TOWARD A LEARNING MODEL
OF INFORMATION TECHNOLOGY IMPLEMENTATION

A Thesis in
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by

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ABSTRACT

This study focuses on the mutual adaptation process that occurs when a new technology is implemented in a team environment and how learning during the adaptation process affects a team’s technology usage. The study contributes to the information technology implementation literature by developing and testing a learning model of implementation that predicts technology usage. The study’s results show that the breadth of a team’s learning and the degree of vicarious learning that occurs within a team during implementation affect its technology usage; and that the degree of vicarious learning and a team’s technology frame affect the depth of a team’s learning. Overall this study demonstrates that what teams learn and how they learn affect their technology usage.
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Chapter 1

INTRODUCTION

New technologies are often implemented in teams as a means of improving the latter’s efficiency (e.g., cost reduction, cycle time reduction). For a technology to improve a team’s efficiency, team members have to adopt it. Because technologies are often not designed with a specific team environment in mind, however, there are often misalignments between the technology and the environment when the technology is implemented, and these misalignments can serve as a deterrent to the technology’s usage. Mutual adaptation theory states that to overcome these misalignments teams engage in a process of recognizing and reconciling these misalignments. This process, over time, either brings the technology and environment into closer alignment or to rejection of the technology altogether. Research in this area has shown that a team’s ability to recognize and reconcile misalignments can affect the team’s technology usage (Tyre & Orlikowski, 1994; Yates & Orlikowski, 2002). What is missing, however, is a description of how teams recognize and reconcile misalignments. For example, what misalignments do they recognize and how are these recognitions linked to reconciliations, i.e., are there intervening processes between these steps and are there steps beyond reconciliation?

The study’s main contributions are the development and initial testing of a model of information technology implementation that describes how teams recognize and reconcile misalignments during an information technology implementation. Because the process of recognizing and reconciling misalignments is a learning process (i.e., individuals who engage in the process modify their cognition and/or behavior as a result of the process), this model is based on learning theory. The model predicts the level of learning that a team experiences
during a technology implementation and how this relates to the team’s technology usage. In developing a learning model of information technology implementation, I traveled a journey that began with my dissertation proposal and is still continuing two-and-a-half years later.

**Dissertation Journey**

I developed my dissertation proposal in 2003-04 and defended it in the summer of 2004. In my dissertation proposal, I deductively developed my initial learning model of information technology implementation based on the learning and information technology implementation literatures. I later came to refer to this model as the “provisional model.” To collect data to test the model, I developed a semi-structured interview protocol. Because I intended to not only test, but also develop theory, I planned to use analytic inductive research methods that would allow me to revise the model as I collected data. Therefore, I began the project with a deductively developed model, but intended to revise it as I collected data that did not conform to the model. After revising the model, I then intended to test the revised model using a new sample.

**The Provisional Model**

Thanks to a contact from one of my committee members, I gained access to an organization in which eleven teams were piloting a new collaborative information technology, Collaborative Workspace (CWS). Within two weeks after the pilot started (June 14, 2004), I began interviewing team members using the interview protocol that I had developed in my dissertation proposal. The pilot project corresponded to a six-month long project that the teams were undertaking – the Annual Enrollment project. As I interviewed team members and reflected on what they told me about how they learned about misalignments, over time I informally (i.e., in my mind) compared my reflections to the
model I had developed. I realized that the model I had developed did not capture the whole picture of how team members were learning about misalignments. My informants were telling me stories of how they learned about misalignments that did not match the learning process that I had depicted in the provisional model. Therefore, I reflected more on what they were telling me that did match the model and I summarized what I learned into three lessons. First, many of the informants seemed to be learning about misalignments without having used CWS. Instead, they seemed to learn about the misalignments from what others told them. Second, some informants also seemed to possess pre-set views of the technology that they had established even before CWS was implemented. (For example, some viewed it as a tool primarily for collaboration with the client, and others viewed it as a document management tool). Moreover, some of these pre-set views of CWS seemed to have been influenced by what they learned from the Implementation Team when the Implementation Team first mentioned the technology to them. Lastly, on some teams, there seemed to be one team member who served as an advocate for CWS. This team member seemed to provide an impetus for others to use the technology. Based on these three lessons, I then began to informally revise the model. Also, as I continued to conduct interviews, I noticed when an informant made a comment related to one of these lessons. When she did so, I asked follow-up questions that related to her comment.

After the CWS pilot project ended, I reviewed and coded all of the informants’ interview transcripts based on the model presented in my dissertation proposal (the provisional model). I then analyzed the data (according to the provisional model) and wrote-up the results in chapters 5 and 6 of my dissertation (i.e., identification of the misalignments recognized and teams’ misalignment-based learning based on the provisional model). Then I reviewed the informants’ interview transcripts again and reflected on the three lessons that I had learned and the implicit, revised model that I had been informally developing. In doing
so, I began to think conceptually about what my informants had told me that was not captured in the model, and I made the following three realizations.

First, I realized that team members may come to recognize a misalignment either through direct experience with the technology or socially, via talking with others. Therefore, misalignment recognition could result from both individual and social processes. Second, I realized that team members’ pre-set views of an information technology may affect how they view a technology and what misalignments they recognize. Lastly, I realized that technology advocacy within a team may influence team members’ level of technology usage.

To develop theoretical support for my realizations (i.e., what I thought I had observed but which had not been captured in the provisional model), I returned to the learning and information technology implementation literatures to search for support. I found support in research concerning “vicarious recognition,” “technology frames,” and “technology structuring.” Also, as a means of verifying my ideas, I reviewed the interview transcripts and determined that although the direction of causality between team members’ misalignment recognitions and technology usage were often not clear, team members did indicate that they (a) sometimes recognized a misalignment based on using the technology (I labeled this “experiential recognition),” and (b) although they used the technology, they sometimes recognized a misalignment based on discussions with others (I labeled this “vicarious recognition”).

My review of the interview transcripts also allowed me to determine that team members’ pre-set views (which I labeled technology frames) seemed to influence how they used the technology and the type of misalignments they recognized. For example, a team member who viewed CWS as a tool only for collaborating with the client did not seem to use CWS to store internal documents and did not seem to recognize misalignments that related to internal documents. Lastly, I determined that team members who mentioned that there was a
CWS advocate on their team seemed to use CWS more than the members of teams on which there did not seem to be a CWS advocate.

After verifying these realizations, I then discussed the ideas with my committee chairman. As a result of our discussion, I came to realize that I had measured learning (in particular, misalignment recognition) in a narrow manner. That is I had only focused on whether a member of a team had recognized a misalignment. Based on our discussion, I developed the notions of learning breath (which is what I labeled the measure I had already captured), learning scope (which is the number of members of a team who recognized a misalignment), and learning depth (which is the degree [number of phases] to which a team engaged in learning about a misalignment). Based on this verification of my realizations, the notions generated with my committee chairman, and my research on vicarious recognition, technology frames, and technology structuring, I then developed the revised learning model of information technology implementation and began to prepare to test it.

The Revised Model

To test the revised model, I developed a survey questionnaire based on the model. To increase the generalizability of the study, I wanted to use the survey with teams that were engaged in other implementations. Therefore, I tried to gain access to three other organizations that were implementing a similar type of technology (i.e., collaborative information technology). Unfortunately I was unable to gain access into any of these organizations. Therefore, I sent the survey to a sample to which I already had access – i.e., the teams that I had interviewed. Because I was familiar with the team members, I expected that the survey response rate would be high. Unfortunately, however, it was not. After collecting the quantitative survey data, I analyzed the data and compared the results to the revised model. I generally found support for the model (five of six speculations were
supported). In reviewing the data, however, I noted that I had not tested the relationship between technology usage and learning. Implicitly in the first model I had considered usage as occurring after learning (in sequence). But I also acknowledged that team members needed to use technology before they could learn. Unfortunately when I interviewed team members during the first part of the study, I was not able to reliably collect the dates when team members recognized, evaluated, reconciled, and reflected-on misalignments; and the CWS usage data I had received was team-level usage that covered the entire six months of the CWS pilot. Therefore, I was only able to determine a team member’s CWS usage – learning sequence when the team member happened to mention it (e.g., when she commented, “As a result of using CWS, I learned that …”). Likewise, in the survey, I was unable to determine team members’ CWS usage – learning sequences. In spite of these data collection limitations, based on reviewing the interview transcripts again and extrapolating from the survey results, it seemed to me that there must be at least two types of typical usage – learning sequences.

First, it seemed that there must be a sequence in which usage precedes learning – one of the purposes of this usage may even be to learn about misalignments; and second, there must be a sequence in which usage follows learning – this would be usage that is informed by what has been learned. I labeled the usage that precedes learning, “provisional technology usage,” and I labeled the usage that follows learning, “confirmed technology usage.” Based on this technology usage distinction, I revised the model again to take into account the two types of usage. – This newly revised model, which is intended to be used for future research, represents the point where I am today.

Outline of the Following Chapters
In the following chapters, I describe the foundation of this study. In chapter two, I review the literatures that were relevant to the study, the learning and information technology implementation literatures. In chapter three, I develop a provisional learning model of information technology implementation based on learning and information technology research and I develop hypotheses based on the model. In chapter four, I describe the research setting and methods that I used to examine this model. In chapter five, I describe the misalignments that teams recognized during the study, and I arrange them by common function or attributes, i.e., communication-related misalignment, document-related misalignments. In chapter six, I describe the teams’ learning experiences with each misalignment and I report the results of the hypothesis tests. In chapter seven, I describe why and how I revised the model. In chapter eight, I describe and report the results of tests of the revised model; and finally, in chapter eight, I offer a discussion of the results and provide recommendations for future research.
Chapter 2

LITERATURE REVIEW

Technology Implementation Literature

Prior research has shown that three factors affect the success of information technology implementations. These factors include the quality, complexity, and cost of the technology being implemented (Aiman-Smith & Green, 2002; Leonard-Barton & Sinha, 1993), the ability to balance technical, economic, and political considerations pertinent to the implementation (Dean, 1987; Dean, Susman, & Porter, 1990; Langley & Truax, 1994), and managerial processes relevant to IT implementation. These managerial processes include the degree of user involvement (Leonard-Barton, 1995), the pace with which the implementation is carried out (Leonard-Barton, 1995), and the degree of mutual adaptation between the information technology and the user environment (Desanctis & Poole, 1994; Leonard-Barton, 1988; Majchrzak, Rice, Malhotra, King, & Ba, 2000; Susman, Gray, Perry, & Blair, 2003). (See figure 2.1 for a model of the factors that affect the success of an information technology implementation.) User learning during technology implementation can focus on any of these factors. Users can increase their knowledge about the technology being implemented. Organizations can increase their knowledge about how to best balance technical, economic, and political considerations to improve the success of the implementation; and, organizations can increase their knowledge about how managerial processes contribute to the success of the implementation. Because I am interested primarily in how users learn during technology implementations and how that learning directly affects the implementation, I focus this project on the third factor: learning that relates to managerial processes. In particular, I am
interested in how users adapt the technology and user environment to each other. Therefore, this project builds upon the “mutual adaptation” stream of literature.

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Insert Figure 2.1 about here

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**Mutual Adaptation Literature**

When new information technologies are implemented in teams, they rarely match the teams’ needs perfectly (Leonard-Barton, 1988). During information technology implementations, mutual adaptation occurs when individuals (users and systems personnel) modify the technology to align it with the unique user environments, and/or they modify user environments to align with the technology (Leonard-Barton, 1988). A user environment refers to the organizational, group, and tasks structures that comprise the environment into which a technology is introduced (Susman et al., 2003). Organizational structures include organizational level reporting relationships and communication and decision-making norms. Group structures include group-level reporting relationships and communication and decision-making norms; and task structures include the levels of uncertainty, complexity, and interdependence inherent in tasks (Susman, et al., 2003). The goal of mutual adaptation is to bring the new technology and the user environment into greater alignment. Presumably by creating greater alignment, an organization can create efficiencies, facilitated by the technology, and raise its overall level of performance (Leonard-Barton, 1988, 1995). In some mutual adaptation cases, new technologies have been adapted to a user environment when features of the technology were modified to align with organizational, group, and task structures. For example in a group decision support system implementation, users adapted the technology’s access features to prevent managers from viewing work-in-progress, which
aligned the technology with the organizational communication norms (Majchrzak et al., 2000). Likewise, in other cases, user environments have been adapted to align with information technologies when modifications were made to organization, group, or task structures to align with a new technology. For example, in the same group decision support system implementation, users adapted their group decision-making norms to align with the more participative nature of the technology’s decision-making feature (Majchrzak et al., 2000). In most cases of information technology implementation, however, both technology and user environment adaptations are made (Leonard-Barton, 1995). That is, technology features and structures within the user environment are both adapted to each other.

To adapt a new technology to a user environment, members of an implementation team commonly modify the technology’s features (e.g., communication, workflow, and/or decision-making features) to align with the organizational, group, and task structures that existed in the user environment before the technology was introduced (Majchrzak et al., 2000; Susman et al., 2003). This means that organization, group, and task structural modifications can also be made to adapt the user environment to the new technology. Modifications to an organization’s structure during technology implementation include changes to organization-level reporting relationships (i.e., who reports to whom), decision-making norms (i.e., how decisions are made and by whom), and communication norms (i.e., how employees gather information). Modifications to group structures include changes to group-level reporting relationships, decision-making and communication norms; and modifications to task structures include changes to the level of uncertainty, complexity, and interdependence inherent in tasks. When a feature of a new technology does not facilitate or match a facet of the pre-existing organization, group, or task structures, a misalignment is said to exist. The mutual adaptation process focuses on eliminating these misalignments.
Although misalignments can occur between any or all four types of structures (i.e.,
group, organization, task, and technology), three types of misalignment are of particular
interest to me because they involve technology. They are technology-organization
misalignments, technology-group misalignments, and technology-task misalignments. See
figure 2.2 for a depiction of these types of misalignments. (The other types of misalignments
include organization-group, organization-task, and group-task misalignments.) A technology-
organization misalignment may occur, for example, when a new information technology
permits managers to access and follow a new product development team’s work-in-progress.
This situation can create a misalignment if the technology’s data access permissiveness
violates a pre-existing organizational norm of allowing managers to only view the team’s
completed work (Majchrzak et al., 2000). A technology-group misalignment may occur, for
example, when a new technology permits team members to view project planning documents
including project schedule and budget information. This situation can create a misalignment
if the technology’s data access permissiveness violates a pre-existing group norm of allowing
only the project manager to view this information; and a technology-task misalignment may
occur, for example, when a new technology does not permit engineers to view a 3-D CAD
model. This situation can create a misalignment if the data access limitation is evidence of
the fact that the new technology is not sufficiently complex to handle engineers’ tasks
because it keeps them from collaborating using 3-D CAD models, as they did before the
technology was introduced.

I propose that user learning during the initial implementation of a new information
technology focuses on these misalignments. In particular, I contend that users learn about
misalignments by first recognizing and evaluating them, then by taking action to reconcile them, and finally by reflecting upon their actions. Ultimately, I believe, the amount and quality of learning that occurs during the implementation of a new information technology may affect the success or failure of the implementation.

Mutual Adaptation and Implementation Success

When an organization implements a new information technology within a team, managers often have a purpose for doing so. These purposes may be specific (e.g., to report data in a new way) or general (e.g., to improve customer satisfaction). Moreover, the underlying motivation for implementing the new technology usually results from a desire to make proactive process improvements or to emulate competing organizations (Srinivasan, Lilien, & Rangaswamy, 2002). Regardless of the underlying motivation, the success of an implementation within a specific team depends upon whether the implementation purpose is realized and to what degree. Because implementation purposes differ between teams and differing factors affect different teams’ implementations, comparing success criteria across teams is difficult. The one factor that does appear to affect most teams’ implementation success is the team’s usage rate. The notion that users must use the technology for the implementation to be successful is implicit in the success criteria for most technology implementations. (Moreover, it is plausible that implementation success can be measured in terms of usage.) Nevertheless, the greater the team members’ usage rates, the more likely it is that the purpose of the technology will be realized.

Team usage has been measured and observed by self-reported and system-generated user adoption rates (Edmondson, Bohmer, & Pisano, 2001) and levels of technology-related activity (Bjorn-Andersen, Eason, & Robey, 1986). A new information technology’s adoption rate refers to the number or percentage of users who use the new technology. A team level of
activity refers to how extensively members use portions of the new technology (e.g., how many documents are created using a new technology, how many sessions are initiated within new technology). Note that team usage rates can be affected by organizational actions taken to motivate users to utilize the technology (Bjorn-Andersen et al., 1986). For example, managers can motivate users to utilize a new technology by decommissioning old technologies that the new technology is meant to replace, providing adequate training and support of the new technology, and tying users’ compensation to their usage of the new technology. The degree to which an organization motivates users to utilize a new technology demonstrates managers’ commitment to the technology implementation. Managers may be reluctant to take actions such as those mentioned for fear that the new technology might not operate properly. Nevertheless, the degree to which users will utilize a new technology depends also on how well aligned the new technology is with the users’ environment (i.e., organizational, group, and task structures) and to what degree they can reconcile any misalignments (Orlikowski, 1992).

Users are more likely to use a new technology when it has features that are aligned with their existing genre systems (Yates & Orlikowski, 2002). Genre systems refer to users’ typified social action patterns, and they are influenced strongly by the organizational, group, and task structures present in a user’s environment. Because users often relate to a new technology in terms of existing technologies, they often presume that the new technology will be aligned with, or facilitate, their existing genre systems (Orlikowski, 1994). A misalignment exists when the new technology does not align with, or facilitate, the users’ existing genre systems. If a misalignment is not reconciled by modifying the technology and/or user environment, then users will likely choose to not use the technology (Orlikowski, 1992). Indeed, choosing to not use a new technology, or a portion of it, may be a common reaction when users experience a misalignment and they are not particularly motivated to use
the technology. This decision to not use the technology then affects the technology adoption rate.

**Assumptions about Mutual Adaptation**

Researchers (Desanctis & Poole, 1994; Leonard-Barton, 1988; Majchrzak et al., 2000; Tyre & Orlikowski, 1994) differ with respect to their assumptions about how mutual adaptation between a new technology and a user environment occurs. These differences relate to (a) whether some features of the technology and user environment are immutable (i.e., less amenable to adaptation than others), (b) whether adaptations occur continuously or discontinuously during the mutual adaptation process, (c) whether the overall level of technology-user environment misalignment declines continuously over time, and (d) whether misalignments exist even if individuals do not recognize them.

**Immutability of technologies and user environments.** A researcher’s assumption about whether some features of a technology and user environment are less amenable to adaptation than others determines what adaptations they believe occur during technology implementations. If some core features of a new technology are “off limits,” as Desanctis and Poole (1994) suggest (that is, they are not open to modification), then the misalignments that relate to these technology features can only be eliminated by making modifications to the organization, group, and/or task structures. In other words, if the technology is immutable, then the user environment will have to accommodate the new technology. On the other hand, if a researcher assumes that no feature of the technology, nor any organizational, group, or task structure is off limits from modification, as Majchrzak, Rice, Malhotra, and King (2000) suggest, then she will be less likely to restrict her analysis to specific types of adaptations. This assumption affects the types of misalignments that become salient for any given researcher. For example, if a researcher was to assume, in the course of an implementation,
that the task assignment feature of a new project management technology could not be modified, then he would not look for, and would therefore not notice, any adaptations that were made to the task assignment feature. Instead, he would look for evidence of user environment modifications that were made to align with the task assignment feature. By assuming that no feature of the technology, nor any organizational, group, or task norm is off limits from modification, however, he would not consciously limit the type of misalignments that he notices. In arguing that no structure is inherently immutable (i.e., resistant to modification), Majchrzak, et al. (2000) stated that previous researchers may have come to this conclusion based on the particular circumstances present in their studies. When Majchrzak and her colleagues addressed this issue by studying mutual adaptation in a setting in which the technology and user environments were quite open to modification (i.e., the implementation of a group decision support system in a virtual, inter-organizational new product development team), they found that no structure was inherently immutable. Therefore, following Majchrzak, et al. (2000), I assumed that the technology and all elements of the user environment were capable of adaptation during implementation.

Timing of adaptations. Researchers also disagree on whether adaptations occur continuously or discontinuously over time. In a study of a new product development team’s implementation of a collaborative technology, Majchrzak, et al. (2000) found that adaptations arose continuously over the ten-month study period. On the other hand, in a study of three technology implementations of different types of information technology, Tyre and Orlikowski (1994) found that adaptations occurred discontinuously in batches over time. They noted that there appeared to be “windows of opportunity” during which organizations made adaptations. Different senses of priorities on the parts of the implementation teams studied, however, may explain some of the differences between Majchrzak, et al.’s continuous adaptation finding and Tyre and Orlikowski’s discontinuous adaptation finding.
In Tyre and Orlikowski’s (1994) studies, high priorities were placed on the three implementation teams to adapt the technologies and user environments to each other quickly so that production losses would be minimized. This priority to adapt quickly discouraged “fine-tuning” adaptations following an initial period of adaptation. Only after users’ discontent with the technologies reached a threshold did the organizations engage in another round of adaptations. On the other hand, in Majchrzak, et al.’s (2000) study, because the collaborative technology being introduced was a critical tool for the organization, the implementation team was motivated to continue to make fine-tuning adaptations after the initial adaptations failed to align the technology and the user environment. In this way, the team’s priority was not on “getting it right the first time,” but instead on “getting it right.”

These different implementation priorities, therefore, may have contributed to the authors’ different findings regarding the continuous versus discontinuous nature of mutual adaptation. Given these different findings, in this study, I assumed that some adaptations would occur continuously, while others would occur discontinuously over time.

Overall level of misalignment. In the original formulation of the mutual adaptation process, Leonard-Barton (1998) assumed that the overall level of misalignment between a new technology and a user environment (i.e., the intensity and number of misalignments) would decline continuously over time. (See figure 2.3.) This continuous decline in the misalignment level occurs as misalignments are recognized and reconciled by the implementation team. Majchrzak, et al. (2000), however, found that although the overall level of misalignment generally declines, periodically, the level of overall misalignment can increase as actions taken by an implementation team to correct one misalignment result in the creation of new misalignments. Therefore, the overall level of misalignment between the new technology and user environment is perceived to be capable of increasing as well as decreasing. Leonard-Barton did not address this possibility of the creation of new
misalignments. In light of these perspectives, I found the latter argument more convincing and assumed that although the overall level of misalignment will generally decline over time, periodic increases in the overall level can occur as organizational members recognize more misalignments. Therefore, taking into account my assumption that adaptations can occur either continuously or discontinuously, I began this project with the belief that the overall level of misalignment between a new technology and the user environment generally decreases over time, with periodic increases, as adaptations are made. (See figure 2.4).

Insert Figures 2.3 and 2.4 about here

Ontological nature of misalignments. A researcher’s assumptions regarding whether misalignments exist if individuals do not recognize them can affect the type of data that is collected. If researchers assume that misalignments do not exist unless members of the implementation team recognize them, then researchers need to capture team members’ reactions to a new technology. In these reactions, team members will individually and socially construct misalignments. On the other hand, if misalignments can exist separately from users’ awareness of them, then researchers do not need to understand team members’ social constructions, but instead can simply note the differences between the technology and user environment. For example, when noting misalignments between a new technology’s built-in project workflow and pre-existing task interdependencies, researchers can simply collect data about misalignments without needing to interview team members. These two perspectives represent nominalist and realist ontological interpretations (Burrell & Morgan, 1979) of misalignments.

Ontologically, I believe that the organizational world is composed of tangible structures that exist external to individual cognition, but that individuals influence the
ongoing construction of these structures via their perceptions of reality. Framed in terms of the nominalism–realism debate (Burrell & Morgan, 1979), my ontological belief is closer to the realist pole than to the nominalist pole. Nominalism refers to the belief that “the social world external to individual cognition is made up of nothing more than names, concepts and labels which are used to structure reality” (Burrell & Morgan, 1979: p. 4), and realism refers to the belief that “the social world external to individual cognition is a real world made up of hard, tangible and relatively immutable structures” (Burrell & Morgan, 1979: p. 4). Although my stated belief is mostly consistent with this definition of realism, I do not accept the notion that structures are immutable. I believe they are subject to transformation and are regularly changed by individuals. Therefore, when compared to these polar definitions, the ontological position that I assume in this project is a modified realist perspective.

This project’s theory of organizational learning during information systems implementation is derived from a tradition of congruence theories in organizational studies. Congruence theories state that systems, such as social and technical systems, evolve toward each other through processes of mutual adjustment. Complete alignment between the systems is never completely realized, however, as systems continually change over time. Examples of congruence theories include Lawrence and Lorsch’s (1967) contingency framework for organizational structures and performance (that states organizations and environments adapt to each other), strategic management theory that suggests organizations match their strengths and weaknesses to the opportunities and threats in their environments (Learned, Christiansen, Andrews, & Guth, 1969), and Leonard-Barton’s (1988) conceptualization of technology-user environment misalignment. Socio-technical congruence theories share a common underlying perspective in that they assume that social and technical (socio-technical) systems exist independently of individuals’ awareness of them, although individuals may shape these systems’ final forms whether they are aware of
them or not. According to this assumption, system members strive to understand the systems in which they find themselves by perceiving the systems based on their individual experiences and learning. But there exists a reality that is separate from individuals’ perceptions of it (Susman, 1983).

In this reality, social and technical systems exist in varying degrees of alignment. The degree of alignment influences a socio-technical system’s performance. Higher degrees of alignment are associated with higher performance levels and lower degrees of alignment, or higher degrees of misalignment, are associated with lower performance levels. Note, however, that although socio-technical systems possess real qualities, individuals create and shape the ultimate configuration of these real qualities through their perceptions and actions. Once individuals act to create and shape systems, the new system configurations become real for them and for future system members. In this way, individuals perceive their environment, act upon their perceptions to modify the systems in their environment, and thereby contribute to their future reality and the reality of those who come after them.

In terms of the present study, my underlying ontological assumption matters because it implies that a misalignment between system elements can exist even if the misalignment is not recognized by anyone. But to use a technology in an effective manner, a user must accurately perceive and act upon the misalignments that most inhibit her effectiveness and by acting upon the real misalignments, users align their real technology and social systems. A more nominalist underlying assumption would imply that a technology–user environment misalignment originates in human perception. Although I believe that some misalignments originate in human perception and have consequences that relate to it, other misalignments are independent of human perception and impact system performance regardless of whether or not individuals perceive them. In this sense, they are real.
Along with believing that real misalignments exist, I also believe that individuals can misperceive misalignments. This can happen, for example, when an individual wrongly attributes cause for a misalignment. When this occurs, individuals act upon their perceptions to create a new relationship between their social system (their user environment) and a technical system (the technology being implemented). This action, however, does not fix the real misalignment. The real misalignment still exists, and will continue to exist until perception appropriately matches the misalignment. I refer to this process of perceiving misalignments as misalignment recognition, and in this project I am concerned only with those misalignments that users recognize.

**Learning Literature**

Unlike the mutual adaptation literature and other organizational behavior topics, a large part of the collective learning (i.e., group and organizational learning) literature is process-oriented (Crossan, Lane, & White, 1999; Huber, 1991; Miner & Mezias, 1996). That is, much learning research has focused on how groups and organizations learn, as compared to studying only what they learn or what factors influence learning. This process research has suggested a variety of learning activities that collectively comprise the collective learning process. In one learning model based on a review of the organizational learning process literature, organizational learning is comprised of knowledge acquisition, information distribution, information interpretation, and organizational memorization activities (Huber, 1991). In another model, the collective learning process includes intuiting, interpreting, integrating, and institutionalizing activities (Crossan et al., 1999); and in a third model, a distinction is made between trial-and-error learning activities, inferential learning, vicarious recognition, and generative learning activities (Miner & Mezias, 1996). Although differences are apparent between these learning process models, parallels also exist between them.
Namely, most models of the collective learning process\(^1\) suggest that learning seems to consist of variants of all or some of the following activities, in this order: knowledge acquisition, knowledge storage, knowledge-based action, and reflection. Not all researchers, however, agree that collective learning includes all these activities. The main difference concerns whether action needs to be taken for learning to occur.

The pragmatist perspective suggests that collective learning requires acting upon acquired knowledge (Crossan et al., 1999). This perspective argues that learning is revealed via a process that includes action and reflection on that action. The pragmatist learning process, therefore, consists of all four types of activities, knowledge acquisition, knowledge storage, knowledge-based action, and reflection; and evidence of pragmatist learning can be observed in behavioral changes on the part of the learning party. The empiricist perspective, on the other hand, suggests that it is only necessary for the possible range of potential behaviors available to have changed for organizational learning to exist (Huber, 1991). Empiricists argue that learning occurs when knowledge is acquired and stored; and it is not necessary for a group or organization to act on the new knowledge for learning to have occurred. An empirical collective learning model, therefore, consists of only knowledge acquisition and knowledge storage activities; and evidence of empirical learning cannot necessarily be observed. Instead, researchers must interview learning process participants and ask if they experienced cognitive changes. Because of the practical concern of observing and collecting behavioral data for this project, I adopted a pragmatic learning perspective.

\(^1\) Note that the primary focus of this study is on collective learning and not on individual learning. Collective learning differs from individual learning in terms of the recipient of the learning (an individual versus a group) and lack of attention to the development of social consensus (Fiol, 1994). In individual learning models, individuals interpret personal experiences by themselves and no consensus with others is developed. In collective learning models, individuals share their interpretations of personal experiences with others and develop a consensual interpretation that allows them to act together. Moreover, as consensus develops, individuals, who may possess different interpretations, often influence each other. Individual learning models, on the other hand, do not take into account social influence. With this said, I also acknowledge that collective learning cannot occur without individual learning. Therefore, although the primary focus of this study in on collective learning, I will not ignore individual learning.
Therefore, at the beginning of the project, I assumed that the collective learning process includes knowledge acquisition, knowledge storage, knowledge-based action, and reflection activities. Moreover, I assumed that the relationship between knowledge and action during these activities will resemble the relationships described by both the decision-making and emergent models of collective learning.

Within the pragmatist perspective, collective learning theories based on decision-making models (Levitt & March, 1988; March, 1991) suggest that group or organization members first recognize and evaluate problems and select an action to take from a list of generated alternatives before they act. Then, after acting, they reflect upon the consequences of their actions to determine if the original problems were solved. If a problem was not fully solved and the member recognizes the gap (which defines the revised problem), a new cycle of learning focused on the revised problem may occur. In this way, members create knowledge about a problem, they plan an action to address the problem, they act, and then they gather information about the results of their action.

In emergent theories of collective learning (Daft & Weick, 1984; Weick, 1995), on the other hand, less emphasis is placed on the knowledge that is developed about a problem before taking an action. Instead, retrospective sensemaking that takes place after taking action largely determines what new knowledge group or organization members gain about a problem. According to this model, after identifying a problem, members select and take an action to address the problem. In taking action, and then reflecting upon the consequences of the action, they come to better understand the problem (i.e., they create new knowledge through enactment). Therefore, in an emergent learning model, action largely precedes knowledge creation. In both decision-making and emergent models of learning, however, the same learning activities occur (i.e., problem recognition, evaluation, action, and reflection).
The primary difference between the two models lies in the emphasis on where knowledge is created. In this project, I assumed that both forms of collective learning would occur.

A Model of Collective Learning

Knowledge acquisition. Knowledge acquisition refers to the activities taken by individuals to obtain information that is important to their group or organization (Huber, 1991). Knowledge acquisition also serves as the first phase of collective learning. During this phase, individuals create knowledge by making sense of their interactions with others, by making connections between previously unconnected items, and by organizing their experiences (Nonaka & Takeuchi, 1995). Because individuals often create this knowledge in the context of their employment, their groups and organizations acquire this knowledge. Moreover, groups and organizations can also acquire knowledge in other ways. For example they also acquire knowledge by hiring new employees or adding new members, by purchasing databases, and by contracting consultants (Starbuck, 1992). Individuals’ knowledge creation activities, however, often provide their groups and organizations with more valuable knowledge than these other forms of knowledge acquisition because the knowledge they create is more group- or organization-specific. Therefore, I primarily studied this form of knowledge acquisition.

As the first step in the collective learning process, knowledge acquisition is vitally important to learning. The ability to learn depends upon group or organization members’ acquisition of new knowledge, that knowledge can be tacit or explicit (Nonaka & Takeuchi, 1995). Tacit knowledge refers to the knowledge individuals possess but are unable to articulate. Explicit knowledge, on the other hand, refers to the knowledge individuals possess that they are able to articulate. Often explicit knowledge is documented. In the context of mutual adaptation during technology implementation, a user, upon initially encountering the
new technology, may sense a misalignment, but be unable to describe it. The user’s knowledge, therefore, is individual and tacit. Then, over time, as the user gains experience with the technology and speaks with other users, he may be able to translate the feeling into words that describe the misalignment, thereby making the knowledge public and explicit. This conversion of tacit knowledge to explicit knowledge, referred to as externalization, represents the greatest opportunity for knowledge acquisition in many groups and organizations (Nonaka & Takeuchi, 1995). Therefore, in this project, I paid particular attention to externalizations enacted by users of new technology.

**Knowledge storage.** Whereas collective knowledge is acquired largely by individuals, it is stored in individuals, groups, and organizations. Knowledge storage refers to the activities taken by individuals to evaluate, categorize, and retain knowledge within the collective memory (Huber, 1991). Collective memory locations include individuals’ minds, an organization’s culture, group operating procedures, a group’s reporting norms, and an organization’s physical environment (Walsh & Ungson, 1991). In addition to simply retaining knowledge, however, groups and organizations also select, evaluate and categorize knowledge. By socially evaluating and categorizing knowledge, especially knowledge recently created by individuals, they attach group- and organization-specific meaning to the knowledge, and create consensual understandings about specific pieces of knowledge. Consensual understandings facilitate unified action based on that knowledge.

**Knowledge-based action.** According to the pragmatist perspective of collective learning, taking action based on new knowledge is necessary to consider learning to have occurred. Knowledge-based action refers to the application of knowledge to group and organizational behavior (Huber, 1991). Taking action can mean slightly changing group communication norms or it can mean radically modifying the organization’s competitive strategy. What is important is that the new knowledge affects behavior in some way.
Without a behavioral repercussion, individuals cannot reflect on the knowledge and cannot complete the learning process.

**Reflection.** In the final phase of the collective learning process, individuals reflect over time on the knowledge that they and their co-workers have acquired and stored (Huber, 1991). They consider how their actions were influenced by specific knowledge and they review the consequences of their actions. This consideration allows them to organize and make sense of their experiences and potentially create new knowledge or lessons. In this way, reflecting on knowledge provides a feedback loop to the beginning of the collective learning process (Crossan et al., 1999; Levitt & March, 1988).

**Decision-Making Approach to Learning**

The collective learning process concepts presented thus far reflect a theory of learning that has derived primarily from the managerial decision-making literature (Cohen, March, & Olsen, 1972; Cohen & Levinthal, 1990; Cyert & March, 1963; Janis & Mann, 1977; March & Simon, 1958). However decision-making theories often differ based on their assumptions. In a rational model of decision-making, decision-makers are assumed to possess perfect knowledge of problems, action alternatives, and the consequences of their actions (Moorhead & Griffin, 2003). In a behavioral model, decision makers are assumed to operate under conditions of bounded rationality and engage in satisficing (Cyert & March, 1963; March & Simon, 1958); and in a garbage can model, decision making is viewed as a process that is influenced by chance, personal influences, and time pressures (Cohen et al., 1972). In spite of these differences in assumptions, these decision-making process theories all generally propose that individuals (a) identify a problem (or issue) about which a decision should be made, (b) evaluate the severity of the problem and generate a list of alternative actions to address the problem, (c) select and implement an alternative, and (d) determine whether the
problem was rectified or if a new action needs to be taken (Moorhead & Griffin, 2003). If a new action needs to be taken, the decision-making process begins again. This sequence of events appears quite similar to the organizational concepts presented in the organizational learning process theories presented above (Crossan et al., 1999; Huber, 1991; Levitt & March, 1988; March, 1991). This similarity, I speculate, exists largely because the latter collective learning theory literature built upon the prior decision-making theories. The learning model presented in this proposal, therefore, is derived largely from a decision-making tradition.

Note that recent collective learning process theories have also built upon this decision-making tradition (Crossan & Berdrow, 2003; Crossan et al., 1999; Kleysen & Dyck, 2002; Lawrence, Mauws, Dyck, & Kleysen, forthcoming). Most notably, this literature has extended learning process theory by highlighting the importance of politics. In this research, various forms of power, including discipline, influence, force, and domination are seen as central to the collective learning process. Discipline is proposed to affect how group and organization members recognize new knowledge. Influence is proposed to affect how members interpret the new knowledge. Force is proposed to affect how they integrate their interpretations; and domination is proposed to affect what knowledge becomes institutionalized. Note, this extension of collective learning process theory resembles the contributions of decision-making theorists who similarly highlighted the importance of politics in decision-making models (Cohen et al., 1972; Cyert & March, 1963).

Exploitative Learning Versus Exploratory Learning

Groups and organizations learn both by exploiting old certainties and by exploring new possibilities (Levitt & March, 1988). When a group learns through exploitation, it takes advantage of knowledge that it already possesses. On the other hand, when a group learns
through exploration, it explores new situations and acquires knowledge from its experiences. Exploitative learning includes activities such as refinement and selection, and exploratory learning includes activities such as search and experimentation. In the context of mutual adaptation during technology implementation, exploratory learning occurs, for example, when an implementation team adapts its pre-existing, hierarchical group decision-making process to match the new technology’s more egalitarian group decision-making functions (Susman, Gray, Perry, & Blair, 2003). Similarly, exploitative learning occurs during technology implementation, for example, when an implementation team adapts the new technology’s workflow function to match users’ pre-existing task interdependencies. I was concerned in this project, therefore, with both exploitative and exploratory learning.

**Learning Consequences**

After engaging in knowledge acquisition, knowledge storage, knowledge-based action, and reflection activities, what do individuals learn? Research has distinguished between two types of consequences of the learning process, single-loop and double-loop learning (Argyris & Schon, 1978). Single-loop learning consequences are simple cause-and-effect mental models that do not take into account the values underlying individuals’ actions. For example, if an individual encounters an “error screen” in the process of signing-on to a software program and then experiences that the error screen “goes away” when she clicks on OK, she will engage in “single loop” learning if she simply makes the connection between “clicking on OK” and “the problem goes away.” This is single-loop learning because she does not question the underlying cause-and-effect relationship – e.g., why did clicking on OK lead to the problem going away? Instead, she assumes that clicking on OK when she encounters the error screen will lead to the problem going away. Therefore, in the case of single-loop learning, if an individual experiences some form of success, she will create a
mental model that attributes cause for the success to the actions taken just before the success (Argyris & Schon, 1978). Conversely, if an individual experiences some form of failure, she creates a mental model (e.g., a heuristic, script, schema, causal map, frame) that attributes cause for the failure to the actions taken just before the failure, and, therefore, will seek to change those actions. Trial-and-error learning is an example of single-loop learning consequences.

Double-loop learning consequences, on the other hand, are more complicated mental models that take into account the underlying reasons for how and why an individual’s actions are related to a consequence of those actions. In the case of double-loop learning, if an individual experiences some form of success, in developing a mental model, he will consider how and why the actions taken just before the success and circumstances surrounding his actions combined to create the success. In the error window example, for double-loop learning to occur, an individual would have to address questions such as “what caused the error window to appear?” and “what happened when I clicked OK?” After encountering several error windows in different programs and after being able to “make the problem go away” by clicking on OK, the individual may conclude that certain types of programs are designed to notify the user of sign-on errors but allow him to continue to work with the program because sign-on errors are not significant enough to terminate program sessions. In this way, the process of developing this more complex mental model that sign-on errors are not significant enough to terminate program sessions (e.g., a double-loop learning consequence) involves the examination of the factors underlying the observed cause-and-effect relationship.

**Why learning matters during information technology implementation**
Learning allows implementation teams to take advantage of the knowledge their members (i.e., users) acquire. During times of change, such as the implementation of a new technology, users often acquire more new knowledge than during other times. Therefore, the potential for learning is great. Users’ newly acquired knowledge cannot, however, benefit their teams unless learning activities are in place to store the knowledge. Therefore, it is important for users to pay attention to their learning activities during implementations. Organizations’ abilities to learn during implementations have been implicated as determinants of important, desirable strategic organization-level outcomes such as organizational strategy modifications (Crossan & Berdrow, 2003) and the creation of competitive advantages (Probst, Buchel, & Uchel, 1997). Note that these outcomes are possible only when organizations invest in their members’ learning activities. On the other hand, a lack of investment in learning activities during implementations can lead to undesirable results. In two technology implementation projects, Ciborra and Patriotta (1998) found that inadequate attention paid to learning led to the projects’ failures. Therefore, at the beginning of this project, I assumed that how an implementation team learns during technology implementation matters and that the learning process in which its members engage can and often does affect the success of the implementation effort. It is important to note, also, that an important underlying assumption is that collective as well as individual learning would occur within the technology implementation I studied.
FIGURE 2.1
Factors that Affect the Success of an Information Technology Implementation

- Information Technology Quality, Complexity, and Cost
- Ability to Balance Technical, Economic, and Political Considerations
- Managerial Processes (degree of user involvement, implementation pace, degree of mutual adaptation*)

Success of an Information Technology Implementation

* This project focuses on the relationship between mutual adaptation and the success of information technology implementation
Technology-user environment misalignments can occur between any of the new technology’s functions and any pre-existing feature of the organizational, group, or task structures.
FIGURE 2.3

Summary of Mutual Adaptation Model (Leonard-Barton, 1988)
The overall misalignment level is represented by the distance between the Technology and User Environment. The slopes represent changes in the overall misalignment level brought about by adaptations.
Chapter 3

PROVISIONAL MODEL

In this chapter, I synthesize the literatures reviewed in the last chapter and I develop a provisional learning process model for the mutual adaptation that occurs during the implementation of a new information technology. This synthesis provides a preliminary model of collective learning during an information technology implementation. I contend that when viewed from a learning framework, it is possible to perceive that a collective learning process can occur during mutual adaptation. Such a process would focus on learning about misalignments.

Following the four-phase learning model outlined above, mutual adaptation can be viewed as a series of learning events. I label these learning events misalignment recognition, misalignment evaluation, misalignment reconciliation, and misalignment reflection. Misalignment recognition is analogous to knowledge acquisition about misalignments and includes activities such as sensing and interpreting a misalignment. Misalignment evaluation is analogous to the organizational learning concept of knowledge storage which includes collective information evaluation, categorization, and retention (Huber, 1991). Misalignment evaluation includes activities such as recognizing differences in interpretations of a misalignment, integrating different interpretations of a misalignment, and determining the importance of a misalignment. Misalignment reconciliation is analogous to knowledge-based action and includes activities such as developing ideas of adaptations that might fix a misalignment, selecting adaptations intended to fix a misalignment, and taking action (making adaptations to the new technology and/or to organization, group, and/or task structures). Lastly, misalignment
reflection is analogous to the fourth phase of collective learning, reflection, and includes activities such as determining if a misalignment still exists and determining if a new misalignment was uncovered as a result of adaptations. It is during this misalignment learning phase that users articulate what they learned.

Although I have listed four misalignment-based learning events, users do not have to engage in all four events for learning to occur. I contend that they can learn by engaging in some or all of these four misalignment learning events. For a particular misalignment, however, I speculate that the more learning events in which users engage, the greater will be their learning about that misalignment. For example, if a team of users recognizes and collectively evaluates a misalignment, but does not reconcile or reflect on it, I speculate that the amount of learning the team experiences around that misalignment will be less than the learning experienced by another team that recognizes, evaluates, reconciles, and reflects on the misalignment. Finally, because I assume that users’ misalignment-based learning will relate to their team’s level of technology usage, I hypothesize that the greater the level of learning a user team experiences, the greater will be its technology usage. (See figure 3.1.)

Misalignment Recognition

When members of a pilot team first experience a new technology, they may recognize misalignments between the technology and their pre-existing user environment. These misalignments will exist between the new technology’s features and the organization, group, and
task structures that existed before the technology was introduced (Desanctis & Poole, 1994; Majchrzak et al., 2000; Susman et al., 2003). The recognition of misalignments, however, is not always straightforward. Most misalignments are not obvious to some members of the implementation team, including the technology designers and implementers. If a misalignment was obvious, that is, if the designers and implementers could detect it, one would expect that the misalignment would have been reconciled before the technology was installed. This is especially the case when designers and implementers are familiar with the task, organization, and group structures which are present in the environment into which the new technology will be implemented (e.g., when the designers and implementers are “in house” or when they have consulted with end-users during the technology’s design). Therefore, the misalignments that do exist at the time of implementation are often not immediately apparent. To recognize them, users often first sense them by engaging the technology and then interpreting and verbalizing their experiences.

Sensing a Misalignment

Individuals often first acquire knowledge about a subject with which they are interacting via gestalt or by organizing their experiences in ways that allow them to understand the experiences (Nonaka & Takeuchi, 1995). They do so in an attempt to make sense of their experiences (Weick, 1995). This sensing activity is the same as intuition (Crossan et al., 1999). That is, in sensing a misalignment, users rely on their intuitions. They strive to recognize patterns in their personal experience with a technology and they seek to find evidence that confirms their expectations for the technology. For example, when a user first encounters a new technology that is misaligned with a restrictive knowledge-sharing norm present in the user’s
organization, she may intuit that the technology is “too loose.” But she may not be able to identify the cause of her intuition (i.e., the misalignment). The user’s experience of the new technology and the underlying misalignment serves as the input to her intuition and the description of the technology as “too loose” is the outcome of her intuition. In this way, evidence that a user may have sensed a misalignment can be found by noting her emotional responses to her initial encounters with the new technology. Because sensing is pre-verbal, users may not yet be able to initially describe misalignments. Instead, when they encounter a new technology, they may experience frustration, confusion, and/or puzzlement. These emotions arise partly from the fact that the technology inevitably does not perform in a manner that is exactly consistent with the way they had previously performed tasks which the technology is intended to facilitate (Zorn, 2002). Therefore, when users of a new technology initially experience the technology as frustrating, confusing, or puzzling, they may be sensing a misalignment.

Note, however, that a user can be frustrated with, confused by, or puzzled about a new technology for reasons unrelated to a misalignment. For example, a user may be frustrated that he has the additional responsibility of testing a new technology. A user could also be confused about how to use a new technology, or he might be puzzled about why he was included in the pilot. These examples of displayed emotions are not indicative of a misalignment. Therefore, it is important to understand the cause of users’ emotional reactions to a new technology.

Interpreting a Misalignment

When individuals acquire knowledge but do not yet quite understand the meaning of the knowledge fully, they often initially describe the tacit knowledge in terms of metaphors, analogies, and examples (Crossan et al., 1999; Nonaka & Takeuchi, 1995). In the case of
misalignments, users may begin to describe misalignments as “problems” with the technology (Zorn, 2002). For example, in recognizing a misalignment between a new technology’s task workflow and pre-existing task interdependencies, a user may describe the technology as “too linear,” but not be able to elaborate on the details underlying this comment. Over time, however, she may then come to describe a “problem with the way the system handles task scheduling.” In this way, interpreting misalignments is an iterative process that occurs as a user continues to engage a technology and seeks to verbally make sense of her experiences.

Note that in some cases, experienced users may be able to quickly verbalize a misalignment and its cause after having engaged a new technology only once. I speculate that this may be the case particularly when the misalignment concerns important components of the user environment and when experienced users are part of the pilot implementation. When the misalignment concerns important components of the user environment (e.g., a well-defined group decision-making norm) and when the users have significant experience (e.g., tenure), they may be more sensitized to how the technology will intersect with pre-existing organizational, group, and task structures. This may occur because they know both the context and their expectations of the technology well.

I expect that in order for a pilot team to learn from misalignments, its members will first have to recognize misalignments; and to be able to recognize misalignments, they will have to use the technology. Therefore, I expect that teams with members who recognized more misalignments will have greater levels of technology usage.

Hypothesis 1: The number of misalignments recognized by a pilot team’s members will be positively related to the team’s technology usage.
**Misalignment Evaluation**

After individually recognizing misalignments, users enter into social discourse about the misalignments that they recognized. During this phase, users share their interpretations of a misalignment, listen to others’ interpretations of the misalignment, attempt to make sense of their experience in terms of others’ interpretations, strive to develop an integrated, social understanding of the misalignment, and possibly attempt to persuade others that their interpretation is correct. During this phase, therefore, users begin to socially learn about misalignments. By speaking with, observing, and being influenced by others, users may confirm or modify their interpretations. Therefore, misalignment evaluation includes the following activities: recognizing differences in interpretations of a misalignment, negotiating different interpretations of a misalignment, and determining the importance of a misalignment.

**Recognizing Differences in Interpretations of a Misalignment**

Because of their functional background and contextual environments, some users are more likely to recognize some misalignments than others (Susman et al., 2003). These background and contextual differences allow users to interpret the technology differently, focus their attention on different features of the technology (Griffith, 1999), and/or emphasize different ways in which the technology may be useful. For example, because of their background, salespeople may be more likely than manufacturing personnel to recognize a misalignment between a new information technology’s sales facilitation functionality and the interdependence of their sales tasks. Moreover, when two users recognize the same misalignment, their interpretations of the misalignment might differ based on their functional backgrounds and
contexts (Susman et al., 2003). For example, a salesperson might perceive a misalignment to exist between the technology’s sales facilitation feature and the interdependence of his sales tasks; and a sales manager might perceive the same misalignment as existing between the technology’s sales facilitation feature and the organization’s reward system for salespeople.

