"Justifiable" circumventing and use of other systems to supplement was enacted	The materiality of the BIS was held up rhetorically as evidence of its limitations, "the BIS can't do X as well as…"
CSR: Extraordinary Item Transaction (EIT): processing and irregular transaction	Split between recognizing the system as more cumbersome, and familiar	The EIT process was imagined as one in which customers needed to be served as quickly and effectively as	Adaptations were argued as better for the customer, improved speed, circumvented controls	In cases where adaptations emerged, material knowledge was necessary in 1.) knowing how to by-pass control features; 2.) how to supplement additional work to compensate for BIS by-pass
RBM: EIT processing and irregular transaction	Split between recognizing the system as more cumbersome, and familiar	possible to decrease disruption to ordinary business.	Adaptations were argued as better for the customer, improved speed, circumvented controls	
CAU: EIT: processing and irregular transaction	Source of increase in quality, organization and quantity of information: good	Technology, and specifically the BIS is perceived to improve business	Unified opinion on the value of the program	Material knowledge of technology was argued to provided more efficient and effective monitor of

				work processes
CSR: new account information: resolving questions of how much of the form to fill out.	The process was new to all; varying degrees of acceptance relative to past practice	Although volume varied, the perception was: there are things the bank needs to know, and things it does not "need"	Various enactments that revolved around what was the required minimum	The material knowledge of the technology was important to know which information components could be avoided, and which not.
CAU: new account information: data reliability	New procedures assumed to be improvement as a source of more reliable and complete data	Legal requirements need to be met	Engagement was limited to review of minimum requirements	Engagement was limited to review of minimum requirements
MKT: new account information: data reliability	Initially, as a new procedure, it as assumed to be a benefit (more data), however, soon data was found to be unreliable	Customer information was important, the more of it there was the better the performance of the marketing department would be; technology helps in collection and use.	Over time – knowledge emerged that information was not reliable, initially questions were leveled at technology, later at points of data entry	Important in order to recognize the deficiencies in the data, not initially recognized.
MKT: acquiring demographics and marketing data	New procedures were created to compensate for technology, (re)creating previous practices in department	Customer information was important, the more of it there was the better the performance of the marketing department would be	New procedures were created to compensate for technology, (re)creating previous practices in department	Important in order to know what aspects of system to recreate using alternate processes
CSR: audit and assurance: increasing	New procedures assumed to be improvement as a	Legal requirements need to be met, process was sacrosanct	Some processes were perceived to be cumbersome, but no	Followed the BIS inscribed design

complexity of work	source of more reliable and complete data		alteration were discussed	
RBM: audit and assurance: increasing complexity of work	New procedures assumed to be improvement as a source of more reliable and complete data	Legal requirements need to be met, process was sacrosanct	Some processes were perceived to be cumbersome, but no alteration were discussed	Followed the BIS inscribed design
CAU: audit and assurance: BIS design	New procedures assumed to be improvement as a source of more reliable and complete data	Legal requirements need to be met, process was sacrosanct	Engagement was focused on reviewing outputs of other departments	Engagement was focused on reviewing outputs of other departments
Executive: audit and assurance: BIS design	New procedures assumed to be improvement as a source of more reliable and complete data	Legal requirements need to be met, process was sacrosanct	Engagement was focused on reviewing outputs of other departments	Engagement was focused on reviewing outputs of other departments
IB: use of the CARS for customer monitoring	The BIS presented inadequate functionality	The banking system should provide seamless and unobtrusive monitoring	Engagement with the technology was a balancing act between satisfying needs of one system (BIS) while working off another system (CARS)	Material Knowledge of the BIS and the CARS system was necessary in order to create a hybrid series of work practices that satisfied the needs of both departments.
IB: Use of the CARS for transactions	The BIS presented inadequate functionality	Alteration was justifiable to improve service		
CAU: Loan approval process	New procedures assumed to be improvement as a	Legal requirements need to be met; firmer controls had to be	Engagement was focused on reviewing outputs of other	Engagement was focused on reviewing outputs of other departments

	Identity-Regulation (IR)	Identity-Work (IW)	Participation	Implications
	source of more reliable and complete data	established	departments	
RBM: Loan Approval Process	Split between regions in which the standardization created new limits, and cases in which no substantive difference was experienced (9/15 stated experiencing "inconvenience")	Processes should be reflective of unique circumstances of a diverse organization		Material was knowledge was necessary in order to establish how work processes might be circumvented to ensure apparent compliance
Executive: Loan Approval Process	New procedures assumed to be improvement as a source of more reliable and complete data	Legal requirements need to be met; firmer controls had to be established; standardization across the company is a strategic benefit	Engagement was focused on reviewing outputs of other departments	Engagement was focused on reviewing outputs of other departments

Appendix D (Part B): Data Analysis Summary

Description	Identity-Regulation (IR)	Identity-Work (IW)	Participation: Full Peripheral, Marginal, Contingent, Journey	Implications
CSR: training on the new information system, BIS	Adherence to some new work procedures	Trying to recreate old work practices for some transactions	Peripheral / Marginal	The training sessions proved to be a period of experimentation as to the degree of alteration the BIS could withstand /
CSR: training on new sales/service program	The Natbank ideals of customer service	Maintaining or improving standards of customer service	Peripheral	

		customer care		could permit
HR: delivering training program for system, BIS	Upholding the executive mandate for standardization, efficiency and customer care	Enacted training programs in the traditional format of THE disseminator of policy and practice at the bank	Journeymen	The HR division relied on outside consultants for the training program design, minimizing their own engagement with the system
HR: delivering training on new sales program	Upholding the executive mandate for standardization, efficiency and customer care		Full	
Executives: introduction of the new system, BIS	Acted in accordance with the goal of Natbank as the / a premier bank in service, products and technology	Acted in accordance with the goal of Natbank as the / a premier bank in service, products and technology	Full / Marginal	Technically speaking, the executive administrators were not engaged with the functionality of the system, and participated only marginally. In terms of organizational mandate and policy construction to use the system, they were full participants of the community
IB: training and implementing the new system	Pressure was applied to the IB division to comply with the new standard operating procedure of the organization.	Asserted the need to alter the BIS / Natbank standards to uphold the continued success of the division	Full / Contingent	(re)created practices within their own network to include BIS only contingently with their own designed mode of operation
CSR: Extraordinary Item Transaction	Upholding the Natbank mandate for	Asserted that practices were cumbersome and	Peripheral / Contingent	Alternate practices were designed in some

(EIT): processing and irregular transaction RBM: EIT processing and irregular transaction	standardization, efficiency and customer care contrary to ready service for customers – an ideal of Natbank employees	Full / Contingent	instances that upheld the idealized identity of a portion of Natbank RBM and CSR. The practices were eventually quashed by executive admin for stated reasons of control and assurance
CAU: EIT: processing and irregular transaction	The BIS inscribed practices allowed the enactment of CAU ideals for assurance and control	Full / Marginal	CAU was unaware of the invisible work generated in the creation of alternate practice
CSR: new account information: resolving questions of how much of the form to fill out.	Upholding the Natbank mandate for standardization, efficiency and customer care Asserted that practices were cumbersome and contrary to ready service for customers – an ideal of Natbank employees	Peripheral / Contingent	The CSR enacted differing practices, not consistently entering forms of data
CAU: new account information: data reliability	The BIS inscribed practices allowed the enactment of CAU ideals for assurance and control	Peripheral / Marginal	CAU was pleased with the data generated for their internal function (legal reporting)
MKT: new account information: data reliability	Data was sought to generate robust opportunities for analysis and marketing programs, thought to have the potential to dramatically improve	Full	The marketing department, while pleased the design of the program, found that in practice data was unreliable.

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		past programs		
MKT: acquiring demographics and marketing data	Pressure was felt to meet the marketing department goals and foster growth for the bank		Contingent	New methods of marketing data collection and analysis were created. This resulted in redundant systems and inefficient uses of reosurces
CSR: audit and assurance: increasing complexity of work	Upholding the Natbank mandate for standardization, efficiency and customer care. However, most important was the ideal of security and reliable assurance	The ideal of Natbank (and employees) as a risk-averse, secure and organization with effective control and assurance	Peripheral	The BIS was enacted as designed
RBM: audit and assurance: increasing complexity of work			Full (in branch) & Peripheral (in wider organization)	
CAU: audit and assurance: BIS design			Full	
Executive: audit and assurance: BIS design			Full	
IB: use of the CARS for customer monitoring	Upholding the Natbank mandate for standardization, efficiency and customer care	The BIS procedures were not complimentary to work practices in the division. Thus, the argument was made that adaptation / augmentation had to be completed or the division would falter	Full / Contingent	Work practices with the BIS were altered, most extensively, the CARS system was maintained as a standard operating technology; work was initiated to integrate the CARS into the BIS system.
IB: Use of the CARS for transactions			Full / Contingent	
CAU: Loan approval process	Upholding the Natbank mandate for standardization,	Effective methods of standardization and control would be	Journeymen / Marginal	The CAU was satisfied with the information the BIS provided, and were

efficiency and customer care	enacted		unaware of work-arounds. Some awareness was burgeoning at the time of study as multiple loans were being attributed to single individuals with great frequency
RBM: Loan Approval Process	The system was cumbersome and not responsive to context – jeopardized the reputation and success of Natbank (and individuals)	Full / Contingent	Created work-arounds such as loan-splitting to circumvent policies and established parameters of BIS
Executive: Loan Approval Process	Effective methods of standardization and control would be enacted	Full (organization) & Marginal (loan approval process)	Happy with initial reports, though at the time this study was concluding, some awareness of work-arounds was emerging

CHAPTER 4: CONSTITUTING INSTITUTIONAL PRACTICE

ABSTRACT

This paper discusses the concepts contained in communities of practice theory (COPT) and how they might contribute to greater understanding of the management of information systems in organizations. The paper draws upon COPT as a approach to broaden the perspective of institutional theory and provide insight into the processes surrounding information system related organizational change and the deployment and management of information systems.

INTRODUCTION

Organizational change, particularly in those contexts in which information systems are instituted as the method and rationale for change, are often treated as pragmatic or practical processes and programs that foster improvement (Tsoukas & Chia, 2002). However, as Barrett, Grant & Wailes (2006) point out, both academic investigation and experience in industry suggest the consequences of such programs are "significant, widespread, and often unanticipated" (7), and do not always achieve the planned successes for which they were intended.

In a seminal article reflecting on organizational change and technology, Orlikowski & Barley (2001) argue it is necessary to acknowledge, "the role of human agency in the process of technological change" (148), while at the same time recognize the material constraints that exist embedded in, and with, any technology. The authors advocate a

departure from technologically deterministic views that suggest the form and fashion of such change is dictated by technology, yet assert that "human action is dependant on material matters" (Orlikowski, 2006, 460). Orlikowski (*ibid*) further argues the importance of attending to the individual practices that are the expression of agency, and how those practices are durable across contexts.

