
Effective collaboration and knowledge sharing in short vs. long term SD projects

[Research in Progress]

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Abstract

Sharing knowledge has become a critical part of inter-enterprise collaboration. Knowledge sharing appears particularly in short-term System Development (SD) projects. Most SD projects entail changes to hardware and software. With the growth in such complex SD projects, and demand for unique technical know-how, there is a greater need to explore the dilemma of effective knowledge sharing among SD project individuals, their technical knowledge, perceptions, and social interaction that shape the outcomes of the projects. Effective collaboration is imperative for business success, however, it remains challenging as ad-hoc teams work across time, geographical, language, and technical boundaries. Often times, one team is dependent upon the work, feedback, or criticism of another team in order to progress in the SD, while lack of trust between and within teams appears to hinder the effectiveness of the collaborations as well as the progress of the SD project. Subsequently only some tacit and explicit knowledge is shared among team members. Our goal is to investigate workers' familiarity with the organization information privacy policy, and their trust on effective collaboration in short and long term projects.

In this work-in-progress, we propose a theoretical model for the impact of trust, tacit and explicit knowledge sharing, and familiarity with information privacy policy on the projects' effective collaborations. We then pose four hypotheses and a proposed agenda for addressing the hypotheses. Some preliminary data analysis is expected to be included in revisions of this draft. We end with a brief discussion and conclusions section.

Keywords: *Effective collaboration, familiarity with privacy policy of the organization, trust building, knowledge sharing, long vs. short term SD projects, information systems projects.*

Introduction

Sharing knowledge has become a critical part of inter-enterprise collaboration. In spite of the propagation of advanced collaboration and communication technologies (i.e. Skype, E-mail, SharePoint, WebEx), a shortage of knowledge sharing appears particularly in short-term System Development (SD) projects (Khoulood, Chirine, Sodki, Lucien, & Emad, 2008). Yet, organizations are increasingly relying on such critical knowledge sharing among knowledge workers (Ribes & Finholt, 2007). Knowledge workers typically engage in a multitude of SD projects with varying time spans. Short term SD projects are defined as project extending over a six month period, while medium and long term SD projects extend over a period of six to 18

months, and 18 months or longer respectively. Most SD projects entail changes to hardware and software. Some examples include hardware downsizing, migration to an application service provider (ASP), migration to the cloud, and upgrade in enterprise software. Recently, analysts in Forrester and Gartner reported that companies worldwide are spending upwards of \$3.7 trillion on information technology (IT) projects related to software and IT services due to cloud migration, and software-as-a-service adoption (Savvas, 2013).

With the growth in such complex SD projects, and demand for unique technical know-how, there is a greater need to explore the dilemma of effective knowledge sharing among SD project individuals, and how their technical knowledge, perceptions, and social interactions shape project outcomes. In fact, McLeod and MacDonell (2011) have long recognized SD projects as a social process. Furthermore, they listed a variety of constructs influencing the outcome of the project, yet the individual factor appears to play a significant role throughout the project lifecycle and outcome. Based on the work of McLeod and MacDonnell (2011), we define the individual factor as individuals and teams that are engaged with the SD project. Their perceptions, behaviors, unique knowledge set, and social interactions ultimately influence the project outcome. Thus, we believe effective knowledge sharing among such individuals, both in the form of tacit and explicit knowledge, influence the degree of effective collaboration.

According to Chen Romano, Nunamaker, and Briggs (2002), project management paradigm is rapidly shifting due to business globalization and IT innovations supporting distributed and virtual project teams. Their study adopted Dyer (1987)'s definition of teams as collections of people who must rely on group collaboration to achieve optimum success and fulfill goals of the project. Warkentin, Moore, and Bekkering (2009), Pardu (1996), as well as Burke Aytes, and Chidambaram (2001) have identified lack of team communication as one of the top factors leading to failure. Subsequently, communication within the team, and across other teams, appears to lead to better management of the project and individual performance. Achieving task goals, and resolving obstacles along the way, require good communication. Thus, inter-enterprise communication appears to play a key role in the outcome of the SD project. Warkentin et al. (2009) provided testimonials about critical factors, where "Good communication is repeatedly mentioned in relation to managing...[individuals] expectations, ...[providing] explicit instructions...[conducting] face to face negotiation" (p. 16). According to Dvir and Shenhar (2011), Glass (1998), as well as Jarvenpaa and Leidner (1998), communication across teams is essential for the coordination of activities and problem solving. Teams often include individuals from diverse areas and backgrounds within one organization; such teams may not have worked with or met each other before. Cross teams include individuals from one or more organizations. In both cases, teams may include individuals who are knowledge workers and others who are technical specialists (Dvir & Shenhar, 2011).