**Negotiating Different Interpretations of a Misalignments**

For an pilot team to take concerted action to address a misalignment, users need to develop a consensual understanding of the misalignment they perceive (Crossan et al., 1999). To develop a consensual understanding requires negotiating users’ interpretations. This negotiation is not difficult when users have similar interpretations of a misalignment. When users possess differing interpretations, however, they are more likely to develop a consensual understanding to the extent that norms supporting open exchange of information exist in the team, their functional backgrounds are homogeneous, and they trust each other (Susman et al., 2003). Also, when users possess differing interpretations, their abilities to influence each other will affect the content of the consensual understanding that develops. A user’s ability to influence her fellow team members depends upon her personal and position power (French & Raven, 1959). Therefore, for example, when a veteran salesperson and an accounting clerk have different interpretations of a sales function misalignment, I would expect that the salesperson would have greater influence during the negotiation process and that his interpretation would be closer to the final, consensual, team interpretation of the misalignment than the accounting clerk’s interpretation.

**Determining the Importance of a Misalignment**
In addition to evaluating misalignments based on their functional backgrounds and contexts, users also place different levels of importance on misalignments (Susman et al., 2003). The amount of importance that is collectively placed on a misalignment will determine if an attempt to reconcile the misalignment will be made. This collective sense of importance, which is developed in a similar manner to the way in which the consensual interpretation is developed, is also subject to users’ influence. Therefore, for example, in the case of differing senses of importance between an accounting clerk and an accounting manager about a misalignment, I would expect that the manager would have greater influence on the other members of the implementation team and that her sense of the misalignment’s importance would be closer to the final, consensual sense of importance than the clerk’s interpretation (controlling for the manager’s and clerk’s other forms of power such as technical expertise).

In beginning this project, I expected that in order for a pilot team to learn from misalignments, its members would have to collectively evaluate misalignments (i.e., recognition is a necessary pre-condition for evaluation); and to be able to collectively evaluate misalignments, multiple team members would have had to have recognized the same misalignments. Therefore, I expected that those teams that collectively evaluated more misalignments would have greater levels of technology usage.

Hypothesis 2: The number of misalignments evaluated by at least two pilot team members will be positively related to the team’s technology usage.

**Misalignment Reconciliation**
A pilot team attempts to reconcile a misalignment when one or more of its members (or someone outside the team acting on its behalf) makes one or more adaptations to the technology or user environment to bring them into alignment. This action is preceded and informed by the interpretations and evaluations that users make about misalignments. The reconciliation phase, therefore, includes the following activities: developing ideas of adaptations that might fix a misalignment, selecting adaptations intended to fix a misalignment, and taking actions (making adaptations).

**Developing Adaptation Ideas**

Before users can take action, they must first develop an idea or ideas of how they might address a misalignment. At this point, the cause of a misalignment becomes important because to effectively reconcile the misalignment, users should have an understanding of why the misalignment exists. For some misalignments, the causes may be obvious, and therefore adaptations that could address the misalignments might also be obvious. For example, if a new sales quote system does not allow supervisors to override preset part costs, as they were able to do before the system was introduced, then the cause of the misalignment is the difference in functionality between what the technology offers and what the task requires. The obvious adaptations that might fix this misalignment include a modification of the technology to allow a supervisor to override preset part costs or a modification of the task rule, such that supervisors are no longer allowed to override the preset costs. For other misalignments, however, the causes may be less obvious. In these cases a variety of different adaptation ideas may be conceived and applied by users. In developing these ideas, users’ functional backgrounds and contexts will affect the types of ideas they develop (Susman et al., 2003).
Selecting Adaptations

After users have developed a list of adaptation ideas, they will select one or more of the ideas to apply to a misalignment. Because users have limited resources (e.g., time, programming skills, authority to change organizational norms), it is likely that they will not choose to apply all the adaptations. Therefore, how they select adaptations will be affected by users’ influences and their willingness to be responsible for enacting the adaptations. Generally, users will be more likely to agree on adaptations when the differences in their functional backgrounds and contexts are small, when they share a high level of trust, and when there is a high level of openness between them (Susman et al., 2003).

Taking Action

Adaptations are modifications made to a technology’s features and/or organization, group, or task structures in such a way that the technology and user environment become more aligned. Adaptations, therefore, are actions intended to reconcile misalignments. Although adaptations are intended to reconcile misalignments, it should be noted that this does not always occur. Adaptations may not reconcile a misalignment for a variety of reasons. For example, because the individuals responsible for taking action (e.g., programmers modifying an information technology at the request of pilot users) may not be the same individuals who developed and selected the adaptation idea (i.e., the pilot users), they may not apply the adaptation in the correct manner. Therefore, after taking action, it is important for users to reflect on the misalignment.
In beginning this project, I assumed that recognition and evaluation were necessary pre-conditions for reconciliation to occur. I also expected that in order for a pilot team to learn from misalignments, its members would have to make adaptations to the new technology or user environment; and by making adaptations, they would bring the technology and user environment into greater alignment, which would promote further use of the technology. Therefore, I expected that teams with members who made more adaptations would have greater levels of technology usage.

Hypothesis 3: The number of adaptations made by (or on behalf of) a pilot team’s members will be positively related to the team’s technology usage.

Misalignment Reflection

After taking action to reconcile a misalignment, users may reflect upon their experience with the misalignment and they may attempt to determine if the misalignment still exists. Moreover, a new misalignment may have been uncovered as a result of their adaptations. Without reflecting, users will not be able to extrapolate lessons from their misalignment experience and they will not know if the misalignment has been fully reconciled.

Determine if a Misalignment Still Exists

Although adaptations are intended to reconcile misalignments, they do not always result in reconciliations. Therefore, users should check whether a misalignment still exists after an adaptation is complete. If a misalignment still exists, users may wish to apply another adaptation. Moreover, whether it still exists or not, users can learn from their experience. They
can learn which adaptations are effective and which are not effective over time. Because making an adaptation changes the relationship between a technology and a user environment, a misalignment that had been previously reconciled may re-emerge after another adaptation is applied. When this occurs, users may become more aware of the interdependent nature of the technology and the user environment.

Users also vary in how they determine whether a misalignment still exists. In determining if a misalignment still exists, some users may only be concerned with whether a specific manifestation of the misalignment disappeared. Others, on the other hand, may be more thorough and test whether the cause of the misalignment was addressed. How pilot teams determine if a misalignment still exists also differs. In some teams, misalignment reflection consists of formal group meetings in which users review the adaptation and its effect, and in other teams, reflection may occur more informally as some group members talk among themselves. Some teams may test one scenario to see if a misalignment still exists, and others may exhaustively test many scenarios to see if the cause of a misalignment still exists. These examples show that some users and pilot teams spend more time and energy determining if a misalignment still exists after making adaptations.

**Determine if a Misalignment was Uncovered**

Because the overall relationship between a new technology and a user environment changes when an adaptation is applied, new misalignments can accidentally be created. For example, human resources information systems (HRISs) often possess features that facilitate the collection and processing of managers input on employees’ performance for promotion purposes. Some HRISs even allow human resources users to weigh the different managers’ performance
ratings differently depending upon managers’ familiarity with an employee. If an HRIS implemented within an organization, however, weighs all managers’ input equally and this equal weighing feature does not match the HR group’s decision-making norm around how promotion decisions are determined (and the group decision-making norms are aligned with the organization’s decision-making norms), a modification to the technology would create a new technology-organization misalignment. Likewise, a modification to the group norm to reconcile the first misalignment would create a new group-organization misalignment. In this way, a new misalignment can emerge when an old misalignment is reconciled.

New misalignments are likely to emerge when greater attention is paid to an aspect of the technology as a result of the adaptation; or when another misalignment that was drawing attention away from an underlying misalignment is reconciled and thereby reveals the underlying misalignment. To be aware of whether new misalignments emerged, therefore, requires vigilance on the part of the pilot team.

Develop Lessons

Contemplating their experience with a misalignment, users may develop lessons attributable to their experience and related to the misalignment. These lessons would be in the form of mental models (e.g., heuristics, scripts, schema, causal maps) that help users to better understand their experience. For example, in reflecting on the HRIS – group decision making norm misalignment listed above, a user team might develop a causal map that explains the cause and effect relationship underlying the misalignment. Alternatively, based on its experience with the misalignment, a team might develop a script for how to best use the HRIS. Both of these are examples of lessons that a user team might develop while reflecting on a misalignment.
I assume that recognition, evaluation, and reconciliation are necessary pre-conditions for reflection to occur. I also expect that in order for a pilot team to learn from misalignments, its members will have to reflect on the misalignments they attempted to reconcile; and by reflecting on these misalignments and the adaptations they made, they will collectively develop lessons attributable to the misalignment. These lessons will allow them to recognize other misalignments and make further adaptations to bring the technology and user environment into greater alignment. This greater alignment will then promote greater levels of technology usage. Therefore, I expect that teams with members who reflected-on more misalignments will have greater levels of technology usage.

Hypothesis 4: The number of misalignments reflected-on by a pilot team’s members will be positively related to the team’s technology usage.

Feedback

The outcome of a learning process, the knowledge that results from reflection, often causes individuals to recognize new learning possibilities (Crossan et al., 1999). In the course of reflecting on their experience with a misalignment, users may conclude that the misalignment was effectively addressed and no longer exists. That is ideally what will occur when the adaptation eliminates the misalignment. When this occurs, the learning process around the misalignment ends. In other cases, users may discover that the adaptations did not eliminate the misalignment, or that the misalignment was only partially reconciled, or that, although the

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2 A misalignment may be partially reconciled when some of the scenarios that reflected that misalignment are eliminated but not all scenarios. For example, there may be a new technology that, when initially implemented, allows both a user’s subordinates and superiors to review his work-in-progress. If the organization in which the technology is implemented, however, possesses a norm which allows users to keep their work-in-progress private,
misalignment was eliminated, another, new misalignment was uncovered. In these cases, the
learning process continues and users begin the learning process anew by sensing and interpreting
the nature of the new or modified misalignment. In this way, misalignment reflection can trigger
misalignment recognition.

then the information-sharing feature of the technology that allows others to view the user’s work-in-progress would
be misaligned with the pre-existing organizational norm. If the implementation team (acting on behalf of users) then
modifies the technology so that subordinates can no longer view the users’ work-in-progress, but superiors still can,
then the misalignment will have been only partially reconciled.
FIGURE 3.1
Provisional Learning Model of Information Technology Implementation

Misalignment-Focused Team Learning of a New Technology

MISALIGNMENT RECOGNITION → MISALIGNMENT EVALUATION → MISALIGNMENT RECONCILIATION → MISALIGNMENT REFLECTION → Technology Usage
Chapter 4

METHODS

This project intends to answer the question, “How do users learn during information technology implementations?” To conduct research to answer this question, I studied the individual and collective learning processes that occurred within eleven user teams implementing a common information technology. In doing so, I used qualitative research methods designed to identify processes (Abbot, 1990; Garud & van de Ven, 1992; Markus & Robey, 1988; Pentland, 1999; Pettigrew, 1990; Sabherwal & Robey, 1993; Van de Ven, 1992; Van de Ven & Poole, 1990, 2002). Additionally, because I hypothesized that greater learning around misalignments would be related to greater technology usage, I also used quantitative research methods to test these hypotheses.

Overview of Process Research Methods

Process research methods strive to answer “how” questions (Van de Ven & Poole, 2002). As such, process research methods are more descriptive and less prescriptive than variance research methods. Process research methods describe (a) a sequence of events – e.g., what events typically occur and in what order do they typically occur, (b) the focal actors involved in processes – e.g., people, (c) actors’ voices – e.g., points of view, social relationships, positions of power, and (d) evaluative contexts – e.g., cultural values and assumptions surrounding a process (Pentland, 1999). Additionally process methods are mostly qualitative in nature. This means the empirical data collected in the context of process research focuses on words, thought patterns,
and discourse rather than on measurement of constructs via scales, surveys, or other numerical indicators of the constructs (Van de Ven & Poole, 2002).

Process research methodology has suggested that there are four ideal types of organizational process theories: life-cycle, teleological, dialectic, and evolutionary theories (Van de Ven & Poole, 1990). (See figure 4.1 for a diagram of these four ideal process theory types.) A process theory is a life-cycle process if it contains “a unitary sequence of stages moving to the progressive differentiation of an entity, regulated by natural or institutional laws” (Van de Ven, 1992: 176). A theory is a teleological process theory if it contains cumulative sequences of planning, implementation, and adaptation to reach a desired end state. A theory is a dialectic process theory if it “contains multiple divergent progressions mediated by partisan struggle between contradictory values or events” (Van de Ven, 1992: 176); and a theory is an evolutionary process theory if it contains a sequence of variation, selection, and retention events. In the real world, however, most processes that researchers observe are a blend of at least two of these ideal types (e.g., life cycle and teleology) (Pentland, 1999).

In the present study, a perusal of the theory development section above reveals there are elements of two of these ideal process types in the learning model of technology implementation presented in chapter four – i.e., evolutionary and life cycle process. That is, the model may be generally viewed as an evolutionary process in which the overall level of misalignment between a technology and a user environment moves from a state of misalignment to a state of alignment as those misalignments that are deemed more important are reconciled; and the model may be
viewed as a life cycle process in which a technology and user environment become more aligned as they mature.

Suggestions for how to conduct process research

Methodologists offer the following suggestions for conducting process research: (a) define the meaning of process, (b) avoid mono-method bias, (c) control for the effects of temporal change, (d) select cases that have successful track records with the phenomenon of interest, and (e) recognize actors’ perspectives. Each of these are explained below.

Define the Meaning of Process

Researchers have considered multiple types of “processes” in their studies (Van de Ven, 1992). These include processes offered as an explanation for variance theories, processes that comprise a category of concepts, and processes that represent developmental sequences of events. It is this third category of processes that I adopted in beginning this study. Therefore, following Van de Ven (1992), I defined a process as “a sequence of events or activities that describes how things change over time, or that represents an underlying pattern of cognitive transitions by an entity in dealing with an issue” (p. 170).

Avoid Mono-Model Bias

Beginning a study of an organizational process with one theoretical explanation in mind can lead a researcher to rationalize the data to fit her model (Mitroff & Emshoff, 1979). To guard against this bias, I developed a provisional model derived deductively from the mutual adaptation and learning literatures, and I used the model as only a starting point from which to
begin an investigation into how the users in this study learned. To guard my research against a possible mono-model bias, I identified events and sequences that did not conform to the model, and I strove to remain open to alternative explanations of how users learned during the study. As such, in beginning this study, I expected that the events and sequences present in the provisional model would change during the study as data were collected and analyzed. Moreover, in analyzing the data I collected to test the provisional model, I used constant comparison analytic techniques (Glaser & Strauss, 1967). These techniques allowed me to identify non-conforming events and sequences which eventually allowed me to revise the learning model that I developed in chapter three.

In using constant comparison techniques (Glaser & Strauss, 1967), researchers begin analysis by coding each incident into categories (e.g., misalignment recognition, misalignment evaluation). These initial categories may be derived deductively from theory, as they are when employing analytic induction methods (Robinson, 1951; Znaniecki, 1934), or they may be derived inductively, as they are when employing grounded theory methods (Glaser & Strauss, 1967). In either case, as a researcher continues to categorize incidents over time, she compares each categorization decision to the incidents that she had previously coded using the same category. This constant comparison practice allows the researcher to modify the categories over time to better reflect the incidents. Occasionally, the researcher will also encounter incidents that challenge her categorization scheme (i.e., the provisional theory). When this occurred in the present study, I followed Glaser and Strauss’s (1967) advice and separated myself from the data. This allowed me to make notes about how and why an incident did not conform to the categorization scheme, and allowed me to take some time to contemplate this difference. This non-conformance signaled that the current categorization scheme that I had developed based on
the provisional model did not adequately reflect the data I had collected. Moreover, it also represented an opportunity to develop a categorization scheme that took into account the incident as well as all the previously coded data. Using these constant comparison techniques, therefore, I revised the content in the provisional model to account for the non-conforming data.

Control for the Effects of Temporal Change

Some of the changes observed by a researcher may result from aging, cohort, or transient factors rather than from the process under study (Cook & Campbell, 1979; Van de Ven & Poole, 2002). To control for these temporal change confounds, I studied multiple teams that were part of the same implementation of an information technology. These teams performed the same task within the same organization and were provided with the same technology and level of support. Moreover, the type of technology that was being implemented in these teams was a collaborative information technology. Collaborative information technology is an emerging form of information technology that allows users to create, store, access, and retrieve data virtually. Studying multiple cases of the same implementation of a single type of emerging technology mitigated the effect that might result from studying different technologies at different times. Moreover, I collected (relatively) real-time data during the implementations, as compared to retrospective data. This also helped me control for some of the effects associated with temporal change (e.g., user turnover, missed implementation deadlines). The collection and use of retrospective data has been criticized because such data often fails to capture short-lived factors that exert influence on the process under study, and relies upon the selective memories of informants and researchers (Pettigrew, 1990). That is, because informants and researchers already know the outcomes of the process under study, they often provide “logical,” rationalized
narrations of the process that support the outcomes. Therefore, retrospective accounts may be error prone due to respondents’ faulty memories (Golden, 1992).

**Select Cases that Already Have Successful Track Records**

To follow this suggestion for this project would mean that I should have, at the beginning of the project, selected user teams that had successful track records with learning during technology implementations. This would provide me with a greater likelihood of being able to observe user learning during technology implementations. To follow this suggestion would also require that I either measure or have a sense of candidate user teams’ past learning experiences. Given the difficulty of measuring teams’ learning a priori, this suggestion was difficult to address, but not impossible. To follow the suggestion, I selected user teams in which new information technologies had been implemented and adopted within the previous two years – i.e., an information technology had been adopted by all team members and been integrated into users’ routines (Edmondson, Bohmer, & Pisano, 2001). That is, I selected teams that had previous technology implementation experience. This provided an indication that the teams had engaged in some new technology-related learning and had experienced some degree of implementation success. Also, I selected teams that matched other criteria including: (a) the user teams had to be just beginning to implement a collaborative technology, (b) the teams had to be implementing an information technology to facilitate a pre-existing process (e.g., benefits annual enrollment processing) rather than implementing an information technology to facilitate a new process, and (c) the teams had to consist exclusively of end-users (i.e., non-technical employees) who planned to use the technology to conduct a real (i.e., non-test) project.
Recognize Actors’ Perspectives

Actors, individuals involved in the process under study, possess unique perspectives, and these perspectives become evident in their actions and the narratives they provide to researchers (Pentland, 1999). These perspectives are important because they chronicle the instances of events that occur in particular settings and provide insight into variations in the actors’ perceived causal explanations. For example, a manager who is serving as the project leader of a technology implementation may describe an administrative error as the cause of a misalignment that the implementation team is experiencing. The team’s information systems engineer, on the other hand, might describe technical difficulties as the cause of the misalignment. Regardless of which one is correct, each informant’s perspective highlights some aspects of a story (e.g., causes, actions, and actors) and silences other aspects (Pentland, 1999). Therefore, to gain a thorough understanding of the process under study, it is important to utilize the narratives of multiple informants and to become aware of the attributed causal factors in each informant’s perspective.

With this suggestion in mind, I interviewed and observed multiple users in each of the user teams. Because the user teams were cross-functional (i.e., they consisted of employees from different functional areas), their members’ perspectives differed. Additionally, I interviewed organizational members outside the teams to obtain an organizational perspective. Together this diverse group of actors provided a variety of perspectives and allowed me, by triangulating respondents’ narratives (Jick, 1979; McGrath, 1982), to identify converging and differing perspectives. Because the development of a consensual interpretation of a misalignment is necessary for the misalignment evaluation process, it was essential that I identify when team members’ perspectives regarding a misalignment converged and when they differed.
Research Context and Design

To conduct research on how users learn during technology implementations, I studied eleven implementations of a common collaborative information technology within the same organization. These teams were identical in structure and they were identical in terms of the task for which they were implementing the technology. They were all implementing the technology to facilitate an employee benefits annual enrollment processing project for which they were responsible. (The clients for whom they were working differed.) Studying multiple concurrent implementations of the same information technology, within the same organization, and targeted toward facilitation of the same project, allowed me to control for organizational, task-, and technology-specific variables that might otherwise explain variance in user teams’ technology usage. Additionally, the users of all eleven teams had access to the same training, received the same level of support and configuration of the new technology, and were subject to the same task requirements at the same time. This setting, therefore, allowed me to focus on how individual and group-level factors relate to variance in teams’ technology usage.

Focal Information Technology

Collaborative Workspace\(^3\) (CWS), the information technology studied in this project, was a modified version of Documentum 5.0, a commercially available collaborative information technology. Collaboration information technology is software that is intended to promote teamwork among users who may be separated by time and space (Majchrzak, Rice, Malhotra, King, & Ba, 2000). Group decision support systems and document management systems are

\(^3\) Because the name of the information technology studied is unique to the research setting the technology’s name has been changed to protect confidentiality.
examples of collaborative information technologies. Some common collaborative information technology features include data sharing features, (e.g., email, synchronous and asynchronous file sharing), data capture features (i.e., repositories, whiteboards), data management features (e.g., version control, document locking, sign-offs, document subscriptions), Project Management features (e.g., workflows, task scheduling and notification, reporting), and data access features (e.g., user rights administration, document and folder security administration). Although Documentum 5.0 contained all of these features, CWS contained only a subset. Notably, it contained document approval, document archiving, document history, document responsibility, document versioning, email, external repository, internal repository, project responsibility, project security, and undo error features. (For a list of CWS features, see table 4.1.)

I chose to study CWS, a collaborative information technology, precisely because it was a new technology and best implementation practices had not yet been established. The user teams that implemented CWS were pioneers, and, as pioneers, they faced steep learning curves (Karsten, 1999; Woiceshyn, 2000). This steep learning curve made the study of CWS attractive for this project. Therefore, because collaborative information technology was an emerging class of information technology and because the implementing users knew little about how to best implement and use it, the potential for learning during the pilot implementation was great.
As previously mentioned the eleven pilot teams that I studied were part of the same organization and used CWS to facilitate the same project.

The organization. BenefitsCo provides human resources and benefits outsourcing services to client companies through the administration of retirement, pension, health and welfare, human resources administration, and payroll programs. The Health & Welfare (H&W) practice handles the administration of client organizations’ insurance, medical, and retirement savings benefits. The services that BenefitsCo provides to its clients depend on the client’s size. For BenefitsCo’s largest clients, the company offers a benefits annual enrollment processing service. This means that large clients can outsource the administration of their annual enrollment project, which is usually handled by in-house human resources personnel, to BenefitsCo. For BenefitsCo’s H&W practice, the annual enrollment service is the most complex service it offers.

The teams. Annual enrollment (AE) projects are large, complex projects that occur every year. During the projects, BenefitsCo employees work with clients to process the annual healthcare and insurance elections of the client’s employees and inactive participants (e.g., retirees). A core team of 5-7 employees serve as the core AE project team. This core team consists of a client service manager (CSM), 1-2 associate client service managers (ACSM), a project manager (PM), 1-2 project analysts (PA), and a Communications manager (CM), who is from outside of H&W. Depending upon the client’s size (i.e., the number of client employees and retirees), more than one ACSM or PA may be assigned to the project. (See table 4.2 for descriptions of the eleven AE teams involved in the CWS pilot.) Also, depending upon the client’s size, the team members may be dedicated to only that client, or shared with other clients.

4 The general description in this chapter of the research site – i.e., the organization, the teams, the project, and the history of collaborative information technology – are provided to provide the reader with an understanding of the research site before explaining the data collection process used in this study. Greater detail about the research site is provided at the beginning of chapter five.
5 All company, division, and team names have been changed to protect confidentiality.
Additionally, other BenefitsCo employees become involved in the AE project at different points during the project’s lifecycle. These non-core, back-office employees include transaction processors, quality assurance testers, systems engineers, and configuration specialists. All of these non-core employees, however, are shared among AE teams.

Additionally, client representatives become involved in AE projects. These representatives, who are mostly human resources personnel, provide the requirements and changes that need to be made to their organization’s benefits plan. For example, they decide which medical carriers to discontinue and which new health savings plans to offer their employees and retirees. They also monitor the development and testing of the plan that BenefitsCo builds for them. During most AE projects, 3-5 client representatives are involved.

During AE, the CSM and ACSM(s) comprise the “Client Services team” and work together closely to collect AE business requirements from the client representatives. Their skills are often similar and they often serve as back-ups for each other. A normal career path for a Client Services employee is to become a CSM after having been an ACSM. The PM and PA(s) comprise the “Project Management team.” Unlike the CSM and ACSM, however, the PM and PA do not have similar skills and they often cannot serve as back-ups for each other. The PM’s primary responsibility is to ensure that tasks are accomplished in a timely manner and that milestones are reached. Therefore, strong management skills are needed to be a PM. The PA’s primary responsibility, on the other hand, is to translate the user requirements into system requirements for the back office employees. As such, strong technical skills are needed to be a
PA. Although some PAs are promoted to the PM position as part of their career path, PA work experience is not required to become a PM. Lastly the CM is the sole Communications member on the team. The CM’s primary responsibility is to create AE Communications documents for the client (i.e., electronic and/or paper notices that are sent to the client’s employees and retirees on behalf of the client notifying them of benefits related changes). As such, the CM, like the Client Services team, deals directly with the client representatives. Also, during AE, all CMs have multiple clients.

In terms of organizational reporting relationships, there are two positions within the AE teams that have more formal authority. These are the CSM and PM positions. The ACSM reports to the CSM and the PA reports to the PM. The CSM and PM, however, report to different positions. The CSM reports to a Vice-President of Solution Delivery (VPSD) and the PM reports to a Manager of Project Managers (MPM). The VPSDs and MPMs, however, report to the same person, a Vice-President of Health & Welfare. The CM, on the other hand, reports to a Senior Communications Manager, who then reports to a Vice-President of BenefitsCo Investments Systems Company. Therefore, the Client Services and Project Management team members are closer to each other in BenefitsCo’s organizational chart than they are to the CM, and this manifests itself in the team members’ physical proximity to each other (i.e., most Client Services and Project Management team members are located in the same city and the CMs are located in another city) and in their communication patterns and access to each others’ data (i.e., Client Services and Project Management team members have access to each others’ “shared network drives” but CMs do not have access to these drives).

The project. According to the BenefitsCo AE training guide, the AE project goal is to:
incorporate a client’s [benefits] plan changes, new plan year rates, and zip code service areas in BenefitsCo systems . . . The AE project provides communications and enrollment channels [i.e., online or telephone employee enrollment systems] to participants that allow them to make their annual elections within a set enrollment window.

To manage AE, which lasts from mid-May until late-December, the project is divided into five phases: Discovery, Requirements, Development and Testing, Execution, and Post-Execution. (See table 4.3 for descriptions of the AE phases.)

During AE, four key documents guide the project. Initially, during the Discovery phase, the Client Services team works with their client representatives to develop a “Discovery Document.” This is the document that lists the AE business requirements. Traditionally the Client Services team communicated with their client representatives via telephone and email about the business requirements and the Discovery Document was sent back and forth between the parties as an email attachment. After it is finalized (i.e., after client representatives formally “sign-off” on the business requirements), the Discovery Document then becomes the guiding document for the creation of AE technical systems requirements.

Also during the Discovery phase, the CM works with her client representatives to develop the Communications Strategy. This is the document that lists the AE Communications requirements. Like the Client Services team, the CM traditionally communicated with her client representatives via telephone and email about the Communications requirements and the Communications Strategy was sent back and forth between the parties as an email attachment.
Also like the Discovery Document, the Communications Strategy, after it is finalized, becomes the guiding document for the creation of the AE Communications materials that are later sent to the client’s employees.

Lastly during the Discovery phase, the PM creates the Project Plan. This is the document that details the tasks, responsibilities, and deadlines related to the AE project. Traditionally the Project Plan has been an internal document (i.e., client representatives did not have access to it) that was maintained only by the PM, and was kept on a shared network drive to which the Client Services team and Project Management team had access and were able to view it. During the later AE phases, the Project Plan serves as the guiding document for the management of the AE project.

The last main guiding document, the “Systems Requirements Analysis,” is created during the Requirements phase. The Systems Requirements Analysis is a document created by the PA that lists the AE technical systems requirements. Traditionally the Systems Requirements Analysis has been an internal document that was only maintained by the PA, and was kept on a shared network drive to which the Client Services team and Project Management team had access. During the later AE phases, the Systems Requirements Analysis serves as the guiding document for the modification of the AE technical systems.

Note that AE is a document intensive project and that several other documents are also created during the project. These documents can be classified as Client Services, Communications, and Project Management documents and they provide direction in these respective areas of the project. The four documents mentioned, however, are the primary guiding documents for the project and other AE documents are primarily derived from them.
History of collaborative information technology in BenefitsCo. At the time that CWS was implemented in BenefitsCo, the AE teams were using other technologies for collaboration purposes. These included email, telephone calls, telephone conference calls, and shared network drives. Additionally, BenefitsCoDoc, a recently implemented tool (i.e., within the past two years) that had some of the document management features that CWS had, was also being used. At the time that the CWS pilot implementation began (June 14, 2004), BenefitsCoDoc was being used primarily for storing reference documents that could be used by multiple AE teams and which could be used for multiple projects (i.e., not just AE projects). Only BenefitsCo employees, however, had access to BenefitsCoDoc. Client representatives could not access BenefitsCoDoc. Lastly, QuickPlace, a tool similar to CWS, had also been recently installed. QuickPlace was collaborative information technology quite similar to CWS and was piloted by five teams during their 2003 AE projects. It was abandoned part-way through AE, however, when the implementation team decided that CWS would better meet BenefitsCo’s collaborative information technology needs.

Data Collection

Process research has distinguished between “incidents” and “events” (Van de Ven & Poole, 2002). Incidents are the activities undertaken by actors while engaging in a process. As such, incidents represent first-order data (Van Maanen, 1979) and can be observed by researchers or narrated by actors. Events, on the other hand, are unobserved concepts to which incidents relate. They are concepts created by researchers based on systematic interpretations of what is relevant to the process under study. As such, events represent second-order data (Van Maanen, 1979) and are created by researchers extrapolating from instances or from prior theory.
In this study, misalignment recognition, misalignment evaluation, misalignment reconciliation, and misalignment reflection are considered events. In the course of collecting data, if an informant, for example, relates a story of how he noticed, when he first encountered CWS, that it did not possess a feature that was important to his job, this story would be an incident of the misalignment recognition event. The data related to user learning that I collected from users, therefore, are considered incidents. The users identified incidents related to misalignments and I, using theory and techniques described in the analysis section, translated these incidents into misalignment recognition, evaluation, reconciliation, and reflection events, or other appropriate concepts if these events did not fit. To begin, however, I collected background data to provide a foundation for the study.

**Background Data.**

Following process methodology suggestions (Poole, Van de Ven, Dooley, & Holmes, 2000), I began by collecting background data. In particular, I began by conducting interviews with nine of the CWS steering team members and two members of the implementation team. These interviews provided me with data about implementation motivations, the base technology from which CWS was modified (Documentum 5.0), the CWS modification, and the pilot teams’ selection. Additionally, to obtain background data on the pre-existing user environment in the AE pilot user teams, I interviewed the implementation team member responsible for rolling-out CWS to the pilot teams. To supplement this interview, I also reviewed BenefitsCo’s AE training documentation. This documentation outlined the formal procedures involved in the AE process.

**Learning Data**
Once CWS was implemented (June 14, 2004), I began to interview members of the AE pilot teams. In total there were 59 team members on the eleven teams. Because of the time required to conduct an interview (30-60 minutes) and team members’ schedules, I visited the two office locations where team members were located on six occasions over the six-month pilot implementation. Moreover, to understand how team members’ misalignment-based learning changed over the course of the pilot (e.g., to observe team members changes in interpretations of misalignments, if any), I interviewed several team members on more than one occasion, depending upon their availability. In total I conducted 83 interviews of 40 team members (an average of 2.075 interviews per team members). See table 4.4 for a summary of the team members interviewed. The fewest number of members of a team I interviewed was three and the most was five; and the fewest number of individuals I interviewed by position was five and the most was ten. Overall the team that was least represented in my interviews was the Client-E team (the largest team); and the position that was least represented was the PA position.

In interviewing team members I used a semi-structured interview protocol derived from the provisional learning model. (See appendix A for the interview protocol.) Because this study was designed to not only test a provisional model, but also to revise the model based on the data that was collected, I did not adhere solely to the questions on the interview protocol. Instead, if a team member began to explain how he learned or what affected his learning, I encouraged him to continue. All interviews were tape-recorded and transcribed. Therefore, team members comments that did not directly answer a question on the interview protocol, but that related to

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Insert Table 4.4 about here

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66
their how and what he learned were captured. The interview protocol questions were based on the provisional model and therefore sought to solicit users’ narrations of incidents related to misalignment recognition, misalignment evaluation, misalignment reconciliation, and misalignment reflection events. But I acknowledged that there was more to how team members learned during an information technology implementation than was represented in the model.

**Misalignment recognition.** Using team members’ interview transcripts, I noted the incidents of a misalignment and coded “misalignment name” as a brief description of a misalignment as described by team members. (Note that team members could describe a misalignment in different ways.) A misalignment was any difference a user mentioned between CWS’s features and the organizational, group and task structures in place when the new technology was implemented. Misalignments have been perceived by users in previous research as opportunities for improvement (Tyre & Orlikowski, 1994) and as problems (Majchrzak et al., 2000). I tried to solicit misalignment descriptions based on both perceptions. To identify these misalignments, I looked in users’ transcripts for incidents in which they described (a) a user structure, (b) a technology feature (or lack thereof), and (c) evidence of a difference. I then noted how the team members described these incidents and whether they were describing similar or different incidents. To test hypothesis 1, I then counted the number of misalignments recognized by a team’s members. (See table 4.5 for a description of the misalignment learning coding scheme.)

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Insert Table 4.5 about here

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67
Misalignment evaluation. Following the incidents of misalignments in team members’ interview transcripts, I noted if and how they developed a consensual assessment of the misalignments they recognized and I looked for evidence that team members had discussed their incidents with each other. I coded “consensual assessment” as a description of how they collectively assessed the misalignment, including descriptions of (a) whether they viewed it as an opportunity or problem and (b) whether it was viewed in positive or negative terms. If team members did not possess a collective assessment (i.e., at least two team members did not assess the misalignment in the same way), then I left this field blank. To test hypothesis 2, I counted the number of misalignments with consensual assessments.

Misalignment reconciliation. For those misalignments for which team members had developed a consensual assessment, I then looked for evidence of how the misalignments were adapted (i.e., what actions were taken to reconcile the misalignment). To solicit incidents of misalignment reconciliation, I asked users to describe ideas that had been generated to address a misalignment and what action was then taken. I coded “adaptations enacted” as a description of how a misalignment was reconciled.

Note that in beginning this project, because of the immutable nature of CWS during the pilot (the BenefitsCo management stated that no changes would be made to CWS during the pilot), I expected that the adaptations that teams enacted would not involve modifications made to the technology to align with existing user structures. Instead, I expected that adaptations would be made only to user structures to align with CWS. However, because of the fact that during the pilot, team members were allowed to continue to use their pre-existing systems (collectively referred to as the “old system”) to perform AE tasks, I also expected that teams would sometimes choose to reject using CWS in favor of the old system. Therefore, because of
the circumstances present during the pilot (i.e., BenefitsCo’s refusal to modify CWS and the fact that team members could opt out of using CWS), I expected that the adaptations enacted by teams would be of two forms. They would involve either a team’s (a) acceptance of a CWS feature (i.e., the team would choose to use a CWS feature to reconcile a misalignment) or (b) rejection of a CWS feature (i.e., the team would choose to use the old system to reconcile a misalignment). If team members, however, did not possess a consensual assessment of the misalignment or if no action was taken to reconcile the misalignment, then I left the adaptation enacted field blank. To test hypothesis 3, I counted the number of adaptations enacted by a team’s members or on behalf of a team.

Misalignment reflection. For those misalignments which team members reported enacting adaptations, I then looked for evidence of whether team members mentioned lessons they had developed that related to the misalignments. I coded “lessons learned” as a description of any lessons that the team members developed as a result of their experience with a misalignment. To solicit incidents of lessons learned, I asked team members if they had developed any decision rules, hints, tips, guidelines, or rules-of-thumb relating to the new technology as a result of a misalignment they mentioned. I expected that these lessons would include (a) guidelines they developed for how to best use CWS features, (b) lists of implications that might result from how the misalignments were reconciled, and (c) changes in how they viewed CWS and the user environment. If no consensual assessment of the misalignment existed, no action was taken to reconcile the misalignment, or team members did not indicate that they had developed a lesson attributable to their experience with a misalignment, then I left this field blank. To test hypothesis 4, I counted the number of lessons learned by a team’s members.


**Coding Procedure**

Using the coding learning coding scheme shown in table 4.5, I kept a separate sheet for each team member I interviewed an ‘informant sheet’. Along the top of this sheet, I listed the ‘Misalignment Name,’ ‘Consensual Assessment,’ ‘Adaptations Enacted,’ and ‘Lesson Learned.’ As I reviewed a team member’s interview transcript(s) I added a line for each potential misalignment that he recognized. After coding the transcripts of all of the members of a team, I then reviewed the informant sheets and looked for descriptions of what appeared to be the same potential misalignment. When I found descriptions of what appeared to be the same potential misalignment, I transferred the data for that potential misalignment to a separate sheet, a ‘misalignment sheet’, where I grouped the data for each team, by misalignment. The data was organized using the same four categories. After following this procedure for each team, I then reviewed each of the misalignment sheets for each team looking for common themes across potential misalignments and across teams. This allowed me to reduce the number of misalignments to eleven.

**Technology Usage Data**

Following previous researchers’ (Bjorn-Anderson, et al., 1986; Edmondson, et al., 2001) conceptualization of team usage of a new technology as a measure of implementation success, I measured AE teams’ CWS usage by noting the number of document versions created by team members and stored in the team’s AE project workspace, and the number of emails created and sent from within CWS by team members. A document version refers to a new version of a document. Therefore, if a document was initially added to CWS on July 1, and then modified three times before September 1, four document versions would have been created. A team’s
technology usage, therefore, equaled the number of CWS document versions created by the team’s members plus the number of emails sent from within CWS by team members.
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document Approval</td>
<td>Users could approve a document within CWS. Approving a document changed its status and prevented it from being further modified.</td>
</tr>
<tr>
<td>Document Archiving</td>
<td>Project documents were automatically stored in inactive project folders after a project’s status became completed.</td>
</tr>
<tr>
<td>Document History</td>
<td>CWS tracked all actions (i.e., create, view, check-out, check-in, lock, unlock, delete, approve) taken on a document including the user names of who accessed a document, how they accessed the document, and when they accessed the document.</td>
</tr>
<tr>
<td>Document Responsibility</td>
<td>All actions taken on a document were linked to a unique user name. Therefore, multiple users could not synchronously take a single action on a document (e.g., multiple users could not synchronously check-out the same document.</td>
</tr>
<tr>
<td>Document Versioning</td>
<td>CWS automatically created a new version of a document whenever a user checked-in a copy of the document. Users could then note who had made what changes by comparing new and old versions of a document.</td>
</tr>
<tr>
<td>Email</td>
<td>From within CWS, users could send email links to other users who had email accounts outside of CWS.</td>
</tr>
<tr>
<td>External Repository</td>
<td>CWS allowed BenefitsCo client representatives to access documents stored in a repository within the BenefitsCo firewall.</td>
</tr>
<tr>
<td>Internal Repository</td>
<td>CWS allowed BenefitsCo employees from different divisions to access documents stored in a common repository.</td>
</tr>
<tr>
<td>Project Responsibility</td>
<td>Projects within CWS had to be initiated by project sponsor. For AE projects, the project sponsors were VPSDs.</td>
</tr>
<tr>
<td>Project Security</td>
<td>CWS allowed project administrators to control who had access to which project documents, and what type of access they had.</td>
</tr>
<tr>
<td>Undo Error</td>
<td>When users accidentally deleted or modified a document, they could backout their error and reinstate a previous version of the document.</td>
</tr>
</tbody>
</table>
### TABLE 4.2
**Descriptions of AE Pilot Teams**

<table>
<thead>
<tr>
<th>Client</th>
<th>Team Description</th>
</tr>
</thead>
</table>
| Client-A | - Six team members; one CSM, two ACSMs, one PM, one PA and one CM  
          - Client-A was included in the CWS pilot because its relationship with BenefitsCo was “at risk”  
          - The CSM had worked previously with another collaborative information technology provided by another client |
| Client-B | - Five team members; one CSM, one ACSM, one PM, one PA and one CM  
          - Client-B participated in the QuickPlace pilot in 2003 |
| Client-C | - Five team members; one CSM, one ACSM, one PM, one PA and one CM  
          - Client-C was included in the CWS pilot because its relationship with BenefitsCo was “at risk” |
| Client-D | - Six team members; one CSM, two ACSMs, one PM, one PA and one CM  
          - Client-D participated in the QuickPlace pilot in 2003 |
| Client-E | - Seven team members; one CSM, two ACSMs, one PM, two PAs and one CM  
          - Client-E participated in the QuickPlace pilot in 2003 |
| Client-F | - Five team members; one CSM, one ACSM, one PM, one PA and one CM  
          - Client-F participated in the QuickPlace pilot in 2003 |
| Client-G | - Five team members; one CSM, one ACSM, one PM, one PA and one CM  
          - Client-G participated in the QuickPlace pilot in 2003 |
| Client-H | - Five team members; one CSM, one ACSM, one PM, one PA and one CM  
          - Client-H participated in the QuickPlace pilot in 2003  
          - Most team members were physically located in a location away from the main H&W office building (in another city) |
| Client-I | - Five team members; one CSM, one ACSM, one PM, one PA and one CM  
          - Client-I was included in the CWS pilot because the VPSD believed that Client-I would want to be involved |
| Client-J | - Five team members; one CSM, one ACSM, one PM, one PA and one CM  
          - Client-J was included in the CWS pilot because client representatives indicated they wanted to be involved |
| Client-K | - Five team members; one CSM, one ACSM, one PM, one PA and one CM  
          - The CSM and ACSM roles both experienced turnover during the CWS pilot  
          - Most team members were physically located in a location away from the main H&W office building (in another city) |
### TABLE 4.3

**Description of Annual Enrollment Project Phases**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Time Frame</th>
<th>Description</th>
<th>Key Deliverables</th>
</tr>
</thead>
</table>
| Discovery         | May – June  | • The client services team members and the CM work with their client representatives to identify all information that can have an impact on AE (e.g., plan changes such as new benefits carriers, rising costs, shifts in employer/employee benefits costs). This information is then converted into business and communications requirements.  
• The PM develops a plan for how to manage the AE project | • Discovery Document – a document created by the client services team that lists the AE business requirements  
• Project Plan – a document created by the PM that details the tasks, responsibilities, and deadlines related to the AE project. The project plan is maintained jointly by the PM and CM throughout the AE project  
• Communications Strategy – a document created by the CM that lists the AE communications requirements |
| Requirements      | July        | • The client services team refines the business requirements with their client representatives  
• The PA translates the business requirements into technical systems requirements  
• The CM develops communication materials per the communication requirements | • System Requirements Analysis – a document created by the PA that lists the AE technical systems requirements  
• Communications materials – includes electronic and/or paper notices that are sent to the client’s employees on behalf of the client notifying them of benefits related changes and AE dates |
| Development and Testing | August – October | • The PA works with back-office BenefitsCo employees (e.g., transaction processors, quality assurance testers, systems engineers, configuration specialists) to develop technical specifications based on the technical systems requirements.  
• The PA receives files from benefits and insurance carriers that relate to the rates and regions covered by their benefits and insurance | • Technical Specifications – documents created by the PA to guide the modification of the underlying AE systems  
• Rates File – a file, provided by a benefits and insurance carrier, that lists the rates for different types of coverage provided by the carrier  
• Zip Codes File – a file, provided by a benefits and insurance carrier, that lists the zip codes (i.e., geographic regions) in which it provides |
<table>
<thead>
<tr>
<th>Execution</th>
<th>November</th>
</tr>
</thead>
</table>
| • The CM works with back-office BenefitsCo employees to send AE communications to clients’ employees  
• Back-office BenefitsCo employees migrate newly configured AE systems from a test environment to a production environment and clients’ employees are allowed to make their annual benefits enrollments  
• AE communication materials are sent  
• AE Enrollment window opens  
• AE Enrollment window closes |

<table>
<thead>
<tr>
<th>Post-Execution</th>
<th>December</th>
</tr>
</thead>
</table>
| • The PA works with back-office BenefitsCo employees to send employee enrollment and payroll files to carriers and clients  
• Carrier Enrollment File – a document sent to a benefits and insurance carrier that lists the client’s employees who enrolled in one of the carrier’s plans, and the type of plan(s) they chose  
• Client Payroll File – a document sent to the client’s payroll department that lists the client employees’ benefits and insurance enrollments and costs |

These descriptions were summarized from BenefitsCo’s AE training documentation.
### TABLE 4.4

**Summary of Team Members Interviewed**

<table>
<thead>
<tr>
<th>AE Pilot Team/Position</th>
<th>ACSM</th>
<th>CSM</th>
<th>CM</th>
<th>PA</th>
<th>PM</th>
<th>Number of team members interviewed</th>
<th>Total Number of team members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client-A</td>
<td>1/2</td>
<td>1/1</td>
<td>1/1</td>
<td>1/1</td>
<td>1/1</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Client-B</td>
<td>1/1</td>
<td>0/1</td>
<td>1/1</td>
<td>0/1</td>
<td>1/1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Client-C</td>
<td>1/1</td>
<td>0/1</td>
<td>1/1</td>
<td>0/1</td>
<td>1/1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Client-D</td>
<td>1/2</td>
<td>0/1</td>
<td>1/1</td>
<td>1/1</td>
<td>1/1</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Client-E</td>
<td>1/2</td>
<td>0/1</td>
<td>1/1</td>
<td>1/2</td>
<td>1/1</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Client-F</td>
<td>1/1</td>
<td>1/1</td>
<td>1/1</td>
<td>0/1</td>
<td>0/1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Client-G</td>
<td>0/1</td>
<td>1/1</td>
<td>1/1</td>
<td>0/1</td>
<td>1/1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Client-H</td>
<td>1/1</td>
<td>1/1</td>
<td>0/1</td>
<td>0/1</td>
<td>1/1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Client-I</td>
<td>0/1</td>
<td>1/1</td>
<td>1/1</td>
<td>1/1</td>
<td>1/1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Client-J</td>
<td>1/1</td>
<td>1/1</td>
<td>1/1</td>
<td>1/1</td>
<td>1/1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Client-K</td>
<td>1/1</td>
<td>1/1</td>
<td>1/1</td>
<td>0/1</td>
<td>1/1</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

The first number in the ACSM, CSM, CM, PA, and PM columns indicates the number of individuals in that position interviewed on the team. The second number indicates the number of individuals in that position on the team. Therefore, “1/2” in the Client-I/ACSM cell indicates that I interviewed one of the two ACSMs on the Client-A team.
TABLE 4.5

Misalignment Learning Coding Scheme

TEAM ____________________

Team Member ______________

<table>
<thead>
<tr>
<th><strong>Misalignment Recognition</strong></th>
<th><strong>Misalignment Evaluation</strong></th>
<th><strong>Misalignment Reconciliation</strong></th>
<th><strong>Misalignment Reflection</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Misalignment Name</strong></td>
<td><strong>Consensual Assessment</strong></td>
<td><strong>Adaptations Enacted</strong></td>
<td><strong>Lessons Learned</strong></td>
</tr>
<tr>
<td>Description of a misalignment that relates to incidents mentioned by team members during interviews</td>
<td>Description of how team members collectively assessed the importance of the misalignment. This included how descriptions of the misalignment’s impact, whether they viewed it as an opportunity or problem, and whether it was viewed in positive or negative terms. — if team members did not possess a common, collective assessment of the misalignment, then this field was left blank</td>
<td>Description of how the misalignment was reconciled — if no consensual assessment of the misalignment existed or no action was taken to reconcile the misalignment, then this field was left blank</td>
<td>Description of any lessons that the team members attributed to their experience with the misalignment — if no consensual assessment of the misalignment existed, no action was taken to reconcile the misalignment, or team members did not indicate that they learned any lessons, then this field was left blank</td>
</tr>
</tbody>
</table>
### FIGURE 4.1

Summary of Ideal Types of Organizational Development and Change Processes (Van de Ven & Poole, 1995)

<table>
<thead>
<tr>
<th>EVOLUTION</th>
<th>DIALECTIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variation → Selection → Retention</td>
<td>Thesis → Conflict → Synthesis</td>
</tr>
<tr>
<td>Set/Envision Goals</td>
<td>Search/Interact</td>
</tr>
<tr>
<td>Search/Interact</td>
<td>Implement Goals</td>
</tr>
<tr>
<td>Implement Goals</td>
<td>Dissatisfaction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LIFE CYCLE</th>
<th>TELEOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 4 (Terminate)</td>
<td>Purposeful Enactment</td>
</tr>
<tr>
<td>Stage 3 (Harvest)</td>
<td>Social Construction</td>
</tr>
<tr>
<td>Stage 2 (Grow)</td>
<td>Consensus</td>
</tr>
<tr>
<td>Stage 1 (Startup)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit of Change</th>
<th>Mode of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Entities</td>
<td>Prescribed</td>
</tr>
<tr>
<td>Single Entity</td>
<td>Constructive</td>
</tr>
</tbody>
</table>

- **EVOLUTION**: Variation → Selection → Retention
- **DIALECTIC**: Thesis → Conflict → Synthesis
- **LIFE CYCLE**: Stage 4 (Terminate), Stage 3 (Harvest), Stage 2 (Grow), Stage 1 (Startup)
- **TELEOLOGY**: Purposeful Enactment, Social Construction, Consensus

- **Single Entity**
- **Multiple Entities**

- **TELEOLOGY**
  - Dissatisfaction
  - Implement Goals
  - Set/Envision Goals

- **DIALECTIC**
  - Thesis
  - Conflict
  - Synthesis

- **LIFE CYCLE**
  - Stage 4 (Terminate)
  - Stage 3 (Harvest)
  - Stage 2 (Grow)
  - Stage 1 (Startup)

- **EVOLUTION**
  - Variation → Selection → Retention
  - Set/Envision Goals
  - Search/Interact

- **Unit of Change**
  - Multiple Entities
  - Single Entity

- **Mode of Change**
  - Prescribed
  - Constructive

- **Pluralism (Diversity)**
- **Confrontation**
- **Conflict**

- **Population Scarcity**
- **Environmental Selection**
- **Competition**

- **Immanent Program**
- **Regulation**
- **Compliant Adaptation**
- **Purposeful Enactment**
- **Social Construction**
- **Consensus**
Chapter 5

RESULTS - MISALIGNMENTS

Research Setting Background Description

The research setting for this project was an information technology implementation pilot project within BenefitsCo, a wholly owned subsidiary of FinanceCorp. FinanceCorp’s main business was financial services (i.e., investment advice, mutual fund manager, individual online trading, retirement planning). In June 2004, at the time the implementation project began, BenefitsCo was a ten-year old business within FinanceCorp that focused on providing employer services to clients. These employer services refer to the benefits that are typically offered by companies’ benefits departments. They include administration and management of defined benefit retirement savings plans (e.g., traditional pension plans, administration and management of defined contribution retirement savings plans (e.g., 401K plans), administration and management of employee stock programs, human resources consulting services, management of company payrolls, and management of health and welfare benefit administration (i.e., medical insurance policies). Moreover, BenefitsCo’s organizational structure mirrored these employer benefits offerings (i.e., Defined Benefits, Defined Contribution, HR Consulting, Payroll, Health & Welfare) and it was in the BenefitsCo Health & Welfare (H&W) practice that the implementation project that is the subject of this study took place.