To that end, this paper seeks to develop an analytic perspective based on a synthesis of institutional theory and communities of practice theory (COPT), to foster a richer examination of the practices at the level of the individual and the interactions and relations that occur between individuals, communities, and institutions. Communities of practice theory is based on the notion of situated learning and action, and reflects the dynamics of relations of power within and between communities of individuals. The ability for communities to influence one another and shift their collective practices and values is posited as a mechanism of organizational change. This paper will proceed with a brief review of the literature focused on organizational change and information systems; a presentation of the concepts and recent work in the extant literature based on both COPT and institutional theory, and the integration of concepts of these perspectives; and, concludes with a discussion of the implications for understanding organizational change in the context of information systems.

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ORGANIZING CHANGE

Change occurs not only in the planned processes that organizations invoke to consciously

alter themselves, but also instances that are "unplanned and [that] go on largely behind

the backs of those that wish to influence it." (DiMaggio & Powell, 1983, 157).

Additionally, the consequences of change, while sometimes successful and predictable,

often result in equivocal degrees of success and generate unintended outcomes that are

sometimes in addition to, and sometimes in place of, planned ones (Barrett *et al*, 2006;

Orlikowski & Barley, 2001).

The shift during the mid 1980's from the predominant perspective (e.g., Hickson, Pugh,

& Pheysey, 1969; Child 1972) of information system related organizational change as a

technological deterministic view relying on a "mechanistic depiction of the organization"

(Barrett *et al*, 2006, 7), to one that defines change as more complex and emergent (e.g.,

Markus & Robey, 1988; Orlikowski & Hofman, 1997) is reliant on the notion of change

as a *process*. These studies focus on the nature of agency shaping the form and use of

technology, as well as the implications for the larger context of the organization. In such

conceptions, agency is articulated as reciprocally constituted by, and constitutive of,

structure. For example, Barley's (1986) study of the use of X-ray technology in a hospital

discusses how technology use unfolds and is implicated in the structuring of radiology

departments, which in turn impacts the identity of individuals working in the department.

This trajectory of research focusing on the technology related change continues with

studies that address the embodiment of structures within information systems (e.g.,

Orlikowski, 1992); the appropriation of information systems in unexpected fashions and

the emergence of new structures (e.g., DeSanctis & Poole, 1994); the impact of practice

on work procedures (e.g., Oakes, Townley & Coopers, 1998); and, the forms of utility of

technology and the emergence of organizational forms (e.g., Orlikowski, 2000)[9].

Hanseth & Monteiro (1996) caution that the focus on agency implicitly diminishes the

consideration of the materiality of technology (see also: Orlikowski & Iacono, 2001).

Orlikowski & Barley (2001; see also: Pickering, 1995) argue the need for a perspective

that recognizes the potency of individual action but also the restrictions and affordances

of information systems and technology. In other words, attention must be paid to "the

specific nature of the IT artifact and its functionality" (Barrett *et al*, 2006, 14).

Re-inserting Materiality

A variety of approaches have emerged in order to meet the challenge of attending to the

dual focus of materiality and agency. Empirical examinations of IS related change and

the implications of material limitations in the design process are addressed in a study of

the London Insurance Market (Barrett & Walsham, 1999); and, in a study of change

during a contentious IS deployment (Harrison & Laberge, 2001). These studies, among

others, have attempted to incorporate multi-level analyses of individual and organizations

alongside material considerations to offer explanations for the unfolding processes of

organizational change (see also: e.g., Pozzebon & Pinnsoneault, 2005; Rolland &

Monteiro, 2002; Rolland, 2001). These studies have provided rich insights into discourses

of organizational politics and power, negotiation of stakeholder interests and the impact

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[9] For a more complete discussion, see Orlikowski, W. J. & Barley, S. R.(2001). "Technology and Institutions: What Can Research on Information Technology and Research on Organizations Learn from

of material constraints. However, Tsoukas & Chia (2002) argue the majority of studies fail to examine microscopic change, which "is subtle, agglomerative, often subterranean, heterogeneous, and often surprising. It spreads like a drop of oil. Microscopic change takes place by adaptation, variation, restless expansion, and opportunistic conquests. Microscopic change reflects the actual becoming of things" (580).

In an effort to focus on individual practice, and the impact of materiality, Walsham & Sahay (1999) focus on individual situated practice in a study framed in actor-network theory, examining the impact of identity and the situated nature of use, in relation to functionality of a Western-designed technology in a GIS deployment in India. Similarly, Heracleous & Barrett (2001) discuss individual modifications of perception and action as the environmental context shifts in the wake of the deployment of a new information system. Closer attention to individual practice is also found in Schultze & Orlikowski's (2004) study of Internet self-serve technologies, in which sales representatives' individual micro-level actions are metered by the macro-social impact of a technology shift. Although these studies were conducted in dissimilar settings with divergent theoretical perspectives similar discussions emerged – the impact of individual action and the motivation/genesis of that action can destabilize the deployment of purportedly effective technology solutions. The conclusions of these studies reinforce Tsoukas & Chia's (2002) assertion of the importance of addressing the microscopic, and the notion that "small" individual perceptions and actions have widespread impacts.

Each Other?" MIS Quarterly 25(2): 145-165.

While not directly addressing the concept of an individual's sense of identity, Ciborra

(2001) suggests the understanding of situated action cannot be understood in terms of

individual cognition alone, but also in terms of emotion, feeling, and affect. In other

words, an individual's feelings toward *how and why* a technology might be enacted in use

is as important as the cognitive assessment of how to enact that use. As a singular

example, Heracleous & Barrett (2001) attempt an analysis of the "deep structure" of the

actions of traders in the London Insurance Market in an effort to examine how

"widespread ways of thinking about technology and practice within social systems

become part of the social reality of those systems" (Heracleous, 2004, 178). Fineman

(2003) echoes the importance of this broader perspective addressing *affect*, and suggests

explorations of the formation and constitution of individual identity is only thinly

examined in present literature.

Institutional theory, adopting a perspective of "a broad form of institutions that ranges

from formal institutional structures... to cognitive structures like norms and values"

(Barrett *et al*, 2006, 10) has been used fruitfully in examining change related to

technology. For example, Avgerou (2000) in a study of Pemex, a Mexican oil company,

argues the impact of identity, alongside the institutionalization of IT itself, is a material

aspect in how organizational change unfolds. Orlikowski & Barley (2001; see also Barley

& Tolbert, 1997) have further argued institutional theory provides a framework through

which agency - the individual's rationale for past decisions, current perceptions and

future actions - can be explored. In other words, the examination of institutional forms

which are a function and component of past decisions, "engender a way of doing things."

(Barrett *et al*, 2006, 10). However, while institutional theory is a powerful method of examining the durability of perceptions, meanings and values over time; critics point out that if past decisions determine future actions, to what extent is change possible? Additionally, Bridgman & Willmott (2006) argue that institutional theory's distance from practice and "disdain, if not phobia, of technology" creates the potential for a further discounting, rather than a re-insertion of materiality into contemporary analyses.

In summary, small organizational change in the context of the information systems academy has been examined through a variety of approaches, with a diverse set of conclusions and recommendations (Barrett, Grant & Wailes, 2006). Orlikowski & Yates (2006) suggest a fruitful direction for inquiry in deepening our understanding of information systems and organizational change is a pragmatic focus on the materiality of technology and the actual practices in which people engage technology. The authors charge that many existing perspectives too easily devolve into a deterministic account of technology or a highly particularized analysis of situated action that pays too little attention to the broader ecology of the context; e.g., history, motivations, values (see also; Ciborra, 2001; Bridgman & Willmott, 2006) and argue for attention to the *why* of enacted practice not merely the *how*. What is required is an approach to examine practice in light of the constraints or facilitations of identity and materiality, in such a way as to understand how and why practice is manifest, and has a durable impact on the structures of the organization.

COMMUNITIES OF PRACTICE

Communities of Practice Theory (COPT) was introduced by Lave & Wenger (1991) as

an approach to examine how learning occurs. The authors focus on the situated nature of

learning, suggesting that the process of learning is related to the emergent action of

groups of people in social environments. Further, these groups of individuals are

collected together in pursuit of a common purpose. Lave & Wenger (1991) cite five

examples including supermarket butchers and midwives in the Yucatec as a method to

articulate the theoretical propositions of COPT.

In examining communities of practice the focus is on the process of how new entrants to

the community (apprentices), proceed through stages of advancement becoming young

masters (journeymen) and senior members of the community (masters) (Lave & Wenger,

1991). The process, which the authors define as legitimate peripheral participation,

occurs as apprentices, from the beginning of their time in the organization, contribute by

performing simple, and highly supervised tasks. Thus, newcomers are instantly part of

the community as functioning contributing members. As apprentices gain greater

experience and mastery they move away from the periphery to places and positions of

seniority. However, the authors are careful to mention that mastery does not only refer to

the skills that are specific to the organization; but also the less formal forms of social

behavior that is consistent with the community.

One particular case examined by Lave & Wenger (1991), that of US navy quartermasters where training is centered on the successful navigation and piloting of vessels, has particular resonance in organizational studies. As Fox (2000) points out, the example is analogous to the operation of information systems. He argues the operation is based on the collection, analysis and output of information required in the ongoing functioning of an organization. Operation must be continuous - at times it may be a simplified routinized set of tasks that can be accomplished by one individual, yet at other times (when entering or leaving a port, for example) the job is complex to the degree that several quartermasters must work in concert to complete the task. In either case, data and information is collected, analyzed, communicated and acted upon.

Learning the responsibilities and skills of a quartermaster involves working in apprentice level positions for the better part of a year; with increased levels of mastery leading to more complex responsibilities. The simpler tasks include taking depth soundings and other positional readings, and the more complex operations are composed of integrating sets of information from instruments and colleagues to provide guidance in the steerage of the ship. Thus, a crucial aspect of communities of practice theory (COPT) is the apprentice's progress through learning in the process of everyday (work) life. This serves as a way to pass on important skills. However, in order to communicate it is also necessary to have learned the social elements of the community, such as values and social norms, to be able to walk in the world with members of the community – to walk the walk, and talk the talk. In such a fashion the evolution of individual identity is influenced

by the work and practice in which people engage, as well as the social environment(s) in which they engage it.

Communities engage in the material "tools and technologies" associated with their practice – the depth sounder for the quartermasters or the procedures of the mid-wife. Peripheral and central participation is focused around how those tools are enacted into the practice of the community. As new tools are engaged, they are interpreted within the framework of past experience - for what have various technologies been used, and how have they been appropriated. Brown & Duguid (1991) extend the theoretical tenets of COPT, arguing that communities should be viewed as communities of communities. Apprentices are taken up by these multiple communities and trained in their practices and socially (re)produce the community as they become legitimate peripheral participants. However, these individuals may come with new frames of reference from past communities of which they were a part, or may have an individual identity and frame of reference constituted from multiple communities within which they may participate (Brown & Duguid, 2001; 1991). As these multiple community experiences come together in interpretation and practice, Brown & Duguid (1991) argue one of the principle mechanisms for change emerges.