Establishing a working relationship and a common goal set becomes a challenge within the teams and across teams. Individuals within their respective teams may be reluctant to disclose sensitive information to others, or share their tacit knowledge. In some cases, they may not be familiar with their organization's privacy policy. Such obstacles may lead to underutilization of knowledge and weak collaboration among teams. Furthermore, Dvir and Shenhar (2011) noted

that successful SD projects require a long period of preparation where the best approach is defined, and stakeholders have an opportunity to 'buy-in' to the vision and mission. Along the same line, individuals should engage in building trust. Warkentin et al. (2009) indicated that communication and trust are essential for coordination within and across teams. The aim of this research-in-progress is to explore the relationship between trust, knowledge sharing (tacit & explicit), familiarity with information privacy policy, as well as effective collaboration across short and long-term projects. More specifically, we seek to address the following main research question: How do trust, knowledge sharing, and information privacy influence the effectiveness of team collaboration?

Theoretical Background

Trust

Trust can be defined as "the extent to which one is willing to ascribe good intentions to and have confidence in the words and actions of other people" (Cook & Wall, 1980, p. 39). Developing trust in virtual organizations is a difficult task (Handy, 1995). According to Mennecke, Hauser, and Byrd (1992), team development refers to the degree of maturity and cohesion a team achieves over time as members interact, learn about one another, as well as develop relationships and roles within the team. Individuals take time to form relationship through observation, communication, and actions. The wide array of communication choices (i.e. phone, instant messenger services, e-mail, Skype, Facebook, etc.) adds a challenge because workers are expected to maintain presence in multiple communication platforms and be available to respond quickly. Choice of communication platforms may change based on time of day, and individual preferences (Peralson & Saunders, 2012). This issue is particularly critical when teams experience strict deadlines for meeting goals and benchmarks. Subsequently, little time is left for camaraderie building in the team. Cross teams, dependent upon one another for tasks, feedback, and constructive criticism in order to progress in the SD, while lack of trust within the team or across teams appears to hinder the effectiveness of the collaborations.

Trust can facilitate transactions and collaboration (Fukuyama, 1995). According to Mitzal (1996), while lack of trust is evident by "keeping our mind open to all evidence, secures communication and dialogue" (p. 10). Moreover, "teams with higher levels of trust come together more easily, organize their work more quickly, and manage themselves better" (Lipnack & Stamps, 1997, p. 225). This suggests that "where relationships are high in trust, people are more willing to engage in ... cooperative interaction" (Nahapiet & Ghoshal, 1998, p. 254). According to these researchers, trust promotes more communication among individuals. Longer projects that are more complex in nature may provide more opportunities to develop trust relationships given the extent of time and coordination between teams. Shorter projects that are simpler in scope and nature may land fewer opportunities to forge trust as workers may be engaged in completing their tasks based on their unique competencies. Therefore, shorter projects are likely to entail fewer iterations and feedback cycles attributed to the short duration of the project. Existing research does not appear to address trust building in short and long term SD projects. As such, this research-in-progress study will fill that gap by proposing a model to assess the contribution of trust to effective collaboration among teams in short and long-term projects.

Knowledge Sharing

Researchers have found that individuals are the prime movers of knowledge creation within organizations (Nonaka, 1994). In agreement with Nonaka (1994), other researchers suggested that knowledge sharing is key within organizations due to the increasing recognition that tacit knowledge provides individuals within a reference team or in other teams the ability to learn from each other (Haas & Hansen, 2005; Marouf, 2007). Quinn, Anderson, and Finkelstein (1996) suggested the value of knowledge increases as it is shared. Importantly, Haas and Hansen (2005) suggested that past knowledge-sharing research focused on causes and impediments, but not as much on how knowledge sharing results in individual or team performance. They also found that a limited amount of research has been conducted linking individual knowledge sharing to the organizational knowledge gained (Hass & Hansen, 2005).

Grant (1996) identified knowledge sharing as one major challenge in organizational knowledge management. However, Nonaka and Konno (1998) suggested that organizational members could absorb new knowledge from their colleagues to be leveraged by organizations. Other Information Systems literature suggested that the individual's reference teams within an organization result in knowledge sharing, which may keep knowledge and information obtained from various sources current in order to serve as a guide for future action (Lukas, Hult, & Ferrell, 1996). Other researchers suggested that learning in an organization results from an accumulation of individual-level learning (Shrivastava, 1983). Dodgson (1993) suggested intra-organizational knowledge sharing helps the organization by the diffusion of individual-level learning, to achieve two major objectives of organizational learning: improving efficiency and innovativeness when the organization is facing environmental uncertainty.