The BenefitsCo’s H&W practice defined itself as a “directed records keeper” for its clients. It was not a medical insurance provider. Being a directed records keeper meant that the H&W practice served as an intermediary between the client and medical insurance companies (in terms of negotiating contracts, filing claims, answering employees’ questions, and managing the
annual enrollment process). Therefore, the H&W practice operated as an outsourced benefits department. Decisions about client employees’ medical insurance, however, were still made by client representatives (hereafter referred to as clients). Note that this type of business was quite different than the primary businesses of BenefitsCo and FinanceCorp. As such, the H&W practice was viewed as outside of the mainstream of BenefitsCo’s primary business, and the BenefitsCo company was viewed as outside of mainstream of FinanceCorp’s primary business. In addition to BenefitsCo, however, there were other internal administrative divisions within FinanceCorp with businesses that did not relate directly to financial services. One of these divisions was TechCo, which was the internal information technology division for all FinanceCorp’s companies. TechCo is described in more detail below.

In addition to a difference in the nature of its businesses, BenefitsCo’s main offices were not housed in the FinanceCorp headquarters. The FinanceCorp and BenefitsCo headquarters were located in different cities. Likewise the main offices of the H&W practice were not housed in the BenefitsCo headquarters. The H&W headquarters was located in yet another city. These differences in primary businesses and office locations illustrate that the part of the organization in which the information technology implementation that is the focus of this study (CWS) took place was far removed from the organization’s upper management.

**Company Culture**

As part of FinanceCorp, BenefitsCo inherited many of the important cultural values of its parent organization. Three of the more important values related to a focus on client satisfaction, a focus on protecting the organization, and a focus on cutting costs. The focus on client satisfaction was partly due to the nature of the parent corporation’s primary business (financial
services) which is client focused; but it was partly due also to the relative immaturity of the employer services industry and to the company’s desire to retain its leadership position in the industry. (In 2004, BenefitsCo was the largest directed benefits record keeper in the United States, in terms of number of clients.) The focus on protecting the organization was also partly due to nature of FinanceCorp’s primary business. In its financial services businesses, FinanceCorp had access to sensitive client information and FinanceCorp employees took care to protect that information and the handling of that information. Most of FinanceCorp’s financial services businesses were regulated by government guidelines and laws pertaining to client privacy. If security was breached (e.g., clients’ personal financial transactions become public), FinanceCorp could be held liable for any damages clients suffer. This liability and security value therefore created a protectionist cultural value within FinanceCorp. This meant that employees constantly sought ways to limit their liability. Similar to FinanceCorp, BenefitsCo’s primary business also depended on sensitive client information and was regulated by government guidelines and laws.

Lastly the focus on cutting costs within BenefitsCo was driven by BenefitsCo management’s desire for the company to become profitable. Since the company had been founded in 1994, BenefitsCo has not had a profitable year. Note that this was not true of FinanceCorp’s other businesses. Therefore, this focus was unique to BenefitsCo. This focus on cutting costs had traditionally been secondary in importance to the client-focused and protectionist values. But after several years without a profit, FinanceCorp management began to pressure BenefitsCo management to become profitable. To become profitable, BenefitsCo management began to place emphasis on cutting costs to improve work efficiency within the company. The selection of Documentum 5.0 and implementation of CWS (the customized
version of Documentum 5.0) can be viewed as an attempt by BenefitsCo management to reduce costs while, at the same time, maintaining satisfactory client satisfaction levels.

In terms of the culture of the H&W practice, the employees of this practice were perceived to have had an influence on the culture as well. Because the H&W practice’s primary business was different from BenefitsCo’s other companies, at the time of this study, most H&W employees had worked only within the H&W practice. This meant that most H&W employees were unfamiliar with the other BenefitsCo practices. Moreover, because the H&W employees were generally perceived as less educated than employees in the other practices and were paid less, a sense of inferiority and of being viewed as different was present in the H&W culture.

**Group Setting**

Eleven Annual Enrollment (AE) teams were volunteered to pilot CWS. In all cases, these eleven teams were volunteered by the Vice-President of Solution Delivery (VPSD) who had primary responsibility for providing BenefitsCo services to a client. In most cases (six of eleven) the VPSD volunteered a team to participate because the team had participated in the QuickPlace pilot in the previous year. In other cases, the VPSD volunteered the team to participate in the CWS pilot because he believed that using CWS to collaborate with client representatives would improve a poor BenefitsCo-client relationship. As such, the eleven AE teams that were volunteered to participate in the CWS project differed in the quality of their relationship with their client. – See table 4.2 for teams’ rationale for being involved in the CWS pilot.

The eleven teams also differed in terms of their group norms related to (a) individual responsibility versus team responsibility, (b) the division of responsibilities among team members during the CWS pilot, and (c) the degree to which the teams catered to their clients.
This last difference, the degree to which the teams catered to their clients, was influenced largely by the length of the BenefitsCo-client relationship, and the service expectations of the client. Teams with long-tenured clients generally catered to their clients more than teams with shorter-tenured clients; and teams that served clients with expectations of a high level of service generally catered to their clients more than teams that served clients with expectations of a lower level of service – i.e., the amount of self-service that clients expected in their relationship with their AE teams differed.

**Technology Design Process**

The BenefitsCo management made the decision to implement a collaborative information technology for three reasons: to lower costs, to protect the company from client charges of mistakes and misunderstandings, and to improve client satisfaction. Within the H&W practice, H&W management wanted a technology that could help lower the cost of AE projects by reducing the number of document iterations between AE teams and clients, reducing the amount of rework due to poor documentation practices, reducing the amount of time AE project members spend chasing down documents and data for clients, reducing AE “project creep”, and allowing clients to assume more document processing responsibility. H&W management hoped that such a technology would also improve client satisfaction by providing clients with direct access to AE documents and reducing the number of misunderstandings between the client and its AE team. To find a technology that might meet these business needs, BenefitsCo management began a technology selection process in 2002.

To meet its business needs, BenefitsCo management initially selected Lotus QuickPlace in 2002 and implemented it on a pilot basis in 2003. Before the end of 2003, however,
QuickPlace was scrapped because it was a technologically unusable solution. In selecting QuickPlace, BenefitsCo had not realized that QuickPlace would not interface with the company’s Microsoft-based network operating system. To make QuickPlace a viable system would have meant that the network operating structure within BenefitsCo would have to change. Because this was beyond the scope of the QuickPlace implementation project, and because several BenefitsCo managers believed that QuickPlace had been too hastily selected, the QuickPlace implementation was scrapped.

When the decision to scrap QuickPlace was made in 2003, a task force composed of members of BenefitsCo management and TechCo (FinanceCorp’s internal information technology division) re-opened the technology selection process. During the selection process, the task force evaluated three collaborative information technology systems. The technology the task force chose was Documentum 5.0. This was the base technology that was customized to become CWS. Documentum 5.0 was selected, a member of the task force told me, because the system vendor, Documentum, was a reputable mature company, because the product had been successfully implemented in other large organizations, because document management features were determined to be the most important features for BenefitsCo’s work and these were Documentum 5.0’s strengths, and because the product’s underlying network operating system requirements matched FinanceCorp’s existing network.

The steering committee. After the task force selected Documentum 5.0, BenefitsCo and TechCo employees were assigned to teams to coordinate the design of CWS – i.e., the customization of Documentum 5.0 so that it could be implemented in BenefitsCo. Initially a steering committee of BenefitsCo and TechCo managers was created to oversee the design of the new technology. This committee met once every two weeks at the beginning of the design phase.
But soon meetings became less frequent. This decline in meeting frequency was due to several committee members leaving their positions and their positions not being filled as a result of an organizational restructuring that began during the design phase. (This restructuring is described further below.) Moreover because of the organizational restructuring and the involvement of many steering committee members in the restructuring, the steering committee relinquished much control for the design of the new technology to the implementation team, a team that reported to the steering committee and that was supposed to coordinate the CWS implementation effort. This led to some frustration within the implementation team for having to assume additional responsibilities. Additionally, throughout the design phase, the steering committee members complained that the committee had been given too small a budget to install, customize, and implement the technology. Most of this budget, steering committee members told me, had to be spent on Documentum consulting services because no TechCo employees possessed Documentum expertise. – That is, most of the budget was paid to Documentum to install the base technology and provide technical consulting and training services to TechCo employees who would later be in charge of supporting the technology. Nevertheless, at the end of the design phase, Documentum 5.0 was customized for the BenefitsCo environment, and became known as CWS.

The implementation team. After the design phase ended, the CWS implementation team was charged with implementing the new technology. The implementation team was a team of non-manager level BenefitsCo employees that was created to “do the real work” of implementing the technology (e.g., selling the technology to BenefitsCo employees, soliciting pilot users, gathering system requirements, training new users, developing an implementation schedule). Because of the limited project budget, however, only one member of this team was
dedicated full-time to the CWS project. For all other members of the implementation team (and steering committee), the CWS project was an addition to their workload. The one employee dedicated full-time to the CWS implementation, Joe, was a non-managerial administrative employee. As the only employee dedicated full-time to the CWS implementation, Joe served as the implementation team leader. A steering committee member stated that Joe was perceived to be the best choice to lead the implementation team because he had previously managed the QuickPlace implementation. He had never, however, worked in a BenefitsCo “line” practice (i.e., Defined Benefits, Defined Contribution, HR Consulting, Payroll, H&W). Joe had come to BenefitsCo three years previously from another company where he had worked in a similar implementation specialist position.

The other members of the implementation team were non-managerial members of BenefitsCo line practices who had been nominated by a steering committee member to be part of the implementation team. This included a representative from the H&W practice, Mary. At the time the CWS implementation project began, Mary had worked for BenefitsCo (entirely within the H&W practice) for five years. Although she had at one time been a CSM, Mary was not a "front-line" employee at the time of this study. She was a regulations compliance specialist. During the design process, Mary had viewed CWS as a tool that would be used mostly by Client Services employees (ACSMs and CSMs) to share documents with their clients. Moreover, because Mary believed that AE project members needed and appreciated a lot of structure, she had been interested in designing CWS in a way that provided a lot of structure. Therefore, because the implementation team had assumed some of the design responsibilities from the steering committee, Mary, with help from Joe, designed an “AE CWS template” (a generic folder structure for an AE project) and a list of documents that should be stored in the template.
The template was intended to help the AE teams that would pilot CWS to structure their AE projects. Incidentally, Joe believed that Mary was creating a folder structure that was too inflexible and that would stymie collaboration and creative uses of CWS (this is the type of behavior he wanted to foster). Joe stated that he would have liked to have seen a folder structure that was less detailed – e.g., fewer folders for more general purposes. He said, however, that he was not surprised by the inflexible, detailed structure that Mary created because a tendency existed within the H&W practice to create highly structured work processes. This norm may have existed, Joe suggested, because of the high level of regulation to which H&W work was exposed and because of the relatively low level of education among the H&W practice’s employees, relative to employees in other parts of the company. Therefore, H&W management may have preferred to have a large amount of structure in place to guide H&W employees, and this was reflected in Mary’s creation of a highly structured, inflexible CWS folder structure. Joe stated that the implementation team representatives of the other H&W practices did not express a desire for as much structure as Mary did.

When the implementation team first formed, Joe, Mary and the rest of the implementation team met twice a week. But like the steering committee meetings, the implementation team meetings became less frequent over time. Like the steering committee, the implementation team experienced a large amount of turnover as a result of organizational restructuring and positions were left vacant for weeks. Additionally some implementation team members perceived that the managers within their practices did not view the CWS implementation project as a high priority. Therefore, they slighted the project by not attending meetings.
Initially the steering committee was to provide oversight to the implementation team. But, as previously mentioned, the steering committee experienced turnover and the level of oversight it provided to the implementation team waned over time. Because BenefitsCo announced a pending reorganization (that included managerial layoffs, new reporting relationships, and new responsibilities) in January 2004, the attention of many of the steering committee members wandered from the CWS project. After the reorganization, which occurred finally in July, half of the steering committee members were replaced with new managers. But between January and July the work of the steering committee members involved in planning the reorganization and the stress of worrying about whether you would still have a job in July took a toll on the steering committee. The effect of the impending reorganization was largely that committee members decreased the priority that they assigned to their CWS-related responsibilities. Once the responsibilities for the final design of the CWS were delegated to the implementation team, the steering committee began to meet less often and these meetings were poorly attended, or cancelled. By the time the final design decisions were due, although the committee officially still existed most members were not engaged in the project. Therefore, the implementation team made the final design decisions (within the budget constraints they had) and requested that TechCo make technical changes to the base technology to conform to these design decisions. TechCo employees acting on the design decisions of the non-manager implementation team, therefore, made the technical changes that transformed Documentum 5.0 into CWS.

The technical team. As mentioned above, TechCo was the FinanceCorp internal information technology division. At the time of this study, TechCo served the entire FinanceCorp organization. To prioritize its work, TechCo operated as an internal revenue center
within FinanceCorp. That is, FinanceCorp businesses had to pay TechCo for providing information technology services, such as customizing a new technology. For customizing a technology, however, TechCo provided only technical services. It did not provide business analysis services. These services had to be performed by the businesses (e.g., BenefitsCo). Because little of the original CWS 2004 budget remained after purchasing the Documentum 5.0 paying for Documentum consulting and installation services, the implementation team only had sufficient funds to pay for TechCo to perform a limited amount of customization work. The implementation team leader stated that the team had a long list of modifications that its members would have liked to have made to the base Documentum technology, but the team did not have sufficient funds to pay TechCo to make all of the modifications on the list. Therefore, Joe and the implementation team determined what they thought were the most important modifications and asked TechCo to make these. These modifications focused on enabling clients to access documents themselves, creating backup versions of documents as they were modified, and allowing users to limit document access to others (to provide more document security). In modifying Documentum 5.0, however, TechCo employees were limited in what modifications they could make based on some functionality that was unchangeable. The unchangeable functionality included Documentum 5.0’s check-in/check-out, versioning, user access, and document restriction functions. Note that all of these unchangeable functions were core document management and document security functions.

Technology Implementation Process

Because BenefitsCo management did not wish to force employees to use the new technology, one of the implementation team’s responsibilities was to find groups of employees
who were willing to pilot the new technology. Therefore, the implementation team leader, Joe, solicited initial user groups to “preview” CWS. Eleven of the groups that were solicited to participate were the afore-mentioned AE teams. Moreover, in soliciting groups, Joe indicated that CWS would initially be released on a “preview” basis. The term “preview” was used, he stated, rather than “pilot” because “pilot” implies that a technology could be modified and BenefitsCo management had stated that it did not wish to modify the technology during the preview. After the design phase and the customization work performed by TechCo, Joe said, there were not sufficient funds left in the project budget to modify the technology during the preview.6

In addition to problems faced by a dwindling budget, Joe noted that BenefitsCo management refused to force employees to use CWS during the pilot by turning-off the “old system.” He had suggested that the old system, the tools that BenefitsCo employees used that were being replaced by CWS, be turned-off once CWS was implemented. The BenefitsCo management, however, had been concerned that CWS might not work correctly and they wished to limit the business’s liability in case the new technology did not work. Therefore, they did not agree to turn-off the old system. Joe also noted that BenefitsCo management did not mandate that specific processes or tasks were required to be facilitated by CWS. The new technology was simply to be offered to groups within BenefitsCo to do with it as they pleased. Overall BenefitsCo management did not want to experience a loss in performance or a reduction in client satisfaction levels, as a result of employees switching over to CWS. Therefore, on June 14, 2004, when the CWS pilot began and the eleven AE teams first gained access to CWS, they were not forced to stop using the old system.

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6 For the sake of clarity, I use the term “pilot” rather than preview elsewhere in this paper.
**Misalignments Reported by CWS Pilot Teams**

During the CWS pilot (June-December 2004), the AE pilot teams reported eleven misalignments during the implementation. I have clustered the eleven misalignments into two groups, six document-related misalignments and five communication-related misalignments. Document-related misalignments are misalignments that relate to the AE documents that were used by team members and their clients during the AE project. These misalignments include misalignments concerned with obtaining notification of document approvals, checking the status of a document, accessing documents, sharing documents, and seeking assistance from others relating to a document. Communication-related misalignments are misalignments that related to how team members and their clients communicated with each other during the AE project. These misalignments include misalignments concerned with attaching comments to communications, capturing discussions, identifying parties to a communication, making communication recipients aware of each other, and allowing communication feedback. For summary descriptions of the document-related and communication-related misalignments, see tables 5.1 and 5.2.

Insert Tables 5.1 and 5.2 about here

Overall individual team members recognized and learned more about the document-related misalignments than the communication-related misalignments. This may have been because when CWS was implemented, most team members viewed it primarily as a document management tool and not as a communication tool. One group of team members however, the CMs, tended to recognize communication-related misalignments more often than did Client Services team members (i.e., ACSMs and CSMs) and Project Management team members (PAs
and PMs). This may have been because CMs may have viewed CWS as more of a communication tool; or it may have been because the nature of a CM’s work required a greater degree of communication with the client and the other team members with whom the CM was not collocated. Note that CMs generally worked in a separate city from their clients and other team members. Client services and project management team members, on the other hand, generally worked in offices located on the same floor of a building. So to communicate with each other, they could simply look over the office wall or walk down the hall. – For a list of the document-related and communication-related misalignments that team members recognized during the CWS pilot, see tables 5.3 and 5.4

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Insert Tables 5.3 and 5.4 about here
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Document-related Misalignments

Approval notification misalignment. During the AE project, clients need to approve key documents before the project can proceed. Approval decisions serve as important stage-gates during the project and BenefitsCo mandates that AE teams keep records of the decisions for auditing purposes. Simply approving the document, however, is not sufficient. Clients must also notify the owner of the document they are approving (or not approving) of their decision. Making and approving a document, but not notifying the document owner, leaves the document owner in a waiting state until she takes the initiative to learn whether a decision was made on the document; and this can cause a delay in the project schedule.
Before CWS was implemented, to facilitate notification of document owners, BenefitsCo created a formal requirement that clients approve or reject AE documents. This approval/rejection task involved team members mailing or faxing an approval form to a client, the client indicating approval or rejection, and then the client mailing or faxing the signed form back to the document owner (usually an ACSM or CSM). This pre-existing task inherently contained a notification step. Team members stated that this task was important because it protected BenefitsCo against future charges from clients that the company had not acted on the client’s behalf without being directed.

CWS, however, does not have a feature that facilitates the notification portion of the document approval task. Using CWS, clients can approve or reject documents, using the system’s “document approval” feature, but this feature simply changes a document’s status. It does not notify the document’s owner of the client’s decision (i.e., approval or rejection).

In the case of this misalignment, CWS is not sufficiently robust to support a pre-existing task. Because the approval task includes a notification step, owners of AE documents that require approval (i.e., team members) are accustomed to receiving notification from their clients and they expect the CWS feature to operate similarly. The fact that the new technology does not match team members’ expectations, nor the expectations of BenefitsCo management, means that the team members may wait on an approval that had already been made and project schedule delays may result.

Check work status misalignment. The interdependent nature of the AE project means that team members and clients collaborate with each other to create and refine AE documents. Sometimes the nature of this interdependence is pooled, but often it is sequential and requires that one team member or client complete modification to a document before another can begin.
This interdependence, therefore, creates the possibility that individuals who do not perform their work in a timely manner could create workflow bottlenecks that delay the project schedule. This delay could then threaten the team’s ability to complete the AE task. As a result, team members often check on the work status of others, particularly those with whom they work most closely (e.g., CSMs and ACSMs check on the status of their clients’ work, PAs checked on the status of the technical support team members’ work).

Before CWS was implemented, team members who were worried about the status of someone else’s work (the work of either a fellow team member or a client), contacted that person either via email, by telephone, or in-person and asked about their status. For example, if an ACSM had asked her client to read and provide feedback on a change to the Discovery Document that she had made, she might call the client and ask if he had read the document. Often, however, team members were reluctant to contact others because they perceived that this was socially undesirable (i.e., they would be bothering them), they did not wish to put undue pressure on them and risk conflict, and they did not think that they could trust the other’s answer (i.e., they could lie about the status of their work). Therefore, some team members did not check on the status of others’ work until a deadline had already been missed. The frequency of use of this check work status norm also differed significantly between teams. On some teams, members stated that it was the responsibility of each individual (team members and clients) to complete their work in a timely manner. If an individual did not complete his work on schedule, then “it was his problem.” Members of other teams stated that they checked regularly on the status of others’ work primarily because they were concerned with the whole team’s ability to complete its work on schedule. The difference between teams seemed to depend on the emphasis team members placed on individual versus team responsibility. On teams in which members
emphasized team responsibility more, employees checked others’ work more regularly; and on
teams in which members emphasized individual responsibility more, employees checked others’
work less often. Therefore, the norm of checking on others’ work differed from team to team.

With CWS, team members can use a document history which allows them, to a limited
degree, to unobtrusively check on the status of others’ work. (Team members can check whether
their fellow team members and clients have viewed and/or modified a document. They can not
check whether they have “thought about” a problem.) This limited ability, nevertheless, could
allow team members to address potential bottlenecks more quickly; and for those teams that had
regularly checked others’ work, this CWS feature could reduce others’ ability to lie about the
status of their work.

The misalignment between the pre-existing team norm of checking on others’ work via
telephone or email and the CWS document history feature (which facilitates checking on others’
work) centers on the degree of obtrusiveness that is involved and the degree of accuracy of the
information found. Checking on others’ work before CWS was implemented involved direct
contact and did not ensure that an accurate assessment of others’ work status was obtained.
Checking on others’ work using the document history feature is unobtrusive and provides an
unbiased assessment of others’ work status. For those team members who did not like the
confrontational nature of directly contacting others and/or suspected that others would lie to
them, the document history feature may be a welcome change. If they used the document history
feature to check on others’ work, however, it could also create more tension among team
members and clients because they would be more aware of others’ failures to perform their work
in a timely manner, and they might then feel more compelled to confront them. Therefore, the
misalignment creates a situation in which one potential source of tension may be exchanged for another.

Document access misalignment. Documents drive the AE project. The effectiveness of the AE project depends upon team members and clients’ ability to efficiently create, modify, read, delete, approve, and otherwise interact with their team’s documents. Moreover, the speed with which team members can access their documents affects their work. The amount of work that team members have to accomplish during the AE project is more than during the rest of the year. During the AE project, team members often have to work twenty percent more hours in order to complete their work. Therefore, to reduce the number of hours they work (or to avoid having to work more hours), they often look for faster and more efficient ways of performing work and they tend to avoid (and detest) technology that they feel is slow or inefficient. As such, many team members use “online chat” and pagers because they view them as quick and efficient means of performing their work. Changes in technology that lead to a slow-down in their work, on the other hand, have generally not been embraced by AE team members.

In the past, team members were able to access their AE documents quickly and easily. They did so by simply navigating to a storage location (their documents were mostly stored either in network drives or local hard drives) and opening the documents. To open the document (to view or modify), a team member simply clicked on the document name and the document automatically opened in a new window on the team member’s desktop. Then, if a team member modified a document, she would save the document (which, by default, stored the modified document in the location from which it had been accessed). Unless there were network problems, this process was usually quick, involved few steps, and was minimally hampered by security. This quick method of document access led to a common expectation among team members that
document access should be quick and direct. Although BenefitsCo did not formally instruct new team members to access AE documents in this manner, members of all teams accessed their project documents in the same manner. Some of the longer tenured team members stated that this document access norm had not existed throughout the organization when they first came to work for BenefitsCo. Instead, teams used different means of accessing documents. Over time however teams developed the document access norm as a best practice rooted in the organizational work efficiency value.

Document access in CWS, by contrast, involves several steps and can take several minutes. To access a document, a user must first proceed through a check-out process that includes several steps. These steps including logging into CWS, selecting which project workspace to enter, navigating to a document’s storage location, clicking on the document name, selecting a type of access (e.g., view-only, modify), selecting a location outside of CWS to which to download the document, and then, finally, opening the document. Similarly if a user makes a modification to a document he has retrieved from CWS, saving the modified document to CWS likewise is a slow process. To save a modified document, a user has to first save his changes in a location outside CWS and then proceed through a check-in process that includes several more steps. The accumulation of the steps in the check-out and check-in processes takes much more time than many team members have been conditioned to expect. Moreover, this slow CWS access process was not designed by BenefitsCo management but instead is a core, unchangeable function of the Documentum 5.0 technology. The company designed the technology this way to emphasize security and document tracking over speed.

In this case, rather than CWS not being robust enough to facilitate an efficiency-based norm, the design of CWS is contradictory to the pre-existing document access norm. As a result,
the quick document access that team members have come to expect is not possible using CWS. In using CWS, because team members are often looking for shortcuts and trying to avoid slowdowns, they may choose to access CWS documents less frequently than they might otherwise if the document access process was less regimented and time-consuming. Instead, they might choose to batch their document modifications. This would allow them to have to access their documents fewer times than if they accessed their documents for each modification. This process of batching their modifications, however, would mean that the documents stored in CWS often would not reflect the most recently discussed or agreed-upon modifications, because there would be a delay between when the document owner learned that a modification should be made and when she makes it. Team members who read these documents, but who are not aware of the modifications waiting to be made, might not know of these changes; and they might make misinformed, unwise, or erroneous decisions based on the version of the document they have. Therefore, CWS’s inability to meet team members’ expectations for document access speed could cause delays in document modifications that, in turn, could cause poor work performance.

Document modification misalignment. The AE project is driven by the creation, modification, and completion of key documents (e.g., the Discovery Document, the Status Change Matrix, the Project Plan, the Communication Strategy). The contents of each of these documents provide direction to team members regarding their work on the AE project. As such, the language used in these documents is important. An unintended change in a Discovery Document requirement, for example, can lead to confusion when a PA attempts to translate business requirements into technical requirements. For this reason, members of many teams have insisted that all document modification requests be performed by them and not by clients. (Some teams have allowed their clients to make modifications to some documents – e.g., the
Communications documents). The practice of allowing only team members to modify AE documents allows team members to maintain greater control over the contents of their documents. Moreover, many clients prefer to allow team members to make the document changes because it frees them (the clients) from having to be responsible for maintaining documents and from any implications that might result from document changes. This preference is especially strong, according to team members, among longer tenured clients that have been coddled for many years. Note, however, that this practice stands in direct opposition to BenefitsCo management’s desire to reduce costs by providing clients with greater control over their documents.

In the past, to support team members’ desire to maintain control over the content of AE documents and to support clients’ desires to not be responsible for the modification of AE documents, team members and their clients developed a mutually agreed-upon document workflow norm wherein only team members were allowed to modify the most important AE documents. For documents that required input or feedback from clients (i.e., the Discovery Document and most of the Communications documents), team members sent a copy of these documents to their clients and requested their feedback. Clients then provided feedback to team members (usually via a telephone conversation or email); but they did not modify the document directly. This feedback ranged from new ideas that they wished to incorporate in documents to comments on word preferences. After receiving this feedback, team members then modified the document in a way that would satisfy their clients and would not be confusing to other team members whose work would be based on the document. If clients had been allowed to modify AE documents, the documents may have become confusing for some team members because of the clients’ inability to use language that the team members would understand. Additionally,
although teams varied in the degree to which they permitted clients to modify some less important documents, all teams prohibited client modifications of the key AE documents; and this norm seemed to be rooted in the organization’s protectionist and work efficiency values. That is, BenefitsCo managers and employees wanted to control the language used in the key AE documents to protect the company against charges of wrongdoing based on clients’ language and to ensure more efficient internal workflows. Again, however, this pre-existing document modification norm stood in direct opposition to BenefitsCo management’s desire to reduce costs, which was increasing in importance.

By contrast, CWS’s document modification feature, as it was designed by CWS management, is quite permissive. Although it does not allow individuals who have not been invited to participate in a project (e.g., members from other teams) to modify a document, it does allow any individual who has access to a team’s documents, including clients, the ability to modify the documents. Although CWS could have been designed in such a way to prohibit clients from modifying documents, CWS management elected not to do so because it wanted to push greater responsibility for document modification on to clients.

The CWS document sharing feature, by design, directly conflicts with the pre-existing document sharing organizational norm. Consequently, in using CWS, if a client chooses to modify an AE document, this may threaten team members’ control of the project and possibly lead to confusion on the part of team members whose work depends upon the document that the client modified; and this confusion could then cause project delays. Interestingly the document modification misalignment highlights the conflict that can occur, and is occurring, between the organization’s client service, protectionist, and cost-cutting/efficiency values.
Document sharing misalignment. During the AE project, team members prefer to control the documents to which their clients and other team members have access. They do this in order to maintain control over their documents and to avoid confusion that might result when a client or team member who is not familiar with a document reads it. For example, if a client were to read an internal project memo relating to how to address a business requirement, she would probably not understand the context surrounding the document and might make a judgment about the team members based on her impression that the memo appears unprofessional and incomplete. This judgment, however, would be unfounded because of the client’s lack of understanding of the context in which the memo was written. Moreover, this type of misunderstanding could occur not just with clients but also within a team between members of different functional areas (i.e., Client Services, Communications, and Project Management). Therefore, access to documents is provided on a “need to know” basis. This leads to most Communications documents not being shared with the Client Services and Project Management team members (and vice-versa) and most Project Management documents not being shared with clients. Moreover, the documents that have been shared in the past, team members state, have almost always been finalized documents, as compared to work-in-progress documents, which may be less polished and reflect more negatively on the authors.

Members of all the teams report that in the past only the AE documents for which client input was required were emailed to the client. These represented mostly Client Services and Communications documents that were created early in the AE project. Documents that were derived from the early documents and created later in the project were not shared with the client. AE team members also report that in the past only those documents that required input between the different functional team members (i.e., the Client Services, Project Management, and
Communications team members) were shared via email. All other internal functional area documents were stored on network drives to which the members of the other functional areas did not have access - e.g., Communications documents that did not require input from Client Services or Project Management team members were stored on a network drive that only Communications employees could access. Because all AE teams stated that they used the same document sharing practice, the document sharing norm appeared to be an organizational norm. Indeed, one team member who had worked in other parts of BenefitsCo stated that the document sharing norm that existed within their AE teams was prevalent throughout the organization. Team members stated that this norm was rooted in managers’ and employees’ desire to not unnecessarily open themselves to attack from others as a result of misunderstanding or poor work on the document owners’ part (i.e., a desire to protect oneself and BenefitsCo).

By contrast, CWS permits all project members (team members and clients) to access any documents stored in the project workspace. Therefore, all members of an AE project team have access to all documents stored in the AE project space. As such, this CWS permissibility is misaligned with the pre-existing organizational norm of sharing documents only on a need-to-know basis. The permissibility allowed within CWS also means that clients and team members can view documents that the documents’ owners might not want them to view and this could lead to confusion, misunderstandings, and uninformed judgments by clients and team members who do not understand the context surrounding a document. These judgments could cause clients to want to become more involved in the project’s management and this might threaten team members’ ability to control their documents.

**Inter-team assistance seeking misalignment.** Team members, especially new team members, sometimes have questions about how to perform their work that no other team member
knows how to answer. For answers to their questions, some team members go outside their teams to ask peers. For example, when a PA has a problem with his Technical Specifications document and the other members of his team cannot help him, he might show the document to a fellow, more experienced PA (who is a member of another team) and ask for assistance. In this way, team members sometimes seek assistance relating to their AE documents from other BenefitsCo employees outside of their team. Moreover, the team members who seemed to more often seek advice outside their team are CMs, PAs, and PMs who were relatively new to their position, who are on teams in which no other member had previously been in their position, and/or who are on teams that emphasize individual responsibility. Because these conditions vary between teams, inter-team assistance seeking varies considerably between teams. Moreover, because team members’ inter-team assistance seeking behavior depends partly on the degree to which their teams emphasize individual responsibility, the assistance-seeking norm is rooted partly in the value that the team places on individual responsibility (versus team responsibility).

Before CWS was implemented, teams stored their AE documents in network drives and on their local hard drives. When a team member had a problem regarding one of his documents and he wished to seek assistance outside of his team, he either emailed the document to a peer with a request for assistance or he asked a peer to assist him and provided her with a link to the network location of his document. This inter-team assistance seeking team norm allowed team members to learn from others in their same position. Because all BenefitsCo employees within the same functional area had access to each others’ documents (i.e., all Communications employees had access to the network location on which the CM of a particular team stored her AE documents), they could view each others’ documents in the process of providing assistance. Moreover, although several AE team members engaged in inter-team assistance seeking, the
norm was not sanctioned by any team or discussed. Usually the fellow team members of an employee who had sought inter-team advice did not know about the advice seeking behavior, and would probably be indifferent if they did know about it.

By contrast, CWS prevents members of different teams from viewing a team’s AE documents. This means that team members cannot use the new technology to seek assistance from peers. In using CWS, only team members can access the team’s AE documents. Although CWS could have been designed to allow more open access to documents, BenefitsCo management, when designing CWS, decided to limit document access to only team members. Managers made this decision to avoid inadvertent document deletion and modification problems that had occurred in the pre-existing environment. These problems of inadvertent document deletion and modifications had surfaced during the CWS design phase. The fact that CWS did not facilitate inter-team assistance seeking, however, had not surfaced during the design phase. The managers involved in CWS’s design said they only learned of the inter-team assistance seeking norm after CWS had been implemented. Perhaps management was initially unaware of the norm because it was an informal, non-sanctioned team norm as compared to a formal and/or organizational norm. Regardless of the reason, limiting access to only team members prevented team members from seeking assistance from peers outside of their team.

Unlike many of the previous misalignments, CWS could have been designed to be capable of facilitating the inter-team assistance seeking norm, but BenefitsCo management, in designing CWS, had been unaware of the norm and had designed a technology that did not facilitate the norm. As a consequence, without the ability to seek assistance from peers outside of their team, team members might not be able to solve their problems as quickly and their performance might be hindered.
Communication-related Misalignments

Comment attachment misalignment. Although the AE project is a document-driven project, the AE documents are not self-explanatory. Often team members and clients need to communicate about the documents they exchange and work-on together. For example, when a CSM and ACSM are creating a Discovery Document together, they might need to specify who will focus on which sections of the documents. Also, when a PA makes a modification to a document, she might ask her PM to review it and want to call attention to the modification; and lastly, when a team member wants his client to take action on a document, he might communicate what he would like the client to do and give her a deadline. All these examples show that although documents drive the AE process, for the documents to be effective, it is necessary for team members and clients to have a way to communicate them. Without the ability to communicate about the documents, team members and clients would often not know how to perform their work.

Before CWS was implemented, to communicate about documents, team members and clients developed an informal norm of attaching comments to their documents. For example, if a PM changed a Project Plan and wanted to call others’ attention to the change, he might send an email explaining his change and attach the modified Project Plan. This norm allowed team members and clients to comment on the documents they exchanged, ask questions about the documents, and give directions related to the documents. Although no member of any team stated that BenefitsCo management had encouraged the comment attachment norm, members of all teams reported using it. Moreover, members of several teams stated that they were not compelled to attach comments to their documents, but that doing so improved recipients’
understanding of what action they should take and facilitated more efficient work. Therefore, the comment attachment norm seemed to be an informal norm rooted in the organizational work efficiency value.

By contrast, CWS does not have a feature that facilitates the comment attachment norm. Although CWS’s "send email" feature allows users to send a link to a document, it does not allow them to enter text. It simply allows them to send a document link (a hypertext link in an email message that allows a user to click on the link to navigate to a document) to other users. Therefore, CWS users cannot specify the sections of a document on which they wish others to focus and they cannot indicate actions that they would like others to take related to a document.

Similar to the approval notification misalignment, CWS is not sufficiently robust to support the comment attachment organizational norm. In using CWS, team members and clients will not be able to attach comments as they used to do. This could lead to confusion and team members and clients having to spend time to learn what action they should take regarding a document or how a document changed.

**Discussion capture misalignment.** In beginning an AE project, clients are often not clear about how they wish to change their benefits packages and what the implications of any changes they envision might entail. Therefore, beginning in the Discovery phase, team members and clients engage in discussions regarding ideas and requirements for the project. These discussions often last for 1-2 months and can cover a wide variety of topics. To remember what has been discussed (e.g., what was said, who said what, when was it said, what was agreed-to), it is important that team members and their clients keep records of all their discussion threads.

Team members and their clients usually begin discussing AE ideas and requirements in-person at the project kickoff meeting (which takes place in April). Thereafter, most of their
discussions take place either via telephone and/or email. To keep track of all their discussion threads, team members developed a norm of having their clients place their decisions in writing and then they saved the decisions. Moreover, they also saved any information they had about the context surrounding the decisions (e.g., meeting notes, notes about questions, clarifications about issues, debates about issues). Although members of different teams varied in the amount and level of discussion detail they captured, members of all teams kept some written records of their discussions. In fact, organizational regulations required that the teams capture and store several standard AE decisions that the clients made. (Team members stated that the purpose of these regulations was largely to protect BenefitsCo in the event that the client later charged BenefitsCo with not correctly acting on its behalf.) In addition to capturing these decisions, however, BenefitsCo’s organizational management encouraged all AE teams to capture the discussion surrounding the decision (i.e., what was said, who said what, when was it said, what was agreed-to). Therefore, although teams differed in the amount and level of discussion detail they captured, the discussion capture norm was largely an organizational norm.

By contrast, CWS does not have a feature that supports the discussion capture norm. That is, CWS does not have a “discussion thread” feature that allows team members and clients to engage in discussion and capture that discussion. This means that CWS is not sufficiently robust to support the discussion capture organizational norm. Without the ability to capture the key client decisions and the context surrounding these decisions, team members and clients will not be unable to refer back to their discussions and they may be more likely to not remember the details of their discussions. This could lead to team members having to spend time recovering the contents of previous discussions (by contacting their client to verify a previous discussion) and a
lower level of personal accountability (because team members and clients could claim that they do not remember a discussion).

**Personal identification misalignment.** To understand a communication (e.g., a request, a question), it often helps team members to place it in the context of their knowledge of the person making the communication. If someone is making a request about insurance premiums, for example, it is beneficial for a PM to know whether this person is a client versus a PA because this information will affect if, when and how she reacts. Also, the PM’s knowledge of the person with whom she is communicating often helps her prioritize when and how she responds. Without knowing the identity of the person who sent her a communication, the PM might not know if and how to reply.

In the past, when speaking on the telephone, team members and clients developed the communication norm of identifying themselves and each other at the beginning of their conversations, if they did not already know each other. This personal identification norm helped team members better understand the context of their conversation (i.e., where the other party was coming from). Moreover, when team members and clients exchanged emails, they also identified each other via their email addresses and signatures. Although no team member stated that the organization required or even encouraged them to identify themselves (and others) in their telephone conversations or emails, all team members indicated that this was a common practice. Moreover, this norm seemed to be rooted in both the organization’s protectionist and efficiency values. A team member’s understanding to whom she was speaking (or from whom she had received an email) allowed her to know both how much and what information to disclose; and it also permitted greater communication efficiency because she could make assumptions about the other person’s knowledge, experience, and the priority that the team member should afford her.
For example, if an ACSM received an email from a client regarding a question with the Technical Specifications, the ACSM would probably know that: (a) the question is not based on detailed knowledge of the document (because clients are not involved in the construction of the Technical Specifications document) and (b) replying to the email is a high priority (because clients are Client Services employees’ primary customer).

By contrast, CWS does not have a communication feature that facilitates the personal identification norm. Again, the only way by which team members can communicate through CWS is via the ‘send email’ feature. This feature does not permit personal identification because the CWS-generated emails are sent from a generic CWS email address, and the feature does not permit users to sign their names.

Like other misalignments already described, CWS is not sufficiently robust to support the personal identification organizational norm. Because of this inability for senders to add personal identification information to the CWS-generated emails, there is no way for recipients to know who sent the email. Without this context, recipients might not know how to prioritize the email and they might, by default, ignore it. This ignoring might then lead to schedule delays if the recipient should take some action on the linked document or offended individuals if the team member or client who sent the email is used to being given high priority.

Public request misalignment. Sometimes during the AE project, it is necessary for a team member to put pressure on a client or other team member. This may be done in order to urge someone to answer a request, perform some work, or make a decision. In addition to ‘escalating’ an issue, another way team members can put pressure on a team member or client is to make him aware that they have let others (maybe even his boss) know that a request had been made of him. This awareness that others know will then (hopefully) motivate him to take action because he
will feel a sense of public disapproval if he does not. Without this ability to place pressure on others, some team members believe they cannot motivate others to respond to their requests. Moreover, it is not enough for team members to simply let others know that a request has been made of another team member or client. For the pressure to be effective, the recipient must also know that others are aware of the request and that must be significant for her.

In the past when a team member wished to motivate a client, for example, to make a decision, she would publicly request that the client make a decision by a specific deadline. This public request might be made via a conference call with other individuals listening to the request, or via email with other individuals copied on the note (not blind copied). Although no formal organizational requirement existed that mandated that team members make public requests when they were attempting to put pressure on a client or team member, employees of each AE team stated that they practiced this public request norm partly to place pressure on others to take action and partly to protect themselves from being accused in the future of not notifying others that action needed to be taken. The values underlying the norm were a desire to address potential delays in an efficient manner and a desire, on the part of the requesting party to ensure that others know that he is not at fault for any delays that might occur.

By contrast, CWS does not have a communication feature that facilitates the public request norm. The only way by which team members can communicate through CWS is via the ‘send email’ feature. But the feature does not allow the sender to copy individuals on an email in such a way that the recipient knows that others also received the email. Therefore, recipients may believe they are the only one to receive an email.

Like the previous misalignments, CWS is not sufficiently robust to support the public request organizational norm. Because of the inability to copy others on an email using CWS,
team members cannot put pressure on clients or team members by copying others. Without this ability to put pressure on others, work requests might be left unanswered and the project schedule could consequentially be delayed.

**Two-way communication misalignment.** During the AE project, team members and clients often have to discuss issues. Few of the project’s work items are self-explanatory and require either no direction or one-way communication (e.g., a PM requests that his PA perform some action and the PA is able to do so without asking for further clarification). Therefore, it is crucial that team members and clients have access to two-way communication media (e.g., telephones, conventional email systems) that allow them to communicate back-and-forth with each other. If a communication medium only operated in one direction, team members and clients would be unable to provide feedback, ask questions, and obtain clarifications.

In the past, two-way communication was the norm between team members and clients. To facilitate this norm, employees throughout BenefitsCo regularly used telephone conversations and a conventional email system. Within the email system, a ‘reply’ feature allowed them to provide feedback, ask questions, and obtain clarifications. Although BenefitsCo did not require that team members communicate with their clients and each other using two-way communication media, the organization did provide the communication media to employees for use. Therefore, although the two-way communication norm was not a formal organizational norm, team members were implicitly encouraged to use the two-way communication media. The two-way communication media also allowed team members and clients to become better acquainted. Being better acquainted with clients, AE team members stated, allowed them to provide better customer service to their clients and work more efficiently within their teams. Therefore, the
two-way communication norm was rooted in the organization’s client-focused and work efficiency values.

By contrast, CWS’s only communication feature, the ‘send email’ feature, does not permit two-way communication. It only permits one-way communication – i.e., an individual can only send an email to another individual from within CWS. The CWS-generated email is then forwarded to the recipient’s email address outside of CWS and there is no way for the recipient to reply to the sender because the email indicates only that the sender is ‘CWS.’

As is the case with most of the other communication-related misalignments, CWS is not sufficiently robust to support the two-way communication organizational norm. CWS’s inability to support two-way communication means that team members and clients cannot provide feedback, ask questions, obtain clarifications, and generally become better acquainted with each other; and because they cannot do these things, team members and clients cannot perform their work as well as they could if they had access to two-way communication mediums.

Now I will describe which of these eleven document-related and communication-related misalignments the AE teams recognized, evaluated, reconciled, and reflected-on.
TABLE 5.1

Descriptions of the Document-related Misalignments

<table>
<thead>
<tr>
<th>Misalignment name</th>
<th>Misalignment description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval notification</td>
<td>Before CWS was implemented, to facilitate notification of document owners, BenefitsCo created a formal requirement that clients approve or reject AE documents by signing an approval document and faxing it to the document owner. CWS is not sufficiently robust to support this pre-existing approval process organizational norm. Because the pre-existing approval norm included a notification step, owners of AE documents that require approval (i.e., team members) are accustomed to receiving notification from their clients and they expect the CWS feature to operate similarly. The fact that the new technology does not match team members’ expectations, nor the expectations of BenefitsCo management, means that the team members may wait on an approval that had already been made and project schedule delays may result.</td>
</tr>
<tr>
<td>Check work status</td>
<td>The misalignment between this pre-existing team norm of checking on others’ work via telephone or email and the CWS document history feature (which facilitates checking on others’ work) centers on the degree of obtrusiveness that is involved and the degree of accuracy of the information found. Checking on others’ work before CWS was implemented involved direct contact and did not ensure that an accurate assessment of others’ work status was obtained. Checking on others’ work using the document history feature is unobtrusive and provides an unbiased assessment of others’ work status. For those team members who did not like the confrontational nature of directly contacting others and/or suspected that others lied to them, the document history feature may be a welcome change. If they use the document history feature to check on others’ work, however, it could also create more tension among team members and clients because they would be more aware of others’ failures to perform their work in a timely manner, and they might then feel more compelled to confront them. Therefore, the misalignment creates a situation in which one potential source of tension may be exchanged for another.</td>
</tr>
<tr>
<td>Document access</td>
<td>Before CWS was implemented, team members were able to access their AE documents quickly and easily. They did so by simply navigating to a storage location (their documents were mostly stored either in network drives or local hard drives) and opening the documents. To open the document (to view or modify), a team member simply clicked on the document name and the document automatically opened in a new window on the team member’s desktop. Then, if a team member modified a document, he would save the document (which, by default, stored the modified document in the location from which it had been accessed). Unless there were network problems, this process was usually quick and involved few steps and was minimally hampered by security. This quick</td>
</tr>
</tbody>
</table>
method of document access led to a common expectation among all team members’ that document access should be quick and direct. In this case, rather than CWS not being robust enough to facilitate an efficiency-based norm, the design of CWS is contradictory to the pre-existing document access norm. As a result, the quick document access that team members have come to expect is not possible using CWS. In using CWS, because team members are often looking for shortcuts and trying to avoid slow-downs, they may choose to access CWS documents less frequently than they might otherwise if the document access process was less regimented and time-consuming. Instead, they might choose to batch their document modifications. This would allow them to have to access their documents fewer times than if they accessed their documents for each modification. This process of batching their modifications, however, would mean that the documents stored in CWS often would not reflect the most recently discussed or agreed-upon modifications, because there would be a delay between when the document owner learned that a modification should be made and when he made it. Team members who read these documents, but who were not aware of the modifications waiting to be made, might not know of these changes; and they might make misinformed, unwise, or erroneous decisions based on the current versions of the documents. Therefore, CWS’s inability to meet team members’ expectations for document access speed could cause delays in document modifications that, in turn, could cause poor work performance.