Within the context of information systems, a simplified example might be found by examining the deployment of enterprise wide information systems (EIS). One broadly defined community with particular sets of practices would be the organization as whole, with respect to the operation of the EIS. However, within this community there might be

several different units of an organization that use the EIS that are distinct from one another, for example, IT, production, marketing and human resource departments. These groups are also communities, and have sets of practices consistent with their own position in the organization and orientation to how they might engage the EIS. The sets of practices that emerge and the communities that exist and evolve in the organization may be quite different from one another. Further, such communities commonly interact with one another, influence one another, and compete for legitimacy and resources (Brown & Duguid, 2001).

As a result of the shifts in positions of legitimacy of communities and the (re)allocation of resources, "communities of practice face a changing environment, and as a result are 'caught in a dilemma'" (Fox, 2000, 856). The dilemma revolves around how the community of practice will unfold. In other words, will multiple communities of user groups of a given technology compete for the ultimate definition of how a technology might be enacted, or will new taken-for granted assumptions become institutionalized as formerly peripheral members of a community become central? In the process of the formation of a social order such as a community of practice, Wagner & Newell (2006) argue it is not necessary that mutual satisfaction be achieved between group members, only that some form of common understanding be established. This understanding might include the establishment of a single use of an information system, but it may also include informal allowance for deviations.

Lave & Wenger (1991) suggest that the power differential in COPT is a triadic relationship (apprentice, journeymen & master), rather than the simple dyadic relationship of teacher-student. Power conflicts that erupt often do so as a result of competition for resources and alterations of work practices (Brown & Duguid, 1991; Brown, 1998; Fox, 2000). These conflicts can come in the form of old ways of working being torn down in favor of new ways (or old practices successfully rebuffing new approaches), where what may be important to one community or group within a community may be unimportant to the next. Allegiances between masters, and journeymen, and younger members of the community are crucial as different individuals may compete to lead the community to a 'new' future. Newcomers are required to engage in existing practice in order to become a member of the community. They must understand its history and its present, and how it has come to be. However, they are also confronted with shaping what the identity of the community will be in the future, and what their role in the community will be. Lave & Wenger (1991) address these notions as continuity and displacement, and analyze the unfolding organizational changes as functions of the ability for individuals within the group to influence sufficient numbers of members to maintain the continuity of practice, or displace that which was with that which is.

As Fox (2000; see also Brown & Duguid, 2001) points out, examining an organization as a community of communities of practice rather than through an amorphous and hard to identify concept such as corporate culture allows a greater emphasis on practice - what it is that people actually do (see also: Suchman, 2000). Additional insight can be gleaned in

the analytical examination of canonical or non-canonical communities (Brown & Duguid, 1991); that is, formal or informal communities. They suggest that non-canonical communities are perhaps more important than formal communities, as they: traverse intra- and inter- organizational boundaries; sometimes include customers and suppliers; and, are often based on common values and interests.

Communities of Practice: recent explorations

The extant literature demonstrates a number of different trajectories in which COPT has been developed in the effort to understand phenomena in the context of the management of organizations (see Table 4-1). Not surprisingly, given the focus on situated learning, numerous studies focus on COPT as an approach to understand learning in organizations (e.g., Carlile, 2002). In this specific orientation of COPT toward the examination of the transfer of information and knowledge, Pan & Leidner (2003) explore an organization's knowledge management / global information sharing strategy, detailing the emergence of virtual communities of practice, suggesting the flexibility and diversity of communities may aid in fostering successful knowledge management strategies.

In addition to studies that explicitly focus on learning, COPT has provided a robust lens for the examination of practice in organizations. Orr's (1996) study of Xerox repair technicians focuses on the situated practice of individuals and the reification of practices within communities. Contu & Willmott (2003) creatively re-analyze the interactions of individuals from Orr's (1996) study to focus on relations of power as constitutional forces in the emergence of certain practices in the hierarchy of the organization.

Table 4-1: COPT in the extant literature: a selected bibliography	
Citation	*Theme of contribution*
Lave & Wenger (1991); Wenger (1998)	Studies of diverse cases including navy quartermasters, mid-wives, tailors, butchers, and alcoholics (the former); and, an insurance office (the latter) are the basis for the development of communities of practice theory and the dynamics of operation within communities.
Brown & Duguid (1991; 1998; 2001)	A focus on interactions within and between communities of practice, with a particular focus on knowledge and information. The authors focus on the emergence of practice within communities and the influence exerted from within communities, an additionally between communities of practice (canonical and non-canonical groups).
Wenger (2000); Wenger & Snyder (2000); Wenger et al (2002)	The formation of identity and the resilience of COP as supplementary and alternative forms of organization.
Lesser & Storck (2001); Swan et al (2002)	Communities of practice are examined in terms of organizational forms within larger organizations that facilitate control, performance and add value. COP are viewed as "structuring" entities.
Carlile (2002); Pan & Leidner (2003); Blackler (1995)	The reciprocal (re)constitution of knowledge, power expressed in practice within communities; and the emergent/situated nature of practice is examined in a variety of case studies.
Orr (1996); Barley & Orr (1997)	Examining aspects contemporary modes of work argues an increasing "technization" of modes of knowledge and thought – "skills and judgment are contextually situated, and formal knowledge is at best, a small portion of enabling individuals to confront ambiguity" Barley & Orr (1997, 16)
Fox (2000); Blackler & MacDonald (2000); Yanow (2004)	Focusing on modes of practice; interaction, identity formation, forms recognition; and sympathetic theoretical perspectives such as actor-network theory (Fox, 2000) to enhance understanding of power.
Swan, Scarbrough & Robertson, (2002); Pan & Scarbrough (1999); Scarbrough & Swan (2001); Swan & Scarbrough (2001); Gherardi, Niccolini & Odella (1998)	Communities of practice are examined the context of vehicles for the dissemination and expression of knowledge; forms and fashions of learning in organizations; and, the diffusion (and resulting acceptance, adaptation or resistance) of innovations.
Storck & Hill (2000); Jarvenpaa & Tanriverdi (2003); Pan & Leidner (2003)	These studies stipulate communities of practice as possessing boundary spanning or boundary crossing capabilities.

The concept of "power" is an avenue that has been explored in a number of contexts within COPT, including examinations of external and internal influence (Coopey & Burgoyne, 2000), the expression of identity and mastery with respect to learning and practice (Blackler & MacDonald, 2000), and the contrast of expert versus local knowledge in the context of power relations (Yanow, 2004). Across these studies, common themes include the formation of identity and the declaration of legitimate knowledge and practice, or at least the struggle for such declaration. In such a fashion, multi-level explorations discuss how individual action impacts the community and organizational forms.

Understanding the emergence of organizational forms themselves has additionally been a focus of COPT. Teigland (2000) discuss the importance of the Internet in the establishment of communities, in some cases consisting of individuals who have never met face-to-face. Wenger, Dermott & Snyder (2002) extend the idea of the non-proximate community in an expansive study of wide-ranging organizations, including Shell Oil and McKinsey & Co., and discuss the concept of communities forming and evolving in geographically dispersed forms – often in a global context. Conclusions drawn from this trajectory of work suggest relatable and relational proximity is more important than geographic proximity (Amin, 2002; Coe & Bunnell, 2003). However, Thomspon (2005) points out community structure and long-term integrity is metered by factors of scale, purpose, and perceived value. The concept of "temporary communities," or groups that cease to exist after a given period of time or following the completion of

task has been explored by Lindkvist (2005), who argues that temporality is not a fatal flaw, in fact this added flexibility of the notion of communities may make COPT a more robust analytic tool in seeking understanding of how organizations function.

Despite its robust usage in the management literature, among other disciplines, COPT is not without criticism. Drawing on notions from actor-network theory (ANT), Fox (2000), as discussed elsewhere in this essay, provides a careful analysis of COPT, suggesting in relations of power that COPT's ability to examine practice over time is limited. Roberts (2000), in a parallel argument suggests that COPT does attend to notions of trust and value beyond a superficial level of interactions between the learning triad. Mutch (2003) extends these critiques, arguing in an explicitly Bourdieuan (v. Bourdieu, 1977) approach that the unconscious modes of thought and senses of value and meaning, especially those durable over time, require further examination.

With reference to the Brown & Duguid's (1991) discussion of non-canonical communities, Hildreth (2004) questions the legitimacy of COPT as a lens to understand organizations, suggesting COP are too self-directed and too self-motivated. This contrasts with Saint-Onge & Wallace's (2003) assertion of COP as an ideal tactic for "strategy directed organizational design." Roberts (2006) joins a renewed interest in COPT, which she argues is due, in part, to the robust critique through which the perspective has passed in recent years. She further suggests COPT offers much potential, but at the same time requires further theoretical exploration to examine concepts of practice, the maintenance of meaning and value (e.g., Contu & Willmott, 2003), identity, and the formation of

identity from the point of entry to the point of mastery within and between communities (Handley, Sturdy, Fincham & Clark, 2003).

In summary, the focus of COPT on the active and situated practices within an organization provides a powerful lens in the analysis of present and evolving practice. However, the durability of organizational practices across time and context, in situations where the master-journeyman-apprentice relationship does not exist is not thoroughly examined, an aspect of theory to which this thesis will contribute. The transmission and development of knowledge, perceptions and values occurs *in situ* through active social interaction in which an individual acts as an active disseminator of the values of the community. In the absence of active interaction and instruction, examination of the formation and changes of perceptions and values is weakly addressed (Swan, 2007). However, institutional theory provides a strong theoretical foundation for the examination of durable social structures, and augmented by COPT offers the possibility of unfolding the practices involved in the (re)production of those same social structures.

INSTITUTIONAL THEORY AND IS-RELATED ORGANIZATIONAL CHANGE

Scott (1987) identifies the influence of Berger & Luckman's (1967) concept of *reciprocal typification* or, "the development of shared definitions or meanings that are linked to behaviors" (Tolbert & Zucker, 1996, 180) as important in the development of institutional theory. Zilber (2002) articulates these concepts in the context of organizational studies as, "institutions are procedures, practices, and their accompanied shared meanings, as perceived by members of an organization. Institutions come about as

a result of social interaction between actors." (234). Further, institutional theory takes the position that organizational structures and practices are taken up through normative inducement. These normative influences may come in the form of the initial imprinting or through isomorphic (imitative) pressures. Organizations adapt to environmental pressure and adopt socially legitimized structures and practices (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Scott, 1987; 2001). It is the taken for granted nature of congealed practices that is the essence of the power of these institutions, in that, as something is taken for granted it is something that is no longer questioned, and the institutional course of action is deemed to be "obvious." Table 4-2 provides an overview of existing research in the management literature, grounded in the perspective of institutional theory.

An emergent trend in institutional theory in recent years has been on the resilience of institutional norms, and how change occurs in institutions that are embedded within these norms. Mazza & Pedersen (2004) suggest this focus has been on an area which institutional theory is least familiar yet at the same time offers the most promise – the multi-level analysis between individuals and organizational fields (see also: Dacin, Goldstein & Scott, 2002). Thornton (2004) conducts such an analysis in a study of the publishing industry, suggesting that the formation of identities of members and constituent communities is an influential component of how the seemingly paradoxical notion of endogenous change from within a mature institutional field might occur (see also: Seo & Creed, 2002). Rao, Monin & Durand (2003), in a similarly themed study, argue the power of communities in establishing their own boundaries as impetus for change – both within the community and how the community is perceived externally.