At the individual level, Ipe (2003) viewed knowledge sharing as an effective leverage for making knowledge available to others within an individual's reference team. Ipe (2003) defined knowledge sharing as a process that transforms knowledge held by an individual and converts it into a format that can be understood, absorbed, and used by other individuals. Ipe (2003) also identified factors influencing knowledge sharing, such as motivation to share, perceived power attached to the knowledge, reciprocity, and relationship with the recipient involving matters such as trust and rewards. According to Gibbert and Krause (2002), knowledge sharing cannot be forced, but can only be encouraged and facilitated. As such, it appears knowledge sharing could be facilitated within an individual's reference team through colleagues and the organization's technical support, however, distinction between the role of knowledge sharing in the context of short-term and long-term projects doesn't appear to be well studied.

Familiarity with Information Privacy Policy

The higher the level of sharing, the greater the social benefit to inter-enterprises and consumers can be (Peijun, 2002). According to Ping, Weijun, and Fang (2009), complete information sharing can increase earnings of the cooperative enterprise, and also increase consumers' income and the welfare of the whole society. Typically, the majority of inter-enterprise collaborative decision-making are carried out under incomplete information sharing, that is sharing common

information and protecting sensitive information such as financial data, or business sales, cost data and other information (Ping et al., 2009). Sensitive privacy information could become a bottleneck of inter-enterprise collaboration, especially to competitive inter-enterprise collaboration. Sensitivity is defined as the need to protect past or current related information from being disclosed to others who might have low or unknown trustworthiness or undesirable intentions (Fan, 2012). Clearly, limiting or restricting information impacts the level of cooperation between inter-enterprises. To achieve some common goals, cooperation between inter-enterprises often needs to share relevant information to achieve efficient allocation and combinations of resources (Gavirneni, Kapucinski, & Tayur, 1999). Organizations develop specific policies, for example, privacy policy that seeks to guide employees on how to protect corporate sensitive information. Research related to familiarity shows that familiarity and recognition based on prior experiences leads to automatic decision process, thus, individuals who are familiar with their organization privacy policy will likely experience more open communication (Jones, Brown, & Atchley, 2007). Individuals, who are not familiar with the organization's privacy policy, will not be able to recollect prior experiences, and will reject or decline communication about sensitive information with certain individuals across teams. In some cases such individuals may seek support and guidance from the team leader or simply decline the communication all together. Thus, this research-in-progress study also seeks to investigate the contribution of familiarity with privacy policy on effective collaboration.

Collaboration

The success of SD projects to a large extent depends on individuals within the team who are engaged in problem solving. Teams experience, or what Collins and Guetzkow (1964) term '*the assembly effect*,' where a team can achieve solutions of higher quality compared to those achieved by any individuals within the team working alone. Subsequently, over the past decades, research shifted focus from work being accomplished primarily by an individual to investigating aspects of collaboration. Perhaps the best-known evidence comes from Hall (1982)'s research with the "Lost on the Moon" problem. Hall (1982) found that "when a team's final decision is compared to the independent points of view that the members held before entering the team, the team's effort is almost always an improvement over its average individual resource, and often it is better than even the best individual contribution" (p. 33). Hill (1982) analyzed experimental comparisons of teams and individuals on four dimensions: task, process, individual differences and methodology. The overall results from the review and analysis showed "team performance was generally qualitatively and quantitatively superior to the performance of the average individual" (Hill, 1982, p.33).

A major organizational SD project challenge involves on-going series of social exchanges (social or knowledge sharing interactions). We believe that as interdepartmental individuals work together toward a common goals set, they move through a collaborative process in which they must combine their experience, their knowledge, and their resources to achieve a goal. By definition, collaboration is broadly defined as a "process through which organizations who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited visions of what is possible" (Gray, 1989, p. 5). Whereas, a single enterprise department often faces problems that are sufficiently challenging

and complex so no single department can accomplish the task alone. To compound SD project complexity, quite a number of these problems have cross-organizational boundaries along with partial or shared ownership creating issues of authority and responsibility among departments. Therefore, a joint effort among departments affects sharing of general, specific, and procedural knowledge towards the common goal such as developing a successful project. As projects become more complex in scope they require extensive collaboration and multiple feedback loops. Short-term projects tend to have fewer iterative cycles and opportunities for collaboration across teams. Instead, the team may rely on experts to achieve specific stark goals in strict short deadlines.

Schrage (1990) defined collaboration as the process of shared creation: two or more individuals with complementary skills interacting to create a shared understanding. In the software and computer science world, definitions of collaboration are: A process in which two or more agents work together to achieve shared goals (Terveen, 1994, p. 67), and a joint effort where in each party provides specific products and services toward a common goal (Beckman Coulter, Khajenoori, & Mead, 1997, p. 50). We define quality of collaboration as appreciation of joint effort by relevant stakeholders.

Effective Collaboration

Belief in the passage "two heads are better than one" is evidenced in the use of collaboration in many societies; for example, committees, boards, councils, and the use of juries within many legal systems (Hill, 1982; Schwartzman, 1989). According to Schrage (1990), collaboration is defined as working together to accomplish a task and discussing with each other to solve difficult problems. Successful collaborative design depends on the ability to manage and share engineering knowledge and experience effectively throughout the entire development process (Liao & Luo, 2012). Based on this definition, effective collaboration includes both individually focused tasks and interactive team-work (Mishra & Mishra, 2009). Other literature suggested that effective collaboration and knowledge sharing skills are crucial for successful employment in the modern economy (Johnson & Johnson, 2007; Parente, Duck, Zhao, & Fizel, 2007). As Johnson and Johnson (2007) wrote:

We live in an historical period in which knowledge is the most critical resource for social and economic development, and people need to be able to participate in a networked, information-based society. Whereas previously people engaged in manufacturing-based work where they generally competed with or worked independently of each other, now people engage in information- and technological-rich work where they work in teams. (p. 785)

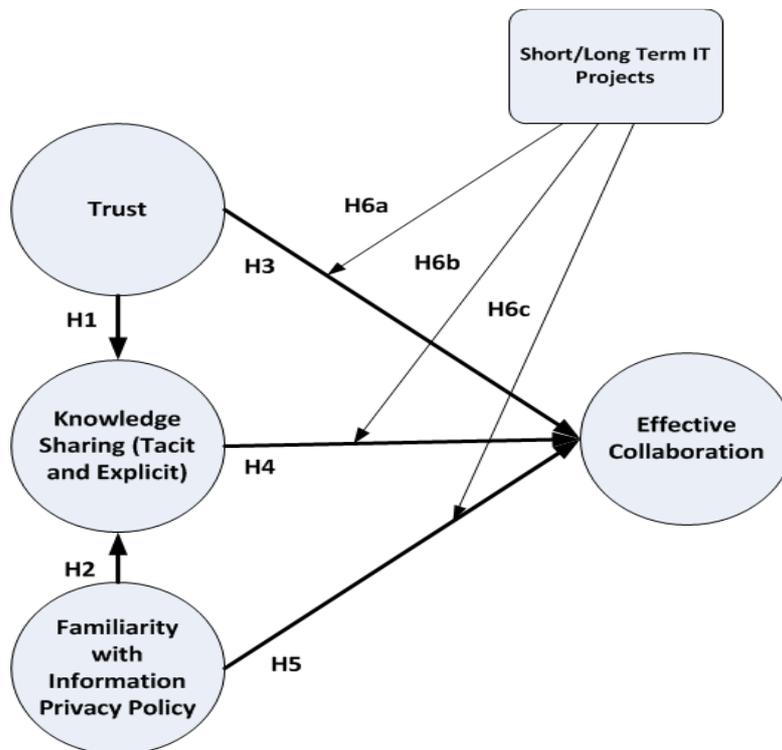
Hall (1994) found in three-surveys of 10,277 U.S. workers from all levels of employment that 97% reported they need conditions that encourage collaboration to do their best work. Effective collaboration is no longer a competitive advantage for companies; now it is imperative for business success (Handoll, Elstubb, Elliott, Kavanagh, & Madhok, 2012). However, effective

collaboration remains challenging as ad hoc teams work across time, geographical, language, and technical boundaries (Forrester, 2009).

For the purposes of this study, effective collaboration is defined as a team of people behaving in a way that not only produces individual benefits, but leads to a degree of success belonging to the team and can only be achieved by team members working together in this fashion (Head, 2003). Whereas, unproductive meetings cost organizations more than money: time may be lost, morale may decline, and productivity may be reduced (Romano & Nunamaker, 2001). Collaboration often times is needed between the technologist teams and knowledge works teams to achieve the goals of the project. In this research-in-progress study we hypothesize that trust among individuals, knowledge sharing, and familiarity with information privacy policy all have a significant contribution to effective collaboration.

Proposed Model and Methodology

The main goal of this research-in-progress paper is to propose a causal model and understand the impact knowledge sharing, trust, and familiarity with information privacy policy have on effective collaboration in long and short term SD projects. The need for this work stems from the recommendation made by Bock Zmud, and Kim (2005), who recommended further research to investigate users' actual knowledge-sharing behaviors in projects. The purpose of this research-in-progress study is to generate deeper knowledge and understanding on how these constructs influence effective collaboration. This study draws on existing collaboration, and trust building theories for its theoretical framework. Figure 1 depicts the conceptual model of this research and identifies the research hypotheses.



- H1. *Trust will have a significant positive contribution on knowledge sharing.*
- H2. *Familiarity with the organization's privacy policy will have a significant positive contribution on knowledge sharing.*
- H3. *Trust will have a significant positive contribution on effective collaboration.*
- H4. *Knowledge sharing as evident in tacit and explicit knowledge will have a significant positive contribution on effective collaboration.*
- H5. *Familiarity with the organization's privacy policy will have a significant positive contribution on effective collaboration.*
- H6a. *The contribution of trust on effective collaboration will not significantly differ when controlled by the length of the SD projects.*
- H6b. *The contribution of knowledge sharing on effective collaboration will not significantly differ when controlling for the length of the SD projects.*
- H6c. *The contribution of familiarity with the organization's privacy policy on effective collaboration will not significantly differ when controlling for the length of the SD projects.*

To test the relationship among trust, knowledge sharing, information privacy policy, and effective collaboration, this research-in-progress study proposes to collect data from three companies. A standardized self-administered Web-based survey will be e-mailed to participants of these three companies. One stipulation to take the survey is that potential participants must have been a member of a project team and have participated in at least one project. The participant will receive an e-mail inviting them to partake in the study. The research team will explain the scope of the study, and provide a link to the survey. Participants will come both from

the technical and managerial fields. The goal of this study is to collect approximately 300 records. Survey submissions will be full anonymous.

This study will use a quantitative approach using a causal modeling research method (Mertler and Vannatta, 2010). The Analysis of Moment Structures (AMOSTM) software will be used to perform the model-fit testing based on Structural Equation Modeling (SEM). According to Simon and Paper (2007), there is agreement in literature that SEM is a robust technique for a model-fit examination, superior to multiple regression analysis or regular path analysis. Moreover based on prior literature, Levy and Green (2009) suggested seven common measures of model-fit analysis. These seven model-fit measures include chi-square/degrees-of-freedom (Chi-square/df), goodness-of-fit index (GFI), adjusted goodness-of-fit-index (AGFI), normed fit index (NFI), non-normed fit index (NNFI), comparative fit index (CFI), and root mean squared error of approximation (RMSEA). In this study, these seven model-fit measures are adopted from Levy and Green (2009).

The Cronbach's Alpha reliability test will be conducted on the constructs to determine the construct reliability across each measured construct. According to Mertler and Vannatta (2010), a Cronbach's Alpha score of over .70 represents a reliable construct. We anticipate that the results of our study will indicate that all measured constructs will demonstrate high reliability as these measures were adopted from previous studies where they have been well validated. In addition, AMOSTM software will be used in testing the proposed hypotheses.

Discussion and Conclusions

From the perspective of sharing knowledge in SD, this research-in-progress study anticipates finding that information is withheld by individuals not willing to share information within and across teams due to either low trust building between the project team or by lack of familiarity with corporate information privacy policies. According to Usoro, Sharratt, Tsui, and Shekhar (2007), one component of knowledge sharing is identifying the degree to which an individual feels they engage in knowledge sharing. With regard to trust, project team trust affects the success of collaboration as well as the overall success of the SD project. O'Hara-Devereaux and Johansen (1994) suggested trust is the glue of the workspace. Trust has been identified as a major influencing factor, especially in communities of practice where there is very little or no face-to-face contact. Trust is described as an expression of confidence between several parties during exchanges, referring to confidence free of harm or risk through either parties' action, and that confidence is not exploited by any party (Jones & George, 1998). Hence, trust building is one of the critical ingredients to successful knowledge transfer (Davenport & Prusak, 1998; Lander, Purvis, McCray, & Leigh, 2004). McEvily, Perrone, and Zaheer (2003) claimed that the level of trust affects the extent of knowledge sharing. We anticipate this study will help highlight further aspects of trust and its contribution to effective collaboration.

This research-in-progress study will also provide deeper understanding of the contribution of an individuals' familiarity with their organization's privacy policy, and suggest practical applications to effective collaboration. Finally, this study will investigate the role of short- and

long-term projects on effective collaboration and contribute best practices that will be helpful to project managers and practitioners in this context. For academic researchers, this study will offer an expanded model for effective collaboration that doesn't appear to be previously explored in the literature. Following our next phase of data collection and analysis, this research-in-progress study is anticipated to conclude with suggestions for future studies across transnational organizations pursuing SD projects resulting from the findings uncovered.

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