Before CWS was implemented, to support team members’ desire to maintain control over the content of AE documents and to support clients’ desires to not be responsible for the modification of AE documents, team members and their clients developed a mutually agreed-upon document workflow norm wherein only team members were allowed to modify the most important AE documents. For documents that required input or feedback from clients (i.e., the Discovery Document and most of the Communications documents), team members sent a copy of these documents to their clients and requested their feedback. Clients then provided their feedback to team members (usually via a telephone conversation or email); but they did not modify the document directly. This feedback ranged from new ideas that they wished to incorporate in documents to comments on word preferences. After receiving this feedback, team members then modified the document in a way that would satisfy their clients and would not be confusing to other team members whose work would be based on the document’s contents. If clients had been allowed to modify AE documents, the documents may have become confusing for some team members, because of the clients’ inability to use language that the team members would understand. The CWS document sharing feature, by design, directly conflicts with the pre-existing document sharing organizational norm. Consequently, in using CWS, if a client chooses to modify an AE project document, this would threaten team members’ control of the project and possibly lead to confusion on the part of team members’ whose work depends upon the document that the clients modified; and this confusion could then cause project delays. Interestingly the document modification misalignment highlights the conflict that can occur, and is, occurring, between the organization’s client service, protectionist, and cost-cutting/efficiency values.
<p>| Document sharing | Before CWS was implemented, only AE documents for which client input was required were emailed to the client. This represented mostly Client Services and Communications documents that were created early in the AE project. Other documents were not shared with clients. In this way, team members controlled what documents they shared with their clients. CWS, however, permits all project members (team members and clients) to access any document stored in the project workspace. This permissibility allowed within CWS is misaligned with the pre-existing organizational norm of sharing documents only on a need-to-know basis. The permissibility allowed within CWS also means that clients and team members can view documents that the documents’ owners might not want them to view and this could lead to confusion, misunderstandings, and uninformed judgments by clients and team members who do not understand the context surrounding a document. These judgments could cause clients to want to become more involved in the project’s management and this would threaten team members’ ability to control their documents. |
| Inter-team assistance seeking | Before CWS was implemented, teams stored their AE documents in network drives and on their local hard drives. When a team member had a problem regarding one of his documents and he wished to seek assistance outside of his team, he either emailed the document to a peer with a request for assistance or he asked a peer to assist him and provided her with a link to the network location of his document. This inter-team assistance seeking team norm allowed team members to learn from others in their same positions. Because all BenefitsCo employees within the same functional area had access to each others’ documents (i.e., all Communications employees had access to the network location on which the CM of a particular team stored her AE documents), they could view each others’ documents in the process of providing assistance. CWS could have been capable of facilitating the inter-team assistance seeking norm, but BenefitsCo management, in designing CWS, had been unaware of the norm and had designed a technology that did not facilitate the norm. As a consequence, without the ability to seek assistance from peers outside of their team, team members might not be able to solve their problems as quickly and their performance might be hindered. |</p>
<table>
<thead>
<tr>
<th>Misalignment name</th>
<th>Misalignment description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comment attachment</td>
<td>Before CWS was implemented, to communicate about documents, team members and clients developed an informal norm of attaching comments to their documents. These comments included information about changes made to the document, questions about the document, and/or instructions of how to proceed with the document. CWS is not sufficiently robust to support this pre-existing comment attachment organizational norm. In using CWS, team members and clients will not be able to attach comments as they used to do. This could lead to confusion and team members and clients having to spend time to learn what action they should take regarding a document or how a document changed.</td>
</tr>
<tr>
<td>Discussion capture</td>
<td>Before CWS was implemented, to keep track of their discussion threads with clients, team members developed a norm of having their clients place their decisions in writing and then they saved the decisions. Moreover, they also saved any information they had about the context surrounding the decisions (e.g., meeting notes, notes about questions, clarifications about issues, debates about issues). CWS is not sufficiently robust to support the discussion capture organizational norm.</td>
</tr>
<tr>
<td>Personal identification</td>
<td>Before CWS was implemented, when speaking on the telephone, team members and clients developed the communication norm of identifying themselves and each other at the beginning of their conversations, if they did not already know each other. This personal identification norm helped team members better understand the context of their conversation (where the other party was coming from). Moreover, when team members and clients exchanged emails, they also identified each other via their email addresses and signatures. CWS is not sufficiently robust to support the personal identification organizational norm. Because of this inability for senders to add personal identification information to the CWS-generated emails, there is no way for recipients to know who sent the email. Without this context, recipients might not know how to prioritize the email and they might, by default, ignore it. This ignoring might then lead to schedule delays if the recipient should take some action on the linked document or offended individuals if the team member or client who sent the email is used to being given high priority.</td>
</tr>
<tr>
<td>Public request</td>
<td>Before CWS was implemented, when a team member wished to motivate a client (for example) to make a decision, he would publicly request that the client make a decision by a specific deadline. This public request might be made via a conference call with other individuals listening to the request, or via email with other individuals copied on the note (not blind copied). CWS is not sufficiently robust to support the public request</td>
</tr>
<tr>
<td>Two-way communication</td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td></td>
</tr>
<tr>
<td>Before CWS was implemented, two-way communication was the norm between team members and clients. To facilitate this norm, employees throughout BenefitsCo regularly used telephone conversations and a conventional email system. Within the email system, a ‘reply’ feature allowed them to provide feedback, ask questions, and obtain clarifications. CWS is not sufficiently robust to support the two-way communication organizational norm. CWS’s inability to support two-way communication means that team members and clients cannot provide feedback, ask questions, obtain clarifications, and generally become better acquainted with each other; and because they cannot do these things, team members and clients cannot perform their work as well as they could if they had access to two-way communication mediums.</td>
<td></td>
</tr>
</tbody>
</table>
## TABLE 5.3

Fraction of Team Members Interviewed Who Recognized a Misalignment, by Position

<table>
<thead>
<tr>
<th>Misalignment</th>
<th>ACSM</th>
<th>CSM</th>
<th>CM</th>
<th>PA</th>
<th>PM</th>
<th>Percentage of all team members interviewed who recognized a misalignment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document-related misalignments</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approval notification</td>
<td>1/9</td>
<td>0/8</td>
<td>0/8</td>
<td>0/5</td>
<td>0/10</td>
<td>2.50</td>
</tr>
<tr>
<td>Check work status</td>
<td>4/9</td>
<td>1/8</td>
<td>2/8</td>
<td>0/5</td>
<td>2/10</td>
<td>22.50</td>
</tr>
<tr>
<td>Document access</td>
<td>8/9</td>
<td>7/8</td>
<td>7/8</td>
<td>5/5</td>
<td>9/10</td>
<td>90.00</td>
</tr>
<tr>
<td>Document modification</td>
<td>3/9</td>
<td>2/8</td>
<td>1/8</td>
<td>0/5</td>
<td>0/10</td>
<td>15.00</td>
</tr>
<tr>
<td>Document sharing</td>
<td>8/9</td>
<td>6/8</td>
<td>4/8</td>
<td>0/5</td>
<td>5/10</td>
<td>57.50</td>
</tr>
<tr>
<td>Inter-team assistance seeking</td>
<td>0/9</td>
<td>0/8</td>
<td>0/8</td>
<td>2/5</td>
<td>0/10</td>
<td>5.00</td>
</tr>
<tr>
<td><strong>Percentage of document-related misalignments recognized by team members interviewed</strong></td>
<td>44.44</td>
<td>33.33</td>
<td>29.17</td>
<td>23.33</td>
<td>26.67</td>
<td>31.39</td>
</tr>
<tr>
<td><strong>Communication-related misalignments</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment attachment</td>
<td>1/9</td>
<td>2/8</td>
<td>4/8</td>
<td>0/5</td>
<td>2/10</td>
<td>22.50</td>
</tr>
<tr>
<td>Discussion capture</td>
<td>0/9</td>
<td>1/8</td>
<td>3/8</td>
<td>0/5</td>
<td>0/10</td>
<td>10.00</td>
</tr>
<tr>
<td>Personal identification</td>
<td>0/9</td>
<td>1/8</td>
<td>4/8</td>
<td>0/5</td>
<td>1/10</td>
<td>15.00</td>
</tr>
<tr>
<td>Public request</td>
<td>0/9</td>
<td>0/8</td>
<td>2/8</td>
<td>0/5</td>
<td>0/10</td>
<td>5.00</td>
</tr>
<tr>
<td>Two-way communication</td>
<td>1/9</td>
<td>2/8</td>
<td>4/8</td>
<td>0/5</td>
<td>1/10</td>
<td>20.00</td>
</tr>
<tr>
<td><strong>Percentage of communication-related misalignments recognized by team members interviewed</strong></td>
<td>4.44</td>
<td>15.00</td>
<td>42.50</td>
<td>0.00</td>
<td>8.00</td>
<td>13.99</td>
</tr>
<tr>
<td><strong>Percentage of misalignments recognized by team members interviewed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>26.26</td>
<td>25.00</td>
<td>35.23</td>
<td>12.73</td>
<td>18.18</td>
<td></td>
</tr>
</tbody>
</table>

The first number in the ACSM, CSM, CM, PA, and PM columns indicates the number of individuals in that position who recognized the misalignment. The second number indicates the number of individuals in that position who I interviewed. Therefore, “1/9” in the Approval Notification/ACSM cell indicates that of the nine ACSMs I interviewed, I recognized the approval notification misalignment.
### TABLE 5.4

**Fraction of Team Members Interviewed Who Recognized a Misalignment, by Team**

<table>
<thead>
<tr>
<th>Misalignment</th>
<th>Client- A</th>
<th>Client- B</th>
<th>Client- C</th>
<th>Client- D</th>
<th>Client- E</th>
<th>Client- F</th>
<th>Client- G</th>
<th>Client- H</th>
<th>Client- I</th>
<th>Client- J</th>
<th>Client- K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval notification</td>
<td>0/5</td>
<td>0/3</td>
<td>0/3</td>
<td>0/4</td>
<td>0/3</td>
<td>0/3</td>
<td>0/3</td>
<td>0/3</td>
<td>0/4</td>
<td>1/5</td>
<td>0/4</td>
</tr>
<tr>
<td>Check work status</td>
<td>0/5</td>
<td>2/3</td>
<td>2/3</td>
<td>0/4</td>
<td>1/3</td>
<td>0/3</td>
<td>1/3</td>
<td>0/3</td>
<td>0/4</td>
<td>3/5</td>
<td>0/4</td>
</tr>
<tr>
<td>Document modification</td>
<td>1/5</td>
<td>0/3</td>
<td>2/3</td>
<td>0/4</td>
<td>0/3</td>
<td>2/3</td>
<td>0/3</td>
<td>0/3</td>
<td>0/4</td>
<td>1/5</td>
<td>0/4</td>
</tr>
<tr>
<td>Document sharing</td>
<td>3/5</td>
<td>2/3</td>
<td>2/3</td>
<td>3/4</td>
<td>2/3</td>
<td>2/3</td>
<td>2/3</td>
<td>3/4</td>
<td>2/5</td>
<td>0/4</td>
<td></td>
</tr>
<tr>
<td>Inter-team assistance</td>
<td>0/5</td>
<td>0/3</td>
<td>0/3</td>
<td>0/4</td>
<td>0/3</td>
<td>0/3</td>
<td>0/3</td>
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<td>1/5</td>
<td>0/4</td>
</tr>
<tr>
<td>seeking</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Comment attachment</td>
<td>3/5</td>
<td>0/3</td>
<td>0/3</td>
<td>2/4</td>
<td>0/3</td>
<td>0/3</td>
<td>1/3</td>
<td>0/3</td>
<td>0/4</td>
<td>3/5</td>
<td>0/4</td>
</tr>
<tr>
<td>Discussion capture</td>
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<td>0/3</td>
<td>1/4</td>
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<td>0/3</td>
<td>1/3</td>
<td>0/3</td>
<td>0/4</td>
<td>0/5</td>
<td>0/4</td>
</tr>
<tr>
<td>Personal identification</td>
<td>3/5</td>
<td>0/3</td>
<td>0/3</td>
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<td>0/3</td>
<td>0/3</td>
<td>1/3</td>
<td>0/3</td>
<td>0/4</td>
<td>1/5</td>
<td>0/4</td>
</tr>
<tr>
<td>Public request</td>
<td>1/5</td>
<td>0/3</td>
<td>0/3</td>
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<td>0/3</td>
<td>0/4</td>
<td>0/5</td>
<td>0/4</td>
</tr>
<tr>
<td>Two-way communication</td>
<td>3/5</td>
<td>0/3</td>
<td>0/3</td>
<td>1/4</td>
<td>0/3</td>
<td>0/3</td>
<td>1/3</td>
<td>0/3</td>
<td>0/4</td>
<td>3/5</td>
<td>0/4</td>
</tr>
</tbody>
</table>

Percentage of misalignments recognized by team members interviewed

|               | 38.18 | 21.27 | 27.36 | 29.55 | 18.18 | 21.27 | 30.18 | 15.18 | 18.18 | 43.64 | 0.00 |
Chapter 6
RESULTS – TEAMS’ MISALIGNMENT LEARNING

As noted in chapter five, except for CMs, team members recognized document-related misalignments more often than they recognized communication-related misalignments. Because misalignment recognition by at least one team member was a necessary condition for a misalignment to be evaluated, reconciled, or reflected-on, teams therefore were more likely to engage in the higher misalignment-based learning processes (i.e., evaluation, reconciliation, and reflection) around document-related misalignments than around communication-related misalignments. – For a summary of the misalignments recognized, evaluated, reconciled, and reflected-on by the pilot teams and described in this section, see table 6.1.

Insert Table 6.1 about here

The Client-A team

The Client-A team engaged in learning behavior associated with three document- and five communication-related misalignments.

Document access misalignment. Every Client-A team member that was interviewed recognized the document access misalignment and evaluated the misalignment as important and problematic. Team members reconciled the document access misalignment in two ways, by “batching” and by “using the old system.” In batching, for the core documents that they believed
should be stored in CWS, Client-A team members stored and maintained copies in the old system and copied new versions of the documents to CWS only when significant changes to the documents were made. In using the old system, which was used for non-core documents, Client-A team members simply continued to store and maintain the documents in the old system. Moreover, the team developed the decision rule that if a document was a core document, it should be stored in both CWS and old system. Otherwise it should be stored only in the old system.

**Document modification misalignment.** The Client-A CM was the only team member who recognized the document modification misalignment. According to the CM, the misalignment was problematic but not very important because she and her client could continue to use the old system to modify documents and her client had no desire to modify documents directly. Although the CM evaluated the document modification misalignment as problematic and not important, no other Client-A team member recognized the misalignment. Therefore, the team did not develop a team evaluation of the misalignment. Again, although the CM reconciled the document modification misalignment by continuing to use the old system, no team reconciliation of the misalignment occurred, and no reflection occurred.

**Document sharing misalignment.** In describing the document sharing misalignment, Client-A team members focused on different aspects of the misalignment. The CM focused on internal document sharing within the Client-A team. Because the misalignment meant that she had more direct access to a greater number of documents (that she needed) than she had previously had, she evaluated the misalignment positively and as a moderately important opportunity. The CSM and PM, on the other hand, focused on external document sharing with their client. Because the misalignment meant that their client could view documents via CWS
that the CSM and PM believed that the client should not view, the CSM and PM evaluated the misalignment as an important problem. From their different perspectives, the Client-A team members evaluated the misalignment differently. The only evaluation that was shared by at least two members was that the document sharing misalignment, as it pertained to external document sharing, was an important problem. To reconcile the document sharing misalignment, the CWS implementation team modified CWS to allow all documents stored on CWS to be viewable by clients and team members or “internal only.” (The default setting was “internal only.”) Note that this reconciliation was made available to every team.

**Comment attachment misalignment.** The Client-A CM, in describing the comment attachment misalignment, stated that CWS did not allow her to exchange certain types of “explanatory notes,” personalized messages that she was used to exchanging with her client (e.g., questions, directions, status reports). These explanatory notes, she explained, were an important part of how she communicated with her client and without an ability to create and send explanatory notes, she and her client’s work efficiency would likely suffer, which might create project delays. Therefore, the CM evaluated the comment attachment misalignment as important and problematic. The two other Client-A team members who recognized the comment attachment misalignment and mentioned it in interviews also evaluated the misalignment as important and problematic. Therefore, all three of the Client-A team members who recognized the misalignments stated that they reconciled the misalignment by resorting to using the “old system” that was still in place. That is, they engaged in comment attachment by using the old system’s email program to send explanatory notes to their clients.

**Discussion capture misalignment.** The Client-A CM described the discussion capture misalignment by pointing out that CWS did allow her and others to store and later reference the
CWS-generated communications that they sent to each other. The team’s CSM described the
discussion capture misalignment with reference to the expectations that she had had for the new
technology. She stated that she had expected that CWS would have a “threaded discussion”
feature. This feature would allow her and others to store and later reference their
communications with each other. Both she and the other team member who recognized the
misalignment, the CSM evaluated the misalignment as important and problematic. Not being
able to capture their communications, they stated, would likely lead to “faulty memories and
confusion about who said what.” The time that would be required to clear the confusion could
then lead to project delays. To reconcile the misalignment, the Client-A CM and CSM both
resorted to using the “old system” that was still in place. That is, they chose to use the old
system’s email program which allowed them to capture their discussions for future reference.

Personal identification misalignment. Both of the Client-A team members who most
often communicated with the client, the CM and CSM, recognized the personal identification
misalignment. Moreover, they both evaluated the misalignment as important and problematic.
They reconciled the personal identification misalignment by using both the old system and by
using CWS, for different purposes. When they wished to send a message to the client or to other
team members and they believed that it was important for others to know who had sent the
message, they used the old system. When they wished to send a message related to a document
stored in CWS and they believed that it was not important for others to know who had sent the
message, they used CWS. To decide when to use the old system and when to use CWS, team
members developed the decision rule that if the message that they wished to send related to a
document stored in CWS and it was not important that the recipient of the message know who
had sent the message, they used CWS. Otherwise they used the old system.
Public request misalignment. The Client-A CM was the only team member who recognized the public request misalignment. According to the CM, the misalignment was problematic and important because she regularly needed to put pressure on fellow team members to provide her with information or complete a task. Making a public request had allowed her to effectively place pressure on her fellow team members. Although the CM evaluated the public request misalignment as problematic and important, no other Client-A team member recognized the misalignment. Therefore, the team did not develop a team evaluation of misalignment.

Two-way communication misalignment. The Client-A CM, CSM, and PM recognized the two-way communication misalignment and they all evaluated it as important and problematic because two-way communication was essential to completing many of the AE project related tasks (e.g., collecting AE requirements, obtaining document signoffs). They reconciled the misalignment in two ways – by using the old system and by using CWS. When they sent a message that required a response (e.g., a message asking for AE requirements clarification, a document signoff request), they used the old system. When they sent a message that related to a document stored in CWS and that did not require a response (e.g., notification of a document update, a notice of a change in a meeting time), they used CWS. Moreover, in deciding when to use the old system and when to use CWS, team members developed the decision rule that if the message that they wished to send related to a document stored in CWS and they did not wish to receive a response from the recipient, they used CWS. Otherwise they used the old system.

The Client-B team
The Client-B team engaged in learning behavior associated with three document-related misalignments.

**Check work status misalignment.** Both the Client-B ACSM and PM recognized the check work status misalignment and evaluated the misalignment positively, but of little importance. The PM stated that being able to unobtrusively check the status of other team members’ work represented an opportunity to save time because she did not have to wait for a team member to reply. However, simply knowing that a team member had not worked on a document did not address the more important problem of completing the work that the team member was supposed to accomplish. Because the ACSM and PM evaluated the misalignment as an opportunity, their resolution of the misalignment was to reject the obtrusive check work status norm that had existed before CWS was implemented and adopt the unobtrusive check work status feature within CWS.

**Document access misalignment.** Every Client-B team member that was interviewed recognized the document access misalignment and evaluated it as important and problematic. Moreover, team members reconciled the document access misalignment in two ways. They engaged in batching for core documents that they believed should be stored in CWS and they continued to use the old system for non-core documents. In deciding when to use CWS and when to use the old system, the team developed the decision rule that if a document was a core document, it should be stored in both CWS and old system. Otherwise it should be stored only in the old system.

**Document sharing misalignment.** The Client-B ACSM and PM both recognized the document sharing misalignment as it related to internal document sharing and no team member recognized the document sharing misalignment as it related to external document sharing. The
team members who recognized the internal aspect of the misalignment both evaluated the document sharing misalignment as problematic and very important. They said that they were concerned with misunderstandings that their client might have as a result of having greater access to AE documents, especially to work-in-progress documents. These misunderstandings could lead to lower client satisfaction and team members having to take time to reply to the client’s concerns. As such, the team chose to not store some of its most sensitive AE documents in CWS until they were finalized – i.e., team members modified some documents in the old system and batched these changes in to CWS when the document was finalized. These sensitive documents included documents that contained incomplete information and questions and/or revealed a sense of uncertainty about AE-related issues. Less sensitive documents, like status documents (e.g., the project plan and status change matrix) and documents on which the team needed feedback from the client (e.g., the discovery document) were stored on CWS even though they were not finalized. In reconciling the document sharing misalignment in this way, the team also developed the decision rule that if a document was not sensitive, if it required client feedback, or if it was in its final form, it should be stored in CWS. Otherwise the document should be stored and maintained in the old system.

The Client-C team

The Client-C team engaged in learning behavior associated with four document-related misalignments.

Check work status misalignment. The Client-C ACSM and CSM both recognized the check work status misalignment and evaluated it as an important opportunity. In discussing the misalignment, they focused exclusively on the opportunity that the misalignment provided them
to unobtrusively check on the work status of the client. Because both the ACSM and CSM stated that they did not like the obtrusive nature of the previously established check work status norm, they saw the unobtrusive CWS check work status feature as an improvement. In reconciling the misalignment, because the ACSM and CSM evaluated the misalignment as an opportunity, their reconciliation was to reject the obtrusive check work status norm that had existed before CWS was implemented and adopt the unobtrusive check work status feature within CWS.

**Document access misalignment.** Every Client-C team member that was interviewed recognized the document access misalignment and evaluated it as important and problematic. But they also stated that in spite of the amount of time required to access documents stored in CWS, the benefits associated with accessing a document in CWS outweighed the access cost (in terms of time) when the document was client-related - i.e., when the document contained information that a client needed to know to make decisions. As such, team members reconciled the document access misalignment in two ways. First they used CWS for documents that they were client-related; and second, they used the old system for all documents that were not client-related. Because this reconciliation involved separate actions depending upon the nature of the document with which a team member was working, the team developed the decision rule that if a document was client-related, it should be stored in CWS. Otherwise it should be stored in the old system.

**Document modification misalignment.** The ACSM and CSM recognized the document modification misalignment and both initially evaluated the misalignment positively and said that it was important. They indicated initially that the misalignment would provide the client with the opportunity to modify documents directly and that this would save time due to fewer misunderstandings, clarifications, and iterations between team members and the client. Part way
through the AE project, however, after the team told the client that it could modify documents directly on CWS, the client expressed that it did not wish to modify the AE documents directly and told the team that the responsibility for modifying AE documents should belong with the team. The ACSM and CSM were both disappointed with the client’s unwillingness to accept responsibility to modifying documents, but they accommodated the client’s wish. Therefore, to accommodate the client’s wish, team members reconciled the misalignment by using CWS to share documents with the client and then receiving modification requests from the client via the old system. After team members received the modifications through the old system, they then made modifications to the appropriate documents in CWS. In this way, although the misalignment was not reconciled by fully adopting CWS (i.e., by the client’s modifying documents in CWS), the new technology was used to share documents with the client.

**Document sharing misalignment.** In describing the document sharing misalignment, Client-C team members recognized both external and internal document sharing misalignments. In terms of external document sharing, the ACSM and CSM both noted that there were documents to which the client should have access (e.g., plan administration documents) and documents to which the client should not have access (e.g., project management documents other than the project plan). Because CWS allowed clients to view any document in CWS, the Client-C team evaluated the misalignment as important and as a problem. In terms of internal document sharing, the ACSM and CSM noted that CWS did not allow team members to control which other team members could view a document. Because being able to determine which team members could view a document was a central part of how the team shared documents, the ACSM and CSM evaluated the misalignment as important and as a problem. In both the internal and external document sharing cases, the Client-C team evaluated both the document sharing
The Client-D team

The Client-D team engaged in learning behavior associated with two document- and five communication-related misalignments.

**Document access misalignment.** Every Client-D team member that was interviewed recognized the document access misalignment and evaluated it as important and problematic. Moreover, they reconciled the misalignment by using CWS to store important documents and using the old system to store less important documents. To determine whether a document was important enough to store in CWS, team members asked themselves whether the benefit gained by placing a document in CWS warranted putting up with the lengthy CWS document access process. Note that each team member weighed the benefits and costs himself and determined
whether a document should be stored in CWS or not. After allowing each team member to
individually determine whether to store documents in CWS or in the old system, team members
realized that team members were judging the importance of documents differently. Therefore,
the team collectively created a decision rule to determine for what documents team members
should use CWS and when they could use the old system. The decision rule was that all AE
related documents that were not “quick notes” (i.e., one-time communications) should be stored
in CWS. Otherwise, if a document was a quick note, team members would use the old system. In
creating this decision rule, the team decided to be “more inclusive rather than less inclusive
because it is better to err on the side of caution.” In justifying the team’s decision to not store
quick notes in CWS, the Client-D PM said:

There are communications and documents that are not critical and should not be put into
[CWS] – for example, communications which do not need to be documented because
they are one-time messages that give me a direction, or tell me something, or provide an
answer to a quick question … These are things I do not need to reference again. The cost
of storing this communication in [CWS] is not justified … There is a threshold cost to
using [CWS] and you have to decide, “Do I want to log-on or not?” Sometimes the
answer is “no.” … [CWS] does not facilitate “quick notes.” … It is not that [CWS] will
not allow you to do it. It’s that the amount of effort required to do it using [CWS] is too

great.

Document sharing misalignment. In describing the document sharing misalignment,
several Client-D team members recognized both the internal and external document sharing
aspects of the misalignment and they evaluated the different aspects of the misalignment
differently. They evaluated the internal document sharing aspect of the misalignment as
problematic but unimportant because they stated that they did not need to exclude fellow team
members from viewing documents they created, and they evaluated the external document
sharing aspect of the misalignment as problematic and important because they often needed to
exclude the client from viewing documents they created. Because the internal document sharing
aspect of the misalignment was evaluated as unimportant, the team members did not reconcile it. But because the external document sharing aspect was evaluated as important, the team did reconcile it. To reconcile the external sharing aspect of the misalignment, the team members used the old system and took advantage of the “internal-only” document feature that the implementation team created.

**Comment attachment misalignment.** The Client-D CM and PM recognized the comment attachment misalignment and both evaluated the misalignment as problematic and important. To reconcile the misalignment, the Client-D team decided to combine use of CWS and the old system. When a team member wished to share a CWS document with another team member or the client, she first used the CWS email feature to send a document link to himself (i.e., to her email account in the old system). Then she attached comments to that document link and forwarded the link, along with her attached comments, to other team members or the client.

**Discussion capture misalignment.** The Client-D CM was the only Client-D team member who recognized the discussion capture misalignment. Nevertheless, according to the CM, the misalignment was problematic and important because she needed to capture discussions that she had with the client; especially discussions in which decisions were made and documented or work status was reported. Although there was no team evaluation of the misalignment, the CM evaluated the discussion capture misalignment as problematic and important and reconciled it by forwarding her CWS communications with the client to herself (i.e., forwarding the communications to an account in the old system).

**Personal identification misalignment.** The Client-D CM was also the only team member who recognized the personal identification misalignment. According to the CM, the misalignment was problematic and moderately important because on a couple occasions she had
become confused when she received a message sent to her through CWS and she could not
determine who had sent the message. For most of the messages that she received through CWS,
however, she said that she was able to determine who had sent the message in spite of the fact
that there was no sender identification information included in the messages.

**Public request misalignment.** Again, the Client-D CM was also the only team member
who recognized the public request misalignment. According to the CM, this misalignment was
problematic and quite important because she regularly needed to publicly request that her client
provide information to her. To reconcile the misalignment, the CM combined CWS’s send email
feature with the copy recipients feature available in the old system. In doing this, the CM initially
created a message in CWS and sent it to her email account in the old system. Then, in the old
system, she forwarded that message to her intended recipients using the old system’s copy
recipients feature.

**Two-way communication misalignment.** For this last misalignment, the Client-D CM was
once again the only team member who recognized the two-way communication misalignment.
Moreover, she evaluated the misalignment as problematic and quite important because she
regularly needed to engage in two-way communication with her client and team members. To
reconcile the misalignment, the CM chose to not use CWS’s send email feature when she needed
to engage in two-way communication. Instead she simply used the old system.

**The Client-E team**

The Client-E team engaged in learning behavior associated with three document-related
misalignments.
Check work status misalignment. One of the Client-E ACSMs was the only Client-E team member to recognize the check work status misalignment. Moreover, she evaluated the misalignment as an important opportunity because the new CWS check history feature allowed her to unobtrusively check the status of her client’s work status, which she preferred as compared to the obtrusive means she had used previously. Because the ACSM evaluated the misalignment as an opportunity, to reconcile the misalignment, she simply began to use CWS to check on the status of her client’s work.

Document access misalignment. Each Client-E team member interviewed recognized the document access misalignment and evaluated it as problematic and important. To reconcile the misalignment, the team members individually chose to create and maintain many of their AE documents outside of CWS (i.e., they used the old system). The types of documents that they individually chose to maintain either within or outside of CWS, however, varied between team members; and this was problematic because they shared these documents between each other. Some team members found that, in their opinion, their team mates were placing too few documents in to CWS and storing too many documents in the old system. Others thought that too many documents were being placed in CWS. Therefore, the team collectively decided that only documents that did not require client input or that were not yet in a finalized form should be stored outside of CWS. When the documents were finalized, the team members then stored the final versions in CWS. Documents that required client input were stored within CWS (even when not finalized). The PM stated that the team developed the understanding that, because the cost of accessing CWS was high, CWS could be best used as a repository for external documents (documents that required client input) and finalized versions of other types of documents. Therefore, in reflecting on their experience with the document access misalignment, the Client-E
team members developed the decision rule that if a document required client input or was finalized, it should be stored in CWS. Otherwise the document should be stored in the old system.

**Document sharing misalignment.** The Client-E ACSM and PM recognized the external aspect of the document sharing misalignment but not the internal aspect. Moreover, they both evaluated the document sharing misalignment as problematic and important. The ACSM said that there were some documents that she would not want her client to view. These documents should be “internal-only” she said because team members do not take as much care in their writing in these documents as she would like (i.e., there are spelling mistakes, poor grammar). Although the ACSM viewed this lack of care as undesirable, she said that it was acceptable for internal-only documents. It would not be acceptable, however, for documents that the client could read. To reconcile the external document sharing misalignment, the team took advantage of the “internal-only” document feature that the implementation team created. To keep the client from viewing documents that the team did not wish it to view, team members marked documents as internal-only.

**The Client-F team**

The Client-F team engaged in learning behavior associated with three document-related misalignments.

**Document access misalignment.** All of the Client-F team members interviewed recognized the document access misalignment and evaluated it as problematic and important. To reconcile the misalignment the team chose to use the old system rather than CWS for all documents.
Document modification misalignment. The Client-F ACSM and CSM recognized the document modification misalignment and both it as problematic and important. To reconcile the document modification misalignment, the team used the old system which meant that team members stored and maintained documents on shared network drives. They and the client exchanged documents via email, and any changes that the client wished to make to a document were communicated to a team member who then made the change to the document stored on a shared network and emailed a copy of the version to the client for verification.

Document sharing misalignment. The Client-F ACSM and CSM recognized the external aspect of the document sharing misalignment and both evaluated the misalignment as problematic and important. Like the Client-E ACSM, the Client-F ACSM stated that the external document sharing misalignment was problematic because clients should not be able to view the “loose” writing style that is typical of documents intended for team members only. To reconcile the misalignment, the team used the old system.

The Client-G team

The Client-G team engaged in learning behavior associated with three document- and four communication-related misalignments.

Check work status misalignment. The Client-G CM was the only team member to recognize the check work status misalignment and she evaluated it as an important opportunity. To reconcile the misalignment, she simply began to use CWS to check on the status of her fellow team members’ and client’s work.

Document access misalignment. All of the Client-G team members interviewed recognized the document access misalignment and evaluated it as problematic and important.
Different than her fellow team members, however, the CM evaluated the misalignment as problematic and only mildly important. She stated that the benefits of using CWS outweighed the cost associated with document access. But the other team members attached more importance to the misalignment. To reconcile the misalignment then, the majority of the team chose to use the old system to access documents instead of CWS. The CM, on the other hand, chose to use CWS. Note that the CM’s reconciliation deviance may have been allowed because the CM and her work were viewed as different from the rest of the team - i.e., the CM worked in a location separated from the rest of the team, the CM’s reporting relationship was different than the rest of the team, and the communications documents that the CM exchanged with the client were largely not viewed by other team members. This reconciliation deviance, therefore, may have been permitted because the CM was viewed as an outsider by her team members

**Document sharing misalignment.** The Client-G CM and PM, like the members of several other teams, recognized only the external aspect of the document sharing misalignment and not the internal aspect of the misalignment. Moreover, in evaluating it, both the CM and PM both viewed the misalignment as problematic and important. To reconcile the external document sharing misalignment, the team took advantage of the “internal-only” document feature that the implementation team created. To keep the client from viewing documents that the team did not wish it to view, team members marked documents as internal-only.

**Comment attachment misalignment.** The Client-G CM was the only team member to recognize the comment attachment misalignment and she evaluated it as problematic and important. To reconcile the misalignment, the CM simply reverted to using the old system.

**Discussion capture misalignment.** The Client-G CM was also the only team member to recognize the discussion capture misalignment. Nevertheless, according to the CM, the
misalignment was problematic and important. To reconcile the misalignment, the CM forwarded her CWS communications with the client to herself - i.e., she forwarded the communications to an account in the old system).

**Personal identification misalignment.** Again, the Client-G CM was the only team member to recognize the personal identification misalignment and she evaluated it as problematic and important. To reconcile the misalignment, the CM simply reverted to using the old system.

**Two-way communication misalignment.** For this last misalignment, the Client-G CM was once again the only team member who recognized the two-way communication misalignment. Because the CM was the only team member to recognize the misalignment, no team evaluation occurred. The CM, however, evaluated the misalignment as problematic and important, and she reconciled it by using the old system.

**The Client-H team**

The Client-H team engaged in learning behavior associated with two document-related misalignments.

**Document access misalignment.** All of the Client-H team members interviewed recognized the document access misalignment and evaluated it as problematic and important. To reconcile the misalignment, the team chose to use the old system rather than CWS for all documents.

**Document sharing misalignment.** The Client-H CSM and PM recognized the external aspect of the document sharing misalignment. On this team, the PM seemed most concerned with ensuring that the client could not view her internal documents. She stated that she did not think clients should be able to view the documents for which she had primary responsibility. But that
they certainly should be able to see other documents, “like client services documents.” The primary reasons that she did not want her client to be able to view her project management documents was because she believed the client, armed with internal project information, might not understand some of the information and make demands on her time asking her to explain information that was not necessary for her/him to know and because she believed that her client might become overly concerned when s/he sees that internal project deadlines are not met and this would lead to “more headaches for me.” Therefore the PM definitely evaluated the misalignment as problematic and important, and the CSM agreed with her. To reconcile the misalignment, the team used the old system.

The Client-I team

The Client-I team engaged in learning behavior associated with three document-related misalignments.

Document access misalignment. All Client-I team members interviewed recognized the document access misalignment and evaluated it as problematic and important. The team reconciled the misalignment by selectively using CWS. Team members stated that they maintained a working version of AE documents in the old system and made minor modifications to the documents there. When a major modification needed to be made, however, they then copied the document version with the accumulated minor modifications into CWS and made the major modification in CWS (i.e., the team engaged in “batching”).

Document sharing misalignment. The Client-I team recognized both the internal and external aspects of the document sharing misalignment. The ACSM, CSM, and PM recognized the external aspect of the document sharing misalignment, and the Client-I CM recognized the
internal aspect of the misalignment. In evaluating the external aspect of the misalignment, the ACSM, CSM, and PM viewed the misalignment as problematic and important. To reconcile it, the team chose to not storing client-facing AE documents in CWS until they were finalized. In doing so, they developed the decision rule that if a client-facing document had been finalized, it should be stored in CWS. Otherwise client-facing documents should be stored in the old system. For the internal aspect, on the other hand, because only one team member recognized it, no team evaluation developed. The one team member who did recognize the misalignment, however, evaluated the internal document sharing misalignment as an opportunity and important because CWS provided her with greater access to other team members’ documents than she previously had. To reconcile the internal aspect of the document sharing misalignment, the CM chose to take advantage of the CWS’s open document sharing characteristic and began to use CWS.

Inter-team assistance seeking misalignment. The Client-I PA was the only team member to recognize the inter-team assistance seeking misalignment. In fact, the PA stated that he was probably the only team member who needs to seek assistance outside of the team. Other team members, he stated, had more similar job responsibilities and therefore they could ask each other for help. Their job responsibilities, the PA said, were mostly administrative. PAs, on the other hand, primarily had technical responsibilities. But unfortunately for PAs, there is no one else on the team who has technical skills who can help them. Therefore, PAs typically have to seek advice from other PAs. Because the PA was the only team member to recognize the misalignment, no team evaluation existed. The PA, however, evaluated the misalignment as problematic and important and reconciled it by using the old system for all of the documents for which he was primarily responsible.
The Client-J team

The Client-J team engaged in learning behavior associated with six document- and three communication-related misalignments.

Approval notification misalignment. The Client-J ACSM was the only team member to recognize the approval notification misalignment and she evaluated it as problematic and important. To reconcile the misalignment, the ACSM reverted to using the old system.

Check work status misalignment. Several Client-J team members recognized the check work status misalignment, although they evaluated it differently. The PM, who was most concerned with checking the work status of team members (not the client), evaluated the misalignment as an opportunity and moderately important. The ACSM, however, evaluated the misalignment with mixed feelings. On the one hand, she stated that being able to unobtrusively check on the status of her client’s work provided her with more information and this could allow her to better plan her workload. In this regards, the misalignment represented an important opportunity for her. On the other had though, she stated that being able to unobtrusively check her client’s work could be problematic when she learned that the client had still not performed the work he or she was supposed to do. Obtaining this information unobtrusively could cause her stress because she would feel that she would need to confront the client about the status of the work. Before she could unobtrusively check on the status of the client’s work (i.e., before CWS was implemented), it was more possible for her to be blissfully ignorant of the status of the client’s work. In either case, the ACSM evaluated the misalignment as important. Because the misalignment was mostly evaluated as an opportunity, the team reconciled the misalignment by using the CWS document history feature that permitted unobtrusive work status checking. The
ACSM (the only team member who evaluated the misalignment as partly problematic) did not mention if she tried to reconcile the problematic nature of the misalignment.

**Document access misalignment.** All of the Client-J team members interviewed recognized the document access misalignment. However, unlike other teams, not all team members evaluated the document misalignment in the same way. With the exception of the ACSM, all team members evaluated the misalignment as problematic and important. The ACSM, on the other hand, evaluated the misalignment as problematic, but moderately important. For her, she stated, the cost of accessing documents (in terms of time) was not significantly greater than she had expected. Because the team largely evaluated the misalignment as problematic and important, team members reconciled the misalignment by creating and modifying “cheat copies” of AE documents in the old system and batching their changes, or copying those documents to CWS periodically. In order to “go along” with her teammates, the ACSM also initially reconciled the misalignment by batching. After batching document changes for several months, however, team members began to notice that their batching reconciliation did not allow them to take advantage of CWS’s versioning feature. Moreover, the use of cheat copies by team members often meant that other team members were not aware of recent changes that were made to a document. (Note that the ACSM was credited with pointing-out these failings of the batching reconciliation.) After considering the consequences of the batching reconciliation, therefore, the team re-evaluated the document access misalignment and decided that the benefits offered by using CWS (i.e., versioning, being aware of recent document changes) were greater than the cost of using CWS (i.e., slow document access). Team members then made a rule that they should use CWS exclusively for all shared AE documents (i.e., documents that were viewed by more than one team member). The decision rule that the team developed was that if a
Document was a shared document, it should be stored in CWS. Otherwise the document should be stored in the old system.

**Document modification misalignment.** Like the approval notification misalignment, the Client-J ACSM was the only team member to recognize the document modification misalignment. Because the ACSM was the only team member to recognize the misalignment, no collective evaluation occurred. The ACSM, however, evaluated the misalignment as problematic and important and she reconciled it by choosing to not take advantage of the CWS feature that would allow her client to modify AE documents itself. That is, the ACSM used the new technology to share AE documents with her client, but she and her client continued to modify AE documents according to the pre-existing norm (wherein the client viewed a document and dictated desired changes to a BenefitsCo employee who then made the changes). In this way, because CWS was malleable (i.e., CWS did not require that the client make changes to documents), the ACSM and her client could, and did, adapt their CWS usage to accommodate the pre-existing document modification norm.

**Document sharing misalignment.** In describing the document sharing misalignment, Client-J team members recognized both the external and internal aspects of the misalignment and they evaluated the different aspects of the misalignment in different ways. The ACSM and CM, who recognized the internal aspect of the misalignment, evaluated the internal aspect as an opportunity and important. By contrast, they evaluated the external aspect as problematic and important. To reconcile the internal aspect of the misalignment the team adopted the open document sharing nature of CWS and began using the new technology. To reconcile the external aspect of the misalignment, team members took advantage of the “internal-only” document feature that the implementation team created.
Inter-team assistance seeking misalignment. The PA on the Client-I team, the Client-J PA was the only team member to recognize the inter-team assistance seeking misalignment. He recognized the misalignment when he was asked by another PA to review an AE document in another team’s CWS project space, and he found that he could not access the project space. In evaluating the misalignment, unlike the Client-I PA, however, the Client-J PA indicated that although the misalignment was problematic, it was minimally important. In comparing the two PAs evaluations of the assessments, I noticed that the Client-J PA was a much more experienced PA than the Client-I PA and that the Client-J PA had been the recipient of the assistance seeking. This difference may have attributed for the difference in their evaluations of the misalignment. Nevertheless, because the misalignment was a problem for the Client-J PA, he reconciled it. To reconcile it he had the ACSM of the other team (the team of the PA who was seeking his assistance) grant him view privileges using CWS’s project invitation and user privileges features.

Comment attachment misalignment. Several Client-J team members recognized the check comment attachment misalignment and they all evaluated it as problematic and important. To reconcile the misalignment, team members combined use of CWS and the old system. When a team member wished to share a CWS document with another team member or the client, he first used the CWS email feature to send a document link to himself (i.e., to his email account in the old system). Then he attached comments to that document link and forwarded the link, along with this attached comments, to other team members or the client.

Personal identification misalignment. Like the approval notification and document modification misalignments, the Client-J CM was the only team member to recognize the personal identification misalignment and she evaluated it as problematic and important. To reconcile the misalignment, she reverted to using the old system.
Two-way communication misalignment. The Client-J ACSM, CSM, and CM recognized the two-way communication misalignment and they all evaluated it as problematic and important. In reconciling the misalignment, the team originally abandoned CWS and reverted to exclusively using the old system. Over time, however, team members found that when two-way communication was not necessary (e.g., reporting work status, providing information that required no reply), CWS’s send email feature worked well. The feature provided a link to a document stored in CWS and facilitated the recipient’s access to that document. Therefore, the team reassessed its CWS abandonment reconciliation. As a result of the team’s reassessment, team members decided that the old system would be used for two-way communications and CWS would be used for one-way communications that related to a document stored in CWS. Therefore, the team developed the decision rule that if a message related to a document stored in CWS and the message sender did not wish to receive a reply from the recipient, then CWS should be used. For all other messages, the old system should be used.

The Client-K team

Unlike all the other teams, the team members of the Client-K team offered no statements in their interviews that indicated they engaged in any misalignment-based learning behavior. Moreover, I do not think that they used CWS at all during the simulation. – Some of the team’s earliest versions of its core AE documents were placed in to CWS at the beginning of the CWS pilot, but the team’s PM said that she thought that the CWS implementation did this in an effort to help the team in its effort to begin using CWS. A possible reason why the team did not engage in any misalignment-based learning behaviors was because the team experienced significant turnover during the AE project.
Within the H&W practice, employees typically only work a couple years at the beginning of their careers as a member of an AE team before being promoted or leaving BenefitsCo. As such, AE teams usually experience some turnover (at least one member) every year. During the AE Project, however, the Client-K team experienced much greater turnover. Two of the team’s members, the CSM and ACSM, both left the team in June and were not replaced until half-way through the pilot. By contrast, none of the other AE teams in the CWS pilot experienced any turnover. As a result of the loss of AE knowledge that accompanied the Client-K’s ACSM and CSM departures, the remaining and replacement team members said that learning about and using CWS was a low priority. They said that they “did not have time to learn about CWS.” Instead they focused on learning the basic client services tasks that related to the AE project and they primarily used the old system to facilitate the AE project. As a result, I think that the Client-K did not engage in much misalignment-based learning.

Next I summarize teams’ misalignment-based learning behavior data and note some patterns in the data before presenting the teams’ CWS usages and testing the provisional learning model of information technology implementation that was developed in chapter three.

Patterns in the Misalignment-Based Learning Data

For a basic summary of teams’ learning behaviors, see table 6.2. The table lists the number of misalignments recognized, evaluated, reconciled, and reflected-on by each team. It shows that the Client-J team recognized the most misalignments (9) and the Client-K team recognized the fewest misalignments (0). The Client-A team evaluated the most misalignments (6) and the Client-K team evaluated the fewest misalignments (0). The Client-A team reconciled the most misalignments (6) and the Client-K team reconciled the fewest misalignments (0); and
Misalignment recognition patterns

To look for patterns in the misalignment learning behavior, I began with the misalignment recognition data. For a list of the misalignments that team members recognized during the CWS pilot, see tables 5.3 and 5.4. In reviewing the data, I noticed that on two teams, a majority of the misalignments recognized were recognized by a single team member. These teams were the Client-D and Client-G teams. On the Client-D team, the CM recognized four of seven misalignments by herself, and on the Client-G team, the CM recognized five of seven misalignments by herself. Note that in both of these cases, the team member who single-handedly recognized the majority of the misalignments was the CM, and the misalignments that she recognized by herself were mostly communication-related misalignments. This pattern of communications-related misalignments being recognized by CMs suggests that these CMs (and maybe most CMs) expected that when CWS was implemented, it would help them to better perform their jobs, and therefore they engaged in learning about the new technology more than other team members. But, because the CMs were isolated from their other teams members (in terms of their functional area and office location), they may not have discussed their learning with other team members. This would have resulted in individual learning but not team learning among CMs. Note that in addition to the communications-related misalignments being
recognized primarily by CMs, only four of the eleven AE teams recognized any communication-related misalignment.

In reviewing the misalignment recognition data I also noticed that the inter-team assistance seeking misalignment was recognized by only two team members – the Client-I PA and the Client-J PA. Like the communications-related misalignments that were recognized by only the CMs, the inter-team assistance seeking misalignment could not be evaluated, reconciled, or reflected-on because no other members of the PA’s teams recognized it; and this would ultimately result in individual learning rather than team learning. In terms of why only PAs recognized the misalignment, this may have been because, as the Client-I PA indicated, no team members other than PAs had a reason to seek assistance from outside the team.

**Misalignment evaluation patterns**

In reviewing the pattern of misalignment evaluation in table 5.5, I noticed that the eleven misalignments were collectively evaluated 32 times. The document-related misalignments were evaluated 25 times and the communication-related misalignments were evaluated seven times. The fact that the communication-related misalignments were less likely to be evaluated than the document-related misalignments may have been because CMs were the team members who were most likely to recognize the communication-related misalignments and because CMs represented eleven of the 59 team members involved in the CWS pilot. Moreover, as mentioned above, teams evaluated misalignments in terms of a level of importance and whether the misalignment was considered an opportunity or a problem. For a summary of how teams evaluated individual misalignments, see table 6.3.
Table 6.3 shows that the majority of evaluations indicated that a misalignment was important (26 of 32 evaluations) and problematic (25 of 32 evaluations). The only misalignment that was consistently evaluated as an opportunity was the check work status misalignment and only one misalignment evaluation was unimportant. This was the Client-B evaluation of the check work status misalignment. Additionally only three misalignments were evaluated with mixed levels of importance or mixed opportunity/problem evaluations, and all three of these misalignments were document-related. Lastly, of the document-related misalignments that were evaluated, no misalignment was evaluated by fewer than three teams. Of the communication-related misalignments that were evaluated, on the other hand, no misalignment was evaluated by more than three teams. Again, this may have been because team members viewed CWS primarily as a document management tool when it was implemented and therefore they focused on CWS’s document management features rather than its communication features.

**Misalignment reconciliation patterns**

Although I originally believed that teams would reconcile misalignments either by acceptance or rejection I found that actually they used five different types of reconciliations. They reconciled by accepting and using a CWS feature and discontinuing use of the old system, by creatively combining CWS feature and the old system, by rejecting a CWS feature and continuing to use the old system, by selectively using CWS and the old system separately, for different purposes, and by modifying CWS (e.g., having the CWS implementation team modify
the new technology on behalf of the teams).\textsuperscript{7} For a summary of how the teams reconciled misalignments, see table 6.4.

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| Insert Table 6.4 about here |
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Table 6.4 shows that the eleven misalignments were collectively reconciled 32 times. The document-related misalignments were reconciled 25 times and the communication-related misalignments were reconciled seven times. This pattern is identical to the misalignment evaluation pattern. Moreover, like the misalignment evaluation pattern, the fact that the communication-related misalignments were less likely to be reconciled than the document-related misalignments may have been because CMs were the team members who were most likely to recognize the communication-related misalignments and because CMs represented eleven of the 59 team members involved in the CWS pilot.

In terms of the types of reconciliations that teams used, the selective use of CWS was the most common type. Over one-third of misalignment reconciliations involved the selective use of CWS and the old system (eleven of 32 reconciliations). By contrast, teams reconciled misalignments by rejecting CWS eight times. In these cases the teams chose to continue to use the old system. Although a rejection represented a deliberate choice to not use the new

\textsuperscript{7} Note that reconciliation by acceptance and by rejection may be viewed as extreme versions of reconciliation by selective usage. That is, when a team selectively uses CWS to reconcile a misalignment, team members decide when to use CWS (i.e., for what purposes). It could be argued, therefore, that reconciliation by acceptance (i.e., using CWS always to reconcile a misalignment) represents the selective usage case in which team members decide to always use CWS; and conversely, reconciliation by rejection could be viewed as the selective usage case in which team members decide to never use CWS. I, however, perceive a difference between these three reconciliation types. In particular, when a team reconciles a misalignment by selective usage, it develops a decision rule that indicates when team members should use CWS and when they should not. This decision rule requires that team members identify what technology to use (i.e., CWS or the old system). Reconciliation by acceptance or by rejection do not require such identification. Therefore, I have categorized the three reconciliations separately rather than viewing them as different versions of a single reconciliation type.
technology, the effect of a rejection was the same as if CWS had not been implemented. The learning that a team engaged in before rejecting the new technology (i.e., misalignment recognitions and evaluation) could be viewed as wasted energy and lead a team to be inclined to not waste any more energy on the technology. Indeed, this may have occurred for two teams, the Client-F and Client-H teams. Both these teams rejected CWS in all of their misalignment reconciliations.