Table 4-2: Institutional theory in the extant literature: a selected bibliography	
Citation	*Theme of contribution*
Scott (1987; 2000) Meyer & Rowan (1977); Meyer, Scott & Deal (1981); Meyer & Scott (1983)	These contributions, among others, articulate the central themes of institutional theory such as normative influence, temporal durability of unquestioned "ways of doing things" and the impact of ritual and myth.
DiMaggio (1983; 1988) & DiMaggio & Powell (1983)	Extending the concepts of institutional theory these papers discuss the seemingly contradictory concept of agency in the embedded context of institutions (*v.* Seo & Creed, 2002) and the manifestation of power and influence in the (re)constitution of institutions.
Bowker & Starr (1999; 1994); Starr (1982)	In the context of health care management in organizations and in the codification of illness the authors discuss the impact of technology on the structuring of institutions, and the reification of information as unquestioned.
Tolbert & Zucker (1983); Barley & Tolbert (1997); Zucker (1987); Greenwood & Suddaby (2006)	The process of institutionalization in organizations is not "one-way" – contributing to the congealing of organizational forms. The authors argue, through various conceptions of action and agency, institutionalization is also an opportunity to initiate change.
Phillips & Zuckerman (2001); Podolny (1993); Malerba & Orsenigo (1996)	These studies argue as organizational fields become mature, that increasing degrees of stratification based on reputation or size will emerge, and in turn will confer increasing ability to extend influence.
Hoffman (1999); Clemens & Cook (1999)	Argue that although fields may mature, their logics are not irreparably "frozen". These logics can be unfrozen by exogenous "jolts" (Clemens & Cook, 1999, 460) and will destabilize existing patterns of force and influence.
Davis, Deikmann & Tinsely (1994); Fox, Boal & Hunt, 1998); Lawrence, Hardy & Phillips (2002); Ruef & Scott (1998)	Exogenous factors that create upheaval sufficient to allow for change and the reformation of institutional forms and organizational fields include: social disorder, regulatory changes, new market entrants, changing demographics, and technological advances.
Boxenbaum & Battilana (2004); Greenwood & Suddaby (2006)	Internal forces such as, forms of entrepreneurial behavior can affect change in organizational fields.
Kratz, (1998); North (1990)	Institutionalized practices can foster adverse conditions for organizations if individuals are unable to detect environmental shifts and cannot perceive new opportunities for learning in the market, or are not aware of market expectations.
Ingram (1998); Salancik, Copay, King (1991)	Institutionalized practices may restrict organizational flexibility by commitments to prevailing arrangements of the institution, causing individuals to be unable to perceive action beyond a set "recipe" (Porac & Thomas, 1990).

Greenwood & Suddaby (2006) extend the investigation of endogenous change in a study of institutional entrepreneurship in large accounting firms. The authors articulate an examination of meaning associated with practice and behavior as a way to understand change in the organizational field and among stable, routinized organizational forms. However, the examination of individual action in the adoption and continuance of practices is often seen as a merely reactive element in the process of change (Seo & Creed, 2002), and the impact aspects of agency and identity remain unclear.

In an effort to examine motivation and the impact of influence throughout an organization, Swan & Scarborough (2005) adapt institutional theory in the examination of politics thwarting versus supporting organizational innovations, and their diffusion. In an examination based on three case studies the authors suggest that inter-network relationships and the relationship between power and knowledge or accomplishment is a cornerstone in understanding how innovations are supported or challenged. This perspective on institutional theory provides a powerful insight into the deployment of power within an organization, and highlights the interaction and influence that exists between organizational fields. Such insight also engenders the questions such as, what are the mechanisms of interaction between organizational networks, and how does practice in one context transfer to another?

The ability for multiple communities or networks to cooperate and coordinate is argued to be effective in supporting change that is metered through technology transfer and innovation (Jain & George, 2007) and in the development of new organizational

strategies – both long-term and short-term (Lawrence, Hardy & Phillips, 2002). Laihonen (2005) argues that knowledge flow, in the context of innovation, is an apt construct for understanding the transition and impact of innovations and technology transfer between organizational communities and networks. These perspectives rely on a focus at the organizational level to draw conclusions of knowledge flow, and the impact it might have on the organization. However, fine-grained changes in practice are left scantly discussed, leaving an understanding of how innovation and technology transfer crosses context unknown. Seemingly successful organizational change and adoption can only be discussed at the aggregated level of the organizational unit. Thus, the actual *working* of new organizational form remains a black box, in which the practice of how work is accomplished remains a mystery. To rectify this, Geels & Schot (2007; see also Greenwood & Suddaby, 2006) stress more attention needs to be paid to individual action: the interpretation of meaning and the emergence and resilience of practice.

In summary, institutional theory has provided valuable insight into the resilience of organizational forms over time and impact of stable organizational routines, rituals and beliefs. However, the mechanisms of practice manifest in how individual actions become taken for granted "ways of doing things," and how particular myths, meanings and values are taken up, and others fall away, is weakly examined. As noted previously, institutional theory requires greater analytical tools to understand how change is enacted, and how organizations evolve over time, rather than solidify. The contrasting perspective of practice in COPT offers an approach to address the micro-level practices in order to examine *how* practice occurs in organizations, and thereby may shed new light on

institutional examinations. Further, as COPT is a theory of practice and the performance of action, it is well equipped to engage in reflections on the implications of the materiality of information technology; further augmenting institutional theory. The following section will further discuss institutional theory, and draw on extant literature in demonstrating the potential for the theoretical synthesis with COPT.

INSTITUTIONAL THEORY AND COPT

Institutional theory approaches social interaction and social construction at a macro-social level of action. In other words, institutional theory operates from a perspective focusing on how the coercive pressures of competition might prompt isomorphic tendencies in an organization - the strive to fit into a particular mold to acquire resources necessary for survival (Covaleski & Dirsmith, 1988; DiMaggio & Powell, 1983). By contrast, COPT examines interaction of individuals within communities (Lave & Wenger, 1991) and individuals between communities (Brown & Duguid, 1991). Harmony exists between the perspectives of Institutional Theory and COPT in the focus on the construction of normative rules and organizational practices.

Fox (2000, 858) points out that a theoretical difficulty in COPT is its inability "to look at practices which essentially include a temporal element, like action or activity, within a context of wider and relatively stable social structure." The breach occurs in discussions of whether broader historical and societal pressures shape concrete practices, or whether local relations of power shape practices. Thus, the question in handling material and social context becomes: what are the differences between practices shaped by pre-given

assumptions and rules, and those that develop in an emergent fashion? Lave (1993) addresses this issue to some extent arguing that there is not a dualism between the emergent and the pre-given, they exist simultaneously. As Fox (2000) points out, the difference lies in efforts of social inquiry in the analytic approach, summed by his reference to Lave (1993, 21, emphasis: original) as, "exploring how it is that people *live* in history, and how it is that people live in *history.*"

Institutional theory provides such a lens to unfold the temporal element of how an organization, or community, developed over time through an examination of the rules, norms, and taken for granted assumptions that are, and have been, present. Organizational imprinting is "the process by which organizations tend to maintain certain practices over time, that the organization was founded upon" (Carpenter & Feroz, 2001, 566). The continuance of these practices is not a feature of rational choice, but rather a function of the sense that "this is what is done" (Scott, 1991, 85). In terms of COPT, this provides a way to examine the power relations of masters of the community, and how the central practices are upheld.

Lave & Wenger (1991) discuss recovering alcoholics and their attendance at Alcoholics Anonymous meetings. The attendees go through a process of sharing their feelings and memories with the group, and relate these histories to their time before beginning the recovery process and to the "Twelve Steps[10]." The meetings are led by those experienced

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[10] One articulation of the Twelve Steps provided on http://www.alcoholics-anonymous.org/ is as follows: 1. We admitted we were powerless over alcohol--that our lives had become unmanageable; 2.Came to believe that a Power greater than ourselves could restore us to sanity; 3.Made a decision to turn our will and our lives over to the care of God as we understood Him; 4.

in the recovery process, in the hope of leading the group to relating these shared experiences with their own personal ones; and acknowledging the habits and behaviors that were left behind as destructive. The "Twelve Steps" are central to the process, and a sponsor guides each aspirant for recovery through them. While there may be a logical progression to the ability to advance through these steps, and proceed toward recovery, there is likely no magic to the number twelve. It is however, how things have always been done and central to the community of Alcoholics Anonymous is the practice of following these steps. As Handley *et al* (2006) point out, understanding the fashion by which one becomes a member of a community, and the practices taken up are essential to understanding the process of the formation of identity, and the subsequent impact identity will have on perception and action.

As one begins and progresses in their own recovery, the individual becomes more central in the organization or local chapter, providing guidance as a sponsor, or direction as a chapter leader. The acceptance of the imprinted rule, or taken for granted assumption, that the Twelve Steps must be followed (and in sequence) is critical to membership in the community. And the community is a self-reinforcing entity, allowing only those that will continue to follow prescribed practice, and shape practice in a concordant fashion, to advance. Thus, the form and evolution of identity is shaped and rewarded. As Zilber

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Made a searching and fearless moral inventory of ourselves; 5. Admitted to God, to ourselves and to another human being the exact nature of our wrongs; 6. Were entirely ready to have God remove all these defects of character; 7. Humbly asked Him to remove our shortcomings; 8. Made a list of all persons we had harmed, and became willing to make amends to them all; 9. Make direct amends to people, except when doing so would injure them, or others; 10. Continued to take personal inventory and when we were wrong promptly admitted it; 11. Sought through prayer and meditation to improve our conscious contact with God; and, 12. To carry this message to alcoholics, and to practice these principles in all our affairs.

(2002) argues, identity is not only something that is reinforced by the behavior within a community, its very formation sustains and extends the influence of the community – thus reifying certain aspects of an identity, humility for example. It is the mutually reinforcing nature of the ritual and the enactment of concrete practices that is constitutive of structure. In the absence of the myth that the progression through the Twelve-Steps would produce successful resolution, would the steps still be followed?

Consistent with Myers & Rowan (1977) notions of myths, it is arguable that the legend of the senior member of the AA group succeeding in this manner, rather than the actual observance of their trek through the steps, that provides practical motivation to the concrete practice of following the Twelve-Steps. However, it is the practice of the adherence to the Twelve-Steps as concrete action that creates the legend. Practice and myth have a mutually reinforcing relationship. Thus, in contrast to Fox's (2000, 865) perspective that "concrete practices, rather than values, myths, and rituals" [emphasis: added] are valuable in understanding the "texture of the cloth", with respect to organizational structure; it may be that a focus on concrete practices interwoven with concepts of values, myths and rituals provides valuable insight into organizational forms, culture and change.

Meyer & Rowan (1977) suggest that organizational rules and regulations are myths that serve as a form to transmit the knowledge of social structure, and act in the constitution of institutions. In other words, myths become rights of passage – hearing them, believing them, and passing them on, is essential to the continuation of the institution and the

organization. In COPT the idea of the myth is not explored, and is perhaps the missing connection between foci of pre-given practice and emergent practice. Meyer & Rowan (1977) argue it is myths that provide the connection to "what was" and that in turn shape our understanding of how we experience and understand the present context. In other words, situated understanding does not occur in a void: the lens through which individuals experience the present is informed by what they know, what they have experienced and the past they have lived, and what they imagine should be the future (Mead, 1932).

Initially, the implication for information systems and organizational change might suggest that the potency of the organizational myth may serve as a rigid form, which inhibits change. However, an important distinction must be drawn, resolving whether the myth relates to the material aspects of the technology itself, or to the end state. If it is the technology itself, resistance to change may in fact be the implication. If however, the lens through which individuals see their own action is directed at achieving a goal, rather than the particular use of technology it might be that deeply embedded perceptions and frames of reference may instead be a technique to foster adaptation of the technology, as Rolland & Monteiro (2002) found in their study of ship surveyors. In other words, a clear focal lens provides a base upon which an individual might base *how* to alter an information system.

Returning to Lave & Wenger's (1991) example of Alcoholics Anonymous, the persistence of myth-making is used as technique to foster the continuity of the

community's values, behaviors and practices. Stories of how one member may have overcome a challenge, avoided a habitual behavior deemed destructive or otherwise progressed toward recovery are meant as encouragement for others, but also as lessons. Nahapiet & Ghoshal (1998, 253) state "myths, stories and metaphors also provide powerful technique in communities for creating, exchanging and preserving rich sets of meanings." These stories communicate the concrete practices involved in following the prescriptions of the community (e.g., the Twelve Steps, and how they provide benefit to oneself, as an aid to recovery). Additionally they foster aspirant forms or elements of identity, for instance to be an honest and forthright person (Handley *et al*, 2006; Zilber, 2002). Thus, the central myth is retold and recast so that new members not only learn to follow that same path, but to adopt those practices and cast themselves in future stories and lessons. The recasting of the myth is the incorporation of the individual and situated experiences of the individual into these concrete practices. Wenger (1998) suggests the process of how members of the community *become* a particular identity is an important part of legitimate participation. Thus, the story of the recovering alcoholic avoiding temptation at a party through reflection on the twelve steps, told to a novice becomes the story of that novice recovering alcoholic avoiding temptation by recalling the tale of the aforementioned recovering alcoholic.

Examining the transmission of learning from experienced individuals to novices, in light of the concepts of myth and ritual from institutional theory (Meyers & Rowan, 1977), it is possible to examine both the *lived* history (how one adapts to emergent context) and the lived *history* (reference to the established practices) that form the core of the

community of practice. The concrete practices of the community, of which COPT is concerned, are communicated to the novice through myth. This acts as a normative force (Meyers & Rowan, 1977) as the choice to participate in these concrete practices is essential to being part of the community (Lave & Wenger, 1991, Wenger, 1998). Thus, myth and rituals used as method of transmission (Nahapiet & Ghoshal, 1998) of values, and legitimate peripheral participation in concrete practice (Lave & Wenger, 1991) are bound together in the incorporation and the instruction of new members into the community.

Living in History: How does Change Occur?

Brown & Duguid (1991) suggest that communities of practice manifest change as a function of interactions within, among new and old members, and between multiple communities of practice. Fox (2000, 863) has extended this point, suggesting that viewing "organizations as communities of practice, we will find that some communities attempt to enroll or betray the others. This is how coalitions of managers are formed". In other words, as part of the furtherance of their own motivations and visions for the direction of a larger community, of which there might be several sub-communities, these fragmented units will align themselves with others of like vision in order to shape the overall direction of the whole. New myths and practices will be taken up and accepted as the new relationship bonds are formed. Lave & Wenger (1991, 50) point out that membership in the community is "an evolving, continuously renewed set of relations". Allegiances are formed and collapse in light of the motivation to move a group in a given direction. The mutual agreements contained within these allegiances that articulate

(formally or not) the modes of practices and parameters of acceptable action and behavior that begin to shape practice, and in turn will impact the use of information systems. For instance, in Rolland & Monteiro's (2002) study of ship surveyors, the practice of technology use emerges and shifts as multiple interpretations of the use of the information system as individual's in the network of relations that comprise the geographically and temporally displaced effort of a ship survey establish how practice will unfold.

Institutional theory articulates possible mechanisms for change as normative isomorphism, mimetic isomorphism, and coercive isomorphism (DiMaggio & Powell, 1983). Established perspectives in information systems (e.g., Avgerou, 2000) have suggested these forms of organizational change occur as processes of de-institutionalization and subsequent re-institutionalization of newly legitimated structures. However, by enriching the analysis offered by institutional theory with COPT as outlined above, it is possible to examine how the concrete practices of change, and unfolding process of institutionalization occurs.

Normative shifts

Larson (1977) suggests normative isomorphism is the project of professionalization, in other words, "the struggle of members of an occupation to define the conditions and methods of their work." (DiMaggio & Powell, 1983, 152). The notion of professionalism is consistent with COPT in suggesting the mechanism whereby individuals progress within an organization. The process of training from apprentice through journeymen to

master level proficiency is addressed by the notion of the selective education, socialization and training of individuals, such that, "individuals who make it to the top are virtually indistinguishable" (DiMaggio & Powell, 1983, 153). Professionalization is the taking-up of a particular identity. In adopting an identity one is indoctrinated in the appropriate beliefs and practices.

Perspectives of individuals in the information system function as members of an occupational community (e.g., Orlikowski & Baroudi, 1989) or as professionals (Agarwal & Ferratt, 2000) have a number of commonalities. First, that those in the IS function form a cohesive community, and within that community there are certain perceptions, values and concrete practices. Second, within these communities, whether they are canonical organizational forms or non-canonical loosely coupled communities of individuals, there are standards of neophytes and experts. Within these communities there are forms of communication and action that are (re)constituted by the practices of members of the community.

For example, Informal web-based technology user groups have protocols for behavior when seeking and offering advice, such as identifying one's experience and giving credit to others for knowledge acquired. Similarly, canonical communities of users with organizations such as those examined by Schultze & Boland (2000) have defined behaviors for seeking and communicating knowledge. These communities are not only method of acquiring knowledge, but also expressing perspectives, demonstrating expertise and advancing one's reputation. Within the language and practices of these

communities, however, taken for granted assumptions and myths are prevalent in shaping

(and being shaped by) the community. For instance, the legend of Sun's Bill Joy being

able to rewrite the entire code for UNIX over the weekend[11] is known and is an

aspirational tale. Advice proffered by such a recognized expert as Bill Joy is likely to be

accepted without question. Thus, a corresponding shaping of practice emerges in the

reinforcement, communication and extension of community ritual and myth, and is

related to the adoption of the identity of a member of the community.

Normative shifts in organizations are those that unfold as standards of behaviors are set.

The identity of individuals in communities is both shaped by, and shapes organizations

through the trajectory of normative shifts. Such normative shifts enable and constrain

perception and action with respect to engagement with change processes. With respect to

the community, as individuals advance through communities and as they (or their

community) gains the currency of legitimacy, what is defined as appropriate behavior

may shift to align with the values and practices associated with the newly consecrated

masters of the community. Concrete practices are not necessarily separable from myths

and rituals in this instance. The myth of the programmer who stays up all night coding

and surviving on Coke and Twinkies may or may not be true. But, if it is true within the

community (or, more accurately, believed to be true) this may influence concrete practice

and change the way individuals work. Thus, the adoption of identity, or the effort to

aspire to an identity shapes individual action and how IS-related organizational change

might be made more or less successful.

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[11] *Nerds 2.0.1* Cringley, RX (1998) Oregon Public Broadcasting

Mimetic shifts

DiMaggio & Powell (1983) argue that, "organizations tend to model themselves on similar organizations in their field that they perceive to be legitimate or more successful" (152). For example, Tingling (2005) discusses the assessment and adoption process in which large financial institutions engage in making software and information technology decisions. He argues that for a variety of reasons including path dependencies, demonstrable use (if not always success), and attributions of superior knowledge by one institution in favor of another, contributes to mimetic (isomorphism) behavior in information system assessment and choice across the industry.

Mimetic shifts establish new communities with practices and values shaped by different orientations than might have been in place in previous communities. This can be manifest in a number of ways; perhaps as a rebuke of "copying" a competitor's practices, or a desire to maintain the existing patterns of work; in contrast to groups that wish to follow a recognized industry leader, or those that desire a new approach. Brown & Duguid (2001; 1991) suggest that the interaction of these communities can result in competition for legitimacy and resources. This competition can foster an increase in the interaction of members of the new community of practice, and the lines of logical separation become all the more apparent as the practices and proceeses of progression of the two communities shift farther from one another in concert with the adoption or rebuke of new practices, perceptions and values.

Avgerou (2000, 242) suggests "the fashion of particular innovations and the 'cultural persistence' of the old regime" will result in clashes of old and new. Proponents of previous systems may perceive greater job security, greater functionality, or any number of reasons as a rationale for supporting the ways things were. In doing so their practices are upheld by ritual and myth of the IS functions. This in turn competes with corresponding interwoven myths and practices of the innovation. For instance, proponents of the old system might advocate it as providing superior customer service. In doing so, the concrete practices that are involved in the use of the old information system are reinforced as valuable. This in turn, may foster the intention to maintain these practices within this community, even in the use of the new system, which may in turn foster strategies for how system "work-arounds" might evolve in attempts to achieve the mythically reified value of the old system.

Coercive shifts

Coercive shifts in organizations are the result of pressure exerted by other organizations upon an organization (DiMaggio & Powell, 1983). One of the myriad coercive forces, as alluded to earlier in the section discussing mimetic shifts, is the nature of relations to competitors. The coercive forces, however, are analytically different from mimetic isomorphism. Whereas mimetic pressure comes in the form of competition within a given field for scarce capital and resources, coercive forces are applied within the community as differing organizations seek to set the standards of behavior and operation.

Coercive pressures from outside the organization and within, contribute to the alteration in the constitution of communities of practice within the organization. The constant (re)construction of a community of practice, as those in compliance with the standards of behavior are those that progress, makes it possible to exert coercive influence. This is manifest as values and taken for granted assumptions are instantiated in the structures of the organization, which in turn impact, and are impacted by, concrete practices. These alterations within the community are reinforced and reproduced over time as old masters fall away and new members are brought into the community, in line with the shifting values. These coercive shifts supported and perhaps encouraged the alterations of the communities of practice that make up the organization, and thereby alter its general institutional structure.

For instance, in industry-wide settings where standards such as protocols for data interchange and format, such as the banking industry (e.g., Ihde, et al, 2001) there is competition for how the standards will be set, and what they actually will be. Similar environments of competition to set standards can be seen in the open-source software market (e.g., West, 2003; Garud, Jain & Umarasawamy, 2002). In these situations influential individuals or communities (e.g., with respect to Linux: Linus Torvalds RedHat Inc., respectively) have strident voices in advocating the evolution of how an industry standard might evolve. It is arguable that the potency of these voices is not solely a result of the evidentiary successes associated with these groups or communities, but also the unquestioned assumptions surrounding their characters. Perceived as industry leading individuals or communities, the concrete practices in which they engage are

bound up in the myths and the identification of these entities. In other words, if the myth of an entity being an industry leader exists and has resonance, the actions and concrete practices of that individual or community may be accepted as "industry leading" practices – unquestioningly assumed to be the standard. This may even occur without active promotion on the part of any particular group. Rather as the perception is held more broadly, and individuals proceed through ranks of novice through expert they carry the knowledge of these practices as industry leading ones, and reinforce the enactment in the community as they become more influential.