Table 6.4 also shows that the only misalignment consistently reconciled by accepting CWS and discontinuing use of the old system was the check work status misalignment. As mentioned above, this misalignment was also the only misalignment that was consistently evaluated as an opportunity. This pattern suggests that when a team evaluates a misalignment as an opportunity, it will likely accept the new technology. Two other misalignments, the document access and the document sharing misalignments, were reconciled in multiple ways by teams. The document access misalignment was reconciled in some teams by using batching (a creative use of both CWS and the old system) for some types of documents and by selectively using CWS depending on a document’s nature (e.g., client-facing vs. non-client-facing documents). The document sharing misalignment, on the other hand, was reconciled in different ways by some teams depending on the two different aspects of the misalignment – i.e., internal document sharing and external document sharing.

In terms of the reconciliation by accepting or modifying CWS, teams only reconciled two misalignments using these reconciliation types – the check work status and document sharing misalignments; and both these misalignments were document-related. The modification of CWS was performed by the implementation team and contradicted the BenefitsCo management’s policy that CWS would not be modified. The implementation manager, however, explained that
the need to hide internal documents in CWS from clients was critical. Therefore, within the first month of the pilot, the implementation team modified CWS to allow documents stored on CWS to be flagged as “internal only.” Note, however, that this was the only technical modification of the technology during the pilot.

Lastly of the document-related misalignments that were reconciled, table 6.4 shows that no misalignment was reconciled by fewer than three teams. Of the communication-related misalignments that were reconciled, by contrast, no misalignment was reconciled by more than three teams.

Misalignment reflection patterns

A comparison of tables 6.1 and 6.4 shows that every time a team reconciled a misalignment by selective usage, it also reflected-on the misalignment. Moreover, when teams reconciled a misalignments in some other way (e.g., by accepting or rejecting CWS), they did not develop a lesson-learned. The only time that teams developed lessons-learned was when they reconciled a misalignment by selective usage. This finding, that teams that reconciled misalignments by selective usage also reflected-on their misalignment experiences, occurred because in the act of selecting when to use CWS, teams developed CWS usage decision rules. These decision rules then became institutionalized norms that represented the lessons that the teams had learned from their misalignment-learning experiences. Note, however, that no team developed a type of lesson other than a decision rule. That is, no member of any team mentioned that they had developed other types of lessons (e.g., scripts, schema, causal maps) as a result of their misalignment experiences.
Teams’ CWS Usage

Teams’ CWS usage during the pilot implementation varied significantly. The Client-K team had the lowest CWS usage (17 document versions created in CWS and no CWS emails sent) and the Client-J team had the greatest CWS usage (355 document versions created in CWS and 56 CWS emails sent). – For a summary of teams’ AE usage, see table 6.5

Insert Table 6.5 about here

The main contention of this study is that those teams that recognized, evaluated, reconciled, and reflected-on more misalignments would use CWS more than those teams that recognized, evaluated, reconciled, and reflected-on fewer misalignments. The lists of misalignments recognized, evaluated, reconciled, and reflected-on by the Client-J and Client-K teams above combined with the teams’ CWS usage numbers listed in table 6.5 provides tentative support for the main contention. Further analysis is described below.

Results

In selecting how to analyze the misalignment learning and CWS usage data, I began with identifying the type of data that would be used to test the hypotheses. A review of the data showed that all of the five hypothesis study variables (number of misalignments recognized, number of misalignments evaluated, number of misalignments reconciled, number of misalignments reflected-on, and CWS usage) were classified as interval data. Then I created univariate descriptive statistics of the hypothesis study variables. These descriptive statistics revealed that none of the study variables were normally distributed using the guidelines that the
magnitude of a variable’s skew and kurtosis measures should each be less than .3 (Bobko, 2001). See table 6.6 for the univariate descriptive statistics.

After identifying the type of data that would be used to test the hypotheses and creating univariate statistics, I then sought to determine the independence of the variables from each other. In doing so, I noted that the values of some of the study learning variables depend on the values of other learning variables. For example, for a misalignment to be evaluated, it must first be recognized. Therefore, the study’s independent variables (IVs) were not independent.

Given the interval data classification, non-normal distribution, and non-independent nature of the study variables, the Pearson’s moment correlation statistic is not an appropriate correlation statistic to test hypotheses 1-4. The Pearson’s moment correlation statistic assumes that variables are interval or continuous, normally distributed, and independent (Agresti & Finlay, 1999). Instead, Kendall’s tau correlation statistic is appropriate (Bobko, 2001). Therefore, in testing hypotheses 1-4, I used Kendall tau (τ) correlations. Moreover, I used a significance level of \( p = .05 \) to establish significance. For the correlations between the study variables, see table 6.7.

Hypothesis testing
In hypothesis 1, I predicted that the number of misalignments recognized by a team will be positively related to the team’s CWS usage. The significant positive correlation in table 6.7 ($r=.584$, $p=.016$) supports this hypothesis. It is essential for a misalignment to be recognized if team members are to engage in misalignment learning; and to recognize a misalignment, team members must use CWS. Therefore, the finding that the number of misalignments recognized by a team is correlated significantly with the team’s CWS usage makes sense – the more a team used CWS, the more misalignments it recognized.

In hypothesis 2, I predicted that the number of misalignments evaluated by a team will be positively related to the team’s CWS usage. The correlation in table 6.7 ($r=.239$, $p=.331$) does not support this hypothesis. The small sample size of eleven teams may partly explain why this hypothesis was not supported. Another reason for the lack of support may relate to the way that misalignment evaluation was operationalized. Two or more members of a team had to evaluate a misalignment in the same manner for an evaluation for have occurred. It may have been, however, that on some teams a single team member recognized and evaluated several misalignments by herself and also accounted for a majority of the team’s CWS usage. If this occurred and the operationalization was modified such that only one team member had to evaluate a misalignment for a misalignment to have occurred, then perhaps hypothesis 2 would have been supported. – I test this speculation in the chapter six.

In hypothesis 3, I predicted that the number of misalignments reconciled by a team will be positively related to the team’s CWS usage. Unfortunately the correlation in table 6.7 ($r=.239$, $p=.331$) does not support this hypothesis. Like hypothesis 2, the small sample size and operationalization of misalignment reconciliation may partly explain why hypothesis 3 was not supported. As defined in chapter four, a misalignment was considered reconciled if two or more
members of a team evaluated the misalignment in the same way and then the misalignment was reconciled based on that evaluation. If, on some teams, a single team member recognized, evaluated, and reconciled several misalignments by herself and also accounted for a majority of the team’s CWS usage, this would not have been reflected in the data used to test hypothesis 3. But if the operationalization were changed such that only one team member had to reconcile a misalignment for a misalignment to have occurred then perhaps hypothesis 3 would have been supported. – I test this speculation in chapter six.

In hypothesis 4, I predicted that the number of misalignments reflected-on by a team will be positively related to the team’s CWS usage. Again, unfortunately the correlation in table 6.7 (r=.333, p=.186) does not support this hypothesis. Of the three hypotheses that were not supported, however, hypothesis 4 received the greatest support (in terms of a significance level). Nevertheless, this hypothesis was also not supported. Like hypotheses 2 and 3, the lack of support may relate to the small sample size used to test the hypothesis and the way in which misalignment reconciliation was operationalized (i.e., two team members had to have evaluated a misalignment in the same way, the misalignment had to have been reconciled based on the evaluation, and the team members had to have mentioned a similar lesson that they learned related to the misalignment). Also like hypotheses 2 and 3, perhaps support would have been found for this hypothesis if the operationalization of misalignment reflection had allowed for only one team member to have recognized, evaluated, reconciled, and reflected-on the misalignment. – I also test this speculation in chapter six.

Other correlations observed
In addition to the correlations predicted in the hypotheses, I also noted correlations between the study variables that were not hypothesized. These include correlations between the number of misalignments recognized, evaluated, reconciled, and reflected-on. Some of these correlations are significant. For example, the number of misalignments recognized by a team was significantly correlated with the number of misalignments evaluated by a team ($\tau=.660, p=.010$). This is not surprising however because misalignment recognition is a necessary condition for misalignment evaluation. Also the number of misalignments recognized by a team was significantly correlated with the number of misalignments reconciled by a team ($\tau=.660, p=.010$). Again this is not surprising because misalignment recognition is a necessary condition for misalignment evaluation. However, the number of misalignments recognized by a team was not significantly correlated with the number of misalignments reflected-on by a team ($\tau=.490, p=.062$).

To further test hypothesis 1, I correlated the number of misalignments recognized by a team with the two types of CWS usage – the number of CWS document versions created and the number of CWS emails sent. The number of misalignments recognized was significantly correlated with both usage types. Again this is not surprising because the number of misalignments recognized was correlated significantly with overall CWS usage.

In terms of correlations between the number of misalignments evaluated and other study variables, I noted that the number of misalignments evaluated by a team was perfectly correlated with the number of misalignments reconciled by a team. This means that in all the cases in which team members evaluated a misalignment, they also reconciled the misalignment; and when a team did not evaluate a misalignment, the team also did not reconcile the misalignment. In other words, whenever two or more members of a team developed an evaluation of a misalignment,
action was taken to reconcile the misalignment; and when only one member of a team evaluated a misalignment, the team did not reconcile the misalignment. This finding highlights the importance of developing an evaluation of a misalignment if the misalignment is to be reconciled.

I also noted that the number of misalignments evaluated by a team was significantly correlated with the number of misalignments reflected-on by a team ($r=.660$, $p=.013$). This means that when a team evaluated a misalignment, it most often also developed a lesson-learned related to its experience with the misalignment. Perhaps if team members exert the energy required to develop an evaluation of a misalignment, they find that reconciling the misalignment and developing a lesson from their experience does not require much more energy. If this is true, then the evaluation learning step may represent the most significant hurdle in the misalignment-based learning model.

To further test hypothesis 2, I correlated the number of misalignments evaluated by a team with the two types of CWS usage – the number of CWS document versions created and the number of CWS emails sent. The number of misalignments evaluated was not significantly correlated with either usage type. This is not surprising because the number of misalignments evaluated by a team was not significantly correlated with the overall CWS usage.

In terms of correlations between the number of misalignments reconciled and other study variables, I noted that the number of misalignments reconciled by a team was significantly correlated with the number of misalignments reflected-on by a team ($r=.660$, $p=.013$). This means that when a team reconciled a misalignment, it most often also developed a lesson-learned related to its experience with the misalignment. Perhaps if team members exert the energy
required to reconcile a misalignment, they find that developing a lesson-learned from their experience does not require much more energy.

To further test hypothesis 3, I correlated the number of misalignments reconciled by a team with the two types of CWS usage – the number of CWS document versions created and the number of CWS emails sent. The number of misalignments reconciled was not significantly correlated with either usage type. Again this is not surprising because the number of misalignments reconciled by a team was not significantly correlated with the overall CWS usage.

To further test hypothesis 4, I correlated the number of misalignments reflected-on by a team with the two types of CWS usage – the number of CWS document versions created and the number of CWS emails sent. The number of misalignments evaluated was not significantly correlated with the number of document versions created but it was significantly correlated with the number of CWS emails sent ($\tau=.552$, $p=.037$). This means that the teams that reflected-on more misalignments sent more CWS emails than the teams that reflected-on fewer misalignments. Because misalignment reflection represents a deeper form of learning than misalignment recognition, evaluation, and reconciliation (i.e., teams had to engage in misalignment recognition, evaluation, and reconciliation before being able to reflect-on a misalignment) and because team members may have viewed email usage as a more sophisticated use of CWS than document version creation, the teams that engaged in misalignment reflection more often may have also been more sophisticated in their CWS usage. The statement that team members may have viewed email usage as a more sophisticated use of CWS is based on the fact that although 1597 CWS document versions were created by the eleven teams during the pilot, only 180 CWS emails were sent.
Lastly in terms of the correlations, I noted that the two types of CWS usage, the number of CWS document versions created and the number of CWS emails sent were significantly correlated ($\tau = .744$, $p = .002$). This means that teams that created more CWS document versions also sent more CWS emails. In other words, the teams that used CWS more for document management purposes used it more for communication purposes as well.

**Effect of rejection reconciliations**

Note that the model did not account for the fact that a team could reconcile a misalignment by choosing to use the old system (i.e., rejecting CWS) and this would then affect CWS usage. To account for a team’s reconciliations by rejection, I counted the number of misalignments that each team reconciled by rejection and by selective use (i.e., the team chose to use CWS some times and the old system sometimes). I counted the selective use reconciliations because they can be viewed as “partial rejections.” Overall, of the 38 reconciliations that teams made during the CWS pilot, seven were rejections and ten were selective uses. Additionally the range of rejections per team was 0-3 and the range of selective uses was also 0-3.

To account for the effect that reconciliation by rejection may have had on the relationship between team misalignment-based learning and CWS usage, I added the number of misalignments a team reconciled by rejection to half the number of misalignments the team reconciled by selective use. Then I subtracted this number from the original number of misalignments a team recognized, evaluated, reconciled, and reflected-on.8 (Because I viewed

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8 Example: The Client-E team’s numbers of misalignments recognized, evaluated, reconciled, and reflected-on were 3, 2, 2, and 1, respectively. To account for the effect of reconciliation by rejection, I counted the number of times that the team reconciled a misalignment by rejection (0) and I counted the number of times that the team reconciled a misalignment by selective use (1). Then I added the number of rejections to the number of selective uses divided by two (0 + ½). This resulted in an adjustment number of ½. I then subtracted ½ from the numbers of misalignments a team recognized, evaluated, reconciled, and reflected-on. The resulting numbers (2½, 1½, 1½, and ½) represented
selective use reconciliations as partial rejections, I divided the number of selective use reconciliations by two so that they did not carry as much weight as a rejection.) I then re-tested hypotheses 1-4 using the new numbers. Although the only hypothesis that received significant support (p<.05) was still hypothesis 1, the significance levels of each of the other hypotheses improved.

**Patterns in the data observed**

In terms of patterns in the data, I noted by comparing the types of misalignment evaluations created by teams (see table 6.3) and teams’ CWS usage (see table 6.5) that the teams that had more mixed evaluations tended to use CWS more (e.g., the Client-D and Client-J teams). Perhaps these teams’ high CWS usage allowed them to experience more incidents of a misalignment; and greater numbers of incidents helped the teams’ members to develop more complex, potentially mixed evaluations of misalignments. This speculation, however, suggests a causality that leads from technology usage to misalignment-based learning. That is, by using CWS more, teams may develop more complex understandings of misalignments, including mixed evaluations of misalignments. In the next chapter I address this question more.

In comparing the results of misalignment recognition and reconciliation data, I also noted a possible rationale that might better explain how teams’ learning related to their CWS usage. Although hypothesis 1 was supported (the number of misalignments recognized by teams related positively to the team’s CWS usage) and hypothesis 3 was not supported (the number of misalignments reconciled by teams did not relate positively to the team’s CWS usage), there may be a relationship between the two independent variables that better explains their CWS usage.

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the numbers of misalignments that the Client-E team recognized, evaluated, reconciled, and reflected-on, accounting for reconciliations by rejection.
than either hypothesis individually. I reason that when team members recognize misalignments but then do not reconcile them (or the recognized misalignments are not reconciled for them) then team members may become discouraged by their experience with the technology and choose to not use it. As an example of this behavior, the Client-G CM stated,

   When [the implementation team] asked for feedback on how to improve CWS, I sent them a list of ideas … but they haven’t done any of them. There is nothing more frustrating than to take the time to give feedback and then go back into the tool a month later and find out that they haven’t done anything … It makes me want to not use it anymore.

   Based on the idea that team members’ CWS usage may have been affected by their frustration with misalignments not being reconciled, I speculated that the percentage of a team’s recognized misalignments that were reconciled would relate negatively to the team’s CWS usage. To test this speculation, I divided the number of misalignments recognized by a team by the number of misalignments the team recognized. I then correlated (using Kendall’s tau) the percentage of a team’s recognized misalignments that were reconciled to the team’s CWS usage. The results ($\tau=-.629, p=.015$) supported my speculation that the percentage of a team’s recognized misalignments that are reconciled better explains teams’ CWS usage than either hypothesis 1 or hypothesis 3. Therefore for some of the teams in the sample, their CWS usage may have been affected by a sense of frustration that arose from not having the misalignments that they recognized reconciled.

   Thus far in this study, I have introduced the topic of my project. I have reviewed the relevant literatures. I have developed a provisional learning model of information technology implementation, and I have analyzed the model. As a result of the results reported in this chapter, I now realize that the concepts contained in the provisional model do not fully explain the variance in the BenefitsCo teams’ learning during the CWS implementation. Based on information that I learned from team members during the project’s data collection process,
however, I believe that the provisional model presented in chapter three can be revised to better explain the variance in the BenefitsCo teams’ learning. Therefore, in the next chapter I review the information that I learned from team members and make a case for revising the model. After revising the model, I then develop a survey instrument to use to test the revised model and I return to BenefitsCo to collect new data. Finally, I analyze the new data and report the results.
### TABLE 6.1

Summary of the Misalignments Recognized, Evaluated, Reconciled, and Reflected-on by CWS Pilot Teams

<table>
<thead>
<tr>
<th>Misalignment</th>
<th>Client-A</th>
<th>Client-B</th>
<th>Client-C</th>
<th>Client-D</th>
<th>Client-E</th>
<th>Client-F</th>
<th>Client-G</th>
<th>Client-H</th>
<th>Client-I</th>
<th>Client-J</th>
<th>Client-K</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document-related misalignments</strong></td>
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</tr>
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<td>RENF</td>
<td>RENF</td>
<td>RENF</td>
<td>RENF</td>
<td>REN</td>
<td>REN</td>
<td>REN</td>
<td>REN</td>
<td>RENF</td>
<td>RENF</td>
</tr>
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<td>REN</td>
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<td>RENF</td>
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<tr>
<td>Inter-team assistance seeking</td>
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<td>R</td>
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<tr>
<td><strong>Communication-related misalignments</strong></td>
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<td></td>
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</tr>
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<td>R</td>
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<td></td>
<td></td>
<td></td>
<td>R</td>
</tr>
<tr>
<td>R = at least one team member recognized the misalignment</td>
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<tr>
<td>E = team evaluated the misalignment</td>
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<tr>
<td>N = team reconciled the misalignment</td>
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<tr>
<td>F = team reflected-on the misalignment</td>
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<td></td>
</tr>
</tbody>
</table>
### TABLE 6.2

The Number of Misalignments Recognized, Evaluated, Reconciled, and Reflected-on, by Team

<table>
<thead>
<tr>
<th>Misalignment</th>
<th>Number of misalignments recognized</th>
<th>Number of misalignments evaluated</th>
<th>Number of misalignments reconciled</th>
<th>Number of misalignments reflected-on</th>
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<tbody>
<tr>
<td>Client-A</td>
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<td>6</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Client-B</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Client-C</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Client-D</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Client-E</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Client-F</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Client-G</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Client-H</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Client-I</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Client-J</td>
<td>9</td>
<td>5</td>
<td>5</td>
<td>2</td>
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<tr>
<td>Client-K</td>
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<tr>
<td>Mean</td>
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<td>2.91</td>
<td>2.91</td>
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</table>
# TABLE 6.3

**Type of Misalignment Evaluations by Team**

<table>
<thead>
<tr>
<th>Misalignment</th>
<th>Client- A</th>
<th>Client- B</th>
<th>Client- C</th>
<th>Client- D</th>
<th>Client- E</th>
<th>Client- F</th>
<th>Client- G</th>
<th>Client- H</th>
<th>Client- I</th>
<th>Client- J</th>
<th>Client- K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval notification</td>
<td>↓+</td>
<td>↑+</td>
<td></td>
<td></td>
<td></td>
<td>!+</td>
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<td></td>
<td></td>
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<tr>
<td>Check work status</td>
<td></td>
<td></td>
<td>↑-</td>
<td>↑-</td>
<td>↑-</td>
<td>↑-</td>
<td>↑-</td>
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<td>↑-</td>
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<td>Document access</td>
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<td>↑-</td>
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<tr>
<td>Document sharing</td>
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<td>↑?</td>
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<tr>
<td>Inter-team assistance seeking</td>
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<tr>
<td>Two-way communication</td>
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</tbody>
</table>

**Level of importance**

↑ = the team evaluated the misalignment as important  
↓ = the team evaluated the misalignment as unimportant  
! = some team members evaluated the misalignment as important, others evaluated the misalignment as unimportant

**Positive vs. negative**

+ = the team evaluated the misalignment as an opportunity  
- = the team evaluated the misalignment as a problem  
? = some team members evaluated the misalignment as an opportunity, others evaluated the misalignment a problem

165
TABLE 6.4
Type of Misalignment Reconciliations by Team

<table>
<thead>
<tr>
<th>Misalignment</th>
<th>Client-A</th>
<th>Client-B</th>
<th>Client-C</th>
<th>Client-D</th>
<th>Client-E</th>
<th>Client-F</th>
<th>Client-G</th>
<th>Client-H</th>
<th>Client-I</th>
<th>Client-J</th>
<th>Client-K</th>
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</thead>
<tbody>
<tr>
<td>Approval notification</td>
<td>A</td>
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<tr>
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<td>S</td>
<td>S</td>
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<td>R</td>
<td>R</td>
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<td>C</td>
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<td>S</td>
</tr>
</tbody>
</table>

A = the team reconciled the misalignment by accepting and using a CWS feature and discontinuing use of the old system
C = the team reconciled the misalignment by creatively combining CWS feature and the old system
R = the team reconciled the misalignment by rejecting a CWS feature and continuing to use the old system
S = the team reconciled the misalignment by selectively using CWS and the old system separately, for different purposes
T = the team reconciled the misalignment by modifying CWS (the CWS implementation team modified the new technology for the teams)
TABLE 6.5

AE Pilot Teams’ CWS Usage

<table>
<thead>
<tr>
<th>Team</th>
<th>Number of CWS document versions created*</th>
<th>Number of CWS emails sent**</th>
<th>CWS usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client-A</td>
<td>193</td>
<td>77</td>
<td>270</td>
</tr>
<tr>
<td>Client-B</td>
<td>115</td>
<td>4</td>
<td>119</td>
</tr>
<tr>
<td>Client-C</td>
<td>27</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>Client-D</td>
<td>256</td>
<td>17</td>
<td>273</td>
</tr>
<tr>
<td>Client-E</td>
<td>126</td>
<td>1</td>
<td>127</td>
</tr>
<tr>
<td>Client-F</td>
<td>30</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>Client-G</td>
<td>319</td>
<td>25</td>
<td>344</td>
</tr>
<tr>
<td>Client-H</td>
<td>82</td>
<td>0</td>
<td>82</td>
</tr>
<tr>
<td>Client-I</td>
<td>77</td>
<td>0</td>
<td>77</td>
</tr>
<tr>
<td>Client-J</td>
<td>355</td>
<td>56</td>
<td>411</td>
</tr>
<tr>
<td>Client-K</td>
<td>17</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>1597</td>
<td>180</td>
<td>1777</td>
</tr>
</tbody>
</table>

* Number of CWS Document Versions Created = the number of documents stored by the members of a team in CWS. This number captures the number of documents and the number of times those documents were modified.

** Number of CWS Emails Sent = the number of emails created and sent from within CWS by the members of a team.
### TABLE 6.6

Univariate Descriptive Statistics of the Study Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of misalignments recognized</td>
<td>4.45</td>
<td>2.841</td>
<td>.298</td>
<td>-1.025</td>
</tr>
<tr>
<td>Number of misalignments evaluated</td>
<td>2.91</td>
<td>1.640</td>
<td>.342</td>
<td>.547</td>
</tr>
<tr>
<td>Number of misalignments reconciled</td>
<td>2.91</td>
<td>1.640</td>
<td>.342</td>
<td>.547</td>
</tr>
<tr>
<td>Number of misalignments reflected-on</td>
<td>1.00</td>
<td>1.00</td>
<td>.733</td>
<td>-.133</td>
</tr>
<tr>
<td>Number of CWS document versions created</td>
<td>145.18</td>
<td>119.326</td>
<td>.724</td>
<td>-.833</td>
</tr>
<tr>
<td>Number of CWS emails sent</td>
<td>16.36</td>
<td>26.553</td>
<td>1.687</td>
<td>1.893</td>
</tr>
<tr>
<td>CWS usage</td>
<td>161.55</td>
<td>138.737</td>
<td>.700</td>
<td>-.984</td>
</tr>
</tbody>
</table>
TABLE 6.7

Study Variables Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number of misalignments recognized</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of misalignments evaluated</td>
<td>.660*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Number of misalignments reconciled</td>
<td>.660*</td>
<td>1.00*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Number of misalignments reflected-on</td>
<td>.490</td>
<td>.660*</td>
<td>.660*</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Number of CWS document versions created</td>
<td>.584*</td>
<td>.239</td>
<td>.239</td>
<td>.333</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>6. Number of CWS emails sent</td>
<td>.710**</td>
<td>.462</td>
<td>.462</td>
<td>.552*</td>
<td>.744**</td>
<td>1.00</td>
</tr>
<tr>
<td>7. CWS usage</td>
<td>.584*</td>
<td>.239</td>
<td>.239</td>
<td>.333</td>
<td>1.00**</td>
<td>.744**</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level 2-tailed.
* Correlation is significant at the 0.05 level 2-tailed.
Chapter 7
A QUALITATIVE ANALYSIS OF TEAMS’ MISALIGNMENT-BASED LEARNING

In chapter six, I focused on analyzing informants’ interview transcripts using a coding scheme derived from the provisional model and displayed in table 4.5. Note that this coding scheme is designed to capture data related to misalignment recognition, evaluation, reconciliation, and reflection at the misalignment level. As such, it captures (a) which misalignments were recognized, (b) who recognized and evaluated a misalignment, (c) how misalignments were reconciled, and (d) how misalignments were reflected-on and what lessons were developed. It does not capture (e) the sequence of RERR that occurred within a team around a misalignment, (f) whether CWS usage led to misalignment-based learning or vice-versa, or (g) other factors that may have influenced team members’ learning and/or CWS usage. Therefore, although the analysis performed thus far is valuable, it limits my ability to understand how team members learned about misalignments because the results are based on a specific view of how learning occurs.

Qualitative Analysis Method

In considering how I might begin an inductive analysis, I considered the nature of a misalignment, without reference to the provisional model. Thinking about the nature of a misalignment, it seemed to me that a misalignment is brought about by a technology implementation that is thrust upon users. The primary effect of a misalignment is that it complicates users’ work routines until the users determine how to respond to the misalignment. To respond to it, users generally interpret what the misalignment means for them and they take
actions that allow them to resume working. For example, they may use the technology or they may reject the technology. Therefore, it seems to me that a misalignment can be viewed as an event that complicates users’ routines and to which they generally respond. Additionally, in thinking about the nature of a misalignment, I then considered how the team members that I interviewed generally discussed their experiences with misalignments and the CWS implementation. In reviewing their interview transcripts, I realized that they generally described (a) the problems or opportunities they perceived that related to the CWS implementation, (b) how they responded to these problems and opportunities, and (c) whom they spoke with about the problems and opportunities.

After considering the nature of a misalignment and reviewing how team members generally discussed their experiences with misalignments and the CWS implementation, it occurred to me that the team members I interviewed often related their experiences to me in stories. A story is a narrative that contains three components:

a. a situation involving some type of “complicating action,” frequently a predicament, conflict, or struggle,

b. a protagonist who engages in a situation for a purpose, and
c. a response through which the predicament is resolved or responded to in some fashion. Complicating actions and responses together constitute the fundamental plot of a story (Gersick, Bartunek, & Dutton, 2000, p. 1030).

By applying the story framework to a team member’s discussion of her misalignment experience, it seemed to me that a misalignment could represent a complicating action, the team member and her teammates (if she mentions them) could represent the protagonists, and any thoughts about the misalignments or actions taken by the team member could be considered a
response. Therefore, an inductive story analysis of team members’ interviews seemed appropriate. Such an analysis would take into account more data than was analyzed in the earlier deductive analysis. It would also provide a richer understanding and description (i.e., story) of how team members learned. It was not sufficient, however, to simply develop stories of how teams learned. To learn from the stories so that I could revise the provisional model, I also had to compare the teams’ stories to the provisional model.

**Constant comparative methods**

In using constant comparison techniques (Glaser, 1992; Glaser & Strauss, 1967; Strauss, 1987), researchers begin by coding each incident into categories. These initial categories may be derived deductively from theory, as they are when employing analytic induction methods (Becker, 1958; Cressey, 1953; Glaser & Strauss, 1967; Goetz & LeCompte, 1981; Robinson, 1951; Yan & Gray, 1994; Znaniecki, 1934), or they may be derived inductively, as they are when employing grounded theory methods (Glaser & Strauss, 1967). (Note that in this project, I deductively derived the initial categories, the provisional model, from theory.) Then as a researcher continues to categorize incidents over time, he compares his categorization decisions to the incidents that he previously coded using the same category. In this way, the constant comparison practice allows the researcher to modify the categories over time to better reflect the incidents. Occasionally, the researcher also encounters incidents that challenge his categorization scheme (e.g., the provisional model). When this occurs he must consider why the incident does not conform to the categorization scheme. The non-conformance of an incident signals that the current categorization scheme does not adequately reflect the data, and represents an opportunity
for the researcher to revise the scheme to take into account the incident as well as all the
previously coded data.

Because this project is partly exploratory and because one of the purposes of this project is to
use the data that was collected to revise the provisional model, constant comparative techniques
seem appropriate. Therefore, following advice for how to employ constant comparative methods
(Boeije, 2002), and an example of how to construct and analyze stories (Gersick, Bartunek, &
Dutton, 2000), I employed the following method to inductively analyze team members’
interviews and revise the provisional model.

**Analysis Technique**

Beginning with the Client-A team, I reviewed the interview transcripts of all team
members and I created a story (first at the misalignment level, and then across misalignments)
that focused on misalignments (i.e., a complicating action), the team members that experienced
the misalignments (i.e., protagonists), and the thoughts or actions taken by team members
relative to misalignments (i.e., responses to the complicating action). In creating a team story, I
attempted to avoid using the language of the provisional model (i.e., misalignment recognition,
evaluation, reconciliation, and reflection). Instead I used the language that team members used.
After creating misalignment stories for each of the misalignments that a team experienced, I then
created an overall team misalignment story and compared this story to the provisional model to
determine if any of the story’s content did not match the provisional model. To create an overall
team story, I created “story lines” for each of the team’s misalignment stories. These story lines
depicted the sequence of misalignment learning events (i.e., misalignment recognition,
evaluation, reconciliation and reflection) and usage at the individual, sub-group, and team levels.
Then I looked across the misalignment story lines for similarities. The degree of similarity between the story lines then allowed me, to a greater or lesser extent, to discover a dominant learning sequence for the team. I also looked across the misalignment stories for recurring themes that appeared to influence the team’s misalignment-based learning (e.g., influence among team members, CWS expertise), and I determined if these themes conformed to the provisional model. The presence of non-conforming recurring themes allowed me to discover concepts that may have influenced the team’s misalignment-based learning and which are not captured in the provisional model.

When a recurring theme did not match the provisional model, I considered why and how the theme did not conform to the provisional model and I created a list of the non-conformances. Then I repeated this analysis technique for the remaining teams. After completing the final story-model comparison (i.e., the comparison of Team K’s story to the provisional model), I then looked across team stories for commonalities between the stories that would allow me to cluster teams’ misalignment-related experiences. To do this I looked across each team’s misalignment story lines for common patterns. From these patterns I developed prototypical learning sequences that the teams used to discover and respond to misalignments. Then I reviewed the lists of non-conformances for common themes. These themes represented the areas of greatest potential revision to the provisional model. The areas of potential revision are discussed in the next chapter before the model is revised.

The Client-A Team Story

The document access misalignment
The first complaint of each Client-A team member with whom I spoke was that the amount of time required to access documents in CWS was too long. One of the ACSMs stated,

It takes much too long to get to a document in CWS … We are used to it taking two or three seconds [in the old system]. … It takes at least twenty seconds with CWS. It has made me not want to use CWS some times.

The CSM stated, “It [CWS] is slow. I continue to use it, but it is slow.” The CM stated, “It takes longer to open a document [using CWS] … than it does with any other tool here at BenefitsCo … I am not used to having to take so long to open documents.” The PM stated,

It takes a long time to check-out a document in CWS, change it, and check it back in … I am finding that it is quicker to save most documents to a shared drive than to saving it to CWS … because it takes less time. Core documents, on the other hand, need to be stored and maintained on CWS.

And, the PA stated, “The first thing I noticed about CWS was that it takes longer [to access documents].” Therefore each of the team members seemed to recognize the document access misalignment from direct usage with CWS. They also all compared the amount of time required to access documents in CWS to the document access time of other document management technologies; and they all viewed the slow CWS document access time negatively.

In response to the slow document access, team members reported that they initially developed their own solutions. But then they realized that for some documents they needed to use a consistent solution.

The PA stated that because of CWS’s slow document access feature, he initially abandoned using CWS for modifying documents. He said that he did continue to use it, however, to access documents that he only needed to read (e.g., the Discovery Document). He justified not storing the latest versions of the documents that he modified in CWS because he said, “CWS is primarily for documents that the client needs to see and most all of my documents the client
never sees.” Therefore the PA’s initial solution to the document access misalignment was to discontinue his CWS usage for documents that he modified.

The ACSMs and CSM, on the other hand did not discontinue their CWS usage after initially finding that the technology’s document access was slow. Instead their solution to the slow document access was to “batch” their modifications and post their batched modifications to CWS periodically when either they felt that it was time to post the modifications or when they had made some significant modifications. Moreover, the CSM indicated that because she and the ACSMs were often working on the same documents, it was important that they have a solution that they agreed-on. For documents that they shared internally and not with the client, however, she said that they did not use CWS at all, except to access documents that they read but did not modify.

The CM stated that when the CWS pilot began, she was leery of the technology because she thought that it represented an effort by BenefitsCo to reduce costs by placing more responsibility on clients. Moreover, she thought that her client would resist this responsibility and the client’s satisfaction with BenefitsCo would decline. Therefore, she seemed to not want to use CWS at all when it was initially implemented. She also stated that when the pilot began, she and the client representatives with whom she was working were “a quarter of the way through AE.” As such, she believed that timing of the pilot’s implementation was poor. She also said that the BenefitsCo Communications management had indicated that CWS usage was a low priority. Therefore, before the CM ever used the technology, she seemed to be convinced that she should not use it. When she did begin to use it however, she found that document access was slow; and this seemed to convince her to quickly discontinue using it. Therefore, the CM’s solution to the
document access misalignment was to discontinue using CWS for documents, even for those documents that she exchanged with her client.

Unlike his fellow team members, the Client-A PM seemed to have more patience for CWS’s slow document access. When the CWS pilot began on June 14, 2004 (during the Discovery phase of the AE project), unlike the CS team and the CM, the PM was not busy with the project. Therefore, during the first month of the pilot, the PM had time to become familiar with CWS before he became busy. He became familiar with CWS by loading reference documents (e.g., the Project Administration Manual) and Project Management document shells (e.g., the Project Plan, a list of standard PM deliverables, a standard project issue log) to CWS. He also began to invite back-office BenefitsCo employees who would become involved later in the AE project to join the AE project in CWS – i.e., he asked them to obtain a CWS ID and to gain access to the project. The familiarization with CWS that he gained as a result of these activities seemed to give him a greater sense of expertise than his fellow team members. In fact, all of the other Client-A team members with whom I spoke indicated that the PM was the most knowledgeable team member about CWS. Moreover, although the PM indicated that he initially was frustrated by CWS’s slow document access, he continued to use it to store documents. As the AE project progressed and he became busier, however, the PM admitted that he started to batch his modifications for some documents. He stated though that batching modifications was not appropriate for some documents (i.e., core documents) because

a lot of people work on them and rely on them to be accurate and up-to-date … You can’t have one person making changes to the document over here and another person making changes over here … These [core] documents need to be stored in a central location and updated in that location every time they are changed.
To end his teammates’ practice of batching modifications to core documents, therefore, the PM spoke with his teammates and convinced them to adopt his solution. All of the team members, except the CM, then reported that they began to use CWS for core document modifications. Because the CM was isolated from the rest of the team, she seemed to not be included in the discussion about batching. Therefore, she continued to mostly not use CWS for document modifications. She did say that the one document that she modified weekly using CWS, the Project Plan, was a Project Management document. She indicated that she felt that she had to use CWS to modify the PP because it was the PM’s document and he demanded that the latest modification to the PP be stored on CWS.

Abstracting from this story of the Client-A team’s experience with the document access misalignment, it seems that all of the team members first individually recognized and evaluated misalignment in a similar way – i.e., they recognized the misalignment through direct experience with the technology – and they evaluated in negatively. Then, they seemed to quickly reconcile the misalignment, but the nature of their reconciliations differed. The PA abandoned using CWS to access documents that he modified. The CM responded similarly, except for using CWS to modify one document. The ACSMs and CSM chose to batch their client-related modifications and abandon CWS for the modification of internal documents; and the PM chose to use CWS to modify core documents. Over time, the PM, who was seen as being the team’s CWS expert, convinced most of his team mates to adopt his reconciliation and the team developed a decision rule for when to use CWS. The process of having different individual reconciliations and feeling that they needed to use a uniform reconciliation forced the team to discuss their reconciliations. This may have led to the articulation of the decision rule that became a lesson-learned.
**The document modification misalignment**

The Client-A CM was the only team member who noticed that CWS would allow clients to modify documents directly. She stated that “if the only copy of a critical document is on CWS, and … if [the client] changes it, this could be a big problem for us.” In truth, however, other team members may have recognized that the client could conceivably modify a document stored in CWS, but they did not mention this possibility, or that they were concerned about it occurring. In a related comment, the CSM stated that she did not think that clients wanted to directly modify AE documents because they might make a mistake, and because they viewed it as the team’s job to make modifications. She thought that clients wanted to dictate their changes to team members, who would then modify the AE documents. This was the practice that the client and the team had used in previous AE projects. As a result, the CSM and most of the team members may have not thought about the possibility of a client modifying a document and therefore they did not recognize the misalignment. Moreover, the CM, who indicated that she felt isolated from the other members of her team, did not seem to have discussed the misalignment with anyone.

In response to the document modification misalignment the CM abandoned using CWS and continued to use the old system. Therefore, within the Client-A team, the recognition, evaluation, and reconciliation of the document modification misalignment seemed to all have occurred at the individual-level, by one team member – the CM.

**The document sharing misalignment**

The Client-A CM was the only team member who recognized the internal-document sharing aspect of the document sharing misalignment. This may have been because she felt that
to accomplish her work, she was dependent on the content of several core Client Services and Project Management documents (e.g., the DD, the PP), but her team mates, she felt, were not dependent on her Communications documents. Therefore, having easier access to the latest versions of core Client Services and Project Management documents via CWS was considered as a positive step by the CM; but having easier access to Communications documents seemed to not matter to the other team members, because they did not recognize the misalignment.

In terms of the internal aspect of the misalignment, the CM stated that she liked that she no longer had to “always be asking the [Client Services and Project Management teams] … for the latest versions … Being able to just go out to CWS and get them is a definite improvement.” Therefore, although the CM did not use CWS for most for her documents, she did use it to access Client Services and Project Management documents that provided input to her work.

The Client-A PM noticed the external aspect of the document sharing misalignment early during the CWS pilot. After noticing the misalignment, based on his CWS usage, the PM stated that the inability to hide internal documents from the client’s view was a “major problem.” His immediate solution to the misalignment was to not use CWS for documents that he thought the client should not see. Additionally he spoke with the team’s CSM to make her aware of the misalignment. When the PM mentioned the misalignment to her, the CSM had not been aware of it. This may have been because the only document that she had posted to CWS at the time was the DD, which she wanted the client to see. Nevertheless she agreed with the PM that the misalignment was a problem and that it would become a larger problem as the AE project progressed and the team began to create more internal documents. Therefore, the CSM and PM together lobbied the CWS Implementation Team to modify CWS to allow the team to hide internal documents from clients. Note that the PM thought that CWS should have an “internal-
only” feature because “QuickPlace allowed you to do this.” Therefore he assumed that CWS did as well. In response to this request, the Implementation Team violated its stated policy that no CWS changes would be made during the pilot and modified the technology to allow teams to hide their internal documents from clients. Note that this was the only CWS modification made during the pilot.

Interestingly, after the Implementation Team made the CWS modification (which occurred within the first three weeks of the pilot), the Client-A CSM and PM seemed to suggest more than other team members (i.e., members of any team) that misalignments should be reconciled by modifying CWS. It may be that because they convinced the Implementation Team to violate its policy once that they would be able to do so again.

The comment attachment misalignment

Early in the CWS pilot, the Client-A CM tried to use the CWS email feature to send an email to her client and discovered that CWS did not allow her to enter comments in her email. She stated that the ability to exchange certain types of “explanatory notes” (e.g., questions, directions, status reports) with her client was important. In response to this problem, she said that she reverted to using the old system’s email when she needed to attach a comment. Working separately, one of the Client-A ACSMs and the CSM also noticed the comment attachment misalignment. Similar to the CM, they encountered the misalignment when trying to send an email to the client from within CWS. Their solution to the misalignment, also like the CM, was to revert to using the old system. But unlike the CM, they discussed the problem with each other. In discussing it, the ACSM and CSM came to the conclusion that not being able to attach a comment was important. But because they were in agreement, their evaluations and the way they
responded to the problem did not change. This lack of change may have been because there was no variance in their individual evaluations and reconciliations. Had there been variance, like there was in the case of the document access misalignment described above, perhaps their collective evaluation and reconciliation would have differed from their individual evaluations and reconciliations.

The discussion capture misalignment

After initially using the CWS email feature, the Client-A CSM said, “With CWS, there is no history of your email conversations with others … and this is something that you need to get work done.” She said that in the old system’s email, there was a discussion capture feature. Based on this feature, she said, she had expected that CWS would have a discussion capture feature as well. The Client-A CM said that she had also noticed this shortcoming when she began using the CWS email feature, and that she similarly had expected that CWS would have the ability to capture discussions. In describing why she expected this, the CM also stated that she had worked with another collaborative information technology on another AE project with another client. Based on her experience with that technology, she said, she had been looking forward to the CWS implementation. However, after initially using CWS and finding that CWS did not match her expectations, she indicated that she became discouraged with CWS. One of the reasons for her discouragement seemed to be related to CWS’s inability to capture discussions. In response to this inability, she acted in the same manner as the CSM. She reverted to using the old system email.

The personal identification misalignment
Much of the CSM’s discouragement with CWS related to what she viewed as deficiencies in the technology’s email feature. The personal identification misalignment represented one of there deficiencies. After initially using the CWS email feature, in addition to noticing the comment attachment and discussion capture misalignments, the CM also noticed that when she sent an email to her client from within CWS, the email that her client received did not indicate that she had sent it. She noticed this because when she sent the email, she copied herself on it; and when she received it, the email indicated that it had been sent by “CWS.” She said, “We have to be able to identify who sent the email … [because] you may be waiting to hear from someone in particular that they finished a change … When the email simply says CWS, you don’t know if it is what you were waiting for.” In response to the misalignment, she reverted to using the old system when she wanted her email recipients to know that she had sent a message to them. There were times she said, however, when she chose to use the CWS email feature “because it was convenient.” She noted that after updating a document in CWS, the technology allowed you to click on a button and an email indicating that the document had been modified would be sent to the email users you indicated. The email did not require that the user type a message and it even provided a link to the updated version in the body of the email. Therefore, the CM said, it was convenient to use the CWS email feature. But she only used it when she thought that it was not important for her respondents to know who had updated the document. Otherwise she used the old system’s email.

Similarly the CM also noticed the personal identification misalignment when she first began to use the CWS email feature; and she responded in the same way as she responded to the other CWS email problems she had noticed – i.e., by selectively using CWS. For the CM, the misalignment was important. When she used the old system email, she always copied and stored
the emails that she sent to her clients. She said, “With CWS, if my client can’t find a document I sent her … I won’t be able to find it in my email either, by looking at the emails that I sent to her from me.” Therefore the CM reverted to using the old system email. But she did indicate that she used the CWS email feature to send an email to the PM every week after she updated the Project Plan on CWS. Although she did not say why she used the CWS email feature in this case, it seemed that she may have done so because she perceived that the PM wanted her to use CWS more than she was; and by sending an email to him via CWS, this would have shown him that she was using CWS. – In summary, for the personal identification misalignment, like the discussion capture misalignment, the CSM and CM both noticed and responded to the misalignment in the same way, in spite of the fact that they did not seem to speak to each other about the misalignment.

The public request misalignment

When she initially used the CWS email feature to send an email to her client, the Client-A CM noticed that the email she received (because she had copied herself) did not indicate to whom she had sent the email beside herself. This was a problem. She said, “I work with four [client representatives] … If I ask one of them to do something and she doesn’t know that I copied the others on the message, she might not get to it as quickly.” Therefore the CM seemed to indicate that her clients needed to be motivated to respond to her requests, and that an important way of motivating them (and one that had worked for her in the past) was to copy others on emails. Therefore, because she felt that she needed to have the ability to put pressure on her clients, the CM reverted to using the old system email when she needed to make a public request. – Note that no other team member mentioned the public request misalignment.
The two-way communication misalignment

When they initially used the CWS email feature, both the Client-A CSM and CM noticed that when a user received an email sent from within CWS, in addition to not knowing who sent the email, there was no way to reply to the person who had sent the email. The CSM said, “The nature of what we do … requires us to be able to talk back-and-forth with each other … Not being able to reply to an email is a problem.” Using the CWS email feature, the CM said that when she sent an email to her clients, “they couldn’t hit reply and have a message come back to me. [When they tried to reply] it just went to CWS and they got an error message.” Therefore when the CSM and CM needed to engage in two-way communication, they chose to not use CWS.

Again, although the CSM and CM did not appear to discuss the misalignment with each other, they reacted similarly to it. The CSM, however, did mention the problem to the Client-A PM. Shortly after the CM told the PM about the misalignment, the PM told me, “I haven’t used the email feature much … [The CSM] told me that there is no way to reply to an email … [and] this seems like it could be a problem.” To see for himself, the PM then familiarized himself with the CWS email feature. After doing so, the PM said that he realized that although the CSM was correct, he thought there were occasions when using the email feature was warranted. In particular, he thought that the email feature was appropriate for emails that related to a document stored in CWS and that did not require a reply. As such, he said that he spoke with the CSM and they decided that for emails that required a reply, they would use the old system email, and for emails that related to a document stored in CWS and that did not require a reply, they would use the CWS email feature. The PM said, “We decided that if you need to receive direction or
feedback on your email, you should use [the old system email] … and if you are simply notifying others that you uploaded a new version, you can use CWS.” Therefore, in this incident, although the CSM initially recognized the misalignment, evaluated it negatively, and reconciled it by rejecting CWS, when she mentioned the misalignment to the PM, he evaluated it differently and convinced the CSM to view the misalignment his way. Based on his evaluation then, the CSM and PM developed a decision rule and reconciled the misalignment in a manner consistent with their decision rule.

**Summary of the Client-A team’s misalignment stories**

**Story line sequences.** Analysis of the Client-A team’s story lines (see Figure 7.1) shows that the most common story line was that of an individual who recognized a misalignment as a result of her CWS usage, and then evaluated, and reconciled the misalignment by herself. In fact all of the misalignments began following this pattern. When the CM was the only team member who recognized a misalignment, the misalignment story line followed this path because she did not seem to discuss misalignments with other team members (i.e., she was isolated). Moreover, in most cases, she reconciled the misalignments by reverting to use the old system. Conversely, in those cases in which members of the Client Services and Project Management teams recognized a misalignment, they often spoke with each other about the misalignment, especially the CM and PM. This resulted sometimes in the development of a consensual evaluation that was identical to the team members’ individual evaluation (e.g., the comment attachment misalignment) and other times it resulted in the development of a negotiated, consensual evaluation. The Client-A team’s story lines also show that when reflection occurred (i.e., during
the document access and two-way communication misalignment stories), it did so only after the team had developed a consensual evaluation of a misalignment.

In terms of the team’s CWS usage, the story lines show that continued usage of CWS (i.e., usage that occurred after reconciliation) occurred more often when social learning occurred than when only individual learning occurred. That is, when two or more team members discussed a misalignment, they were more likely to develop a reconciliation that included using CWS than when they did not discuss the misalignment. This may have been because when social learning around a misalignment occurred, the PM was often involved, and he appeared to be more willing to try to use CWS than other team members.

The team’s misalignment story lines also show that in most cases, recognition of a misalignment resulted from team members’ CWS usage. In one case however (the two-way communication misalignment), the PM recognized the misalignment because the CSM told him about it. Therefore, it seemed possible that team members could learn about a misalignment (i.e., come to recognize a misalignment) through discussion with others in addition to learning through direct experience with the technology. In summary, looking across Client A’s misalignment story lines, it appears that team members generally recognized a misalignment based on their CWS usage, and this was followed by evaluation and reconciliation at the individual level. Moreover, in those cases where social learning occurred, reflection and subsequent CWS usage was more likely to occur. Note that except for the role of a team member’s isolation in influencing the level of learning that occurs (i.e., individual versus social) and the possibility that a team member could vicariously recognize a misalignment without having to directly experience the technology, these learning sequence results are generally consistent with the provisional model.
Recurring themes. The following themes in the Client-A team’s misalignment stories seemed to influence the team’s learning: the isolation of the CM, team members’ initial expectations for CWS, the PM’s CWS advocacy, the PM’s perceived CWS expertise, and the fact that team members learned from each other about misalignments. First, the isolation of the CM seemed to result often in the CM individually learning about a misalignment. Because the main focus of the provisional model beyond the misalignment recognition process was on social learning, the provisional model did not address individual learning beyond misalignment recognition. Second, team members had initial expectations of CWS and these expectations influenced the misalignments that they recognized and how they evaluated those misalignments. This finding was not captured in the provisional model and represents a possible enhancement to the model.