IMPLICATIONS FOR INFORMATION SYSTEMS IN ORGANIZATIONS

Existing perspectives on organizations make a number of important contributions to the understanding of organizational change, and change in the specific context of information systems (e.g., Orlikowski & Barley, 2001; for a broader discussion see: Barrett, Grant & Wailes, 2006). In this paper I have argued for an examination approach that attends to the individual practices in which people engage, what people actually do as members of an organizational community. Understanding organizational practices and myth-making in a situated context may provide greater insight to understanding organizations as, "continually contingently reproduced by knowledgeable human agents - that is what gives it fixity, and that is what also produces change." (Giddens & Pierson, 1998, p.90, see also Orlikowski, 2002). Rather than conceiving concrete practice and myths and rituals as discrete and uneven in their informative power (e.g. Fox, 2000), I argue for an approach that allows for the examination of both myth and practice, and more specifically how they are interwoven and mutually influential.

Barrett *et al* (2006, 9) charge that the larger balance of "established perspectives of change focus on the outcome or "destination" of the change process and do not pay enough attention to the process of change itself." The authors acknowledge there has been foundational work in examining the processes of organizational change and information systems in a variety of perspectives including institutional theory and strucutration theory (e.g., Barley & Tolbert, 1997) and discourse analysis (e.g., Dollin, 2003) to name a few. However, critiques of the "institutionalist" or social constructivist perspectives suggest that there may be too little attention paid to the material practices associated with technology and the situated nature of action (Monteiro & Hanseth, 1996). Conversely, commentary has been offered on situated analysis of change and information system use (e.g., Suchman, 1987) that such perspectives do not adequately address issues of how and why people act; their feelings, values and motivations (Ciborra, 2001).

The analytical lens offered by a synthesis of concepts derived from COPT and institutional theory is an attempt to bridge this theoretical gap. By attending to the actions and practices of social order, and the material actions and practices in which individuals (or, communities of individuals) engage alongside the myths and unquestioned assumptions that exist, it is possible to examine how practices may be made concrete by the belief in how things are or should be. This perspective expands on the theoretical position of Wagner & Newell (2006; see also Doolin, 2003) where stories are used in the establishment of social order in the context of an ERP implementation and the associated organizational change. The added dimension of COPT offers the ability to

unfold the concrete practices both as how they may contribute to, and be a result of, the forms of organizational narrative that both structure, and are structured by, organizations - providing insight on issues of power and influence; materiality; and, identity and practice.

Power & Influence

Wagner & Newell (2006) argue in order to foster an effective information system deployment, it is necessary to create a social context, or social order that is amenable to that end goal. The authors charge, "a workable solution does not mean that consensus must be sought, or achieved" (*ibid*, 54), but rather, common aims are promoted and compromises articulated such that a system "works" – even if not as originally intended. The emphasis of studies in this trajectory (e.g., Lawrence, Hardy & Phillips, 2002; Constantinides & Barrett, 2006) is typically on inter-relations of networks, and the expressions of dominant perceptions of what is legitimate. However, as Fox (2000) points out, action is ultimately performed by an individual; which raises the question: "how does an actor grow?" (862).

The COPT/IT lens suggested in this essay focuses on an "active" aspect of power – as something expressed in action, rather than existing *in potentia*, as it focuses on *how* individuals are able to engage in practice, and how other individuals might be induced to adopt similar practices. Further, the understanding of relations of force articulated in institutional theory (e.g, normative influence) provides insight into the reification of practice; how perception and meaning might be durable over time and distance –

expressing influence for meaning and forms of practice beyond singular communities. For instance, Constantinides & Barrett, (2006) discuss the deployment of a regional healthcare system and the influence of networks of power in the ultimate deployment of the system. The study provides valuable insight into the potency of unquestioned aspirational goals in mobilizing individual action, such as a "consistent information space." However, further examination might prove insightful, such as understanding *how* this notion became the idealized goal, which was a vehicle in enrolling individuals into particular courses of action. How is it that particular individuals rose to a position in which a particular vision could be articulated as ideal? And, what were the force relations that contributed to shaping these perceptions?

Materiality

The enhancement that COPT offers a perspective grounded in institutional theory is one explicitly grounded in practice, and as Roberts (2006) notes it is a view of practice that incorporates the physical and technical aspects of work. In other words, COPT fosters inquiry into how work is performed, and in the case of information systems how the use of given technologies are taken up and incorporated into an identity. The experience of the "mastery" (Blackler & MacDonald, 2000) of a tool at one time unfolds the social aspects of how given technologies might be viewed for possible use, while at the same time addresses what those technologies are capable of doing (*ibid*; Fox, 2000).

Bridgman & Willmott (2006) offer an engaging perspective of an IS deployment in the context of a discourse study of technology use at Inland Revenue in the United Kingdom.

Orlikowski (2006) points out, in doing so, they offer an interesting angle of view upon the materiality of technology, as the form and use of ambiguous material technology in light of "concepts that are discursively attached to forms of technology" (131). However, while this viewpoint offers much potential, the theoretical boundaries make it difficult to examine "how to analytically address materiality that is not actively engaged by particular communities" (*ibid*, 131). In other words, the influence from the wider field of organizational practice is obscured by the fine-grained analysis offered by discourse approaches as they have been employed. However, the perspective discussed in this essay offers a broader view that engages in the broad organizational field, explicitly examines the coercive and competitive relations that might impact how a technology is viewed and ultimately enacted. With respect to questions of materiality and the implications of related organizational change, the COPT/IT lens discussed here offers a space in which discussions of the substantive actions of engaging technology can be explored alongside how those individual actions expand to a wider community of individuals, and the mechanism by which those practices are accepted as legitimate.

Identity & Practice

Barley & Kunda (2001) observe that examinations of what people actually do, "articulates relations between work practices, situational contingencies, and organizational patterns" (85). In their argument that authors focus on individual action as a manifestation of identity in a given contingency which is mutually (re)constitutive of organizational patterns. In other words, the organizational fields in which individuals operate shapes their identity, perceptions and values, which in turn informs the practices

they will enact. Those practices affect the shape of organizational patterns, which in turn will have an impact on identity and practice.

Individuals' awareness of identity, and their construction of identity, is expressed through a sense of agency in, among other fashions, the form of adoption or adaptation of work practices (Handley *et al*, 2006; Mutch, 2003; Heracleous & Barrett, 2001). The development of identities, and how practice evolves as identities shift and emerge, is a result of influence both from within and outside of communities in which individuals inhabit (Handley *et al*, 2006). While COPT strongly conceptualizes the process of entry into a community and the development of individual identity as an individual operates within a community(ies), additional theoretical tools, such as those offered by institutional theory must be brought to bear to engage in how identities and practice are durable across physical and temporal contexts in which there is no "community" linkage. Similar to examining issues of power, a COPT/IT lens suggests an analytic pathway to examine how practice is introduced and continued in communities over time, and evolves a degree of resiliency that makes the practice itself an unquestioned process that is deemed to be "obvious".

In conclusion, the focus on the forceful nature of both concrete practices of individuals and communities alongside the myths and rituals that exist in these communities can provide insight into organizational change and information system use that may better "show us the threads [of organizations] as interwoven into a fabric that may have a unified pattern" (Fox, 2000, 865). In other words, as Fox (2000) charges, the surface

pattern of the organization may tell us little; the ability to trace the threads of the

construction of the fabric - in terms the mechanics of concrete practice, the formation of

individual identity and, the motivation of meaning, value and perception – may provide a

more complete understanding of the process of organizational change in the context of

information system use and deployment.

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CHAPTER 5: CONCLUSION

In order to get a more complete understanding of how information systems impact

organizations, both in terms of how organizational change unfolds and how the use of

information systems emerges, it is necessary to gain insight on how situated use

influences durable, resilient and persistent meanings and practices, and the material

aspects of technology. For example, the deployment of the standard operating system at

Natbank can be directly linked to values of consistent and quality business practice and a

desire to extend successful practices across the organization, as well as the evolving

capabilities of information systems to facilitate deeper organizational integration and

improved communication and coordination. A theoretical perspective housed in concepts

of practice can shed light on the material, situated and institutional aspects of

organizations that can provide such insight.

The case of Natbank is exemplary of the fact that information systems will not be

perceived, adopted, nor adapted in a universal fashion within an organization. Different

local contexts, whether geographic divisions or functional areas of the organization

possessed differing frames of reference which in turn contributed to variances in situated

usage and spurred different intended and unintended outcomes across the organization.

Further, the case illustrates that the unintended outcome of one unit of the organization

may have been an intended outcome of another unit. To articulate all the points of

variance between the differing contexts at Natbank would be impossible. However,

through an examination of practice it is possible to unfold the situated practices and

meanings, the mechanisms and procedures of local work and regulation, and the emergence of these meanings and practices over time, as mutually reinforcing aspects of life at Natbank.

Accounting for Workability

The purpose of this dissertation was to address the research question, *What is the effect of practice on efforts to make information systems workable?* In order to facilitate an inclusive examination, housed in a perspective of practice, the thesis was segmented into three integrated, but discrete, components. Chapter 2, "Contradiction, Praxis and the Flexibility of Organizational Routines," addresses the emergence of reflective action in moments of praxis. These praxial moments arise out of the perception of a contradiction in network relations – the assertion that things are not as they should be. The flexibility and rigidity of organizational routines are apparati that facilitate organizational change. Individual action and its reverberations through relations of practice are examined as instruments that both shape and are shaped by the process of organizational change in the context of information system deployments. The analysis suggests relational support is necessary in the maintenance of a routine over time, whether the routine is old, new, or newly adapted. The ability to enroll others (explicitly or implicitly) in alternate/new practices is material in the durable instantiation of work practice.

A further contribution is offered in the perspective of analysis, in that the extant literature has focused on the examination of routines that are "large" – organization wide, spanning multiple individuals and relations, and often long temporal periods, by contrast, this study

focused on routines of everyday practice. However, an implicit assumption of the examination in this chapter is that the possibility for recognizing contradiction, or creatively imagining alternatives exists, without exploring the constitution of this potential. In an examination focusing on a different aspect of relations of practice, Chapter 3 seeks to unfold how identity and forms of knowledge contribute to how the possibility for change might be recognized and enacted.

Chapter 3, "Practice, Adaptation and the Resolution of Technology Use," addresses the broad research questions, *how does identity impact information system use?* and *how does material knowledge of technology impact information system use?* This paper focuses on notions of identity and the forms of knowledge through which individuals encounter information systems in everyday (work) life. In doing so, the paper takes the position that notions of identity and the sense of "who we are" is inextricably intertwined with our individual understanding of "what we do", and "how we do it." In other words, the forms of knowledge with which we come to know the world, and the way that we envision ourselves in it are coupled to our own images of what we do, and how it should be done. In such a fashion individuals constitute a dynamic frame of reference that is constantly informed by present circumstance; but also informs present circumstance through notions of past experience and future possibility. Thus, the impact of identity and forms of knowledge on how information use unfolds is theorized as a focal point through which we evaluate and (re)invent practices of information system use.

The fourth chapter, "Constituting Institutional Practice" is an essay proposing a perspective relying on a synthesis of institutional theory and communities of practice theory. The previous two chapters provide synergistic forms of analysis that focus on different aspects of relations of practice – how it is that mechanisms of change might unfold in moments of reflective action, and how individual frames of reference might evolve such that the possibility of recognizing contradiction and the potential for reflective action emerges. The paper concludes suggesting the theoretical synthesis finds harmony in similar foci of practice. Additionally, both perspectives provide insight into the other perspectives "unlit passage ways". Communities of practice theory offers a robust technique to analyze the individual and the importance of the material aspects of technology, and institutional theory allows for the examination of practices and beliefs over time and across networks.

The broad question in which this dissertation is framed, *What is the effect of practice on efforts to make information systems workable?* is specifically addressed in several ways:

1. Chapter 2 "Contradiction, Praxis and the Flexibility of Organizational Routines": A workable information system is the instances and occurrences of negotiation and compromise that occur in organizations in which an information system is able to achieve the aims of its users. However, alternate aims may emerge over the course of the deployment of the system – what was an intended goal may be set aside in favor of a new goal.

The practices that were involved in the maintenance and modifications of routines at Natbank served to make the system workable, in some cases in the form of durable practice. Relational practices in the performance of routines were also observed to be factors affecting the flexibility of organizational routines.

Multiple different orientations to "what should be done" existed at Natbank. These orientations were coupled with differing ways in which the information system was approached and adapted – all with the goal of making the system work from a particular interpretation. The resilience of a modification was related to the impact of the adaptation as it reverberated throughout the organization. If the adaptation did not affect another entity, or in fact made the system workable for another entity, the durability of that adaptation was enhanced – it was more likely to survive and become part of the lasting information infrastructure.. In the context of this study of the recognition of contradiction and creative action (or praxis), the ability to recognize contradiction and enact compensatory creative practices in such a fashion as they become durable is material in the ability for an information system to be made *workable*.

2. Chapter 3 "Practice, Adaptation and the Resolution of Technology Use": Within the context of the research question of the thesis addressing the effect of practice on efforts to make information systems workable, the notion of frame of reference provides valuable insight. The notion of a workable information system is coupled to the individual assessments of goals and the appropriate methods to achieve them. Thus, understanding individual frames of reference facilitates knowledge of how individuals might define a

"workable information system", and more to the point, what parameters might be placed on action to make a system workable.

In the case of Natbank, analysis suggests that technology is incorporated into sense of identity in terms of what individuals are able to, and should be able to, accomplish. Analysis further suggests that the material knowledge of technology is important in that individuals form their own understanding of *how* they perform certain functions. Within a community or network, the accepted way of doing things is often as important as what must be done. In light of the study of Natbank, observations suggest the performance of certain duties contributes to the formation of identities – "I am an international banker, I deal with the valuable clients" or "I am an auditor, I protect the bank." The perspective of many users suggests the BIS as a tool to achieve some end, which was part of the fulfillment of who individuals believed they are. It is more important to be able to deal with customers and perform certain functions in a particular fashion, than to adhere to the thin parameters of proper use of the BIS. Practice in this context of everyday activities in (work)life affects the enactment of workable information systems through an individual's ability to (re)create a mode of work consistent with their identity and frame of reference. In other words, if components of a work procedure need to be circumvented or altered to satisfy the ideal of the aggregate or whole procedure, the modification s deemed justifiable. Thus, identity is material in the emergence of workable information systems in as a frame of reference establishes what is *workable*.

3. Chapter 4 "Constituting Institutional Practice": The final paper of this thesis is a theoretical essay that suggests a means to incorporate the multiple viewpoints offered through the theoretical lenses of the prior two empirical studies. This chapter seeks to provide insight into the knowledge of the influence of practice in the emergence of workable information systems through a focus on durable constitutive practice. The conclusions of the previous two papers that suggest workable information systems emerge when individual frames of reference identify contradictions from the expected and resilient creative practice is enacted. The theoretical vocabulary and perspective introduced in this paper, through a synthesis of institutional theory and communities of practice theory, puts forth an argument for understanding practice as durable action that is both constitutive of, and informed by, context - consistent with the theoretical frames from which it is drawn.

The synthesis of the two perspectives contributes to knowledge through a focus on relational practice as durable across context of time and place, but examines the possibility of change through focus on practice that might constitute contradiction – and how such contradiction might maintain or modify existing institutions. In other words, this essay suggests work behaviors and practices may be consistent over time, geography and function. These consistencies are influenced by an organization's social setting, by the physical features of a technology, and by the environment. However, despite the reinforcement of consistent practices, organizational change does occur. Incongruity with perceptions of what is expected, or what should be done is argued as the seed which

stimulates and initiates creative action, that may foster lasting change if there is sufficient support for the new action within the context of the organization.

In summary, organizational change appears to emerge in instances where individuals are able to perceive a contradiction from the way things "should be" and are able to enact alternative practices to correct such contradictions. These enactments must be resilient such that through explicit or implicit action, individuals are able to enroll the support of other networks in making the practice legitimate. Further, the thesis suggests a method for analyzing how individual frames of reference emerge such that one can perceive the possibility of change, and in turn deploy adaptive practices such that they meet individual perceived needs. Further insights relating to the resolution to the overarching question of the thesis are discussed in the following section.

The Implications of Practice for Workable Information Systems

The durability of meaning and practice over time emerges in a seemingly contradictory fashion, at some points constraining change, at other points encouraging wholesale adoption of the new technology. However, further examination of this seeming paradox suggests that a cohesive understanding might emerge, in that the durability of meaning and practice cannot be examined in isolation. Through a focus on instantiated practices that have solidified over time, and also the flexibility and potential for improvisational action, along-side the knowledge of the material aspects of technology it is possible to posit how persistent meaning is both informative and adaptive. In unfolding these

phenomena at Natbank several themes emerged, such as the presence of invisible work,

the resilience of the material form of information systems and the durability of meaning.

Invisible Work, the Material Form and Persistent Meaning

The experience of deployment of the BIS at Natbank, a system that had been found

successful in other contexts, reinforces the notion that standardized information systems

cannot be simply inserted into any remote context without being adapted to fit such a

context. Individuals in various units at Natbank encountered the BIS in varying levels of

engagement and with varying levels of acceptance. In some instances, such as the

international banking groups desire to continue using the CARS system, the material

capabilities of the technology were altered in order to accommodate desired appropriation

of the larger information system at Natbank. In other cases, the technology of the BIS

was found to be substantially malleable, and in some fashions altered (such as with new

account entry) and in other cases left unchanged (as in the audit function).

Invisible work was a primary process of accommodating the continuing workability of

Natbank as an organization. Some invisible enactments were temporary, such as those

enacted by the international banking unit to facilitate the continued use of the CARS until

it was formally (re)included in the infrastructure of the organization. Many of the

temporary invisible enactments ceased over time, by virtue of being made visible to the

BIS by virtue of technological integration (such as the example above) or by forced

discontinuation, as was the case with the enactments surrounding the provision of no-fee

accounts. However, some invisible action attained states of semi-visibility, as might be

argued was the case with the marketing department. The new system developed by this division to compensate for the failings of the BIS was an accommodation that was invisible to both the BIS and administration of Natbank, at least initially. While the marketing departments system was never integrated into the BIS, it became the standard mode of operation and was done so with acknowledgement, if not support of the executive administration. While the system remained invisible to the BIS, it was a component of the larger bank, and contributed to the operation of Natbank being workable.

While not all improvisations and enactments were successful, many appropriations of the BIS were lasting alterations of the systems of the organization. There were in many of the adaptation applied to the BIS instances of the influence of persistent values, meanings, and practices. While again, the international banking unit offers a robust and substantially material example it is far from the only instance of technological applications being altered to accommodate perceptions of *how things should be done.* However, this perception of propriety of procedure was not always an impetus for modification of the technology. The material reality of the audit function was that it was rife with the opportunity for alteration. In several phases of the audit function, invisible work could have supplanted the BIS and by-passed prescribed work procedures. Similarly, the data entry applications themselves were not rigidly controlled and could have been altered through practice. Yet, in the instance of the internal audit function, despite frequent commentary on its cumbersomeness, the BIS procedures were adhered to strictly. In this instance, the persistent practices and meanings associated with less work-intensive audits

were perhaps over-ridden by the more weighty and potent perception of the audit as sacrosanct and inviolate.

The implementation of the BIS itself occurred over an extended period, and training followed allowing individuals trained in one stage of the deployment to aid in the training of individuals in subsequent deployments. In such a fashion the various communities of practice that comprised the distributed regions of Natbank encountered one another, in a cascade as users with one set of frame of reference was involved in the education of individuals with other frames of reference. With each new training experience, new approaches to how technology should enable the work practices of individuals encountered the prescribed procedures of the BIS. As these groups came together, interacting in ways in which they had not before, new awareness of the technology emerged. Users encountered the technology in entirely new ways, gaining new knowledge of constraining and enabling aspects that they had not encountered before, or had not realized existed before. For instance, individuals who did not work in one of the five regions in which the international banking division operated had no awareness of the CARS system. Thus, any perception of the BIS being constraining because third-party applications could not be integrated was unknown to them, until they encountered these constraints through the benefit of another's frame of reference over-lapping with their own.

In sum, the historical and present context converged with the material aspects of the technology at Natbank, such that individuals encountered the information system in

seemingly contradictory fashion. For instance, an individual that was willing to circumvent the BIS to provide no-fee accounts, and by-pass proper data entry when accounts were open was not willing to appropriate the audit function. However, by examining the practice, perception, and identity in a holistic fashion it is possible to examine how persistent meanings and present practice in the broad sense are intertwined in making information systems in organizations *workable*.

Limitations

The research in this dissertation must address several potential limitations. First, this theory-building research study is based on an iterative cycle between theory and data. Which demands an immersion in both theory and context, on the part of the investigator. Mitigating this issue requires substantial engagement with the literature with respect to the theoretical perspective one might bring to such a case study, and also the disciplinary area in which one is operating. Additionally, the researcher must adopt logical and certain procedures for the collection and analysis of data, as the field setting is entered and re-entered multiple times.

This raises the additional question of the number of data sites. Unlike studies that seek statistically relevant generalizability, case studies in the fashion of this dissertation often deal with a limited number of physical sites; or perhaps only one site. The organization in this study is, "a particular case of the possible." This challenge can be addressed in multiple fashions. First, while only one organization was examined, multiple sources of data were reviewed including historical documentation, industry documentation, in

addition to interviews and observations. Further, with respect to the focal point of analysis multiple critical incidents were examined in multiple contextual settings within the organization. For example, multiple interviews and documents were reviewed in a variety of Natbank settings to examine a number of different EIT incidents, as a method of understanding how events unfolded around EIT (additionally, several EIT were observed). The completion of the process of data collection around incidents did not occur until a point of saturation occurs – a point when no new insights are emerging through iterations between data and theory and analysis.

Another potential limitation is the call on a researcher to be reflexive in the course of a study. An analysis informed by a practice perspective must avoid an unbalanced reading of the phenomena A solely *etic* reading will "destroy the reality it is seeking to grasp" by relying on preconceived notions and an intellectual bias of fitting the situation to a model. Concurrently, a solely *emic* interpretation is so immersed in the context that the phenomena cannot be seen or commented upon with any analytic challenge to bias and doxa. This concern was addressed in various fashions. I utilized techniques in data collection focused on triangulation of multiple sources as well as several iterative steps between data, theory, analysis, and distance from the project, which fostered an opportunity to strive for the above-mentioned balance.

Finally, a primary source of data collection was interviews (both formal and informal). Interviewees discussed events that had happened at Natbank with varying degrees of historical distance – some occurring recently, some having happened some time ago. As

discussed above, a triangulation of data collection techniques such as observation,

documentation (public and private) review was utilized to minimize distortion of the data,

in order to strive for accurate collection and analysis.

IMPLICATIONS

This thesis approaches the notion of *workability* in a unique fashion that recognizes

emergent and historical context, without ignoring the impact of the material. The

emergence of workability in information use is conceived as an on-going process in

which users draw on existing frames of reference, in some cases trying to re-create past

contexts, in order to affect the material technology such that a particular vision of the

future can be reached. Rather than simple alteration to local environment, making the

system workable often involves the development of practice, sometimes purposeful and

sometimes by accident, which can accommodate the needs of the individual performing

the action and the broader organization.

The emergence of workable information systems is a reflexive process through which

individuals encounter not only the immediate circumstance, but also the resolute social

structures through which individuals have operated over time; the possible future they

wish to fashion; and, the realities of what can be physically accomplished. The

understanding of how organizational change occurs is extended through the recognition

of multiple interwoven routines as constitutive of aggregate organizational practice. In

other words, organizational "work" is constituted by multiple overlapping routines that

can be mutually reinforcing or debilitating.

The case of Natbank suggests that when these re-inventions find durable reinforcement in relational practice in the organization, they have the potential to be lasting adaptations of the system. A single adaptation of the system is not done in isolation of the other components of the larger information system in which it operates. Thus, an adaptation that makes the system workable form one perspective may disrupt the workability of the system in another interpretation. In such a fashion alterations of the information system reverberate through the organization, and as individuals encounter new information systems and other forms of contradiction with their perception of what should be, re-inventions of designed work procedures may emerge in attempt to right a perceived wrong. Researchers may be well served in examining how these relational components might constitute reinforcement or the contrary.

Direct implications for theory and practice suggest a broader understanding of the importance of notions of identity as a depiction of organizational/network/community culture in interactions with technology. As individuals take up the use of technology in a particular fashion it becomes incorporated into their identity and frame of reference. For researchers this is a call to understand how individuals come to incorporate technology into their identity, and how that use changes over time. With respect to the concerns of industry, the implications of a full understanding of how technology is incorporated into identity and in what forms, is the ability to more appropriately design technology such that its form is consistent with organizational identity and thereby more likely to be accepted and taken into use.

The emergence of workable information systems is also a process of negotiation, whether realized or not. As localized adaptations are made to the system, inter-related components of the information system are affected and new practices must emerge to accommodate or compensate for the alteration in the system. Thus, workability emerges over time, and through multiple iterations of alteration and compensation. In such a fashion, the emergence of workability generates side-effects that reverberate through the organization as well as the local context – some that are intended and some that are unintended. This potent impact of localized efforts to make a system workable suggests that even in widespread and distributed information system deployments, the impact of local action can have far reaching effects. Further, the potential for reverberating side-effects and alterations suggests that the reversibility of such action is extremely limited. Once a particular chain of events occurs, and accommodations are made in other localities it may be difficult to engineer a mechanism to revert all or partial situated contexts to the "original design."

Implications in Industry

With respect to industry, understanding how adaptations might occur, and how reciprocal changes in the organization might emerge may allow a new means to assess and achieve success. Such a perspective might encourage management to examine the possibility of managed flexibility of information systems, where reciprocal adaptations of the information systems might be coordinated to ensure that a system remains "working." This may foster innovation and facilitate greater rates of success in system deployments.

By contrast, this perspective might also allow enhanced means of monitoring - to discourage alteration of the system where management deems it to be harmful to the organization.

The consequences of the emergence of workability are at one time obvious and ambiguous. As a system that is made workable through official and non-official accommodations is made workable the observable conclusion for the organization, as an aggregate is that the system "works." However, still ambiguous is the various contortions that the information system (both visible and invisible) has completed in order to achieve a status of "working." Some implications for industry include:

1. Difficulty in Evaluation: The variation of use in information systems makes it difficult to perform a standardized form of evaluation such as benchmarking. Thus, recognizing how and what forms of local adaptations have occurred creates the potential for developing a method of evaluation that are sufficiently robust so as to provide a more accurate picture of the effectiveness of a system functions.

2. Processes of Design: The process of localized accommodation that occurs in instances where information systems are subjected to uses other than the designed suggest that increasing levels of uncertainty, control and effectiveness may result in instances of wide-scale standardization. By contrast, more flexible design that is more suited to localized accommodation might allow for the emergence of workable information systems, while at the same time provide for organizational needs of assurance of control and standard operational parameters.

3. <u>Training and Past Practice</u>: Considerable inertia builds in localities as the practices and technologies bound in the information systems are institutionalized and come to operate in a particular fashion. Instantiated practices and structures tend to contribute to the emergence of unintended consequences during attempts to put new infrastructures in place. Attention not only to *what* people have done in the past, but *why* they have done it may contribute to a more complete approach of training.

4. <u>Governance and Standardization</u>: One possible recommendation from this study is the deeper consideration of more decentralized approaches to control and standardization. A strategy that offers a degree of flexibility at the local level, while maintaining a robust underlying infrastructure to interconnect and interrelate the various 'islands' of system use and governance, within a larger 'archipelago' of an organizations' information infrastructure. Some of the advantages of this approach include greater flexibility and response to change and greater attenuation to the local context. Without proper attention, this strategy also evinces possible disadvantages such as potentially higher costs to manage multiple systems and the management of the interface between these systems to ensure overall organizational coherence. However, some instances of such deployments suggest that maintenance costs of such systems are less than a centrally focused control, the localities being more sensitive to timing, price, and need of system upgrade, maintenance, and expenditure.

APPENDIX 5-1

Ethics Approval

IVEY

Richard Ivey School of Business
The University of Western Ontario

October 6, 2002

To whom it may concern:

The Ethics Committee has approved the ethics protocol for Louis Beaubien. The title of the proposal is: "Innovation in Information System Development in International Banking".

Sincerely,

Daphne Stevens
Manager, Research & Development

cc. Abhijit Gopal

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EDUCATION

PhD, Ivey School of Business, University of Western Ontario   2008 (ant)
Thesis: "Accounting for Workability"

MBA, Sobey School of Business, St. Mary's University   1997

BA, Dalhousie University   1994

BSc, Dalhousie University   1992

PROFESSIONAL CERTIFICATION

Certified Management Accountant (**CMA**)
Canadian Securities Certification (**CSC**)

HONOURS AND AWARDS

1994 Dalhousie Varsity "D" Award
1995 Frank H. Sobey Academic Merit Scholarship
1996 Canadian Coast Guard Royal Commendation – Rescue #1756
2000 University of Western Ontario & RG Ivey Foundation Scholarship (4 year)

EMPLOYMENT – ACADEMIC

INSTRUCTOR, COLLEGE OF THE HOLY CROSS
Worcester, MA USA   2008-Present
Responsibilities will include: Teaching AIS / MIS & Managerial Accounting

INSTRUCTOR, PROVIDENCE COLLEGE
Providence, Rhode Island USA   2004-2008
Taught Information Systems & Management Accounting and served as a student advisor

VISITING INSTRUCTOR, ÉCOLE SUPERIOR DE COMMERCE BREST-BRETAGNE
Brest, France   Contract Basis
Taught Comparative International Accounting, and AIS

INSTRUCTOR, UNIVERSITY OF WESTERN ONTARIO (UWO)
RICHARD IVEY SCHOOL OF BUSINESS & KINGS COLLEGE
London, Ontario Canada   2003-2004
Taught Management Accounting & Information Systems and served as a student advisor

INSTRUCTOR, TASIS
Lugano, Ticino Switzerland   2001-2002
Taught courses in introductory business and computer applications

INSTRUCTOR, Canadian Securities Institute (contract basis)   1998-2000
Delivered the Canadian Securities Course and associated financial analysis courses

EMPLOYMENT – INDUSTRY

CONSULTANT – REALITYCLICK   1998-2001
Business process technology integration consultant. Focused on integrating Internet based
direct marketing technology into organization/enterprise systems and financial systems

BANK OF NOVA SCOTIA   1997-1998
Corporate banking, responsibilities included internal audits and assurance systems analyses.

ACADEMIC PUBLICATIONS

Refereed Publications

Beaubien, L. (*Revise & Resubmit*) "Routines of Deployment of a Management Control System" *Management Accounting Research*

Conference Proceedings

Beaubien, L. (2007) "Control the Distance: Management Control Systems in the International Context"
Conference of the American Accounting Association, Chicago: August 5-8

Beaubien, L. (2007) "Practice and Organizational Change," Conference of the American Accounting Association,
Chicago: August 5-8

Beaubien, L. (2005) "Dynamic Capabilities, COPT and global strategy" *Global Information and Technology Management Conference,* Anchorage, Alaska

Beaubien, L. (2005) "Do our technologies stifle the periphery: technology in the international context?"
Global Information and Technology Management Conference, Anchorage, Alaska

Gopal, A., **Beaubien, L.,** Marcon, T. (2002) "Old Wolf New Wool Suit: Globalization and Information and
Communication Technologies, the case in India" *International Conference of Information Systems (ICIS)* (AIS)

Working Papers & Papers Under Review

Beaubien, L. & Tingling, S. (Under Review) "Qualitative Research in Organizations: Watching the Watchmen"
Journal of Research Practice

Learning Materials Developed – Texts & Cases

Beaubien, L. (2005) *Instructors Manual: Practical Managers Guide to Innovation* (NY: Wiley)

Beaubien, L. (2004) "FirstCaribbean International: IS Implementation" (London, ON: Ivey).

Beaubien, L. (2002) "Valley School Board" (London, ON: Ivey).

ACADEMIC SERVICE

Curriculum Committee AACSB – Providence College (2004-2006)
Recruitment Committee – Providence College (multiple committees: 2005/06, 2006/07)
Faculty Senate – Providence College & Academic Affairs Committee (II) – Providence College
Academic Review Committee Administrative Sciences Association of Canada 2003/04
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