Third, the PM’s CWS advocacy seemed to influence other team members’ CWS usage. This finding also was not captured in the provisional model. That is, in developing the provisional model, I did not consider how team members’ advocacy might influence other team members’ usage. Moreover, as the Client-A misalignment learning story lines showed, individual usage always preceded misalignment recognition. Therefore, it is conceivable that by advocating technology usage, a team member could trigger a greater number of misalignment recognitions than if he did not advocate technology usage. Fourth, the PM’s CWS expertise (as perceived by his team mates) seemed to influence the social evaluation and reconciliation processes that occurred when he and the CSM evaluated and reconciled the two-way communication misalignment. It seemed that because of the PM’s greater CWS expertise, the consensual evaluation and reconciliation that the CSM and PM developed were closer to the PM’s evaluation and reconciliation than to the CSM’s evaluation and reconciliation. Note that this is
consistent with the provisional model which suggests that team members’ expertise will influence the evaluation and reconciliation processes. Lastly, the Client-A CSM and PM seemed to learn from each other in two different ways during the CWS pilot. When the PM discussed his evaluation of the two-way communication with the CSM, she re-evaluated CWS and modified the way that she reconciled the misalignment based on what she learned from the PM. Note that this type of social learning is captured in the provisional model. However, when the CM initially discussed the misalignment with the PM, the PM had not been aware of the misalignment. That is, he came to recognize it through her experience – i.e., he learned about the misalignment vicariously. This find suggests that the social process of discussing a misalignment may also influence the misalignments that a team member recognizes. Note that this is not captured in the provisional model and represents a possible enhancement to the model.

**The Client-B Team Story**

The check work status misalignment

The Client-B ACSM thought that CWS’s document history feature represented an improvement over the old system. He said, “I used to have to call my client and try to figure out a way of tactfully asking if she had looked at the document I sent her … Now I check the document history … [The CWS document history feature] is better.” Therefore he said that he used CWS when he wanted to check whether his client had accessed a document that he had placed in CWS. The PM also thought the document history feature represented an improvement but she was less enthusiastic than the ACSM. She indicated that although she liked not having to contact someone to check on his or her work status, the more important issue for her was completing the work. She said, “The document history is good but it doesn’t help get the work
completed.” Nevertheless, she used the document history feature to check on others’ work statuses.

The PM also said that she and the ACSM had spoken about the misalignment and that she knew that he was more enthusiastic about the document history feature than she was. She indicated that this may have been because the ACSM worked more with the client and he did not like bothering the client with work status requests. She, on the other hand, did not work as much with the client; and in the past when she had to check on others’ work statuses by contacting them, they were always BenefitsCo employees, whom she seemed to not mind contacting. Therefore, although the ACSM and PM discussed the misalignment, their discussion did not change their individual evaluations or reconciliations, because they were already largely in agreement. Therefore, they did not change they way that they responded to the misalignment.

The document access misalignment

When the pilot started, the PM said that she had hoped that CWS would help her better organize the AE project for her team. She thought that in the past, the team, particularly the Client Services team, had been unorganized during AE projects – i.e., they often misplaced documents, they experienced version control problems. Therefore, she hoped that she could use CWS to provide some structure for the team’s work. As such, she began using CWS as soon as the pilot began to familiarize herself with it. One of the first things that she noticed was that the amount of time required to access a document in CWS compared with the old system was much greater. Although she thought this was troublesome, she still thought that the benefit that the team might gain from having its documents organized in CWS would outweigh the trouble associated with the slow document access.
After making this assessment and beginning to familiarize herself with CWS, the other client team on which the PM worked (which was not part of the CWS pilot) experienced a problem with its AE project. When this occurred she began to focus more on the other project and began to spend less time familiarizing herself with CWS. As a result of becoming busy, it seemed that her tolerance for CWS’s slow document access feature began to wane. She indicated that she began to use “cheat copies” of documents and engaged in batching to update CWS periodically. She justified her use of cheat copies, however, by saying that her fellow team members were mostly not yet using CWS. But she foresaw that she would not be able to continue to use cheat copies indefinitely. She said,

Logging-in to CWS and then having to check-in/check-out takes longer than just editing something on the shared drive … and this can sometimes be a pain. Because of this, I find that I am maintaining documents on the shared drive and only saving them to CWS when I make a significant change. … This may hurt me in the future when other folks begin to use CWS to maintain the same document that I am working on, and I am using my cheat copy.

Later in the pilot, other team members began to also use CWS, and like the PM, they complained about the slow document access. In response to the misalignment, however, some team members, like the PM, began to use cheat copies and engage in batching, and others responded by reverting to use the old system for all of their documents. When this occurred, the PM saw that CWS was not going to be able to help her organize the project as she had wished. Moreover, she felt that she was too busy to enforce CWS usage. She said, “I don’t have the time … to track down every document and make sure that everyone is using CWS as they should.” But she also thought that some documents, because they were modified frequently by numerous team members and because the client accessed them frequently, should be stored and modified in CWS. Therefore, she brought up the use of cheat copies in a team meeting and proposed that the team maintain its core client-facing documents in CWS. All other documents, she proposed
should be stored in the old system until they were finalized. In talking about this meeting later, the ACSM indicated that because the PM was “in charge of running the project,” the team accepted her proposal and created a decision rule that core client-facing documents would be stored and modified in CWS. This experience, therefore, suggests that the PM’s position as team leader allowed her to influence how the team finally evaluated and reconciled the misalignment.

The document sharing misalignment

The Client-B ACSM, CM, and PM indicated that before the CWS pilot, they generally limited their client’s access to their work-in-progress documents as much as possible because they believed the client would react poorly if it had access to these documents. The PM said, “This client, they’re really difficult to manage, and they’re really not nice people. We really don’t want to expose ourselves to anything … I never share anything with them that I don’t have to until it was in its final form.” Therefore, when the ACSM, CM, and PM noticed that the client could view documents that were stored in CWS, they each responded by reverting to the old system to store their work-in-progress documents. Then, during the meeting mentioned above, the PM also brought up this issue of the client’s ability to view work-in-progress documents if they were stored in CWS. Although the team had not posted a document that the PM thought the client should not have been able to see, she wanted to address the issue before it occurred. In talking about this meeting later, the ACSM said that all team members at the meeting agreed that the client should not be able to view work-in-progress documents that did not require its feedback. Therefore, the team collectively decided to use the old system for non-client-facing work-in-progress documents until they were finalized. When they became finalized, they would then be moved to CWS where the client could view them.
Summary of the Client-B team’s misalignment stories

Story line sequences. Comparing the Client-B team’s three misalignment story lines (see Figure 7.2) shows that in each story, team members’ CWS usage triggered misalignment recognition. After they recognized a misalignment, they then evaluated and reconciled the misalignment individually before they discussed it with each other. Then, after discussing the misalignment, team members then developed a consensual evaluation. Note that this sequence of learning events is different than the sequence proposed in the provisional model. The provisional model proposes that team members individually recognize and evaluate a misalignment. But then, before they reconcile the misalignment, they develop a consensual evaluation. The story line in each of the misalignment stories described above indicates the Client-B team members individually reconciled the misalignments before they developed a consensual evaluation. The story lines also show that similar to the Client-A team’s experience, the Client-B team also reflected on a misalignment only when social learning occurred; and subsequent CWS usage was more likely to occur when social learning occurred.

Recurring themes. In the case of the document access misalignment, the Client-B PM, like her counterpart on the Client-A team, seemed to have influenced the consensual evaluation and reconciliation that the team developed. In the case of the Client-B team, however, the ACSM’s comments indicate that the source of the PM’s ability to influence the consensual evaluation and reconciliation was her position as a team leader. This is consistent with the provisional model which suggests that team members’ position power will influence the evaluation and reconciliation processes.
The Client-C Team Story

The check work status misalignment

The Client-C team was the last team to join the CWS pilot. This was because the Client-C VPSD had originally not considered Client-C for the pilot. She had not done so because BenefitsCo and the client had recently experienced some difficulty, and the relationship between the companies was “at risk.” But right before the pilot was implemented, the VPSD thought that using CWS during the AE project might help improve the relationship. Therefore, she volunteered the Client-C team for the pilot.

One of the causes of the troubled relationship between Client-C and BenefitsCo related to a previous Benefits Conversion project that BenefitsCo had managed for the client. During that project, the CSM who was in charge of the project failed to regularly send updated versions of the project documents to his client representatives. As a result the client representatives did not know whether the direction that they had given to BenefitsCo was being followed. At one point during the project, the client’s management accused the CSM of making certain decisions on its behalf that he was not authorized to make. The CSM responded saying that the accusations were false. He said that his client representatives had directed him to act as he did, and he provided documentation to support his claim. The client representatives, however, claimed that they had never seen the documentation and there was no evidence of the CSM having sent it to them. Eventually the problem was resolved and in an attempt to improve the relationship, BenefitsCo management replaced the CSM and looked for a way of improving communication and document management between the client and its H&W teams (including the AE project team). With this background, therefore, the VPSD reasoned CWS might be a technology that could
improve communication and document management and she volunteered the Client-C AE team for the pilot.

One of the advantages of CWS over the old system that the ACSM and CSM noticed when they began to use the new technology was the document history feature. The ACSM, who was designated as the “CWS point person for the team,” said she first noticed the feature in early July when she was experimenting with the new technology. At that time only she and her CSM were using CWS and she told him about the feature. (He had not noticed it.) They both agreed that being able to unobtrusively check whether a client accessed a document was an advantage over having to rely on the client’s word. Therefore, they used the feature to check on their client’s work status.

The document access misalignment

For most of the pilot, the ACSM, CSM, and PM were the only Client-C team members who used CWS. This was due, in part to the fact that the PA and CM were brand new to BenefitsCo at the beginning of the pilot and they focused on learning about their AE tasks rather than how to use CWS. Of the three team members who did use CWS, they all indicated that document access in CWS took longer than in the old system. The ACSM, however, seemed to be the most tolerant. She said, “I think the benefits [of CWS] far outweigh the extra step of having to go in and upload documents … Some people don’t like that they have to log in to get something … but, for me, I stay in CWS all day.” But others, like the PM, were less tolerant. The PM said, “I see the advantages of CWS but … checking-in and checking-out continually takes a lot more time … [and] AE is one of the busiest times of year.” Therefore, whereas the ACSM responded to slow document access by not being discouraged and choosing to use CWS, the PM
responded by not storing any of his documents, except the documents that the client needed to see, on CWS.

Additionally, because one of the primary reasons for the team’s involvement in the pilot was to use CWS to avoid document management problems with client-facing documents, the ACSM raised the issue of using CWS consistently across team members when she realized that the CSM, the PM, and she might be using CWS to store different documents. Collectively they then decided that they would use CWS only for documents that the client needed to view, and they would use old system for all other documents. In commenting on this decision, the PM indicated that this solution seemed like the correct solution because, at the time that the CWS pilot began, he thought that it was being implemented primarily as a tool for client-facing documents.

The document modification misalignment

At the beginning of the pilot, the Client-C ACSM and CSM stated that they had received the impression from their VPSD that one of the reasons that CWS was implemented was so that clients could modify AE documents themselves. The ACSM said,

It is going to give the client the opportunity to make changes directly. Whereas in the past, they have always relayed their changes to us, we have had to decipher the change and implement it, and there is a lot of opportunity for people to put their own twist on “what they really mean when they say they want this.” So it’s going to allow us to be a lot more precise with the updates now that they can do it themselves, and this will be a definite improvement.

Therefore the ACSM and CSM responded to the opportunity by encouraging the client to make changes directly to the documents stored in CWS.

After a short time, however, the client indicated that it did not wish to change the document modification pattern that it had used with the team. The CSM said,
They [the client] were definitely very strong when we first started using it that they don’t want the responsibility of updating the documents. That’s our job. I understand where they are coming from. From a liability standpoint … they don’t want to be held accountable. They want to be able to supply us with updates, and it is up to us to take what they’re doing and put it in the document. I think part of it too, is just what they are used to. That’s the way it has been.

After the client indicated that it did not wish to modify documents, the ACSM and CSM were both disappointed, but they accommodated the client’s wish. To accommodate the client’s wish, the ACSM and CSM reconciled the misalignment by using CWS to share documents with the client and then receiving modification requests from the client via the old system. After they received the modifications through the old system, they then made modifications to the appropriate documents in CWS.

The document sharing misalignment

Prior to the CWS pilot, the Client-C team had experienced problems related to internal and external document sharing. In terms of internal document sharing, the ACSM said that there had been times when she wanted to share a document with only one of her team members (e.g., her CSM) and she did not want other team members to be able to view the document. But because documents stored on the shared drives in the old system were capable of being opened by all BenefitsCo Client Services and Project Management employees, she said that she was unable to do so by simply relying on the old system’s features. But using application features, she said that she and her team mates were able to develop a means of preventing their documents from being viewed once they were opened. To do this, they used the password protection features that were available in many applications (e.g., Excel, Word). Therefore, in the past, when the ACSM wished to prevent anyone but her CSM (for example) from viewing a document that she was stored in the old system (i.e., on a shared drive), she created a password for the
document before storing it; and then she gave the password to the CSM. This solution, she said, worked well. As a result, after CWS was implemented, when the ACSM and CSM noticed that internal BenefitsCo employees could access their documents stored on CWS, they responded by employing the same solution that they had used in the old system – application passwords. Interestingly although both the ACSM and CSM said they noticed this misalignment and they both evaluated and reconciled it in the same way, it did not seem that they discussed the misalignment with each other.

In terms of external document sharing, the PM indicated that although most of the documents that the team stored on CWS were intended to be seen by the client, there was one document, a Microsoft Project version of the Project Plan, that he did not want the client to see. Therefore, in response to this misalignment, he and the other team members who noticed the misalignment (the ACSM and the PM) decided to use the “internal-only document feature that the Implementation Team had created at the suggestion of the Client-A team.

Summary of the Client-C team’s misalignment stories

Story line sequences. Comparison of the Client-C team’s misalignment story lines (see Figure 7.3) shows that social learning occurred with each of the misalignments but one (the internal aspect of the document sharing misalignment). Additionally the story line of the discussion modification misalignment shows that the team’s learning began with the recognition of the misalignment rather than with CWS usage. That means that team members recognized the misalignment before they used the technology. Note that this occurred because the ACSM and CSM had been told before the pilot began that CWS would allow clients to update documents themselves. This suggests that when the differences of a new technology and a previous
technology are highlighted before the technology is introduced, team members may come to recognize some misalignments without directly using the technology. When this occurs I suspect that the misalignment recognition may be the same as if a team member learned about a misalignment from a fellow team member – i.e., the team member comes to recognize a misalignment without directly experiencing the technology.

**Recurring themes.** In the Client-C team’s misalignment stories, like in the misalignment stories of the Client-A and Client-B teams, the initial expectations that team members had of CWS seemed to influence the misalignments they recognized and how they evaluated the misalignments. Again, it could be that a team member’s expectations of a technology may influence how he uses the technology, and the type of misalignments he recognizes. Note that this is not captured in the provisional model.

**The Client-D Team Story**

The document access misalignment

When the CWS pilot began, the Client-D team was busy finishing another project and did not attend CWS training or begin using CWS for the AE project until mid-July. After beginning to use CWS in mid-July, all of the team members with whom I spoke mentioned that accessing a document in CWS took longer than accessing a document in the old system. The PA, however, did not seem to be concerned much about the slow access because he viewed CWS as primarily a tool for collaborating with the client. Because he did not collaborate often directly with the client, therefore, the slow access did not seem to bother him. He said, “I mostly go into CWS to get [AE reference documents] … I really don’t put anything in it. Mostly I just take information from it. Most of the documents to the client go through our Client Services team … So I haven’t
really had a need to put things in there.” This means that when the pilot began, the PA expected that CWS would be primarily a tool for use with documents that the client needed to see. Based on this expectation, therefore, he expected that he would not use CWS to post most of his documents, which were internal documents. Then when he first used CWS and noticed the document access misalignment, he evaluated it negatively, but it was not important for him because he did not believe he would have to use CWS often. He planned to store his documents in the old system.

This expectation that CWS was primarily a tool for client documents seemed to be fairly widespread among the Client-D team members. The ACSM, CSM, and PM also indicated that they did not expect that CWS should be used for internal documents. Commenting on this, however, the PM, stated that there were times when it was difficult to determine whether a document was entirely an internal document or whether the client might want to view it. He said that because team members may view a document differently, some members might choose to store it on CWS and another might store in the old system. Moreover, the PM thought, when a team member was undecided as to whether he should post a document to CWS, the technology’s slow access time might serve to convince him to not do so. The PM said,

There is a threshold cost to using CWS. You have to decide, do I want to log-on … and is it worth all that I have to do to have it [a document] stored in CWS? Sometimes the answer is “yes,” and often the answer is “no.” It is not worth it. But if we really need it out there, then we will definitely take the time to put it into CWS … We are developing a common sense of what should go out there and what should not … In the case of our zip codes, for example, one group thought we should put out there [on CWS] only the zip codes that are changing, and not put out those that are not changing … and others thought all the zip codes should be out there because there were new rules pertaining to zip codes … So we all got together and decided what we should do and we decided to put all the zip codes out there … Whenever we have run into that situation like that since then, we have defaulted to putting more information out there.
According to the PM, therefore, the Client-D team members seemed to have noticed that CWS document access was slow, but they seemed to also have the expectation that the new technology was intended for use only with client documents. Therefore, when team members encountered the document access misalignment, they responded by selectively using CWS, depending upon whether they were working on an internal or client document. Then, over time, the team realized that for some documents, deciding whether a document was internal or a client document was difficult; and although the slow CWS document access should not help determine whether a document should be stored in CWS, it may influence the decision for the difficult-to-decide documents. Therefore, when the issue of whether to store all of the zip codes on CWS arose, the team met and decided to err on the side of caution and use CWS for more documents.

The document sharing misalignment

All of the Client-D team members with whom I spoke said that they did not store the work-in-progress documents that they did not want their client to see in CWS. The ACSM even said that she was aware of the internal document feature that would allow her to hide a document in CWS from the client, but that she did not use it. She said, “We just don’t use it much. If a document isn’t intended for the client, we just don’t think about CWS as an option.” Therefore it seemed that team members used CWS only for documents that they thought were ready for the client to view. Note that although team members responded to the misalignment consistently (across team members), this common practice did not seem to result from team members’ discussion. That is, they did not seem to arrive at their common response via misalignment. Rather the practice seemed to result from a common view that CWS was intended only for finalized client documents, or at least “‘polished’ client documents.
In describing why he did not use CWS for documents for documents that he did not want the client to see, the PM said,

If the quality’s not there [in a document] and I put it out on CWS and the client sees it … they might say ‘He didn’t spell-check it. The grammar is bad.” So I might then send it to someone else and ask them what they think first before I put it out there [on CWS] … When you are working with the client, you want to give them something that is more finished and polished … So, you might be working on something on the side. Then when it’s finished, you put it out there. So when I am working on something, I first think, “Who is the audience? Who am I going to be giving this to?”

In terms on how they initially recognized the misalignment, the Client-D team members seemed to notice it based on CWS usage (as opposed to learning about it vicariously). However, because they viewed CWS as a tool for storing only finalized or polished documents, they reacted to the misalignment in a manner consistent with their view. In terms of the internal aspect of the document sharing misalignment, the Client-D team members seemed to not be concerned with the greater ability that some BenefitsCo employees had to view the documents that they stored on CWS; and possibly because they were not concerned with it, they did not seem to have discussed it with each other. In commenting on her lack of concern, the ACSM said,

CWS allows the VPSD to have much greater access to information about AE than in the past. Last year, I don’t think they had access to much data. But we are not worried about it. … The fact that he [the VPSD] can see what we are doing has not changed how we use CWS … It has not kept us from putting certain documents in there.

The comment attachment misalignment

Three Client-D team members mentioned that they used the CWS email feature, the CSM, the PM, and the CM; and the CM seemed to use it a lot more than the CSM and PM. The other team members either mentioned that they did not use it or did not mention the email feature. For those who said they did not use the feature, one reason that they gave for not using it
was because at the beginning of the pilot, they had been several broadcast emails from the Implementation Team indicating that the email feature was not working correctly. Therefore, not wanting to work with a feature that might not work, they simply chose to not use it. Because the CSM, PM, and CM used the email feature, however, they all noticed that the email feature did not permit them to attach comments about a document. To remedy this problem, the CSM said that he noticed that when the CM sent him an email about a document that she had updated in CWS, she seemed to first send an email from within CWS to herself. Then, after she received the CWS-generated email in her old system email, she would then attach comments and forward the email to him and others. After noticing how she remedied the comment attachment misalignment, the CSM said that he began to follow her example. Interestingly he said that he never spoke with the CM about CWS (in fact, he did not interact very much with her), but in the case of this misalignment, he seemed to have learned from her example. This story suggests that team members do not have to communicate with each other for social learning to occur. Social learning can also occur by noticing another team member’s actions and following her example.

The discussion capture misalignment

The Client-D CM seemed to be the team member who used CWS the most, both in terms of document usage and email usage. This may have been because the team viewed CWS primarily as a tool for collaborating with the client, and most of the AE documents that required client collaboration were Communications documents. At the beginning of the project, when she began to collaborate with her client using CWS’s email feature, she noticed that the feature did not allow her to capture her discussions with the client. Because it was vital to her to be able to capture her discussions, she said that she contacted the Implementation Team to ask if CWS had
a feature that would allow her to capture her decisions. She said that she contacted the Implementation Team because there was no CWS support person within the Communications practice. In response to her query, the Implementation Team informed her that there was no easy way of capturing email discussions in CWS. Therefore, the CM reverted to using the old system when she needed to capture a discussion.

The personal identification misalignment

The Client-D CM’s reaction to the personal identification was one of mild annoyance. She said that she did not receive too many CWS-generated emails. But when she did, she often could determine who sent the email, regardless of the fact that the email did not indicate who had sent it. She was able to do this, she said, because the CWS-generated emails referred to documents stored in CWS; and when she received an email relating to a particular document, she had usually been waiting for someone to update that document. Therefore, when she received weekly CWS-generated emails on Fridays that related to the Project Plan, she determined that the emails must have been sent by the PM because they had an arrangement that on Fridays, he would modify the Project Plan first and then she could modify it after he was done. Therefore, because she usually could determine who had sent the CWS-generated emails, and because she did not receive too many CWS-generated emails, she did not view the misalignment as important.

In reaction to the misalignment, however, she realized that when she sent a CWS-generated email, her recipients might not know that she had sent it. Therefore, when she updated a document in CWS and wanted to let others know of this, she first sent a CWS-generated email
to herself (i.e., her old system email account). Then she forwarded the email to others. In this way, they would know that she had sent the email.

The public request misalignment

Unlike most other CMs who worked with 3-5 client representatives, the Client-D CM worked with 25-30 client representatives who were located in various cities across the United States. A byproduct of working with some many representatives, the CM found, was that when she made a request from the client representatives (e.g., a request for information, request to approve a document), some of them might take a while to respond to the request because they assumed that another representative would respond. Therefore, the CM said that she often had to put pressure on some of her representatives to respond; and CWS’s email feature did not allow her to do so. In response to this misalignment, she said that she either used the old system email which allowed her to publicly copy others on her request, or she combined use of the CWS email feature and the old system email when she needed to send a document link.

The two-way communication misalignment

Like the members of other teams who noticed that CWS’s email feature did not facilitate two-way communication, the Client-D CM saw the misalignment as a problem and recognized the misalignment based on her CWS usage. She said that her job during the AE project “mostly involves working back and forth with my clients about the Communications documents that we are designing …[e.g.] What do you think of this change? What color should this be?” Therefore the nature of her work required that she be able to engage in two-way communication with her
client. Because CWS did not allow her to do so, she responded to the misalignment by reverting
to the old system when she needed to engage in two-way communication.

**Summary of the Client-D team’s misalignment stories**

*Story line sequences.* Analysis of the Client-D team’s story lines (see Figure 7.4) shows
that much more individual learning than social learning occurred. Social learning only occurred
in one case (the document access misalignment). The story lines also show that in all cases, team
members’ misalignment recognitions were triggered by CWS usage. In one story, however, a
team member learned from another team member without speaking with her. Instead he noticed
how she reconciled a misalignment and he learned by her example. Note that this type of social
learning by example was not captured in the provisional model. Lastly, in one story,
reconciliation did not follow evaluation. Note that this is consistent with the provisional model
that suggests that when an individual or team evaluates a misalignment as unimportant, it may
choose not to reconcile the misalignment.

*Recurring themes.* The dominant recurring themes in these misalignments were
individual learning and team members’ expectations. All but one of the Client-D misalignment
stories are stories of individual learning. Also, like the members of other teams, the Client-D
team members seemed to have expectations of CWS that influenced their initial usage and the
misalignments they recognized.

**The Client-E Team Story**

The check work status misalignment
The only Client-E team member who mentioned that she was aware of the CWS document history feature was one of the ACSMs. She said that she discovered the feature when she was familiarizing herself with CWS. Moreover, she thought the feature was great because it allowed her to check whether her client representatives had accessed a document without having to call them. Therefore, she used it regularly. The ACSM indicated, however, that her client representatives were generally good at accessing the documents that they needed to read or approve in a prompt manner; and she also indicated that the client was quite receptive to using CWS. The client had used QuickPlace in 2003 during the AE project and had been receptive of that technology too. The ACSM guessed that the client representatives’ receptiveness of the two technologies and the preference it showed to work with collaborative technology rather then the old system may have been because the client company’s primary business was information technology. As evidence of the client’s support for the CWS, the ACSM said that the client representatives were the biggest advocates for using CWS on the AE project. Additionally, she said, the regularly posted new documents and modified some AE documents on CWS.

The document access misalignment

The only misalignment that was discussed by all team Client-E team members was the document access misalignment, and generally they did not like the amount of time it took to access a document in CWS relative to the amount of time it took to access a document in other information technologies. The PA said,

I use it [CWS], but I kind of shy away from it a little bit because it is just not as easy as [the old system] … You have to go to the website and login and wait for it, and pick your client … I like the instant satisfaction of being able to go to a shared network drive and click on what I need. It’s a lot quicker. So I will usually do my work there [the old system], and then when I need to save, when I have my final product, it’s easier for me to just move over there [into CWS] rather than keeping it and maintaining it there.
Other team members reacted differently. One of the ACSMs said, “It takes me a little bit longer to use CWS, but the benefits of using it with the client … such as freeing up email space [and] having to answer less requests for the latest documents … make it worthwhile.” Therefore based on whether they thought using CWS was worthwhile, team members responded differently to the misalignment. The PM responded by generally choosing to not post any documents to CWS, and the ACSM responded by using CWS to post documents, but only documents that the client needed to view.

Over time some team members came to feel that their team mates were placing too few documents in to CWS and storing too many documents in the old system. Others thought that too many documents were being placed in CWS. Therefore, the team collectively decided that only documents that did not require client input or that were not yet in a finalized form should be stored outside of CWS. When the documents were finalized, the team members then stored the final versions in CWS. Documents that required client input were stored within CWS (even when not finalized). Commenting on this decision, the PM stated that the team developed the understanding that, because the cost of accessing CWS was high, CWS could be best used as a repository for client-facing documents (documents that required client input) and finalized versions of other types of documents.

The document sharing misalignment

All of the Client-E team members with whom I spoke said that they viewed CWS primarily as a tool to be used for exchanging documents with the client. Therefore, they generally used CWS only for client-facing documents and the fact that clients could view these documents was not a problem. In a few cases however, one of the ACSMs and the PM said, there
were some Project Management documents that were stored on CWS that they thought the client
should not see. They should not see them, the ACSM said, “[because] they are a little sloppy. It
is okay if you are a little in your writing on internal documents … but for things that the client
will see, you can’t have sloppy writing.” In response to this misalignment, therefore, for the few
CWS documents that they did not wish the client to see, the team used the internal document
feature that the Implementation Team had added to CWS. – Note that although the ACSM and
PM both mentioned noticing the misalignment, they did not seem to have discussed the
misalignment with each other

Summary of the Client-E team’s misalignment stories

Story line sequences. Comparison of the Client-E team’s misalignment story lines (see
Figure 7.5) shows that social learning occurred with one of the misalignments (the document
access misalignment). Note that each of the three Client-E misalignment story line sequences has
already been seen in the misalignment stories of the four previously analyzed teams.

Recurring themes. In the Client-A story, I speculated that the PM may have influenced
his fellow team members’ CWS usage by strongly advocating CWS usage, and this advocacy
may have influenced the type of misalignments that the team recognized. In the Client-E story,
there was also a strong CWS advocate, and it was the client. In this case, because the client was
the CWS advocate, it may have advocated greater usage of CWS for client-facing documents
(documents that it would be able to see) and this may have influenced the type of misalignments
that team members recognized (e.g., the external aspect of the document sharing misalignment).

The Client-F Team Story
The document access misalignment

When the CWS pilot began, the first Client-F team members to begin using CWS were the ACSM and CSM. Although they viewed CWS as a Project Management tool, they reported that they performed the administrative tasks of inviting BenefitsCo back-office employees to join the project and loading AE reference documents to CWS. In explaining why she viewed CWS primarily as a Project Management tool, the ACSM said,

I see the Project Manager as the AE driver, not Client Services. Client Services’ main role on the AE project relates to the Discovery Document. After Discovery, Client Services’ job is to keep after the client to meet their deadlines. Therefore, CES should be most helpful for the Project Manager.

The PM, who was busy on another non-AE project when the CWS pilot began, did not begin using the new technology until about a month after it was implemented. Interestingly, in contrast to the ACSM, he viewed CWS primarily as a Client Services tool. He said, “My understanding is that CWS is supposed to help the Client Services team work better with the client … Most of my documents, the client never sees … [Therefore] I don’t expect that I will use CWS as much as the Client Services team.”

In spite of their different expectations, when the ACSM, CSM, and PM initially used the new technology at the beginning of the pilot, they all complained that the amount of time required to access documents was too slow (i.e., slower than they were used to with other document management technologies). In response to this misalignment, the ACSM and CSM decided to store only their core client-facing documents in CWS, and the PM seemed to simply revert to using the old system. Over time, however, the ACSM and CSM began to use CSM for less of their documents and they reverted to using the old system for more of their documents. The CSM explained this was because the client preferred to have documents emailed and increasingly resisted using CWS. Eventually the client refused to use CWS altogether. When this
happened, the ACSM and CSM said that they stopped posting documents to CWS and they reverted completely back to the old system. They CSM said that he thought that the client (which was a long-term BenefitsCo client and which was used to “hand-holding”) may have viewed the CWS implementation as an attempt to pass more responsibility for the project on to the client. Because the client may have viewed document management as BenefitsCo’s responsibility, the CSM said, it may have resented having to use CWS. In response to this refusal to use CWS, the ACSM and CSM stopped using CWS for client-facing documents.

The document modification misalignment

Before the CWS pilot began, the ACSM and CSM had heard that that one of the advantages of CWS (according to the Implementation Team) was that the client could modify documents in CWS itself. They, however, did not view the client being able to modify documents as an advantage. On the contrary, they viewed it as a problem. They indicated that except for the Discovery Document, they did not want their client to modify documents on CWS. The CSM said,

The client has the capability to make the updates. But it is better if the updates are controlled by me and my team. This is the way that it has always been. … If they have some updates that they need to make, I ask them to send them over to us [via email] and we then go in and make those updates … I think that with the Discovery Document, however, it’s a little different … [Because] you’re mapping out the changes that are coming for AE … they’re a critical component in that process because it’s them making the changes. So for the Discovery Document, the intent is for me to make the preliminary update, throw it out on CWS, and then have them go out and look at it and make any updates they want. That I am okay with. Our other documents, those I want us to control.

Therefore when the ACSM and CSM began using CWS they were already aware of the misalignment based on what they had been told by the Implementation Team. In response to the misalignment, the ACSM and CSM asked the client to access the documents stored on CWS
only for reading purposes, except for the Discovery Document. The Discovery Document, they indicated to the client, it could modify on CWS on CWS if it wished. If the client wished to change the other documents, however, the ACSM and CSM requested that it revert to using the old system to request that modifications be made. The ACSM and CSM would then modify the documents in CWS. Because the client eventually refused to use the CWS for any document, the ACSM and CSM eventually reverted to using the old system.

The document sharing misalignment

Before the CWS pilot began, the ACSM and CSM had also heard that that one of the advantages of CWS was that they could store internal documents such as meeting notes and issue logs in CWS. By storing these documents in CWS, they would be less likely to be misplaced and they would be versioned as they were modified. When the ACSM and CSM first started using CWS, however, they realized that the client would be able to see these internal documents; and because they did not wish for the client to see these documents, the reverted to using the old system all internal documents.

Summary of the Client-F team’s misalignment stories

Story line sequences. Comparison of the Client-F team’s misalignment story lines (see Figure 7.6) shows that social learning occurred with all of the misalignment, especially social learning between the ACSM and CSM. Also, the story lines of the document access and document modification misalignments show that a second misalignment reconciliation followed the team’s subsequent CWS usage. This sequence reflects the fact that after using CWS for a
while, the client refused to continue using it and the team re-reconciled the misalignment by reverting to the old system.

Recurring themes. Like in other teams’ stories, in the Client-F team’s story, team members appeared to have a view of CWS before the pilot began; and their views may have influenced how they initially used CWS and what misalignments they recognized. Additionally, in the Client-F story, members of the team did not share the same view of CWS. The Client Services team viewed CWS primarily as a Project Management tool, and the PM viewed CWS primarily as a Client Services tool. Nevertheless, the individual team members’ views may have influenced their individual CWS usage and the misalignments they individually recognized.

The Client-G Team Story

The check work status misalignment

The CWS Implementation Team manager said that he thought the Client-G CM was “one of the heaviest [i.e., most prolific] and most enthusiastic CWS users.” The CM had actually been a member of a BenefitsCo task force in 2000 that had, she said,

first looked into how we might put BenefitsCo’s internal knowledge into the hands of clients. We made a recommendation that eventually became PSW [another BenefitsCo collaborative information technology] … [Therefore, as a result of this experience] when I learned we would be in the CWS pilot, I was excited to have the opportunity to finally work directly on a collaborative tool.

Because she was excited to use CWS, the CM said that when the technology was implemented, she began using it immediately. One of the first features that she discovered was the document history feature. Because the document history feature would allow her to unobtrusively check her client’s work status, she viewed it as an improvement over the old system; and she responded to the misalignment by using CWS when she needed to check on a client’s work status.
Like in other teams, all of the Client-G team members with whom I spoke noticed that the time required to access a document in CWS was longer than with other document management technologies. Their level of annoyance with this misalignment, however, differed. The CM indicated that although CWS document access was slow, the benefits of using CWS outweighed the slow access. The PA, on the other hand said, “It takes way too much time to get in to a document [in CWS]. We are extremely busy during AE and don’t have time to deal with this.” Therefore the PA seemed to mostly revert to using the old system for his documents. – Note that the PA may have been able to choose to use CWS often because the Client-G PM regularly emailed him copies of documents that were stored on CWS so that he would not have to take the time to access the CWS document. In this way, the PM enabled the PA and other team members to not have to use CWS.

As a means of explaining why she did this, the PM stated that she was “not as involved in this year’s AE because the PA is experienced and I don’t’ need to be so involved … He is managing the [BenefitsCo back-office employees] and I haven’t needed to get involved.”

Focusing on overall project management also seemed to mean that she planned and ran several AE meetings each week. As part of these meetings, she created issue logs, meeting agendas, and project plan update documents, which she stored on CWS. But she did not force others to access the documents in CWS. Instead, she made copies of these documents and sent them via the old system email before meetings. She said,

I am the type of Project Manager that spoils teams. Before my meetings I send the agenda. Then when I go to meetings, I print everything out, so I make it easy for them … I don’t ask the team members to go out and get the agenda themselves [on CWS] because I know they’re busy.

Therefore, although the PM used CWS, she enabled others to not use it.
The document sharing misalignment

The Client-G CM said that she shared most of her documents with her client and that she did not have a reason to hide documents from them. But she also indicated that there were a few documents that she did need to hide. These seemed to mostly be early versions of documents that she would later share with them. But she did not wish to share these early versions with them, she said, “because I write notes to myself [in the documents] and I don’t want them to see the notes.” In response to this misalignment, therefore, she used the internal document feature that the Implementation Team added to CWS. The PM also noticed the misalignment because she needed to hide her internal Project Management documents from the client. Without discussing the misalignment with the CM, the PM responded to the misalignment in the same way – by using the internal document feature.

The comment attachment misalignment

The CM was the only Client-G team member who mentioned that she used the CWS email feature. In using the feature, she noticed that she could not attach comments to the CWS-generated email. Being able to attach comments, however, was important to her, so she reverted to using the old system to attach comments.

The discussion capture misalignment

The CM also noticed that the CWS email feature did not allow her to capture her discussions with her clients. She said, “For auditing, I am required to have a history, in writing, of the key decisions that the client took.” Therefore the CM responded to the misalignment by reverting to the old system to capture discussions with her clients. Then when a decision
regarding an issue was finalized, she copied the captured discussion into a Word document and posted the Word document to CWS.

**The personal identification misalignment**

When she started using the CWS email feature, the CM also noticed that when she received a CWS-generated email, she could not determine from whom it had been sent; and when she sent an email to herself, the fact that she had sent the email was not evident in the received email. Because she felt that it was important to let her recipients know that she had sent them a message, she reverted to using the old system email.

**The two-way communication misalignment**

When the CM began using CWS email feature, she noticed that the email feature did not allow the recipient to reply to the sender (because the sender was “CWS”). Again, because communication with her client was important and she needed the ability to have two-way communication with the client, she reverted to using the old system when she needed to engage in two-way communication.

**Summary of the Client-G team’s misalignment stories**

**Story line sequences.** The Client-G team’s misalignment story lines (see Figure 7.7) show that in every misalignment learning event, team members learned individually.

**Recurring themes.** Unlike the CWS advocacy that was discovered in other teams, there appeared to be the opposite of advocacy present in the team. Namely, although the PM
used CWS, she enabled others to not have to use CWS. This enabling may have negatively influenced the team’s CWS usage and the number of misalignments the team recognized.

The Client-H Team Story

The document access misalignment

All of the Client-H team members with whom I spoke mentioned that they noticed when they first used CWS how slow document access took compared to other document management technologies. In response to the misalignment, the PM seemed to decide to not store many of her documents on CWS; and the ACSM and CSM agreed to primarily store their core documents on CWS. The ACSM said, “When we [the CSM and I] realized how slow it was, we decided just put our core documents, like the Discovery Document … out there [on CWS].” The PM, on the other hand, described why she chose to not use CWS by stating that she viewed CWS primarily as a tool for collaborating with the client. Therefore, when she noticed the document access misalignment, she chose to not use CWS because she viewed CWS as a tool that was appropriate for use with Client Services documents, but not for her documents.

The document sharing misalignment

When they first began to use CWS and they noticed that the client could view any document that they placed in to CWS, the Client-H CSM and PM became concerned. The PM said, “If the client … could see, for instance my [AE issue log] they would not understand why there are so many outstanding issues … This would probably be a cause for alarm for them … and they would start calling me every day to ask about the status of [an issue] … and would start to micro-manage me.” As such, the PM responded to the misalignment by wanting to revert to
the old system for any documents that were not “documents that the client had to see.” Then, so that the Client Services team knew that she planned to not use CWS for most of her documents, the PM discussed her plan with the CSM who agreed with her that the client should not be able to view internal documents.

Summary of the Client-H team’s misalignment stories

Story line sequences. The Client-H team’s misalignment story lines (see Figure 7.8) show that in both stories, social learning occurred.

Recurring themes. Similar to team members in other teams, the Client-H PM seemed to hold a view of CWS when it was implemented that may have influenced her initial CWS usage and the misalignments that she recognized.

The Client-I Team Story

The document access misalignment

A week before the CWS pilot began, the Client-I CSM returned to work from maternity leave. Coincidentally, the ACSM had also been out-of-work on maternity leave and returned three months before the pilot began (shortly before the CSM left. At the beginning of the pilot, as a part of their agreement to return to work, both the ACSM and CSM were working four days a week in BenefitsCo’s offices and one day a week at home. When the pilot began, because they perceived that CWS might allow them to work more efficiently from home, the ACSM and CSM were enthusiastic about the new technology. They assumed responsibility for training the client on how to use CWS, they performed the initial administrative tasks associated with establishing a project in CWS (e.g., inviting participants to join the project, granting them user rights, loading
reference documents in to CWS), and they promoted CWS to their fellow team members. One stumbling block they had in promoting CWS, however, was that document access was slow.

Commenting on the slow access, the CM said,

> It takes a while to load documents on to CWS. You have to sign-in. You have to go into a particular section of CWS. You have to pull the document … Its so much easier to just attach a document [in email] and send it … which is two seconds as opposed to three or four minutes.

In response to this misalignment, therefore, all of the team members engaged in some level of selective CWS usage and batching. In terms of the type of selective usage that the CM employed, she said that she used CWS in a couple ways – as a repository for the final versions of documents for the client and also as a place where the client can review documents for approval purposes … [However] I have not used it for going back-and-forth with the client … For the back-and-forth [i.e., the iterative document development process] we’ve used email [i.e., the old system].

Moreover the CM indicated that she viewed CWS primarily as a tool for collaborating with the client. As such, she said, “I haven’t used it with the technical team [i.e., the Client Services and Project Management teams]. Its easier to use email and shared drives internally … My impression was that it was meant to be used with the client and not necessarily internally.” The CM’s view of CWS as primarily a tool for client-facing documents, therefore, may have influenced her usage.

Similarly the Client-I PM viewed CWS primarily as a client-facing tool, and therefore a tool for the Client Services team. Moreover, she viewed it as the Client Services team’s responsibility to rollout the technology to team members and train them how to use the tool. This included, she thought, convincing the BenefitsCo back-office employees who became involved in last phases of the AE project to learn and use CWS. Therefore, the PM did not perceive that
she had any responsibility for CWS. Note that the Client Services team had a contentious relationship with the PM. They felt that she often made their work more difficult. The CSM said,

There is often push-back from the Project Manager regarding roles and responsibilities … saying, ‘It’s not my job’ … Ultimately, Client Services is the one on the forefront, dealing with the client and you would expect the support of the Project Manager and it is not always there … I hear a lot of ‘No, I can’t do it’ and ‘It’s not my job.’ With my Project Manager, it’s a constant battle.

As an illustration of the PM’s attitude, the CSM indicated that she (the PM) should be the team member responsible for convincing the BenefitsCo back-office employees to learn and use CWS because they reported to her, not to the Client Services team. The PM, because she viewed responsibility for CWS as “not my job,” disagreed with the CSM.

Ultimately the conflict between the Client Services team and the CM may have influenced how the PM viewed CWS and how she chose to use it. Although she indicated that she did not like using it because the document access was slow, the PM’s decision to use it for only two documents (the Project Plan and the System Requirements Analysis), may have been influenced by the fact that she had a contentious relationship with the Client Services team and because she viewed CWS as a Client Services tool. The team’s learning relative to the document access misalignment, therefore, seemed to be largely based on individual learning (because team members did not seem to discuss the misalignment with each other) and influenced by a number of factors, including team members views and expectations of the technology and inter-team conflict.

The document sharing misalignment

The Client-I CM indicated that one of the benefits of using CWS internally was that she had access to the latest version of the Client Services and Project Management documents.
without having to ask a member of the Client Services or Project Management teams to send them. She said,

What has been great this year is that I haven’t had to ask continually for the latest versions of [Client Services and Project Management documents] … I can just go out [on CWS] and get them. In the past it has always been a struggle getting them to keep me in the loop and remembering to send the latest versions … especially with the Project [Management] team.

In response to this misalignment, therefore, the CM began to use CWS to access the documents that she could not previously access.

In relation to the external aspect of the document sharing misalignment, after using CWS for a little while, the ACSM and CSM became concerned that there might be documents stored in CWS that were not ready for the client to see (i.e., there may be misspellings, dates may be tentative, team members may have placed notes to themselves in the document). In response to this misalignment, the ACSM and CSM created a decision rule that only finalized documents or documents that were ready for the client to see on CWS (i.e., finalized or polished documents) should be stored in CWS. Note that the PM and CM did not seem to be aware of this decision rule.

The inter-team assistance seeking misalignment

At the beginning of the CWS pilot, the Client-I PA had been a PA for less than a year. As such, he considered himself to be a relatively inexperienced PA. To learn how to perform his job, he stated, he had sought advice from other, more experienced PAs. Usually this advice-seeking involved sending a link of one of his documents to a senior PA and asking for assistance on the document. Unlike the PAs on other pilot teams, because he used CWS, however, he was unable to ask for advice because other PAs could not access his CWS documents. Additionally he said
that none of the people who had access to this CWS documents (i.e., his team members) could or would help him. Although the PM had been a PA, the PA said that she either had forgotten her technical skills or was not interested in helping him. The CSM, commenting on this, indicated that she thought the latter was true. She said, “[The PM] used to be a PA, but now she wants nothing to do with the technical aspects … She just focuses on the Project Management aspects of her job and lets [the Project Analyst] figure out what he needs to do. She is done being a PA and has moved on.” Regardless of the reason the PM did not offer to help the PA, the PA stated that in response to the inter-team assistance seeking misalignment, when he needed assistance on a document, he copied a version of the document to the old system and sent a link to a senior PA asking for assistance – i.e., he reverted to using the old system.

Summary of the Client-I team’s misalignment stories

Story line sequences. The Client-I team’s misalignment story lines (see Figure 7.9) show that in only one of the four stories did social learning occurred. Also, in all of the stories, team members’ CWS usage triggered misalignment recognition,

Recurring themes. The misalignment stories show that several team members seemed to view CWS as a tool for collaborating with the client and as a tool for finalized and polished documents. As such, it is possible that their view of CWS may have influenced how they used the technology and the type of misalignments they recognized. Also the misalignment stories show that the contentious relationship between the PM and the Client Services team coupled with the PM’s view of CWS as a Client Services tool, may also have influenced the team’s misalignment-based learning. Because the PM viewed CWS as a Client Services tool and because she was not inclined to support the Client Services team, she may have chosen not to
promote or use the technology. Her limited usage and lack of promotion may, in turn, have limited the number of type of misalignments that the team recognized.

The Client-J Team Story

The approval notification misalignment

When the ACSM began to use the CWS approval feature to approve Communications documents, she expected that the feature would automatically send a notification to the documents’ owner, the CM, notifying her whether the documents had been approved. Several days after she had approved the first Communications document, the ACSM said that she received an email from the CM asking whether she reviewed the document yet. This made the ACSM realize that the approval feature did not automatically notify the document owner. Thereafter she said she sent an email (using the old system) to a document’s owner after she approved or rejected the document.

The check work status misalignment

Several Client-J team members noticed CWS’s document history feature when they began using the technology and they all viewed it as an improvement over the old system. One team member, the ACSM, however, had mixed feelings about the feature. On the one hand, she stated that being able to unobtrusively check on the status of her client’s work provided her with more information and this could allow her to better plan her workload. In this regards, the document history feature seemed like it could help her. On the other hand though, she stated that checking on her client’s work status and learning that a document that needed to reviewed had not been accessed could be stressful. Before CWS was implemented, to check on the status of the
client’s work, she had to call or email the client and ask for the status; and if the client had not begun to work on the document but lied to her, then she could be blissfully ignorant. With CWS, she said, “She [the client] can’t lie. I can see whether or not she viewed the document.” In spite of these mixed feelings, however, the ACSM, like her fellow team members who noticed the document history feature, responded by taking advantage of the feature.

Note that all of the ACSM’s team members mentioned that she (the ACSM) seemed to use CWS the most and had the most CWS expertise. Additionally, they said that she advocated the technology’s use more than any other team member. But differently than the members of other teams who advocated CWS usage to their team members but who did not follow-up to determine whether their team members actually used CWS, the Client-J ACSM followed-up with her team members and the BenefitsCo employees back-office employees who became involved in the Client-J AE project. When following-up, if a team member or back-office employee had not begun to use CWS, she then “escalated” to the team member or employee’s manager. In this way she forced her team members and the back-office employees to use CWS at least minimally. In advocating CWS usage, however, the ACSM said that she did not have to escalate too often. The team members and back-office employees generally responded to her CWS advocacy. Her client representatives, on the other hand, were more difficult to motivate to use CWS.

The ACSM said that at the beginning of the CWS pilot, the client representatives seemed interested in using CWS. But after a couple weeks, their interest seemed to wane and, using the document history feature, the ACSM could see that they were not accessing the documents she had sent them to review. She said,

CWS allows me to see what the client is viewing … and it has made me feel nervous, for example, when I post a document and I go into the history tab and I see that they are not looking at it … I have been trying to get the client to use CWS … but I first have to get them on the phone and force them to look at a CWS link I sent. They will not look at it
otherwise. I have to be on the phone with them … I check everyday to see if the client has viewed the documents I have put out there … and they generally have not … and this is distressing because this means they are going to miss their deadlines.

To force her client representatives to use CWS, the ACSM then escalated. She said,

“Certainly I would never be pushy with a client, but because I am frustrated with my client’s choosing to not use CWS, I have escalated. I have engaged everybody I needed to engage (my manager, [the CSM], and the VPSD). I have let it be known that dates have already slipped on the project plan.”

After a few days, the ACSM reported, the client began to use CWS and then did so for the remainder of the project. This story shows that the Client-J ACSM’s level of CWS advocacy was much higher than the advocacy displayed by any member of any other team. Additionally, the ACSM also seemed to act as the team’s CWS help desk. She said that when the client or one of her team members, or a back-office employee had questions about how to use CWS or was experiencing difficulty with the tool, she offered her assistance, often by going to their desk or walking-through CWS with them over the telephone.

The document access misalignment

All of the Client-J team members noticed CWS’s slow document access when they started using the tool. Their reactions to the slow access initially were negative but, over time, they generally became accustomed to it. The ACSM said, “At first, it was a nuisance to load a document onto CWS rather than saving it in a folder. In my mind, it does take an extra 30-40 seconds. So that was hard to get used to. Now that I have gotten used to it, however, it is just an extra click. My routine changed.” The PM, however, seemed to never get used to the slow access time. Speaking in December (i.e., near the end of the pilot), he said, “I find CWS to be very slow. When you are trying to get things done, it is too slow. It is unacceptable … this [the slow
document access] should have been fixed before it was put in place … and it certainly should have been fixed by now. The project is almost over.”

Nevertheless the PM and the other Client-J team members did not respond to the misalignment by choosing to revert completely back to the old system. Instead they decided collectively to engage in batching. The ACSM who did not view the document access misalignment as negatively as her team mates and who seemed as if she was not completely in favor of the solution, nevertheless went along with her team members’ decision. After batching document changes for several months, the PM and CM encountered a problem updating the Project Plan.

The PM and CM shared responsibility for updating the Project Plan every Friday. One Friday when she was updating the Project Plan, the CM said,

I went in there [CWS] to get the Project Plan. It wasn’t checked out, so I checked it out and began to make my updates. Fifteen minutes later, I am about ready to check it back in, and I have my Project Manager call me and say “I just went to check the Project Plan back in and you’ve got it checked-out.” “Well yeah. No one had it checked-out.” “Well I check it out. Save it to my desktop. Then check it back in so that people can access it while I am working on it,” he said. And I was like “I thought you could access it. That’s why there is a history.” Then I found out after this that he was wrong. And I actually went back and re-did all my updates because I thought I had less [updates] than him. He was the one who had messed it up. I shouldn’t have been penalized and had to have re-done my work. He should have had to. But I just said, “Oh, just throw it back.” I was so annoyed with the whole thing. ‘If you are ever going to do that again, you are going to have to send a note to the whole team saying “This is what I have done, do not lock it.”’ I later found out that he saves it to his own desktop and then just goes into there and updates it and doesn’t even pull it from CWS and assumes that no one is out there making changes to it.

When she discovered the PM’s deception, the CM contacted the PM’s manager and let him know what had happened. As a result of this incident and team members’ noticing that batching did not allow them to take advantage of CWS’s versioning feature, they began to question whether they should continue batching. Then, at the ACSM’s suggestion, the team
reconsidered its solution and decided that the benefits offered by using CWS (i.e., versioning, being aware of recent document changes) were greater than the cost of using CWS (i.e., slow document access). They decided that they would use CWS for all shared AE documents (i.e., documents that were viewed by more than one team member) without batching. Documents that were not shared between team members would be created and maintained in the old system. – In summarizing the team’s experience with the document access misalignment, it seemed that the team’s response to CWS’s document access was originally to engage in batching. Then, over time, as team members realized that batching did not allow them to take advantage of some of the benefits they perceived of using CWS, they changed their response and began to update their CWS documents more regularly.

The document modification misalignment

When the CWS pilot began, the Client-J ACSM said that she was aware that the client would be capable of modifying documents stored in CWS. She stated that this capability seemed to reflect BenefitsCo management’s desire to push more responsibility for document modifications on to clients. She, however, did not think that allowing or asking clients to modify the AE documents was a good idea because the language used in many of the documents had to be precise and because modifying the documents should be the teams’ responsibility. She said, “The client has not yet created or edited a document in CWS. That is our job. That is what they pay us to do. They read documents and provide comments back to us, and then we change the document based on their comments.” Therefore in response to the misalignment, the ACSM used CWS. But she did so in a way that was consistent with the pre-existing norm that only team members should modify documents. She did this by asking the client to read a document on
CWS and then use the old system to provide her with comments. She then took these comments and incorporated them in a new version of the document that she then loaded to CWS. – Note that although no other team member mentioned this misalignment, they all also practiced the same response. This may have been because the pre-existing norm was so ingrained in their routines that they did not notice that the client could change CWS documents, or because they did not even entertain the thought the client would want to do so.

The document sharing misalignment

Unlike the CMs of other teams, the Client-J CM seemed to enjoy a good relationship with the Client Services team. She said that she spoke regularly with the ACSM and felt that in the past, the ACSM had “always kept me in the loop by sending new versions of documents that I needed when they were updated.” Therefore although she thought that having access to Client Services and Project Management documents through CWS was helpful, she said that in the past she had usually had access to these documents. Nevertheless, she responded to the misalignment by using CWS to access Client Services and Project Management documents. Similarly the ACSM noticed that she could access the Communications documents through CWS without having to contact the CM, and she responded by using CWS to access these documents. Note though that the CM and CSM did not discuss the misalignment with each other, the simply noticed the misalignment by themselves and responded by taking advantage of CWS’s open nature.

In terms of the external aspect of the document sharing misalignment, several team members indicated that they did not like that the client could view their CWS documents, even their documents that were not ready to be shown to the client. They responded by not posting to
CWS their documents that were not ready to be shown to the client. Then when the
Implementation Team addressed this misalignment by modifying CWS to have an internal
document feature, they responded by posting these documents in to CWS and marking them as
internal. When they were ready to be shown to the client, they were then made public (so the
client could see them).

The inter-team assistance seeking misalignment

The PA was the only Client-J team member who noticed that CWS did not allow team
members to seek advice from others outside of the team. Describing how he noticed the
misalignment, the PA said,

I was asked to come in on a weekend to help out with something on another client … My
MPM, she had asked me to come in and she had stayed a little late the night before and
had emailed me all the details. One of the details was a link to CWS to get into a certain
document that I needed to work on. And, when I got in here on the weekend, I tried to go
to that link, and there was nothing there for me because I hadn’t been invited to the
project. So here I am on the weekend, by myself, with nobody around. They couldn’t
invite me. So my manager [MPM] had to actually come in just to get me into the project … This was not an issue last year.

In this case, the PA was not seeking advice but was trying to provide advice to a member
of another team and his response in his situation was to gain access to the project. Therefore, he
responded by continuing to use CWS. – Note though that he said this situation did not occur
again. That is, for the remainder of the AE project, he was not asked by a member of any other
team for advice on an AE document, and he did not seek advice from anyone outside his team on
any of his documents.

The comment attachment misalignment
Unlike other teams, the Client-J team seemed to regularly use the CWS email feature. This may have been because when the ACSM first used it (in the first weeks of the CWS pilot), she noticed its shortcomings compared to the old system’s email. One of these shortcomings was the email feature’s inability to allow a team member to attach a comment. In response to this shortcoming the ACSM determined that after updating a document, she could send a CWS-generated email to herself (which contained a link to the updated document in CWS). Then she could attach comments using the old system email and forward the CWS-generated email. When she determined that she could do this, she then mentioned this solution to her team members, who adopted the solution.

The personal identification misalignment

The ACSM was the only team member who seemed to notice that the CWS email feature did not identify who had sent an email. Perhaps she was the only one to notice, however, because she may have provided a solution to her team members before they had a chance to notice. The response was the same response as listed above for the comment attachment misalignment. Namely, by sending a CWS-generated email to herself and then forward that email to others, a team member could resolve the misalignment.

The two-way communication misalignment

When the Client-J CM tried to use the CWS email feature, she noticed that it did not facilitate non-document related two-way communication. Because it was important to her to be able to receive feedback from her client, she chose to abandon using the CWS email feature altogether and she reverted to using the old system email. By contrast, when the ACSM noticed
the misalignment, she also abandoned use of the CWS email feature for two-way communication, but she did not abandon using the feature altogether. Instead, she continued to use it for sending links to documents stored in CWS. Over time, as other team members adopted different individual solutions to the misalignment, the team’s overall email usage patterns among team members became inconsistent. To address this inconsistency, the ACSM proposed the following solution. (a) When a communication does not relate to a document stored in CWS, the old system email should be used. (b) When a communication relates to a document stored in CWS and the sender wants the recipient to have the ability to respond, the sender should send a CWS-generated email to herself (i.e., to her old system email account). Then she should forward the CWS-generated email to the intended recipient. (c) When a communication relates to a document stored in CWS and the sender does not want the recipient to have the ability to respond, the sender should use the CWS email feature. In response to this suggestion, the team adopted the solution.

**Summary of the Client-J team’s misalignment stories**

*Story line sequences*. The Client-J team’s misalignment story lines (see Figure 7.10) show social learning occurred in six of the ten stories. Moreover, in three of the misalignment stories that related to communication-related misalignments, a social reconciliation followed an individual reconciliation. In these cases, the ACSM reconciled a misalignment. Then she convinced others to reconcile the misalignment in the same way. – This pattern is not captured in the provisional model or in any of the preceding team stories.

*Recurring themes*. The dominant recurring theme across the Client-J misalignment stories was the ACSM’s ability to influence the team’s learning through her CWS advocacy and
expertise. Beyond simply advocating that her team members use CWS, the ACSM also advocated the client to use the tool. She also acted as a CWS help desk for her members and client, and she provided solutions for how the team might reconcile misalignments. Her advocacy and expertise may have influenced other team members’ CWS usage and the misalignments they recognized.

The Client-K Team Story

At the beginning of the CWS pilot, the Client-K CSM had been working for BenefitsCo for one month, and the ACSM position was vacant. Because she was not familiar with the AE project, when she began to use CWS, the CSM asked the Implementation Team H&W representative how she might begin. The H&W representative sat with her and showed her who to request access for fellow team members, how to create a new project, how to invite people to join a project, how to give users project rights, how to obtain the AE project template, and she recommended some reference documents and AE document shells that could be loaded to CWS. Following her advice then, the CSM performed the administrative tasks associated with starting a project in CWS. In doing so, however, because she was unfamiliar with the pre-existing environment within BenefitsCo and the team, she did not notice any misalignments.

In mid-August, an ACSM joined the team and a week later, the CSM quit BenefitsCo. This left the new ACSM in charge of CWS for the project after only being on the team for a week. Fortunately, before she quit, the CSM had requested CWS access for the ACSM and had given her project rights. Unfortunately, however, the CSM gave her only manager rights instead of administrator rights. This meant that the ACSM could not invite anyone to the project. The CSM should have given her administrator rights. Because of the difficulty she was having with
CWS, the ACSM asked the Implementation Team H&W representative how highly she should prioritize learning and using CWS. The H&W representative told her that it should not be a priority for her at all. She should instead focus on familiarizing herself with the client and the client’s AE changes, and “do what needs to be done to finish AE.” As a result, the ACSM did not ever begin to use CWS. The Implementation Team did, however, grant her administrator rights in mid-September, about the same time that a new CSM joined the project. When the new CSM arrived to the project, she asked the ACSM for a list of priorities for herself. The ACSM repeated the H&W representative’s advice to not prioritize CWS. Therefore, the CSM did not even obtain CWS access during the remainder of the CWS pilot.

In terms of other team members, the PM stated that she did not use CWS because she viewed it as a Client Services tool and the Client Services team was not even using it. Conversely, the CM was the only team member who said that she had wanted to use CWS with the client. Early in the pilot, the CM requested CWS access for one of the client representatives with whom she worked. Shortly after the client representative obtained access, however, she went on maternity leave and was replaced by someone who did not have CWS access. Because she was starting to get busy and did not have time to setup and train the new client representative on how to use CWS, the CM said that she reverted to using the old system for her collaboration with the client. Therefore, unfortunately the Client-K team members seemed to not have used CWS much and not have noticed any misalignments.

**Cross-team Analysis**

Collectively the CWS pilot teams engaged in learning about 54 misalignments (counting the internal and external aspects of the document sharing misalignment separately). The
sequences of each team’s misalignment sequences, the misalignment story lines, are shown in Figures 7.1 – 7.10. To determine how many different learning sequences the teams used, I compared the 54 misalignment story lines. Before comparing the story lines, however, I first considered what I was attempting to discover – i.e., prototypical learning sequences that the team used. That is, I was attempting to discover the patterns of misalignment recognition, evaluation, reconciliation, and reflection that teams typically used. Therefore, because I was interested only in the sequence of misalignment recognition, evaluation, reconciliation, and reflection, I stripped away references to when team members used CWS – i.e., I modified the 54 story lines by removing the “usage” references. Also, to generalize between individual learning and social learning, I collapsed the organizational, team, and sub-group learning levels into one level which I referred to as social learning – i.e., I modified the 54 story lines by collapsing the learning levels into just two levels, individual learning and social learning. Then I looked across the misalignment stories for common patterns. In doing so, I found that the CWS pilot teams used six prototypical learning sequences. One of these learning sequences included only individual learning and five included social learning. See Figure 7.11 for depictions of the prototypical learning sequences, and see Table. 7.1 for the prototypical learning sequence frequencies.

**Prototypical team learning sequences**

**Individual learning.** In this learning sequence, team members recognize, evaluate, and reconcile a misalignment by themselves, but they do discuss the misalignment with others. This sequence was the most common sequence. It account for 28 of the learning sequences.

**Evaluate before acting.** In this learning sequence, team members recognize and evaluate a misalignment by themselves, but they wait to act on the misalignment until they have spoken
with others about it. Of the seven prototypical learning sequences, this is the learning sequence that is most similar to the learning sequence contained in the provisional model. In this project, this sequence was used five times, by four different teams.

**Vicarious recognition.** In this learning sequence, team members recognize, evaluate, and reconcile a misalignment by themselves. Then another team member who has not recognized the misalignment learns about it by interacting with another team member. This sequence occurred only once, when the Client-C CSM learned about the check work status misalignment from his ACSM.

**Act before evaluating.** In this learning sequence, team members recognize, evaluate, and reconcile a misalignment by themselves, and then they later discuss the misalignment but do not develop a new reconciliation. This occurs often when the team members’ individual evaluations of the misalignment agree with each other. In this case, they may have reconciled the misalignment similarly, based on their similar evaluations, and therefore no further reconciliation is needed. This sequence was used three times, by three different teams.

**Reevaluation creates new reconciliation.** In this learning sequence, team members recognize, evaluate, and reconcile a misalignment by themselves, and then they later discuss the misalignment and develop a new reconciliation. This occurs often when the team members’ individual evaluations of the misalignment do not agree with each other. This sequence was used eight times, by six different teams.

**Reflection.** In this learning sequence, team members recognize, evaluate, and reconcile a misalignment by themselves, and then they later discuss the misalignment and reflect-on their misalignment experiences. As a result of their reflection, they develop a decision rule that leads to a new reconciliation. This sequence occurred was used nine times, by six different teams.
Note that this learning sequence that included misalignment reflection shows the misalignment reflection occurred after evaluation, but before reconciliation. This sequence is different from the sequence depicted in the provisional model.

Recurring themes that were not captured in the provisional model

I discovered five themes in the teams’ misalignment stories that did not conform to the provisional model but that seemed to influence teams’ misalignment-based learning. They are team member isolation, a team members’ view of CWS, team members’ CWS advocacy, vicarious recognition, and inter-team conflict.

**Team member isolation.** In some stories, it appeared that a team member was isolated from the rest of her team. This was especially the case with CMs. In these stories, when the isolated team members learned about a misalignment, they did not share their experiences with their fellow team members. This meant that more individual learning occurred in those teams where a team member was isolate. Therefore, it may be that team member isolation influences the level of learning a team experiences (i.e., individual vs. social learning).

**A team member’s view of CWS.** In many misalignment stories, team members indicated that they either had expectations for CWS or they viewed CWS in a particular way that influenced how they used the technology. Because a team member’s usage affects the type of misalignments she notices (e.g., a PA who views CWS as a tool for finalized documents may not recognize the document modification misalignment), her view of the technology may influence the type of misalignments she recognizes. Note that team members often mentioned that they viewed CWS in terms of being a: (a) Client Services, Project Management, or Communications
tool, (b) tool for finalized or work-in-progress documents, and (c) tool for internal or external collaboration.

Team members’ CWS advocacy. In some teams, it seemed that there was a team member (or client) who advocated others to use CWS. Moreover, although this advocacy appeared to often be general (e.g., the Client-A PM seemed to sometimes advocate team members to simply use CWS), the advocacy could also be more specific (e.g., the Client-J ACSM’s advocacy of the CWS email feature). In both cases, it may be that CWS advocacy influenced the amount of team members’ CWS usage; and in the latter case, it may be that specific types of advocacy may influence specific types of usage. Team members’ general and specific CWS usage might then have influenced the number and type of misalignments that team members recognized.

Vicarious recognition. In some stories, it seemed that team members learned about a misalignment from a fellow team member, without directly experiencing the misalignment themselves. That is, they learned about a misalignment through someone else’s experience. This suggests that in addition to occurring at the individual-level, misalignment recognition may also occur socially. Moreover, this suggests that a team member would not have to first use a technology to be able to recognize a misalignment.

Inter-team conflict. In one story, conflict between a PM and her Client Services team, coupled with the PM’s view of CWS as a Client Services tool, seemed to influence her willingness to use the technology and encourage others to also use it. This suggests that inter-team conflict, coupled with a view of the technology that is affected by the conflict, may influence a team member’s technology usage. This technology usage could then, in turn, influence the number of misalignments that a team recognizes.
Lastly, in considering the team member isolation and CWS advocacy recurring themes, I realized these themes may be linked to the level of engagement of certain team members (i.e., team members in certain positions) in the team’s learning. For example, the isolates in this study tended to be CMs, and they seemed to engage in individual learning more than other team members. Therefore, on a team in which the CM was engaged in misalignment-based learning, it may be that the team tended to engage in more individual learning sequences than those teams in which the CM was not engaged in learning. Additionally, a team member’s position may have made it easier (or more likely) for her to become a CWS advocate. Because advocates are more effective at convincing others to follow their suggestions (e.g., use a new technology) when they possess a position of authority (French & Raven, 1959), it seems that the team members who possessed more authority (i.e., CMs and PMs) would be more likely to become CWS advocates if they were engaged in their team’s learning. Therefore, on a team in which the CM or PM was engaged in learning, it may be that team’s level of CWS usage may have been higher. This line of reasoning about a team member’s position and his or her level of engagement in learning then suggests that that a team member’s being classified as an isolate or advocate may correspond often to his or her position.
TABLE 7.1

Frequencies of prototypical team learning sequences

<table>
<thead>
<tr>
<th>Prototypical Team Learning Sequence</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
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<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td>5</td>
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<tr>
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<td></td>
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FIGURE 7.1
The Client-A team’s misalignment story lines

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<th>Misalignment</th>
<th>Level</th>
<th>Story Line</th>
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<td>Document Access</td>
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<td>Team</td>
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<td>Subgroup</td>
<td>Evaluation → Reconciliation</td>
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<td></td>
<td>Individual</td>
<td>Usage → Recognition → Evaluation → Reconciliation</td>
</tr>
<tr>
<td>Document Modification</td>
<td>Organization</td>
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</tr>
<tr>
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<td>Team</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subgroup</td>
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<td></td>
<td>Individual</td>
<td>Usage → Recognition → Evaluation → Reconciliation</td>
</tr>
<tr>
<td>Document Sharing (internal aspect)</td>
<td>Organization</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subgroup</td>
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<td>Individual</td>
<td>Usage → Recognition → Evaluation → Reconciliation</td>
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<td>Document Sharing (external aspect)</td>
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</tr>
<tr>
<td></td>
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<td>Usage → Recognition → Evaluation → Reconciliation</td>
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</table>

Reconciliation process for individual users: Usage → Evaluation → Reconciliation → Usage
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The Client-D team’s misalignment story lines

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The Client-H team’s misalignment story lines

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The Client-I team’s misalignment story lines

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FIGURE 7.10

The Client-J team’s misalignment story lines

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Prototypical team learning sequences

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<td>Reevaluation Creates New Reconciliation</td>
<td>Social</td>
<td>Evaluation → Reconciliation</td>
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<td>Reflection</td>
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<td>Evaluation → Reflection → Reconciliation</td>
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Chapter 8

MODEL REVISION

Thus far this study has focused on developing and testing a provisional learning model of information technology implementation. As seen in chapter five, based on data collected using the model, the hypotheses derived from the provisional model received only partial support. (One of four hypotheses was supported.) In the process of collecting data for the provisional model, however, I discovered that some of the assumptions that I had made about how teams would learn and what behavior was required for a team to learn may have been incorrect; and I discovered that in addition to the types of learning that I had represented in the provisional model, team members engaged in other types of learning behaviors. Therefore, if I modify my assumptions and revise the provisional model to account for these new assumptions and other types of learning, I might create a model that better explains how teams learned during the CWS pilot.

While I was collecting data with which to test the provisional model, between June and December 2004, I came to question the provisional model’s assumptions based on comments made to me by team members during interviews. During interviews, team members often made comments that extrapolated on answers to questions I had asked them or to explain their behavior and thoughts. Using the coding scheme developed from the provisional model, however, many of these comments were omitted in the analysis presented in chapter five because they did not directly pertain to concepts contained in the provisional model – i.e., misalignment recognition, evaluation, reconciliation, and reflection. But, in an attempt to improve on the provisional model, I returned to the interview transcripts and reviewed comments that team
members made that extrapolated on their answers. Based on these comments, I developed a list of five potentially invalid assumptions that I began to question. I had implicitly made these assumptions in developing the provisional model and the team members’ comments made me question their validity. They included:

a. the assumption that more learning events means more learning
b. the assumption that a team’s misalignment-based learning affects its technology usage, rather than a team’s technology usage affecting its misalignment-based learning
c. the assumption that the pre-existing user environment is identical for each team member
d. the assumption that multiple members of a team have to learn about misalignments for the team’s technology usage to be affected
e. the assumption that team members possess equal amounts of influence during team learning

In addition to this list of potentially invalid assumptions, I also developed a list of three learning behaviors that team members mentioned that I had not accounted-for in the provisional model. These included:

a. how teams use different criteria in evaluating misalignments
b. how team members learn about misalignments without directly experiencing them
c. how team members develop general technology perceptions

**Potentially Invalid Assumptions**

More learning events means more learning.

In analyzing the provisional model, I created a count of the number of misalignments learned-about, and for each misalignment, I counted the number of learning behaviors in which
teams engaged (i.e., misalignment recognition, evaluation, reconciliation, and reflection). My general conjecture implicit in the provisional model was that the more misalignments a team recognized, evaluated, reconciled, and reflected-on, the more learning it would experience. That is, I implied that teams that engage in more learning events will learn more. I did not distinguish, however, between the breadth, depth, and scope of teams’ misalignment-based learning.

The breadth of a team’s misalignment-based learning can be thought-of as the number of misalignments that a team learns-about. (This is what I used to analyze the provisional model.) Because each team must first recognize a misalignment before it can engage in deep learning related to the misalignment, the number of misalignments that at least one team member recognizes serves as an indicator of the breadth of a team’s learning. – See table 6.1 for the number of misalignments that teams recognized that corresponds to teams’ learning breadths.

The depth of a team’s misalignment-based learning can be thought-of as the level of learning sophistication that a team develops related to a misalignment. The amount of time and energy that a team’s members spend learning about a misalignment is an indicator of the depth of the team’s learning. The scope of a team’s misalignment-based learning can my thought-of as the extent to which all members of the team are involved in learning about misalignments. The proportion of a team’s members who actively engage in learning about misalignments is an indicator or the scope of a team’s learning. After noting this distinction between learning breadth, depth, and scope, I realized that although I purported to measure the amount of learning that a team experienced, I only measured the breadth of a team’s learning. Therefore, I wondered if the depth and scope of the CWS pilot teams’ learning was related to their CWS usage. Note that in hypothesis 1 I had already tested whether the breadth of a team’s learning (as indicated by
the number of misalignments that at least one team member recognized) related to its CWS usage and found that it did.

To begin to measure the depth of teams’ misalignment-based learning, I arbitrarily assigned values of 1, 2, 3, and 4 to misalignment recognition, evaluation, reconciliation, and reflection, respectively, to represent increasingly deeper levels of learning. I assigned the values in this order to represent increasing degrees of learning depth. Then I noted the misalignments that each team recognized, evaluated, reconciled, and/or reflected-on (see table 6.1) and I assigned a learning depth value to the teams’ misalignment specific learning experiences (e.g., I assigned a learning depth value of 4 to the Client-A team’s document access learning because the team recognized, evaluated, reconciled, and reflected-on the misalignment). Finally I created a mean of each team’s learning depth. See Table 8.1 for the learning depth values for each team-misalignment combination and for the mean team learning depths.

To test whether teams’ depth of learning was related to CWS usage, I correlated teams’ mean learning depth with their CWS usage using a Kendall tau statistic because the magnitude of the mean learning depth variable’s skewness and kurtosis were both greater than .3. (Skewness = -1.58 and Kurtosis = 3.14.) The correlation between teams’ mean learning depth with their CWS usage was not significant (τ=-.278, p=.240). Therefore, the depth of a team’s misalignment-based learning did not appear to relate to the team’s CWS usage.

To measure the scope of teams’ misalignment-based learning, for each misalignment-team combination, I created a count of the number of team members who recognized a
misalignment. See table 8.2 for a list of the counts. Because I interviewed more members of some teams than others, I expected the number of misalignment recognitions per team would be higher for the teams that had more members represented in the sample. Therefore, I divided the number of misalignment recognitions within a team by the number of team members I interviewed to obtain a mean number of misalignments recognized per team member. This mean number would allow me to compare the number of misalignment recognitions made by team members across teams.

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Insert Table 8.2 about here

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To test whether teams’ scope of learning was related to CWS usage, I correlated the mean number of misalignments recognized per team member with their CWS usage using a Kendall tau statistic because the magnitude of the mean number of misalignments recognized variable’s skewness and kurtosis were both greater than .3. (Skewness = -.75 and Kurtosis = 1.12.) The correlation between the mean number of misalignments recognized with CWS usage was significant ($\tau=-.500$, $p=.034$). Therefore, in addition to the breadth of learning, the scope of a team’s misalignment-based learning (i.e., the extent to which all members of the team were involved in learning about misalignments) also appeared to relate to the team’s CWS usage for the eleven CWS pilot teams.

A team’s misalignment-based learning affects its technology usage

The provisional model implicitly assumes that a team’s misalignment-based learning affects its subsequent technology usage. Although I recognized this limitation early in the paper,
due to an inability to collect reliable, longitudinal data that showed when team members experienced misalignment recognitions, evaluations, reconciliations, and reflections, and when their CWS usage changed, I was not able to test a causal model. Nevertheless, implicit in the provisional model is the assumption that a team’s misalignment-based learning affects its technology usage. From my interviews, however, I learned that teams’ CWS usage also affected the teams’ misalignment-based learning. That is, although it may have been true that the more team members learned about misalignments, the more they used CWS, it was probably also true that the more teams used CWS, the more they learned about misalignments (i.e., causality went in both directions). Therefore, based on the interviews, I suspect that a reciprocal relationship exists between learning and technology usage. Nevertheless, this realization makes me wonder if, although there is not one-way causality between learning and technology usage, in certain circumstances (e.g., a technology pilot implementation), does a dominant causal direction exist? Again, to test this question would require the ability to collect reliable, longitudinal data that showed when team members experienced misalignment recognitions, evaluations, reconciliations, and reflections, and when their CWS usage changed. If I had been able to collect such data in this study, however, a confound in attempting to determine the dominant direction of causality in this study would have been that team members could choose not to use CWS after learning about a misalignment. That is, in this study, team members could revert to using the old system regardless of how much they learned. Therefore, in this study, determining the dominant causality between learning and technology usage would have been difficult.

The pre-existing user environment is identical for each team member
In developing the provisional model, I implicitly assumed that the pre-existing user environment was a static concept that was identical for each team member at the beginning of a technology implementation. Although previous technology implementation research (Desanctis & Poole, 1994; Leonard-Barton, 1988; Majchrzak, et al., 2000) has not addressed this question, neither has it indicated that individuals’ user environments differ. From my interviews with CWS pilot team members I discovered that team members had experience with different technologies in their pasts. These different experiences, which may have shaped their expectations for CWS, might therefore be different. In developing the provisional model, because I assumed the user environment to be identical for all team members, this assumption could affect the misalignments that I coded. – If I took into account that users could have different user environments, perhaps I would have coded more misalignments.

To check whether the number of misalignments would have changed if my assumption changed, I reviewed each interview transcript and found two statements in which team members described a difference between their expectations for CWS based on their unique experience and CWS’s actual features. In both statements, however, the team members described an expectation that CWS would have a discussion capture feature; and this expectation was based partly on their familiarity with a technology that they viewed as similar to CWS and which they had used with another client. – The two team members were the Client-A CSM and the Client –D CM, and they both had experience with the same technology, with the same client on a previous AE project. In describing that she expected CWS to have a discussion capture feature, the Client-A ACSM stated, “One of the ideas of CWS, I thought, was that we could use it to capture all of our decisions. … But it is not quite as robust as I thought it would be. My expectation that CWS would have this functionality may have resulted from my having used a similar tool with another
client.” Describing the same misalignment, the Client-D CM stated, “Two years ago, I used MSN which allowed you to keep track of email histories. … I expected CWS would also allow you to do this too.”

Because this “similar tool” was not a technology with which the Client-A CSM and the Client-D CM’s team members were familiar, I had not considered it to be part of the user environment that was common to every member of the Client-A and Client-D teams. So I had not coded a misalignment recognition event based on these statements. The CSM and CM, however, also stated that their expectations were also based on their familiarity with the discussion capture feature that existed in the old system (i.e., the discussion thread feature of the email program that was being used by every member of the Client-A and Client-D teams); and I did code discussion capture misalignment recognitions for these incidents. Therefore, the number of misalignments and the pattern of misalignments recognized did not change as a result of my new assumption that team members can have different user environments. Nevertheless future technology implementation research should recognize that users can have different user environments.

Multiple team members must learn about misalignments for a team’s technology usage to be affected

I conceptualized the provisional model as a sequential process model in that each phase of the learning process (except the misalignment recognition phase) depended upon the successful completion of the previous phase. Moreover, after the misalignment recognition phase, each of the subsequent learning phases was conceptualized as a social learning process. This means that for misalignment evaluation to have occurred, at least two members of a team
had to recognize a misalignment and develop a consensual evaluation of it. The evaluation process therefore required that teammates share their knowledge of the misalignment with each other. In several instances of a team’s learning about a misalignment, however, team members reported that although they had recognized a misalignment, they did not share their knowledge of the misalignment with their fellow teammates. Therefore, according to the provisional learning model, no team evaluation, reconciliation, or reflection around that misalignment took place.

Note that because I was focused on team learning in developing the provisional model, I purposely did not consider the relationship between individual learning and team technology usage when developing the provisional model, except in the case of misalignment recognition. It is entirely likely, however, that an individual user can account for the majority of learning and team technology usage by himself; and this may especially be so when the user is a member of a team with few members.

To test whether individual learning alone was related to team technology usage, I counted the number of times that a team member evaluated, reconciled, or reflected on a misalignment by herself. Note that because misalignment recognition was already conceptualized as an individual-level concept, I did not need to test recognition. – See table 8.3 for a summary of the misalignments evaluated, reconciled, and reflected-on by individual team members.

Insert Table 8.3 about here

Then I re-tested hypotheses 2 and 3 and compared the new results to the original results. I did not re-test hypothesis 4 because an individual never reflected on a misalignment by herself. Reflection only took place when at least two team members evaluated, and reconciled a
misalignment. This may have occurred because the development of a lesson-learned is probably more likely to result from a social process than from individual learning. Nevertheless, because no individual reflection occurred, there was no variation in the number of misalignments reflected-on. Therefore, I did not include the number of misalignments-reflected-on in the tests of individual learning. – See table 8.4 for descriptive statistics and correlations of the individual learning study variables.

I found that the numbers of misalignments evaluated and reconciled by individual team members was significantly related to CWS usage (τ=.761, p=.002 and τ=.749, p=.003, respectively). This means that individual learning accounted for the variance in some teams’ CWS usage. Because the skewness values for number of misalignments evaluated and reconciled were .905 and 1.207, respectively, however, I suspected that there may be outliers in the sample. A review of table 8.3 showed that the Client-D, Client-G, and Client-J teams had the greatest number of individual evaluations and reconciliations. When comparing the corresponding numbers on table 6.1 (the number of misalignments evaluated and reconciled by at least two team members), only the Client-D and Client-G teams had larger individual evaluation and reconciliation numbers. This suggests that the majority of the learning on the Client-D and Client-G teams may have been individual learning, and the findings that individual evaluations and reconciliations were significantly related to team learning levels may have been attributable largely to the Client-D and Client-G teams. To test this speculation, I removed the Client-D and Client-G teams from the sample and re-tested hypotheses 2 and 3 using the individual learning
data. The resulting correlations were not significant. Therefore, it seems that individuals can account for a substantial amount of learning in the technology usage. In this study, individuals on the Client-D and Client-G teams proved this. But the test also showed that on most teams, team learning and individual learning both occurred together.

To learn more about the individuals on the Client-D and Client-G teams who had evaluated and reconciled so many misalignments I reviewed the interview data and learned that in both cases all of the individual evaluations and reconciliations were performed by the teams’ CMs. This was not surprising. In interviews, the Client-D and Client-G CM both commented that they felt isolated from their fellow team members and that they did not have much influence within their teams. These comments, coupled with the pattern of individual learning in both teams suggest that there was little social interaction between these CMs and their fellow team members and therefore, the amount of social learning that occurred in the Client-D and Client-G teams was not as great as in the other teams.

Additionally to test whether a higher social learning threshold would better explain teams’ usage of the new technology, I reconceptualized team misalignment evaluation, reconciliation and reflection so that three team members were needed to evaluate, reconcile, or reflect-on a misalignment for these misalignment learning phases to have occurred. – See table 8.5 for descriptive statistics and correlations of the re-conceptualized study variables.

Insert Table 8.5 about here

Then I re-tested hypotheses 2-4 and compared the new results to the original results. – See table 8.6 for a descriptive statistics and correlations of the re-conceptualized study variables.
I found that like the single team member hypothesis tests above, when misalignment evaluation, reconciliation, and reflection required three team members, significant support was found for hypotheses 2 and 3, but not for hypothesis 4. For hypothesis 2, the Kendall tau correlation statistic was .541 (p = .031), suggesting that the hypothesis was supported. For hypothesis 3, the Kendall tau correlation statistic was also .541 (p = .031), suggesting that the hypothesis was supported; and for hypothesis 4, the Kendall tau correlation statistic was .367 (p = .150), suggesting that the hypothesis was not supported. This result was not surprising because when more team members learning via experience with the technology, this means that more team members are also using the technology. Therefore, I would expect that a team’s usage would increase. – Note that I did not test higher social learning thresholds (i.e., 4-5 team members) because for some teams, I interviewed only three team members.

The patterns of results presented here, when compared to the results of the provisional model hypotheses (that required at least two team members needed to evaluate, reconcile, or reflect-on a misalignment) show that individual learning explained the variance in technology usage for two teams (the Client-D and Client-G teams) and a higher social learning threshold explained the variance in technology usage better. This suggests that individual users can account for a majority of a team’s learning and technology usage by themselves, and when a larger percentage of the team becomes involved in learning, team usage may be higher.

*Team members possess equal levels of influence during team learning*
In speaking about the document access misalignment, the Client-J PM noted that his team’s ACSM had the greatest influence on his and other team members’ evaluations of the misalignment. This influence was due, he stated, to the fact that the ACSM had the greatest amount of expertise with CWS and that she encouraged others to use CWS to access documents in spite of the time and effort required to use it. The PM said, “We have started to come to understand better why we should use it [CWS] largely because of [the ACSM] … She is more experienced with the tool and has been pushing it more than anyone else.” This quote illustrates how a member of one team advocated other team members to use CWS document management features. This type of advocacy and the effect that it had on the ACSM’s team members is an indicator of the ACSM’s influence.

In this instance, the Client-J PM described how, in evaluating misalignments, he deferred to his ACSM who he perceived understood the CWS misalignments better than he and his other fellow team members. This deference allowed the ACSM to have a greater level of influence than other team members. The observation that team members who had greater CWS expertise had greater influence on other team members’ evaluations is consistent with the theoretical technology implementation research that suggests that individuals who are perceived as more expert about a technology often structure how others perceive a technology (Orlikowski, Yates, Okamura, and Fujimoto, 1995).

Note that a team member’s position power could also be used as an explanation for why a team member had more influence. – As described in chapter four, CSMs and PMs had greater position power than ACSMs and PAs in teams because the ACSMs and PAs reported to them. Therefore, CSMs and PMs, because of their position, may have also had greater levels of influence than other team members. The observation that team members who had greater
position power had greater influence on other team members’ misalignment evaluations is consistent with the theoretical power research that suggests that individuals with greater position power will have greater influence over those with less position power (French & Raven, 1959).

To determine if there were differing levels of influence regarding CWS within teams, I reviewed all the interview transcripts searching for quotes team members had made in which they stated that someone had encouraged or demanded that they use CWS. In these cases, I considered the person who had attempted to encourage or demand CWS usage to be a CWS advocate. Moreover, by advocating CWS, I expected that the advocate had either a position of power within the team from which to advocate CWS usage or a high level of expertise with CWS that derived from direct experience with the new technology. Therefore, I expected that CWS advocates would have greater influence regarding misalignment evaluations within their teams than other members.

From the advocacy quotes, I coded two variables, “who advocated CWS usage” and “what type of CWS usage was advocated.” Note that team members often stated that the BenefitsCo management and implementation team encouraged them to use CWS. Because management and implementation team were not central to the misalignment evaluation process, however, I did not include these statements. In terms of what type of CWS usage advocated, my review of advocacy quotes showed that advocates encouraged or demanded three types of CWS usage: general usage of CWS, document-related usage, and communication-related usage. See table 8.7 for a summary of the team members who were mentioned by others as CWS advocates and the type of CWS usage that they advocated.

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Insert Table 8.7 about here
The table shows that of the twelve team members who were identified as CWS advocates, five of them were PMs, three were CMs, three were ACSMs, one was a CSM, and none were PAs. Moreover, in three of the four cases in which a team member advocated CWS communication-related usage, the advocate was a CM. In only one of the ten cases in which a team member advocated CWS document-related usage, the advocate was a CM. When these findings are combined with the findings of which team members recognized which types of misalignments (see table 5.4), it is evident that the team members who were more likely to advocate others to use CWS in a particular manner (i.e., for document-related or communication-related purposes) also are the team members who more often recognized misalignments that were related to the type of usage they advocated (i.e., document-related or communication-related misalignments). That is, CM advocates tended to advocate others to use CWS for communication-related purposes and they also tended to recognize more communication-related misalignments. Conversely, client services and project management team members who advocated CWS usage tended to advocate others to use CWS for document-related purposes and they also tended to recognize more document-related misalignments. This finding supports the idea that team members may have held general views of how they characterized CWS based largely on their functional responsibilities. Their functional responsibilities may have conditioned them to pay attention to particular aspects of their user environment and particular features of the new technology; and team members’ misalignment-based learning and technology advocacy behavior may have been influenced by their functional responsibilities.

Overlooked Learning Behaviors
Team members use different criteria in evaluating misalignments

Although the interview protocol did not ask respondents how they determined the importance of a misalignment, in describing how they evaluated a misalignment most respondents offered explanations. (Respondents offered explanations in 96 of the 105 evaluation descriptions coded.) These included explanations based on concerns with customer satisfaction, effectiveness, efficiency, and privacy. To determine if any type of criteria were more prevalent in team evaluations, I reviewed all the statements that were coded as evaluations and looked for common types of criteria that were mentioned as important. I found four criteria that teams used in evaluating misalignments. These related to customer service, effectiveness, efficiency, and privacy. In terms of customer service, teams appeared to be concerned that a misalignment would negatively affect the service that the team provided to its client. In terms of effectiveness, teams were concerned that a misalignment would not allow team members to complete their work. In terms of efficiency, teams were concerned that a misalignment would not allow team members to complete work in a timely fashion; and in terms of privacy, teams were concerned that a misalignment would not allow team members to shield their communications and/or documents from others. Based on these categories, I then coded each of the 32 misalignment evaluations in terms of the criteria that were used to evaluate a misalignment. – See table 8.8 for a summary of the criteria teams used in evaluating misalignments.

Insert Table 8.8 about here

Table 8.8 shows that in no case did a team use more than one criterion to evaluate a misalignment. It also shows that for each evaluation of a common misalignment, the teams
evaluating the misalignment used the same criterion. For example, for the check work status
misalignment, all three teams that evaluated the misalignment evaluated the misalignments in
terms of their concern with team members’ privacy. (In the case of individual evaluations
however, there were cases in which individuals used different criteria to evaluate a
misalignment.) The pattern of criteria used by teams in evaluations also shows that all of the
communication-related misalignments were evaluated in terms of effectiveness. Note that the
evaluative criteria I developed from reviewing the team evaluations are consistent with the
important BenefitsCo business values that I listed when providing a background description of
the organization in chapter five. This suggests that the teams used organization-level values
when evaluating misalignments, and because the teams were all part of the same organization,
there was little variance in how their evaluation criteria. Therefore, although the insight provided
by analyzing the criteria that teams used in evaluating misalignments is interesting, because there
was no variance across teams in terms of the criteria they used to evaluate a common
misalignment, the criteria that teams used to evaluate misalignments did not explain the teams’
variance in CWS usage.

Team members can learn about misalignments without directly experiencing them

The provisional model assumed that individuals needed to use a new technology in order
to learn about it. That is, the model assumed that AE team members needed to directly
experience CWS in order to learn about the misalignments between the new technology and the
pre-existing user environment. In interviews, however, some team members stated that they
learned about misalignments without having experienced the misalignment directly. That is,
they vicariously recognized a misalignment from other team members. The Client-J CSM
provided an example of this when she commented on the check work status misalignment. She said, “I have not used it [the CWS check work status feature] … However I think that it is a great tool for checking-up on the client … [The Client-J ACSM] told me about it.”

This example shows that the Client-J CSM recognized the misalignment vicariously through conversation with the team’s ACSM and developed an evaluation of the misalignment, in spite of the fact that she never directly encountered the misalignment by using CWS. This idea that individuals can vicariously recognize a misalignment from others is consistent with learning research that suggests that organization members learn through their own experience and through others’ experiences (Miner & Mezias, 1996).

In terms of the provisional model, I think that the vicarious recognition that team members mentioned in their interviews provided a substitute means by which they recognized a misalignment. That is recognizing a misalignment via direct experience with CWS was one way by which a team member could become aware of a misalignment. Another way she could recognize a misalignment is vicariously from another team member. Therefore, there seemed to be two means by which a team member could come to recognize a misalignment. After the team member has recognized a misalignment, however, I assume that the misalignment evaluation, reconciliation, and reflection learning phases are identical, regardless of whether a team member came to recognize the misalignment vicariously or experientially.

In terms of vicarious recognition, note that for vicarious recognition of a misalignment to occur, at least two users must be involved (i.e., vicarious recognition is inherently a social process) and at least one user must have direct experience with the misalignment. In the case of the AE pilot teams, because there was little discussion of misalignments between teams, I expect that at least one team member would have had to have recognized a misalignment directly for
others to have vicariously recognized it. In an implementation setting in which more discussion occurs, it is possible that no members of a team could recognize a misalignment from direct experience. Instead all members of a team could become aware of the misalignment from users outside the team.

Combining this finding that team members vicariously recognized misalignments from teammates and the finding listed above that team members had different levels of influence in evaluating a misalignment (based partly on expertise with a misalignment), I would expect that the team members who vicariously recognize a misalignment would have less expertise with a misalignment than the team members who recognize the misalignment via direct experience, based on the assumption that expertise is more attributable to direct experience than vicarious experience. Therefore, I would expect a team member who vicariously recognized a misalignment to have less influence in evaluating the misalignment than a team member who recognized the misalignment through direct experience, controlling for the difference in position power between team members. Therefore, based on what I was told by team members about how they learned from others about misalignments, I think that the misalignment recognition phase conceptualized in the provisional model represents only one process by which individuals may recognize a misalignment. Namely, the misalignment recognition phase depicted in the provisional model is an experiential recognition process. Individuals may also learn about a misalignment via a vicarious recognition process as well.

In terms of the implications of team members’ vicarious recognition of misalignments on the team’s technology usage, it may be that for teams in which there is a large amount of vicarious recognition, there might also be a low level of technology usage. The reasoning for this is that if one team member is recognizing misalignments via direct experience with the
technology and then other team members are becoming aware of misalignments from her, then
the team would obviously have less usage of the technology than the team in which all members
were recognizing misalignments via direct experience.

Team members’ develop general technology perceptions

When I conceptualized the provisional model, I assumed that users’ experiences with
specific misalignments affected their usage of a new technology. In interviews, however, team
members often explained that their CWS usage was driven partly by what they perceived to be
the new technology’s primary purpose(s). These primary purposes tended to cluster around three
themes: CWS as a technology that was to be used for specific functional purposes (i.e., for Client
Services, Communications, and/or Project Management purposes), CWS as a technology that
facilitated collaboration between specific parties (i.e., between team members and/or between
team members and clients), and CWS as a technology that was used to be used with specific
types of documents (i.e., with finalized and/or work-in-progress documents) Moreover team
members seemed to possess a perception of CWS’s purpose(s) even before they used the
technology. This perception was based, team members told me, on the message that the CWS
implementation team had advertised when it promoted CWS. Although the message the
implementation team advertised was identical for all team members, team members seemed to
remember different messages and therefore their perceptions of CWS’s primary purpose(s)
differed. Note that the implementation team promoted CWS to the AE teams via a “roadshow”
that all AE team members who were going to participate in the CWS pilot were supposed to
attend. It was at this roadshow that team members said they first learned about CWS.
Nevertheless team members mentioned that their perception of CWS influenced if, why, and
how they used CWS; and this perception seemed to be based in what they believed to be the new technology’s primary purpose(s).

In illustrating how a team member’s perception could influence his CWS usage, the Client-J PA stated, “CWS is a Client Services tool … Because I do not get involved with too many Client Services documents, I do not use CWS very often.” In terms of how the Client-J PA developed the perception that “CWS is a Client Services tool”, he may have developed this perception based on his direct experience and learning with CWS, or he may be developed it based on what he learned from others. In either event, the perception that he held of CWS appeared to affect his CWS usage – i.e., he implied that a cause for his not using CWS very often was that he viewed CWS as a Client Services tool, and he was not a Client Services employee.

The perception of CWS that the Client-J PA and other team members mentioned seems similar to the concept of a “technology frame” (Orlikowski and Gash, 1994). A technology frame is an individual’s set of assumptions, expectations, and knowledge that s/he uses to understand a particular technology; and a team technology frame is a team’s set of assumptions, expectations, and knowledge that it uses to understand a particular technology.

In reviewing the Client-J PA’s interview and other interviews in which team members suggested that their CWS technology frame influenced their CWS usage, I began to wonder how a team member’s technology frame may have influenced her usage and if her technology frame affected the number and type of misalignments she recognized. I reasoned that, for example, if a team member viewed CWS as a Communications tool then she might recognize more communication-related misalignments than a fellow team member who did not view CWS as a Communications tool. Therefore, I speculate that a team member’s technology frame may relate to the type of misalignments she recognizes. – I test this speculation later in this chapter.
After considering the invalid assumptions and other learning behavior that I extrapolated from data collected to test the provisional model, I realized that my original conceptual model only captured teams’ experiential recognition about misalignments. Therefore, I revised the provisional model and developed a survey to test the revised model. – See figure 8.1 for a depiction of this model. Note that in revising the model I focused exclusively on the “front end” of the model. That is, I focused on modeling factors that influence the misalignment learning process.

Revised Model Survey

After the pilot was completed and I revised the model, I conducted a survey of AE team members regarding their experiential and vicarious recognition during the pilot. – See appendix B for a list of the survey questions.

Experiential recognition during the pilot

The provisional model implicitly assumed that to recognize a misalignment a team member had to directly experience CWS. Therefore, “experiential recognition” as a factor that influenced how a team member recognized a misalignment was implied in the model. Since identifying this assumption and realizing that there is an alternative means by which to recognize a misalignment (i.e., by vicarious recognition), I have explicitly added experiential recognition to the revised model. But because the provisional model already assumed that team members
recognize misalignments via direct experience, there is no need to explore it further. Instead, I focus on the relationship between vicarious recognition and misalignment recognition.

**Vicarious recognition during the pilot**

A team member, in learning vicariously about a new technology from a fellow team member, may learn about some of the misalignments that exist between the technology and the user environment. In this way, a team member can recognize misalignments without directly experiencing them. Unlike the experiential recognition based misalignment recognition process described in the provisional model (i.e., misalignment recognition that results from direct experience with a technology), vicarious recognition inherently is a social process because it involves at least two team members.

Part of the social process of vicarious recognition related to misalignments involves a team member sharing her knowledge of a misalignment (or misalignments) with a fellow team member who did not seek her advice. In doing so, she may serve as an advocate for or against the new technology, and her advocacy may affect her fellow team member’s usage of the technology. Additionally part of the social process of vicarious recognition related to misalignments involves a team member actively seeking to learn about a new technology from another team member. In doing so, he may learn about his fellow team member’s misalignment experiences, and this may affect his usage of the technology. Thus vicarious recognition can occur in both “push” and “pull” fashion. A team member can push her experience of a new technology on a fellow team member (for example, by encouraging use of the technology for a particular purpose) and a team member can pull knowledge of the new technology (for example, by soliciting a fellow team member’s opinion of the usefulness of the technology in performing a
particular task). Because misalignment-based vicarious recognition within a team involves a team member sharing his misalignment recognition experiences with another team member, this will allow the other team member to recognize misalignments. Moreover, the other team member’s recognition of misalignments will then increase the number of misalignment recognitions within the team and the number of members in the team who can evaluate, reconcile, and reflect-on a misalignment together. Therefore, I suspect that vicarious recognition will affect the depth and scope of a team’s learning.

In learning vicariously, team members share knowledge of misalignments with each other. This means that team members expend more time and energy learning about misalignments than if they did not engage in vicarious recognition. Moreover, expending time and energy on learning about misalignments, team members may develop stronger levels of commitment to the misalignment-based learning process. As an example, if a team member who experienced a problem with a new technology contacts three of her fellow team members to ask for assistance in resolving the problem, as a result of the time that she has invested in attempting to resolve her problem, she may become more committed to learning about the technology. Being more committed to the technology would mean that she would spend more time learning about the technology, which would increase the likelihood that she would recognize more misalignments. Moreover, because she is committed to learning about the technology, it likely that she would follow-through on the misalignment and engage in deeper learning related to the misalignment (i.e. evaluation, reconciliation, and reflection). Therefore, sharing knowledge of misalignments within a team may increase team members’ commitment to learning about a technology. This commitment, in turn, may increase the likelihood that team members would be willing to engage in deeper learning.
Note that although technology advocacy is part of the vicarious recognition social process, in the CWS pilot, team members appeared to be encouraged to use CWS from a variety of sources within and outside of their teams. These sources included the implementation team, BenefitsCo management (e.g., the VPSDs), and fellow team members. From team members’ interviews, however, I suspected that team members viewed that the motives behind the encouragement differed. For example, the Client-I PA stated that although his PM had encouraged him to use CWS, the PM had little experience using CWS, she was not specific in how he should use it, , and he believed that she may have been encouraging him to use CWS simply because she had been asked to promote the new technology. As such, although the PM had advocated for CWS, the PA did not believe that CWS usage was a priority for the PM, and therefore he believed that it was not a priority for him either. As result of this example, it seems that without knowing how team members perceived the CWS advocacy that occurred within their teams, it would be difficult to predict how it affected team’s CWS usage.

By contrast, when a team member actively seeks to learn from another team member by asking about his experience with a new technology, then I suspect that the team member’s primary motive is to learn about the technology. That is when team members seek advice about a new technology I suspect that they are genuinely attempting to learn about the technology.

In developing measures of vicarious recognition, I reasoned that during the CWS pilot, team members who wished others to learn about CWS would act as advocates for the new technology. In advocating others to use CWS, team members would share their experiences of the technology (including their experiences with misalignments). I also reasoned that team members who wished to learn about CWS from other team members would seek advice from
teammates regarding their opinions of and experience with CWS. Seeking and receiving advice from their teammates (i.e., advice-seeking) would allow them to vicariously learn about CWS.

Based on this reasoning, I developed two questions that asked team members about the levels of CWS advocacy and advice-seeking within their teams. CWS advocacy and advice-seeking were then used as indicators of the level of vicarious recognition that existed within a team. The survey questions were:

a. During AE, did one or more of your team members regularly encourage others to use CWS? (0=no, 1=yes)

b. During AE, did you seek advice from one of more of your team members regarding CWS? (0=no, 1=yes)

See table 8.9 for a summary of the CWS advocacy and advice-seeking responses.

Table 8.9 shows that 62 percent of respondents indicated that they did not seek advice from one of their teammates. Of the 38 percent who indicated that they did seek advice from one of their teammates, 44 percent sought advice from a CSM and 34 percent sought advice from a PM.

Technology frame

During technology implementations, team members pay attention to different features of the new technology depending on their experiences (Griffith, 1999; Susman, et al., 2003). Based on their experiences and their position, team members may possess different technology frames
relative to the new technology. To support this speculation, in chapter five, I found that team members’ positions related to the misalignments they recognized. In particular, CMs were more likely than other team members to recognize communication-related misalignments. This may have been because the nature of a CM’s work required a greater amount of communication with more individuals than the amount of communication inherent in a CSM’s or PA’s work. Because of her work experience, therefore, a CM’s position may have affected how she viewed CWS.

In terms of how a team collectively views a technology, this view depends on how the team’s individual members view the technology, and there were many possibilities. For example, one team member may view a new technology as a tool for collaborating with clients, as a tool for performing project management tasks, and as a tool for archiving finalized documents. By contrast, another team member might view the technology as a tool for collaborating with clients and as a tool for working with documents that are not yet in a finalized state. Collectively the members’ team frame team would view the technology, to varying degrees, as a tool collaborating with clients, as a tool for performing project management tasks, as a tool for archiving finalized documents, and as a tool for working with documents that are not yet in a finalized state (i.e., the team frame represents the union of the team members’ frames). As such, note that team members’ technology frames may be wider or narrower. In the example listed above, the team member who views the new technology as having three purposes (client collaboration, project management, finalized documents) can be considered to have a wider technology frame than the team member who views the new technology as having two purposes (client collaboration and work-in-progress document). Similarly, because teams’ technology frames are unions of their members’ frames, team technology frames may be wider or narrower.
I expect that the features of a new technology to which a team member pays attention may determine the types of misalignments that she recognizes. That is, I expect that if a team member primarily pays attention to a technology’s document management features, then she will be more likely to recognize document-related misalignments. Moreover, at the team-level, I expect that the greater the width of the technology frame, the greater will be the number of technology features that the team’s members will pay attention to; and the greater will be the team’s learning breadth (i.e., the number of misalignments that at least one team member recognizes). Also, if a team has a wide technology frame, it may be that team members may pay attention to multiple features of the new technology. Paying attention to multiple features may, in turn, increase the number of misalignments that team members recognize. Because teams must first recognize a misalignment before they can evaluate, reconcile, and/or reflect-on it, increasing the number of misalignments recognized would also increase the likelihood that a team would engage in deeper learning of some of the recognized misalignments. Therefore, I expect that the level of technology frame width within a team will relate positively to the team’s learning depth (depth per misalignment).

A team member’s technology frame encompasses the set of assumptions, expectations, and knowledge that he uses to understand a particular technology (Orlikowski & Gash, 1994). Because this definition is broad, rather than attempting to develop questions that exhaustively operationalize the concept, I focused on developing questions that would collectively serve as an indicator of a team member’s expectations of CWS. To do so, I reviewed team members’ interviews for statements that characterized their CWS technology frames. I found that AE team members generally characterized their technology frames in terms of:
a. the technology’s primary functional uses – i.e., Communications, Client Services, and/or Project Management

b. when it would be most appropriate to use – i.e., CWS as a tool for work-in-progress documents and/or finalized documents

c. what type of collaboration the technology should facilitate – i.e., collaboration with clients and/or with other BenefitsCo employees

Based on these characterizations, I developed the following questions that asked team members about their CWS technology frames.

Indicate the degree to which you agree or disagree with the following statements:

a. I viewed CWS as a Communications tool. (1-5)

b. I viewed CWS as a Client Services tool. (1-5)

c. I viewed CWS as a Project Management tool. (1-5)

d. I viewed CWS as a tool for work-in-progress documents. (1-5)

e. I viewed CWS as a tool for finalized documents. (1-5)

f. I viewed CWS as a tool for collaborating with client representatives. (1-5)

g. I viewed CWS as a tool for collaborating with other BenefitsCo employees. (1-5)

See table 8.10 for a summary of the technology frame responses.

Survey sample

The survey response rate was 37 percent. Twenty-two of 59 possible respondents completed the survey. See table 8.11 for descriptive statistics of the survey respondents
Table 8.11 shows that for four teams only one team member completed a survey, and for no team did more than four team members complete a survey. That means that team response rates ranged from 16% to 80%. Also, of the eleven CMs who participated in the CWS pilot, only two completed surveys – a CM response rate of 18%. The greatest response rate, by contrast, was from project managers. Six of the eleven PMs who participated in the CWS pilot completed surveys – a PM response rate of 55%. Similarly ACSMs were over-represented in the sample. The ACSM response rate was 50%. – In the population of all team members, ACSMs account for 23 percent of all employees. CSRs account for 19 percent. CMs account for 19 percent. PAs account for 20 percent, and PMs account for 19 percent. Unfortunately the variance in team and position response rates suggests that the 22 team members who completed the survey are not representative of the total population of team members who participated in the CWS pilot. Therefore, the responses to the survey questions should be considered in light of this response bias.

Vicarious recognition speculations

In examining the relationship between vicarious recognition and misalignment-based learning, I intended to use the CWS advocacy and advice-seeking data that I collected from the survey. Upon reviewing the CWS advocacy data, however, I discovered there was little variance in the data (20 of the 22 respondents answered “yes” to the CWS advocacy question). Because this lack of variance would undermine my ability to find relationships between vicarious
recognition and misalignment-based learning, I decided to discard the CWS advocacy data and
test the vicarious recognition speculations using advice-seeking as the sole indicator of vicarious
recognition. Therefore, I created a team level measure of advice-seeking by averaging the
advice-seeking scores across all respondents within a team.

Advice-seeking – learning scope. Because advice-seeking within a team is assumed to
increase the likelihood that more team members will recognize more misalignments as they share
their experiences with each other, I reasoned that the greater the amount of advice-seeking that
occurred within a team, the greater would be the scope of a team’s misalignment-based learning.
Therefore, I speculated that a team’s vicarious recognition score would relate positively to the
number of misalignment recognitions within a team.

Because of the small sample size used to test this relationship (eleven teams), I decided to
divide the advice-seeking and learning scope data in half at the median. Doing so would allow
me to use a Chi-square test that would focus only on whether a team’s advice-seeking and
learning scope scores were above or below the median. Because the advice-seeking and learning
scope data were interval data and because the data distributions of the advice-seeking and
learning scope data were not normal, I used a Wilcoxon Signed Ranks test to determine the
goodness-of-fit (Siegel, 1956). The Wilcoxon test is a nonparametric Chi-square test that
compares the distributions of two variables to determine their independence. The SPSS version
of the Wilcoxon test used in this study required that I enter teams’ advice-seeking and learning
scope scores (SPSS, 1999). Then the test divided the advice-seeking and learning scope data at
the median and assigned ranks of 1 and 0 to the data above and below the median, respectively.
Data at the median were randomly assigned a rank of 0 or 1. The test then used these ranks to
test the relationship between the variables.
I expected that teams in which advice-seeking occurred more often (i.e., teams with an advice-seeking rank of 1) would have a greater scope of learning (i.e., a learning scope rank of 1). And, I expected that teams in which advice-seeking occurred less often (i.e., teams with an advice-seeking rank of 0) would have a lower scope of learning (i.e., a learning scope rank of 0). The test found the predicted relationship in ten teams. The value of the z statistic and the two-tailed asymptotic significance statistic were -2.851 and .004, respectively.

The z statistic that results from the Wilcoxon test is a standardized measure of the distance between the group of negative-ranked cases (in this case, the one team for which the predicted relationship was not found) and their predicted values. The asymptotic significance statistic is an estimate of the probability of obtaining a z statistic that is equal to or greater in absolute value as the z statistic result if there truly is no difference between the group ranks. A generally acceptable cutoff level for the asymptotic significance statistic is \( \alpha = 0.05 \) (Slud & Wei, 1982). – Because the asymptotic significance statistic equaled .004, the speculation that a team’s advice seeking score would relate positively to the team’s learning scope was supported.

Advice-seeking – learning depth. During the CWS pilot, team members had the option of using CWS or using the old system. Therefore, when a team member sought to learn about CWS, he did so voluntarily and not because he was required to do so. Moreover, when one team member asked another for advice regarding CWS, this action was a sign that the team member had taken an interest in learning about CWS and had developed a level of commitment to learning about the new technology that was sufficient to cause him to ask for advice. As mentioned above, a team member’s level of commitment, as evidenced by his advice-seeking behavior, may have increased the likelihood that he would recognize more misalignments and the likelihood that he would follow-through on the misalignments he recognized and engage in
deeper learning (i.e. evaluation, reconciliation, and reflection). Based on this reasoning, I speculated that on teams in which more advice-seeking behavior occurred, more misalignment evaluation, reconciliation, and reflection would also have occurred. That is, I expected that a team’s advice-seeking score would relate positively to the team’s learning depth score.

Similar to the test described above that involved the advice-seeking measure, I used the Wilcoxon Signed Ranks test to evaluate the relationship between advice-seeking and learning depth. I expected that teams in which advice-seeking occurred more often (i.e., teams with an advice-seeking rank of 1) would have greater learning depth levels (i.e., learning depth ranks of 1). And, I expected that teams in which advice-seeking occurred less often (i.e., teams with an advice-seeking rank of 0) would have lower levels of learning depth (i.e., learning depth ranks of 0). That is, I expected that the advice-seeking and learning depth ranks would be equal.

The test found the predicted relationship in ten teams. The value of the z statistic and the two-tailed asymptotic significance statistic were -2.848 and .004, respectively. – Because the asymptotic significance statistic equaled .004, the speculation that a team’s advice seeking score would relate positively to the team’s learning depth was supported.

**Advice-seeking – CWS usage.** Because advice-seeking within a team increases the likelihood that team members will learn from each other about misalignments, and because the main conjecture of this study is that a team’s misalignment-based learning will relate positively to the team’s technology usage, I reasoned that the greater the amount of advice-seeking that occurred within a team, the greater would be the team’s technology usage. Therefore, I speculated that a team’s vicarious recognition score would relate positively to the team’s CWS usage.
Similar to the two tests described above that involve the advice-seeking measure, I used the Wilcoxon Signed Ranks test to evaluate the relationship between advice-seeking and CWS usage. The test found the predicted relationship in all eleven teams. The value of the z statistic and the two-tailed asymptotic significance statistic were -2.934 and .003, respectively. – Because the asymptotic significance statistic equaled .003, the speculation that a team’s advice seeking score would relate positively to the team’s CWS usage was supported.

Technology frame speculations

To create a measure of the degree to which team members viewed CWS as appropriate for multiple purposes, I began by reviewing team members’ responses to the seven technology frame questions. See table 8.10 for a summary of team members’ responses aggregated at the team level. In reviewing table 8.10, I observed that team members generally viewed CWS as a Communications, Client Services, Project Management, finalized document, and external collaboration tool. The only answers which appeared to suggest that variance existed within the sample related to the views of CWS as a work-in-progress and internal collaboration tool. This difference became even more evident when I collapsed the Likert scale into two categories.

Because the categories represented positions along the agree/disagree continuum, I collapsed the “strongly agree” and “agree” categories into a single category (agree) and I collapsed the “strongly disagree”, “disagree”, and “neutral” categories into one category (disagree). To learn if there was variance within teams, I then reviewed team members’ individual responses and replicated for team members the category-collapsing that I had

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9 In reviewing individual team members’ responses to the survey for the work-in-progress and internal collaboration frame questions, I found that the variance in team members’ responses was divided along team lines. That is, there was little variance between the responses of members of the same team. The variance existed between teams. The teams that viewed CWS as a work-process tool were the Client-F, Client-G, Client-H, and Client-J teams; and the teams that viewed CWS as an internal collaboration tool were the Client-D, Client-G, Client-H, and Client-J teams.
performed at the team level. To create a measure of the degree to which team members viewed CWS as appropriate for multiple purposes, for each team member, I counted the number of technology questions to which the member answered “agree” or “strongly agree.” For example, one of the Client-A team members answered five of the questions with “agree” one question with “neutral,” and one question with “disagree.” Therefore I entered a count of five for this team member. This score can be thought of as the width of a team member’s technology frame. After calculating the width of the team member’s technology frame, I then replicated this procedure for every member of the Client-A team. To obtain an average measure of the width of team members’ technology frames, I calculated the mean of technology frame width across all the members of a team who completed surveys. See table 7.12 for a summary of the teams’ technology frame width scores.

Note that in four teams only one team member completed a survey. Because I was not sure whether these team members were representative of the other members of their teams, I did not know whether I should use the survey answers from these team members to calculate a team frame width measure. To determine whether to include the responses of these team members, I reviewed the technology frame data of the teams in which more than one team member completed a survey to learn how much variance existed between team members’ frames. By reviewing the answers that members of the Client-A, Client-B, Client-C, Client-E, Client-I, Client-J, and Client-K teams provided to the technology frame questions, I learned that there was little difference overall in the answers to a particular question. This suggests that a contagion
effect may have existed within teams that resulted in team members having similar CWS technology frames. Because of this similarity between team members’ frames, I concluded that in the cases where only one member of a team had completed a survey, that team member’s technology frame was probably representative of the technology frames of her fellow team members.

Technology frame width – learning breadth. On teams in which team members viewed CWS as having multiple purposes, I expected that team members would pay attention to multiple CWS features. Paying attention to multiple features would, in turn, increase the number of misalignments that at least one team member recognized. Therefore, I speculated that the width of a team’s technology frame would relate positively to the team’s learning breadth. For a list of the teams’ technology frame width and learning breadth scores, see table 8.12.

Similar to the two tests described above that involve the advice-seeking measure, I used the Wilcoxon Signed Ranks test to evaluate the relationship between technology frame width and learning breadth. The test found the predicted relationship in four teams. The value of the z statistic and the two-tailed asymptotic significance statistic were -.460 and .645, respectively. – Because the asymptotic significance statistic equaled .645, the speculation that a team’s technology frame width would relate positively to the team’s learning breadth was not supported. Perhaps this speculation was not supported because the sample size was too small to achieve statistical significance or because there was not sufficient variance in the frame width data.

Technology frame width - learning depth. On teams in which team members viewed that CWS had multiple purposes, I expected that team members would pay attention to multiple CWS features. Paying attention to multiple CWS features would, in turn, increase the number of misalignments that the team recognized. Because teams must first recognize a misalignment
before they can evaluate, reconcile, and/or reflect-on it, increasing the number of misalignments recognized would increase the likelihood that a team would engage in deeper misalignment-based learning, i.e., more misalignments on which deeper learning could happen. Therefore, I speculated that the width of a team’s technology frame would relate positively to the team’s learning breadth.

Similar to the other tests described above, I used the Wilcoxon Signed Ranks test to evaluate the relationship between technology frame width and learning depth. The test found the predicted relationship in eight teams. The value of the z statistic and the two-tailed asymptotic significance statistic were -1.960 and .050, respectively. – Because the asymptotic significance statistic equaled .050, the speculation that a team’s technology frame width would relate positively to the team’s learning depth was supported.
### TABLE 8.1

The Depth of Teams’ Misalignment-Based Learning

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<th>Client-C</th>
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<th>Client-E</th>
<th>Client-F</th>
<th>Client-G</th>
<th>Client-H</th>
<th>Client-I</th>
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<td>0</td>
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</tr>
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<td>K</td>
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</table>
**TABLE 8.3**

The Number of Misalignments Evaluated, Reconciled, and Reflected-on by Individual Team Members

<table>
<thead>
<tr>
<th></th>
<th>Number of misalignments evaluated</th>
<th>Number of misalignments reconciled</th>
<th>Number of misalignments reflected-on</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0</td>
</tr>
<tr>
<td>3Client-B</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Client-C</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Client-D</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Client-E</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Client-F</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Client-G</td>
<td>5</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Client-H</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Client-I</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Client-J</td>
<td>4</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Client-K</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
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<td>1.55</td>
<td>1.36</td>
<td>0</td>
</tr>
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<td>Mean</td>
<td>Std Dev</td>
<td>Skewness</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------</td>
<td>---------</td>
<td>----------</td>
</tr>
<tr>
<td>1. Number of misalignments evaluated</td>
<td>1.55</td>
<td>1.916</td>
<td>.905</td>
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<td>2. Number of misalignments reconciled</td>
<td>1.36</td>
<td>1.804</td>
<td>1.207</td>
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<tr>
<td>3. CWS Usage</td>
<td>161.55</td>
<td>138.737</td>
<td>.700</td>
</tr>
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</table>

Note: all correlations statistics and Kendall tau statistics
** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
TABLE 8.5

The Number of Misalignments Recognized, Evaluated, Reconciled, and Reflected-on when Three Members were Needed to Evaluate, Reconcile, and Reflect

<table>
<thead>
<tr>
<th>Misalignment</th>
<th>Number of misalignments evaluated</th>
<th>Number of misalignments reconciled</th>
<th>Number of misalignments reflected-on</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client-A</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Client-B</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Client-C</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Client-D</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Client-E</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Client-F</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Client-G</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Client-H</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Client-I</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Client-J</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Client-K</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>1.82</td>
<td>1.82</td>
<td>0.91</td>
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</table>
TABLE 8.6

Study Variables Univariate Descriptive Statistics and Correlations when Three Team Members were Needed to Evaluate, Reconcile, and Reflect

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number of misalignments evaluated</td>
<td>1.82</td>
<td>1.47</td>
<td>1.30</td>
<td>1.25</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
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<tr>
<td>23. Number of misalignments reconciled</td>
<td>1.82</td>
<td>1.47</td>
<td>1.30</td>
<td>1.25</td>
<td>1.00*</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>3. Number of misalignments reflected-on</td>
<td>0.91</td>
<td>.944</td>
<td>1.081</td>
<td>1.206</td>
<td>.815*</td>
<td>.815*</td>
<td>1.00</td>
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<tr>
<td>4. CWS Usage</td>
<td>161.55</td>
<td>138.737</td>
<td>.700</td>
<td>-.984</td>
<td>.541*</td>
<td>.541*</td>
<td>.367</td>
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</tbody>
</table>

Note: all correlations statistics and Kendall tau statistics
** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
TABLE 8.7

CWS Advocates and the Types of CWS Usage they Advocated

<table>
<thead>
<tr>
<th>Team</th>
<th>ACSM</th>
<th>CSM</th>
<th>CM</th>
<th>PA</th>
<th>PM</th>
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</thead>
<tbody>
<tr>
<td>Client-A</td>
<td></td>
<td>2,3</td>
<td>1,2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client-B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Client-C</td>
<td></td>
<td>1,2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client-D</td>
<td>1,2</td>
<td>3</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Client-E</td>
<td>1,2</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Client-F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client-G</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client-H</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Client-I</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client-J</td>
<td>1,2,3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client-K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

1 = team member advocated general CWS usage
2 = team member advocated CWS document-related usage
3 = team member advocated CWS communication-related usage
### TABLE 8.8
The Criteria Used in Evaluating Misalignments

<table>
<thead>
<tr>
<th>Misalignment</th>
<th>Client-A</th>
<th>Client-B</th>
<th>Client-C</th>
<th>Client-D</th>
<th>Client-E</th>
<th>Client-F</th>
<th>Client-G</th>
<th>Client-H</th>
<th>Client-I</th>
<th>Client-J</th>
<th>Client-K</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document-related misalignments</strong></td>
<td></td>
<td></td>
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<td>F</td>
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<td>P</td>
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<td>Two-way communication</td>
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<td></td>
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</table>

C = customer satisfaction  
E = effectiveness  
F = efficiency  
P = privacy
TABLE 8.9

Advice-seeking and Technology Frame Variables

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<tr>
<th></th>
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<td>2.33</td>
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<td>2.67</td>
<td>2.67</td>
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<td>4</td>
<td>3.5</td>
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<td>2</td>
<td>4</td>
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<td>4</td>
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<td>4</td>
<td>4</td>
<td>4</td>
</tr>
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<td>3.75</td>
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</table>

All scores are means
* n = the number of team members who completed the survey
TABLE 8.10

Team Members’ Answers to the Technology Frame Questions: Frequencies and Descriptive Statistics

<table>
<thead>
<tr>
<th>I viewed CWS as a …</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>… Communications tool</td>
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<td>.740</td>
<td>1</td>
<td>0</td>
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<td>10</td>
<td>1</td>
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<tr>
<td>… Client Services tool</td>
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<td>.730</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>… Project Management tool</td>
<td>3.09</td>
<td>.865</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>… tool for work-in-progress documents</td>
<td>2.95</td>
<td>1.091</td>
<td>1</td>
<td>8</td>
<td>6</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>… tool for finalized documents</td>
<td>3.82</td>
<td>.680</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>… tool for collaborating with client representatives</td>
<td>3.45</td>
<td>.856</td>
<td>0</td>
<td>4</td>
<td>5</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
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<td>2.64</td>
<td>.910</td>
<td>1</td>
<td>6</td>
<td>8</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

For the descriptive statistics, 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree
### TABLE 8.11

Descriptive Statistics of the Survey Respondents

... by team

<table>
<thead>
<tr>
<th>Team</th>
<th># of members who completed survey / Total # of members</th>
<th>Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client-A</td>
<td>3/6</td>
<td>50%</td>
</tr>
<tr>
<td>Client-B</td>
<td>2/5</td>
<td>40%</td>
</tr>
<tr>
<td>Client-C</td>
<td>2/5</td>
<td>40%</td>
</tr>
<tr>
<td>Client-D</td>
<td>1/6</td>
<td>17%</td>
</tr>
<tr>
<td>Client-E</td>
<td>3/7</td>
<td>43%</td>
</tr>
<tr>
<td>Client-F</td>
<td>1/5</td>
<td>20%</td>
</tr>
<tr>
<td>Client-G</td>
<td>1/5</td>
<td>20%</td>
</tr>
<tr>
<td>Client-H</td>
<td>1/5</td>
<td>20%</td>
</tr>
<tr>
<td>Client-I</td>
<td>2/5</td>
<td>40%</td>
</tr>
<tr>
<td>Client-J</td>
<td>4/5</td>
<td>80%</td>
</tr>
<tr>
<td>Client-K</td>
<td>2/5</td>
<td>40%</td>
</tr>
<tr>
<td>All</td>
<td>22/59</td>
<td>37%</td>
</tr>
</tbody>
</table>

... by position

<table>
<thead>
<tr>
<th>Position</th>
<th># of members who completed survey / Total # of members</th>
<th>Response Rate</th>
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</thead>
<tbody>
<tr>
<td>ACSM</td>
<td>7/14</td>
<td>50%</td>
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<tr>
<td>CSM</td>
<td>3/11</td>
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<tr>
<td>CM</td>
<td>2/11</td>
<td>18%</td>
</tr>
<tr>
<td>PA</td>
<td>4/12</td>
<td>33%</td>
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<tr>
<td>PM</td>
<td>6/11</td>
<td>55%</td>
</tr>
<tr>
<td>All</td>
<td>22/59</td>
<td>37%</td>
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## TABLE 8.12

Technology Frame, Learning, and CWS Usage Values

<table>
<thead>
<tr>
<th>Client</th>
<th>Technology frame diversity</th>
<th>Learning breadth</th>
<th>Learning depth</th>
<th>CWS usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client-A</td>
<td>4.333</td>
<td>8</td>
<td>2.88</td>
<td>270</td>
</tr>
<tr>
<td>Client-B</td>
<td>1.667</td>
<td>3</td>
<td>3.67</td>
<td>119</td>
</tr>
<tr>
<td>Client-C</td>
<td>3</td>
<td>4</td>
<td>3.25</td>
<td>27</td>
</tr>
<tr>
<td>Client-D</td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>273</td>
</tr>
<tr>
<td>Client-E</td>
<td>4</td>
<td>3</td>
<td>2.67</td>
<td>127</td>
</tr>
<tr>
<td>Client-F</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Client-G</td>
<td>7</td>
<td>7</td>
<td>1.57</td>
<td>344</td>
</tr>
<tr>
<td>Client-H</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>82</td>
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<td>Client-I</td>
<td>2</td>
<td>3</td>
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<td>77</td>
</tr>
<tr>
<td>Client-J</td>
<td>5.75</td>
<td>9</td>
<td>2.33</td>
<td>411</td>
</tr>
<tr>
<td>Client-K</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>17</td>
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</tbody>
</table>
FIGURE 8.1

Revised Learning Model of Information Technology Implementation

Initial Technology Frame

Experiential recognition

Vicarious recognition

Team Learning of a Technology around a Misalignment

Misalignment Recognition
- breadth
- scope

Misalignment Evaluation

Misalignment Reconciliation

Misalignment Reflection

Technology Usage
Chapter 9

DISCUSSION

This study focused on the implementation of an information technology in eleven user teams. Mutual adaptation theory states that when a new information technology is implemented in a team, misalignments between the technology and the user environment may exist; and these misalignments may serve as deterrents to team members’ usage of the technology. To overcome these misalignments, team members engage in a process of recognizing and reconciling the misalignments. Mutual adaptation theory has not indicated, however, how this process works. This study attempted to address this deficiency by developing and testing a learning model of information technology implementation that focuses on team members’ misalignment-based learning. The study’s main research questions were (a) how do team members learn during information technology implementations and (b) does a team’s learning relate to its technology usage? The study’s results showed that in learning about misalignments, team members tended to engage in a sequence of misalignment recognition, evaluation, reconciliation, and reflection processes. The results also showed that a team’s learning breadth (the number of misalignments a team recognized) was related significantly to the team’s level of technology usage.

In addition to the study results, four issues arose in the course of the study that relate to the research questions but that were not directly addressed by them. Two of these issues related to team members’ individual and social learning and two related to team members’ experiential and vicarious recognition.

Team Members’ Individual and Social Learning
Individual learning occurs when a team member recognizes, evaluates, and reconciles a misalignment by himself. Social learning occurs when team members evaluate and reconcile a misalignment together. Of the 54 misalignment learning instances, teams engaged in individual learning 28 times (52%) and social learning 26 times (48%). These findings, however, do not address (a) how the type of misalignment recognition affects whether a team learns individually or socially, (b) whether individual and social learning yield different results.

How does the type of misalignment recognition affect whether a team learns individually or socially?

In the case of experiential recognition (i.e., when a team member recognizes a misalignment through direct experience with a technology), after recognizing a misalignment, a team member may or may not choose to discuss the misalignment with her fellow team members. If she chooses to not discuss it, she will engage in individual learning (i.e., when a team member recognizes, evaluates, and reconciles a misalignment by herself). If she chooses to discuss it, the team will then engage in social learning (i.e., when team members evaluate and reconcile a misalignment together). Therefore, experiential recognition can lead to individual or social learning.

In the case of vicarious recognition (i.e., when a team member recognizes a misalignment as a result of a team member telling her about it), after recognizing a misalignment, a team member also may or may not choose to discuss the misalignment with her fellow team members. I speculate, however, that when a team member recognizes a misalignment through discussion with another team member, she will likely continue to discuss the misalignment with her fellow team member and develop a social evaluation and reconciliation. This may occur because when a
team member recognizes a misalignment by herself (i.e., experientially), she may question whether it is worthwhile to discuss the misalignment with her fellow team members. When she recognizes a misalignment vicariously, however, the question of whether the misalignment is worthwhile to discuss has been implicitly answered by the team member who discussed the misalignment with her. Moreover, when a team member recognizes a misalignment as a result of a team member telling her about it, she may feel a obligation to reciprocate and engage in social evaluation and reconciliation of the misalignment with the team member who first discussed the misalignment with her.

Do individual and social learning yield different results?

In the 28 misalignment instances in which individual learning occurred, technology usage followed reconciliation fifteen times (54%). Note that this means that a reconciliation that indicated that CWS should be subsequently used occurred in fifteen instances. In the other thirteen instances, the team members individually reconciled the misalignment by rejecting CWS, thereby indicating the CWS should not subsequently be used. In the 26 misalignment incidents in which social learning occurred, technology usage followed reconciliation 21 times (81%). This means that team members collectively reconciled via rejection (i.e., no subsequent CWS usage) five times. This pattern of reconciliations suggests that individual learning may be more likely to lead to reconciliation via rejection (i.e., no subsequent technology usage), and social learning may be more likely to lead to a reconciliation that includes technology usage (i.e., confirmed technology usage). This may be because in the cases of individual learning, the individual team members involved may have evaluated the misalignments as less important, and in the cases of social learning, the team members may be evaluated the misalignments as more
important. When a team member evaluated a misalignment as unimportant, she may have decided that discussing the misalignment with her fellow team members was not worthwhile, and reconciling the misalignment by accepting (or partially accepting) CWS may not have been worthwhile.

Conversely, when a team member evaluated a misalignment as important, she may have decided that discussing the misalignment with her fellow team members was worthwhile; and in discussing the misalignment, the likelihood that the team would reconcile the misalignment by adopting CWS may have increased. This likelihood may have increased because in discussing the misalignment among themselves, team members publicly exposed their experiences and evaluations of the misalignment, as well as their view of the technology. And, to the degree that they did not wish to appear anti-CWS (and violate the pro-CWS norm that existed in teams), they may have been more inclined to reconcile the misalignment by adopting the technology.

In addition to the evaluated importance of the misalignment, whether the team members who recognized a misalignment evaluated it as a problem or as an opportunity may have also affected whether they discussed the misalignment with others (i.e., social learning) or whether they did not (i.e., individual learning). If a team member evaluated a misalignment as an opportunity, he may have been more likely to reconcile the misalignment by adopting CWS because doing so allowed him to improve on the old system (e.g., CWS’s unobtrusive check others’ work feature). Moreover, to the degree that the team member found value in adopting the technology, he may have been more inclined to discuss the misalignment with others and advocate for adoption of the technology.

**Experiential versus Vicarious Recognition**
I realized late in the project, after I had begun to collect misalignment learning data, that team members could recognize misalignments in different ways – i.e., experientially and vicariously. Because of this late realization, I did not collect data on how team members recognized specific misalignments. When I revised the provisional model, however, I hypothesized that the way in which a team’s members recognized misalignments (i.e., experientially or vicariously) would relate to the team’s misalignment breadth and scope. I did not, however, address when is experiential recognition more likely than vicarious recognition to occur, and what are the consequences of experiential and vicarious recognition.

When is experiential recognition more likely than vicarious recognition to occur?

Experiential recognition may be more likely than vicarious recognition to occur in three cases. First, experiential recognition may be more likely to occur in those teams in which team members do not perceive that one team member has a greater degree of expertise with the technology than other team members. Experiential recognition may be more likely to occur in this case because team members do not perceive that there is a fellow team member who has greater expertise than they do regarding the technology. Therefore, they do not believe that they can learn from their fellow team members about the technology; and, if they wish to learn about the technology, they believe that they have to do so themselves – i.e., via direct experience with the technology. Second, experiential recognition may be more likely to occur when there is an isolate who is engaged in misalignment-based learning. In this case, I assume that the nature of being isolated means that the isolate does not communicate often with fellow team members. In the case of an isolate who is engaged in misalignment-based learning, the only way by which the isolate can learn about the technology is via direct experience with it, since she does not often
communicate with other team members, and therefore does not have the opportunity to learn from them. Lastly, experiential recognition may be more likely to occur when team members are pushed or forced to use the technology. When team members are pushed or forced to use the technology, they may use the technology more than if they were not pushed. Because of this greater level of usage, they would spend more time directly experiencing the technology and therefore would have more opportunity to directly experience misalignments than if they were using the technology less.

Conversely, vicarious recognition may be more likely than experiential recognition to occur in three cases. First, vicarious recognition may be more likely to occur in those teams in which team members perceive that a team member has a greater degree of expertise with the technology than other team members. Vicarious recognition may be more likely to occur in this case because team members perceive that there is a fellow team member who has greater expertise than they do regarding the technology. – i.e., someone from whom they can learn about the technology. Second, vicarious recognition may be more likely to occur when there is an information-sharing norm among all team members. In this case, the team members who directly experience a new technology may be more likely to share their experiences with other team members, including their misalignments experiences. The team members who have not experienced a particular misalignment would then recognize the misalignment vicariously. Lastly, vicarious recognition may be more likely to occur when team members are not pushed or forced to use the technology. When team members are not pushed or forced to use the technology, they may use the technology less than if they were pushed. Because of this lower level of usage, they would spend less time directly experiencing the technology and therefore would have less opportunity to directly experience misalignments than if they were using the
technology more. In this case, if they wanted to learn about the technology, they might be more likely to recognize a misalignment vicariously through someone who had more experience with the technology.

What are the consequences of experiential and vicarious recognition?

In the case of vicarious recognition learning, the team member who is the first person on his team to recognize a misalignment and who then discusses the misalignment with others may be perceived by his fellow team members as having greater expertise about misalignments than those who recognize the misalignment vicariously through him. This team member will recognize the misalignment experientially (because there is no team member from whom he can learn about it). Moreover, his experiential recognition may result from his spending more time using the new technology than other team members who recognize the misalignment vicariously though him. This greater amount of time may lead to unique insight on the team member’s part – i.e., misalignment recognitions, evaluations, and reconciliations that are unique on the team. These unique recognitions, evaluations, and reconciliations may then lead the other team members to attribute a high level of technology-related expertise to the team member.

Team members who recognize a misalignment experientially and who then discuss the misalignment with others may have greater influence in the development of social evaluations, reconciliations, and reflections than those of recognize the misalignment vicariously. The amount of expertise a team member possesses in an area influences his ability to influence others concerning issues related to that area. In other words, a team member’s expertise contributes to the level of influence he has. Therefore, I expect that the team member who has experientially recognized a misalignment will have a greater level of influence in issues relating to the
misalignment – i.e., the development of social evaluations, reconciliations, and reflections – than the team member who has learned vicariously.

Limitations

This study suffered from two theoretical limitations. First, although a sequential learning – technology usage relationship was suggested in the provisional model, it later became clear that some usage usually precedes learning. I did not, however, determine when learning preceded usage and when usage preceded learning. Second, although a team’s technology frame was shown to influence a team’s learning, it may also be a consequence of a team’s learning. I did not, however, determine whether the team technology frames mentioned were a consequence of teams’ learning, or vice-versa.

In terms of methodological limitations, this study suffered from limitations related to the research setting, study design, data collection, and data analysis techniques used. In terms of the study’s research setting, the study’s generalizability is limited because only eleven teams were studied, and they were each implementing the same technology, in the same organization. Therefore, the organization and technology’s idiosyncratic characteristics may have had influenced the team’s learning and technology usage. Also, during the CWS implementation, the Implementation Team refused to modify the technology. In information technology implementations in which the technology is modifiable, how misalignments are reconciled may differ; and therefore the nature of team members’ misalignment-based learning may differ. Moreover, during the CWS implementation, team members were not forced to adopt CWS. That is, they could reconcile a misalignment by continuing to use the old system. In information technology implementations in which team members are forced to abandon their old systems,
this reconciliation option would not exist; and therefore the nature of team members’
misalignment-based learning may differ. Lastly, in terms of research setting limitations, during
the study, the adoption of the technology relied partly on a client’s willingness to use it. This
willingness may have influenced a team’s learning and usage, but it was not controlled-for.

In terms of study design limitations, the cross-sectional nature of the study’s design did
not allow me to reliably test causal or sequential relationships between the learning processes
and technology usage. Also, the cross-sectional study design did not allow me to reliably capture
whether the members of a team learned about a misalignment individually or socially. In chapter
six, I assumed that if team members possessed the same evaluations and reconciliations of a
misalignment, they must have developed them socially. However, it is possible that team
members may have developed the similar evaluations and reconciliations individually, while
interacting with each other. On the other hand, in chapter seven, I did not assume that if team
members possessed the same evaluations and reconciliations of a misalignment that these were
developed socially. I only classified the learning as social if team members mentioned that they
interacted with others in developing an evaluation and reconciliation. It is possible, however, that
team members may have developed an evaluation and reconciliation socially, and not mentioned
this in their interviews. Therefore, it seems that the amount of social versus individual learning
that is depicted in chapter five is probably overstated, and the amount depicted in chapter six is
probably understated. This problem might have been avoided if data regarding the social
influences on a team members’ learning had been more systematically collected. Note, however,
that one of the questions in the interview protocol asked team members whether they had
discussed the misalignments they noticed with others. Lastly in terms of study design limitations,
although the study took place over six months, the low number of misalignment reflections
suggests that the time period may not have been long enough or that the team members did not reflect much.

In terms of data collection limitations, during the first part of the study I was able to interview only 40 of the 59 team members. Some of the team members that I did not interview may not have been well represented by their fellow team members whom I did interview. Also, during the second part of the study, I distributed the survey after the CWS project had ended. Because the survey questions asked team members to remember their past thoughts and actions, the responses are liable to suffer from respondents inability to remember accurately. Lastly in terms of data collection limitations, on the survey, the vicarious recognition concept was represented by only two yes-no questions. For one of these questions, however, there was insufficient variance in team members’ responses to warrant its use in testing. Therefore, the vicarious recognition concept was represent by a single item measured using a binary scale.

In terms of data analysis limitations, I performed all of the coding of informants’ interview by myself, with no inter-rater reliability check or inquiry audit. Although coding informant interview transcripts is inherently a subjective process, conducting an inquiry audit would have improved the dependability of my coding. Also, the small sample sizes used in the quantitative analyses limited my ability to find significant results.

Implications

This study holds implications for learning research and information technology research. First, in terms of learning research, in this team-level study, individual learning always occurred before social learning –i.e., when social learning occurred, misalignments were always recognized first by at least one team member, then social learning (including vicarious
recognition in some cases) followed. This may mean that all team-level learning is dependent on individual level learning occurring first. Also, in this study misalignment recognition always occurred first, followed by evaluation, and reconciliation. This may mean that studies that apply a learning model to other types of team or organizational change (e.g., learning after a corporate merger) may find a similar sequence of learning processes. Lastly, in terms of implications for learning research, in this study, misalignment reflection only occurred only when social learning occurred. This may mean that reflection is generally more likely to occur socially rather than individually.

In terms of implications for information technology implementation research, in this study I found that misalignment-based learning affected a team’s technology usage (i.e., adoption rate). Therefore, future researchers who attempt to predict a team’s technology adoption rate should consider the amount of misalignment-based learning the team has engaged-in; in particular the number of misalignments team members have recognized and evaluated. Also, it should be noted that I identified two types of technology usage in this study (provisional technology usage and confirmed technology usage) and I proposed that these different types of usage related differently to team members’ misalignment-based learning. Specifically I proposed that provisional technology usage is an antecedent to learning and confirmed technology usage is a consequence of learning. This distinction between different types of technology usage should be noted by future information technology researchers.

In addition to these theoretical implications, the results of this study have implications for managers as well. One of the study’s results was that advice-seeking related positively to team members’ technology usage (and, barring methodological limitations, technology advocacy may have related positively to usage as well). Therefore, managers who wish to increase team
members’ usage of a new technology should encourage team members to seek advice from each other and should encourage at least one member per team to advocate others to use the technology. Another of the study’s results showed that advice-seeking related positively to the breadth and scope of a team’s learning. Therefore, managers who wish to increase a team’s learning should encourage team members to seek advice from each other. I also found that the presence of a technology expert on a team may increase the breadth and scope of a team’s learning. Therefore, managers who wish to increase a team’s learning should attempt to develop at least one team member’s expertise in the technology. In terms of team members’ initial technology frames, I found that the initial frames influenced the scope of a team’s learning, and these initial frames were influenced by how managers “sold” the technology before it was implemented. Therefore, managers who wish to increase a team’s learning should attempt to depict the new technology as a tool that is appropriate for a broad set of uses. Lastly, I proposed that there are two different types of technology usage during an information technology implementation: provisional technology usage and confirmed technology usage. If a manager’s goal is to increase the amount of provisional technology usage, it should follow the suggestions that have been listed so far. If a manager’s goal is to increase confirmed technology usage, it should encourage social learning among team members, as compared to individual learning.

Future Research

My recommendations for future researchers include recommendations for how to collect misalignment-based learning data and recommendations for future relationships to study. First, in terms of how to collect misalignment-based learning data, I recommend that researchers utilize longitudinal study designs that capture the timing of team members’ technology usage,
and learning processes (i.e., misalignment recognitions, evaluations, reconciliations, and reflections). To conduct such a study, I recommend that researchers seek to first identify misalignments and then ask team members to chronologically describe their experiences with the misalignments. To identify misalignments, a researcher should first ask team members what problems or opportunities they have noticed relative to the new technology. Then the researcher should ask them to describe what bothers them about the technology and what they like. Lastly, the researcher should ask if there are any pre-existing tasks that they cannot perform using the new technology and if there are any tasks that they perform differently as a result of the new technology. In asking team members to chronologically describe their experiences with the misalignments, the researcher should prompt team members with the following questions. When did you first notice the problem/opportunity? How did you recognize the problem/opportunity (e.g., via technology usage, by speaking with someone else)? How important was this problem/opportunity to you? Why? Has your view of the problem/opportunity ever changed? How? With whom have you discussed the problem/opportunity? What did you discuss? What did you do about the problem/opportunity (i.e., what did you do to overcome the problem, what did you do about the opportunity)? How did you determine what to do about the problem/opportunity? Did you discuss what you should do about the problem/opportunity with anyone? What did you discuss? Did you develop any lessons relating to your experience with the problem/opportunity? What are they? – Given the nature of these questions, I believe that this type of study would best be conducted using interviews.

In terms of recommendations for future relationships to study, an obvious future research study would be a confirmatory study of the second revised model presented in this paper. In performing a confirmatory study of this model, researchers should separate provisional
technology usage and confirmed technology usage and attempt to determine the effects of provisional technology usage on misalignment recognition and the effects of misalignment learning on confirmed technology usage. Also, although only a team member’s (and team’s) initial technology frame is discussed in this study, future research should explore the relationship between misalignment learning and technology frame change. It may be that causality between a team member’s technology frame and misalignment-based learning runs in both directions. Lastly, future research should determine how team members’ position and technology expertise influence the misalignment evaluation, reconciliation, and reflection processes. In the latter part of this study, I focused on factors that influence the misalignment recognition process. But because misalignment recognition is only part of misalignment-based learning, studies that focus on understanding the factors that influence misalignment evaluation, reconciliation, and reflection processes would represent important extensions to the research begun in this study.
REFERENCES


Appendix A

INTERVIEW PROTOCOL

1. How long have you been working for the company?
2. How long have you been in your current position?
3. How long have you been a member of your team?
4. Have you worked with technology similar to the new technology before this project?
5. Regarding the new technology, what have you found that has not performed in any way that you thought that it should?
6. Have you found that the new technology allows you to perform the tasks that you needed to accomplish?
7. Have you noticed any discrepancies between the way that the technology performed certain tasks and the way that you had previously been performing those tasks?
8. Have you had to change how you communicate with other project members as a result of the new technology?
9. Have you made any changes in how you communicate with people outside of the project, concerning the project as a result of the new technology?
10. Have there been any changes with regards to who has authority to make project-related decisions as a result of the new technology?
11. Of the problems and discrepancies you have identified, have you discussed any of them with others?
12. After discussing the issues with others, did the way that you perceived any of the issues change?
13. After discussing the issues with others, did you become aware of any new issues or problems?
14. Were there cases where your perceptions of an issue changed more than once as a result of talking with others?
15. Was any action taken to address the issues you identified?
16. Was any testing done to determine if the actions fixed the problems?
17. Do you think you have access to more or less information regarding the project than you did before the new technology was implemented?
18. In using the new technology, have you developed any hints, tips, guidelines, or rules-of-thumb for how to best use the tool?
19. Has the new technology helped you to understand the nature of your work (i.e., your tasks, your team, the company as a whole) differently, or has it clarified some misunderstanding you had?
Appendix B

SURVEY QUESTIONS

Section 1: YOU AND CWS
The following questions relate to your position during the 2005 Annual Enrollment project. In answering these questions, consider the AE project to have started with the project kickoff meeting and ended when the final carrier and accounts payable files were finalized (roughly April 2004 - January 2005). Please respond to the following questions by selecting the appropriate box(es).

On which client account(s) did you work during last year’s AE?
Client-A
Client-B
Client-C
Client-D
Client-E
Client-F
Client-G
Client-H
Client-I
Client-J
Client-K

What was your position during last year's AE?
Assistant Client Services Manager
Client Services Manager
Communications Manager
Project Analyst
Project Manager

When last year's AE started, how long had you been working in your position?
less than 6 months
6-12 months
1-2 years
over 2 years

Section 2: YOUR TEAM AND CWS
The following questions relate to your Annual Enrollment team during the 2005 AE project.
In answering these questions, consider your AE team to have consisted only of those BenefitsCo Health & Welfare employees who worked as a client services manager, assistant client services manager, communications manager, project analyst, or project manager on your client account. Please respond to the following questions by selecting the appropriate box(es).

During AE, did one or more of your team members regularly encourage others to use CWS?  
Yes  
No  
If Yes, what was/were their position(s)?  
Assistant Client Services Manager  
Client Services Manager  
Communications Manager  
Project Analyst  
Project Manager  

During AE, did one or more of your team members seem particularly knowledgeable about CWS?  
Yes  
No  
If Yes, what was/were their position(s)?  
Assistant Client Services Manager  
Client Services Manager  
Communications Manager  
Project Analyst  
Project Manager  

During AE, did you seek advice from one of more of your team members regarding CWS?  
Yes  
No  
If Yes, what was/were their position(s)?  
Assistant Client Services Manager  
Client Services Manager  
Communications Manager  
Project Analyst  
Project Manager  

Section 3: YOUR CWS USAGE.  
The following questions relate to your CWS usage during the 2005 Annual Enrollment project. Please answer these questions regarding your CWS usage for the period that corresponds to last year’s AE project (i.e., between the project kickoff meeting and when the final carrier and accounts payable files were finalized).  
Please respond to the following questions by selecting the appropriate box.
On average, how often did you use CWS last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

How often did you use CWS for working on Communications documents last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

How often did you use CWS for working on Client Services documents last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

How often did you use CWS for working on Project Management documents last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

How often did you use CWS to store work-in-progress documents (documents that were being modified and were not yet in their final forms) last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day
How often did you use CWS to store finalized documents (documents that were in their final form and required no further modification) last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

How often did you use CWS for obtaining client signoff last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

How often did you use CWS for obtaining team member signoff last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

How often did you use CWS for inviting someone to the AE project last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

How often did you use CWS for notifying others that a document had changed last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

How often did you create a new document that you stored immediately in CWS last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

How often did you view a new document in CWS last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

How often did you modify a document stored in CWS last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

How often did you use CWS to check who had accessed a document last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

How often did you use CWS to search for a document last year?
Never
Once a month
2-3 times a month
Once a week
2-3 times a week
Once a day
More than once a day

Section 4: YOUR VIEW OF CWS
The following statements relate to your view of CWS during the 2005 Annual Enrollment project.
Because your view of CWS may have changed since last year, please answer the "last year" questions based on the view of CWS that you had during the 2005 AE project.
Please respond to the following statements by selecting the appropriate box.

Last year I viewed CWS as a Communications tool.
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

Last year I viewed CWS as a Client Services tool
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

Last year I viewed CWS as a Project Management tool.
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

Last year I viewed CWS as a tool for work-in-progress documents (documents that were being modified and are not yet in their final form).
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

Last year I viewed CWS as a tool for finalized documents (documents that were in their final form and required no further modification).
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

Last year I viewed CWS as a tool for collaborating with client representatives.
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

Last year I viewed CWS as a tool for collaborating with other BenefitsCo employees.
Strongly disagree
Disagree
Neutral
Agree
Strongly agree

Thank you for completing the survey.
VITA

John T. Perry

Education
- Ph.D. Business Administration, Pennsylvania State University, December, 2006.
- M.S., Organizational Dynamics, University of Pennsylvania: December 1999.

Work Experience

Academic Work Experience:
- 2005-present  Assistant Professor, Department of Management, Wichita State University
- 2000-2005  Teaching and Research Assistant, Pennsylvania State University

Professional Work Experience: