Essays In Outsourced Is Program Management

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ESSAYS IN OUTSOURCED IS PROGRAM MANAGEMENT

by

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ABSTRACT

IS vendor organizations are increasingly using program management practices to manage complex projects (Gierra 2004). The move to program teams is due to the realization that the management of many client projects and their underlying dependencies requires teamwork among project managers from different projects (Cooke-Davies 2002; Ferratt et al. 2006; Sanghera 2007). With two separate studies, first we extend the team competence framework and utilize organizational learning theory to understand the antecedents and outcomes of teamwork behaviors. Empirical results from the first study indicated that teamwork behaviors within the program team were significantly related to an increase in team competencies of personnel development, methodology development and dissemination and customer focus. Further, the three program team competencies were a significant predictor of program outcomes. In the second study, we investigate the outcomes of conflict resolution and their impact on program performance. The results indicated that conflict resolution can enhance the level of communication, mutual support and effort among IS program members Directions for practitioners and implications for future research are discussed.

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CHAPTER 1 INTRODUCTION

This chapter includes a description of the background and motivation for the two studies, the objectives and research questions of the studies, and the structure of the dissertation.

1.1 Motivation for the study

IS outsourcing vendors are project based organizations (Kodama 2007; Tanaka 2003) which deliver an array of IS services and products to their clients through projects. These projects integrate people with different competencies, backgrounds and experience in order to develop complex, and often innovative solutions (Prencipe and Tell 2001; Sydow et al. 2004). Project-based organizations represent a new organizing logic with flat organizational hierarchies and emphasize interconnectedness of different units (Powell 1990). Large IS vendors have organizational structure consisting of divisions based on client industry types or vertical and growth platforms. Projects are allocated according to the division based upon the domain they belong. Employees with domain expertise such as business analysts are usually assigned to a particular industry vertical while those with generic IS or non-functional expertise could be rotated around different industry types depending upon project requirement. Smaller IS vendors typically serve a specific industry vertical and organize their employees around projects belonging to clients in that vertical. Irrespective of the size, projects are the bedrock upon which IS vendors organize employees at the operational level. This form of organizing makes it possible to integrate diverse expertise and knowledge from different organizational units to complete complex projects.

With the evolution of outsourcing, vendor's role has transformed from a service provider to strategic partner (Lindner 2004). Outsourcing contracts sizes can include hundreds of projects (Rost 2006) and sometimes run in billions of dollars (Kedia and Lahiri 2007). Vendors no longer have to just manage projects but manage long term relationships spanning numerous years (Mehta et al. 2006). Strategic mission for outsourcing include improvement of core competencies, gaining market share, and improved customer satisfaction (Schniederjans and Cao 2006).

In light of these developments, vendors are increasingly utilizing program management to accomplish client's mission and optimize its resources (Gierra 2004; Iyengar 2003). Program Management is defined as the integration and management of a group of related projects with the intent of achieving benefits that would not be realized if they were managed independently (PMI 2004). Vendor's program management capability is responsible for the improvement of its three competencies: relationship, delivery and transformation competency (Feeny et al. 2005). Program management capability also plays a role in improving client's service transformation over a period of time (Feeny et al. 2005). It is important for vendors to begin planning any outsourcing initiative by facilitating a strong project and program management process (Mohan Babu 2006). Lack of project and program management skills among IS vendors was often stated as a problem by clients (Epner 2001). In case of offshore vendors, Mehta et al. (2006) identified sophisticated program-management skills to be critical for offshore operations. For IT product firms (such as IBM, Ericsson), greater program and project management capabilities are required to address competence risks when they become custom solution providers for their clients

(Sawhney 2004). Hence program management becomes the preferred vehicle for implementing business strategy for IS vendors.

1.2 Program team in IS vendors

Programs are organized into a core team structure and a set of individual project teams to certify that decision making and authority has a definitive source (program manager), the work of program manager is efficient, and the needs for direction and decisions are assured. Program manager is the head of the program and oversees the delivery of the business objectives and adherence to the practices (Brown 2007). The program manager apprises the main client stakeholder and top management with the progress of the program. Depending upon the size of organization and the maturity of program management process, the organization may have a program management office (PMO) which would typically support program/project manager or be a part of the project team. Project managers are responsible with the execution of individual projects by managing offshore and onshore teams. Program teams also typically include technical architects, business analysts and quality assurance experts. Depending upon project size and firm resource, these experts could be dedicated to single project or shared across the program.

1.3 Issues facing program team

Program teams face challenges to teamwork which are typical of other types of teams and organizational units. Inherent personality differences related to needs, goals, and motivation have been suggested to obstruct the cooperation between different parts of the organization (Griffin

and Hauser 1996). Organizational impediments to cooperation appear as a result of different task priorities and responsibilities. Top management insufficient support towards cooperative action between functions result from lack of importance of integration in evaluating functional success. (Dougherty 1992; Griffin and Hauser 1996; Souder 1977; Souder and Sherman 1993) In addition, physical barriers, such as geographical separation decrease the possibility for ad hoc meetings and informal face-to-face discussions and develop communication barriers between the separated groups (Allen 1970). Furthermore, it has been proposed that separation leads to the appearance of overly emphasized group identity which causes goal incongruence between the group and the parent organization (Ashforth and Mael 1989; Brown et al. 1998; Hoegl et al. 2004). Wurst et al. (2001) contend that dysfunctional conflicts are one of the reasons that may create organizational boundaries by destroying cohesion and open communication between individuals in organizations. They suggest that conflicts in multi-team projects (or programs) arise from divergent and conflicting team objectives and priorities, frequent changes in team goals, strategies, and management, lack of a team's willingness to meet the needs of the other team, communication barriers and attitudinal differences, geographical separation, complex reporting relationships, and competition for resources. (Pinto et al. 1993) posit that cross-functional cooperation is important for the successful execution of projects and the effective performance of an organization as a whole.

1.4 Objectives and research questions

The objectives of this study are to explore teamwork behaviors in IS development program teams in outsourcing vendor organizations. More specifically, the first objective of this study is to

unveil the outcomes of teamwork behavior in program teams. Second, the study aims at understanding the outcomes of conflict resolution and their effects on program performance.

Moreover, the first study aims at revealing how the utilization of teamwork is related to the development of specific program team competencies: professional competence and methodological competence. Furthermore, the objective of this study is to reveal the relation between the different components of team competence and how they impact program performance. In order to meet the objective of the research, the following research question is posed:

RQ1: "What are the antecedents and consequences of teamwork behaviors in ISD vendor program teams?"

This research question has been set up to explore what kinds of outcomes are evident when program team members interact with each other during the course of program tenure. The overall literature review of team competencies in a wider organizational context provides guidelines that help to interpret and analyze the data from the empirical study. Theoretical support for competency development is derived from organizational learning theory. In-depth analysis of empirical data from 88 programs is used as the source of knowledge in this explorative-oriented question.

RQ2: What are the outcomes of conflict resolution in ISD vendor program teams?

This research question provides knowledge on the influence of conflict resolution and three mediators on program performance. Theoretical support was drawn from organizational model of

conflict to explain outcomes of conflict resolution. Through the use of path analysis, the results indicated that the dimensions of promotive interaction (communication, support, effort) fully mediate the effect of conflict resolution on program performance.

1.5 Plan of this dissertation

The purpose of this dissertation is to develop an integrated view of the teamwork process, with the contemplation of antecedent variables to the teamwork and the consequences of the teamwork behaviors.

In Chapter 2 we offer a literature review of past competency research conducted in groups as well as in the organizational literature at large. Research question 1 is addressed in this chapter. We offer a discussion of our findings, an assessment of the limitations of our study, and suggestions for future research.

Chapter 3 starts with a review of past research on approaches to conflict resolution. Next, it introduces various theoretical perspectives on the outcomes of conflict aftermath. It concludes with a set of hypotheses proposed for empirical testing. The methodological aspects of our investigation are also reported. Finally, we offer a discussion of our findings and an assessment of the limitations of our study.

Chapter 4 discusses general conclusion of the two studies and provides managerial contributions.

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CHAPTER 2 UNDERSTANDING ANTECEDENTS AND CONSEQUENCES OF IS PROGRAM TEAM COMPETENCIES.

2.1 Abstract

Traditional project management researchers have proposed program management as a mechanism to link business strategy with multiple projects (Murray-Webster and Thiry 2000; Platje et al. 1994; Tjosvold 1991). In long term outsourcing relationships, IS program management is recognized as critical to the survival of vendor organizations (Feeny et al. 2005). An extensive body of literature indicates the importance of team work in project management. Extending this concept to an ISD program team, this essay investigates the role of teamwork behaviors on program outcomes and empirically tests the hypotheses. Results from the empirical study indicated that teamwork within the program team was significantly related to an increase in team competencies of personnel development, methodology development and dissemination and customer focus. Further, the three program team competencies were a significant predictor of program outcomes. Directions for practitioners and future research are discussed.

2.2 Introduction

Past research on IS project management have studied factors which impact goal oriented dependent variables of performance and success. With changing business scenario, project goals have undergone a sea change. In a typical project management situation, projects are focused on efficiency and operational performance, which mainly means meeting time and budget goals. Today, however, dynamic business environments and global competition require finding new ways to use projects as powerful, competitive weapons. Although even today almost all projects

are initiated with a business perspective in mind and a goal that is typically focused on achieving better business results, in modern organizations, project managers are increasingly required to focus on business aspects (Winch 2004). Their role is expanding from getting the job done to achieving business results and winning in the market place. There is a clear distinction between operationally managed projects and strategically managed projects (Shenhar and Dvir 2004). Operationally managed projects focus on meeting the projects quality goals within the schedule and budget constraints; strategically managed projects focus on contributing to the overall business results. Management teams in strategically managed projects spend a great deal of their time and attention on activities and decisions that will improve business results. They are concerned with customer needs, competitive advantage, and future market success. While time-to-market is often critical to business success, in most cases organizations need a more long-term, strategic perspective (Shenhar and Dvir 2004).

In case of IT consulting (or vendor) firms, there has been a shift in terms of managing projects from operational perspective to strategic perspective. This shift is consistent with the transition of outsourcing phenomenon with an aim to achieve mere cost savings to a strategic transformation tool (Lindner 2004). IT vendor firms achieve economic and other benefits by executing projects for clients. Revenues generated from successful execution of projects have a direct impact on their revenues and gain value proposition from outsourcing (Levina and Ross 2003). Levina and Ross (2003) create a model of vendor's strategy and practices in outsourcing. This model of the vendor's value proposition suggests that client satisfaction culminates from services supplied by vendors through the application of a complementary set of core competencies addressed at delivering higher service at a lower marginal cost. These core

competencies are client relationship management, personnel development and methodology development and dissemination. These competencies are developed through the vendor's firm-wide experience gained from controlling a large number and variety of projects, which increase due to its reputation developed through its ability to satisfy customers. Feeny et al. (2005) recognize similar competencies which vendors should posses: relationship, delivery and transformation competency. They contend that expertise in program management encompasses these competencies. They suggest that in long term relationships, where client's goals extend to service transformation, clients will evaluate vendor's program management capability.

In IS outsourcing, lack of project and program management skills was often stated as a problem by clients (Epner 2001). In case of offshore vendors, Mehta et. al (2006) identified sophisticated program-management skills to be critical for offshore operations. For product companies (such as IBM, Ericsson), greater program and project management capabilities are required to address competence risks when they become custom solution providers for their clients (Sawhney 2004). Hence program management becomes the preferred vehicle for implementing business strategy for IS vendors.

Program management takes into account the interconnectedness of various project objectives in order to maximize the accomplishment of combined project outcomes (Blomquist and Müller 2004). This focus produces definitions of programs as groups of projects, managed together to obtain benefits not available from managing individually (Maylor 2003; PMI 2004). To manage program, organizations have created program teams which are similar to cross-functional teams.

Program teams are headed by program managers, constituent project managers and leaders and functional experts.

It is imperative for vendor firms that project managers buy-in to the concept of program management. That means they look at projects as a system of interrelated activities that combine to achieve common program goal. Lack of teamwork among program team members can potentially reverberate throughout individual project teams (Englund and Graham 1999). Any lack of upper-management cooperation will surely be reflected in the behavior of project teams, and there is little chance that project managers alone can resolve the problems that arise (Englund and Graham 1999). Hence teamwork within the program team will play a critical role in program's performance. Unfortunately, past research has not investigated teamwork related issues in a program team. This research aims to fulfill this gap by proposing the mechanisms by which teamwork behaviors can improve program performance.

Hence summarizing the core issues, this essay aims to answer the following research questions:

How can an ISD program team in IS vendor organization improve its competencies?

What are the outcomes of the program team competencies?

2.3 Theoretical background

Organizational learning is presented in the literature in two different ways: some researchers discuss learning as an outcome; others focus on a process they define as learning. For example, (Levitt and March 1988) conceptualized organizational learning as the outcome of a process of

organizations "encoding inferences from history into routines that guide behavior"; in contrast, Argyris and Schon (1978) defined learning as a process of detecting and correcting error. In this study, we select the first tradition in treating learning as an outcome and attempt to articulate the team work behaviors through which such outcomes as competency development in teams can be achieved.

Teams enable organizations to learn (and retain learning) more effectively (West 2004). Team members also learn from one another during the course of team working (West 2004). Teamwork plays a central role in the development of learning inside firms, bridging organizational and individual learning (Swieringa and Wierdsma 1992) and enhancing knowledge flows between teams or individuals in a team (Marquardt, 1996). In order to reach a high level of organizational learning, active attention needs to be paid by management to the handling of the conditions to create cohesion, co-ordination and teamwork (Dyerson and Mueller 1999), since although the sphere of the learning is organizational, in learning organizations, the learning is defended through work teams (Swieringa and Wierdsma 1992).

From a knowledge management perspective, teamwork may bring knowledge together that hitherto existed separately, resulting in “new combination” (Schumpeter 1951), it may facilitate cross-functional communication, cross fertilization of ideas and enhance worker involvement. Through the integration of knowledge of individual members, teams may not only blend knowledge and insights beyond what individual members may achieve; the development of new knowledge may also be stimulated by conversations and language based learning in teams (Brown and Duguid 1991; Nonaka and Takeuchi 1995). Stevens and Campion (1994) reviewed

the literature on groups to determine the knowledge, skill, and ability (competency) requirements for teamwork. Fourteen specific KSAs are derived from literature on socio-technical systems theory, work teams in the organizational behavior literature, social psychology and classified into interpersonal KSAs (social competency) and self management KSAs (self competency). Their research concluded that social and self competencies are essential for team member to participate in effective team working.

Organizations are concerned with learning if it helps them to perform better. Therefore learning which is valuable to organizations is embodied in competencies to do things better or do different things (Dunphy et al. 1997). When an individual, group or organization has learned something it develops a competence (capacity) to use continuously that learning to achieve purposes (outcomes) (Dunphy et al. 1997). These purposes relate to the organization's current performance and its ability to learn to adapt and change for future performance. Learning has been recognized as a managerial competence (Marino 1996) to nurture, expand or create specific technological competencies (Bitondo and Frohman 1981; Prahalad and Hamel 1990). Learning is particularly critical in technology concentrated markets, since the rate of technological change has surpassed the ability of most firms to efficiently manage the learning and absorption process (Ransley and Rogers 1994). Consequently, competitive advantage may be partially derived from firms being able to learn faster than their peers. This rapid learning allows the firm to differentiate between itself and its competitors (Hitt et al. 1982; Leonard-Barton 1995; Prahalad and Hamel 1990), by increasing the firm's level of technical competence with respect to their competitors. The fundamental theoretical outline is based on the theories of Argyris (1990) and Senge (1990), in which theories of individual and organizational learning are grounded in the

belief that individual and workplace growth and skills development (competency) are mutually interdependent.

In the context of team participation, organizational learning leads to development of competencies at individual level (individual competency) and team level (team competency). At the team-level, the construct 'team competence' emerges from the lower level construct 'individual competence (Kauffeld 2006). Team and individual competence are distinct and they impact each other in a reciprocal manner (Kauffeld 2006). For example, a team could perform a task requiring multiple competences but the same task may not be performed by individual team members. The focus of this study is the group level variable of team competence. Task and work characteristics in a team determine which team competencies are required for successful team performance (Cannon-Bowers et al. 1995). However, classification of team competencies is not consistent across researchers. Cannon-Bowers et al. (1995) conceptualized team competences as teamwork skills, team-relevant knowledge and team attitudes. They suggest that situational and task characteristics impinging on a team will determine the type of competencies it requires. Druskat and Kayes (1999) categorize thirteen team competencies into effective interpersonal behaviors, team performance strategies and effective cross boundary actions. (Kauffeld 2006) classified team competence into four types, professional, methodological, social and self-competence. Past literature has identified three core competencies of IS vendor program team, personnel development, methodology development and dissemination and customer relationship management (Levina and Ross 2003). These competencies map to two types of team competences (professional and methodological competence) classified by Kauffeld (2006). These competencies are essential to provide high levels satisfaction to the client through

project/program implementation and win future contracts (Levina and Ross 2003). Based upon organizational learning theory, we can argue that, these core team competencies are developed as a result of interactions during teamwork among the program team members. Personal and self competencies are required to participate in teamwork (Stevens and Campion 1994). Progressive internalization of technical and social skills through teamwork enhances the project member's professional competence (Sohmen 2002). The chain of relationships suggested by the literature provided the basis for our research model; this is shown in Fig.1.

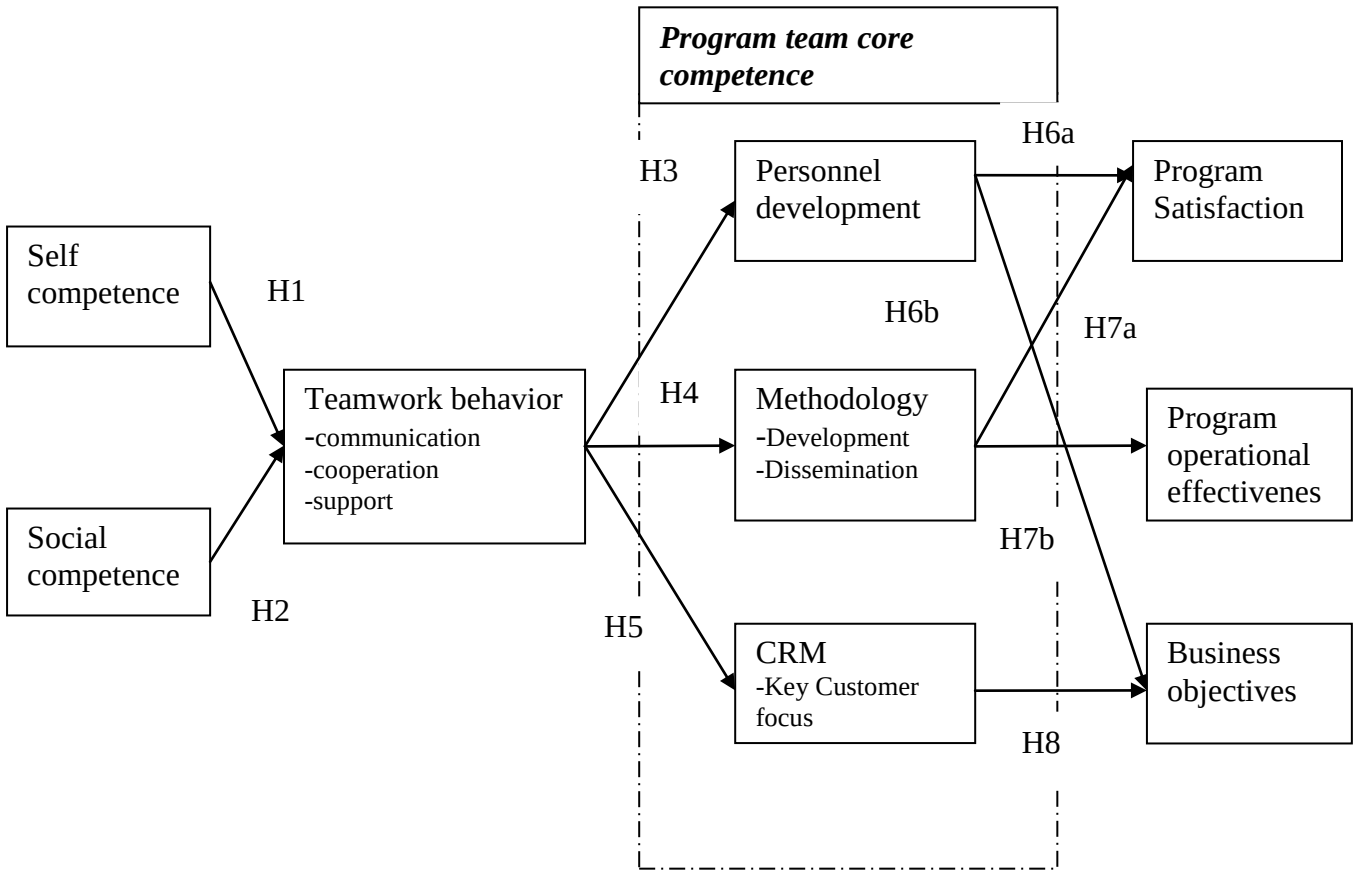

Figure 2.1 Theoretical model

2.4 Hypotheses

Self-competence in the context of IS program team is understood as the team member's willingness to create conditions in order to grow in the process of program implementation. In self-directed group work such as a program team, more responsibilities and greater action and decision latitude are assigned to the team (Kauffeld 2006). Kauffeld (2006) found support for the argument that self-managing teams show more self-competence than traditionally managed teams. In the context of new international business relationships, accurate predictions of trusting cooperation are enabled by taking into account several determinants among which include the self competence of the trusted and trusting party (Currall and Judge 1995; Mayer et al. 1995). Self management knowledge, skills and abilities (competencies) are an essential attribute of work teams (Stevens and Campion 1994). Hence we expect that,

H1*: Program members' self competence will positively improve the teamwork among program members.*

Social competence describes the individual's willingness and ability to experience and shape relationships, to identify and understand benefits and tensions, and to interact with others in a rational and conscientious way, including the development of social responsibility and solidarity (Delamare Le Deist and Winterton 2005). Increased demands for cooperation encourage self-directed work groups to learn how to reconcile the diverse needs of their members (Kauffeld 2006). The greater the social competence of team members in ISD project teams involved, the earlier can misunderstandings be recognized and dealt with (Schneider 1995). According to (Stevens and Campion 1994), social competence facilitates cooperation, and includes skills for

conflict resolution, collaborative problem-solving, communication, joint goal setting, performance management, planning and task co-ordination. Hence we hypothesize that,

H2*: Program members' social competence will positively improve the teamwork among program members.*

Personnel development is concerned with the level of skill development among employees at an organization. The need for personnel development in IS vendor firms is created when there is a gap between the demands of the program and the competences of the program employees. Personnel development is embodied in the idea that "*members of an organization should be able to free themselves from domination and structural limitations by a process of self reflection, which has to be organized according to the ideal of a free discourse of power and domination"* (Zuber-Skerritt 1996). For human resource development, cooperative work relationships between organizational units need to be established (Mone and London 1998). Past literature has confirmed that the groups are more creative and productive if high level of participation, cooperation and contribution evolve among the members (Bencsik and Bognár 2007). Hence we expect that,

H3*: Program member teamwork will positively improve the personnel development practices in the program.*

The process of team knowledge development process involves creativity, the ability of problem solving, developing best practices and lessons learned through team work (Decker 2002). Over a period time, employee's helping behavior can be the mechanism through which "best practices"

are spread throughout a work unit or group (Podsakoff and MacKenzie 1997). Informal communities of knowledge workers in project-based organizations which were setup to help connect with peers working in various projects were responsible for development of new methods and approaches (Ruuska and Vartiainen 2005). Strategic business units utilize cross-functional project team cooperation in order to develop new service innovations (Pinto et al. 1993). Through multifunctional teamwork, teams acquire additional know-how that can bring all of individual know-how's together to do problem-solving (Nayak 1991). Combining the idea-generation process with the ideal problem-solving process will increase firm's product innovation and hence delivery capability (Nayak 1991). In a case study conducted by Hantos and Gisbert (2000), comparing construction and software development projects, the authors recognize that collaboration among teams, and the interdependence of tasks on coworkers and the overall project have a major impact on an organization's delivery capability and productivity. Hence this leads to believe that,

H4*: Program member teamwork will positively improve the methodology development and dissemination in the program.*

In order to delight the customer and achieve a sustainable competitive advantage, companies need to comprehend the concept of "customer focus" which means talking to customers and seeking their advice (Macdonald 1995). Process management literature has stressed the need for involvement of employees in cooperative efforts to excel in process management (Oakland 1997; Waldman 1994) and improve customer focus by avoiding the limitations of managing by vertical functions (McAdam 1996). According to Borman and Motowidlo (1993), member selection in

work teams is critical to improve customer focus and the criterion domain for selecting team member should be expanded to include factors such as helping and cooperating with others. Informal and close interactions between team members in physical collocated design teams facilitated improved customer focus (Sharifi and Pawar 2002). Pellegrinelli et al. (2007) conducted multiple case studies at companies where program team utilized team working techniques in stakeholder relationship management. Arnett and Badrinarayanan (2005) found support for positive relationship between team design factors such cross functionality, team processes (such as communication) and relationship marketing competence. Papasolomou-Doukakis (2002) detected qualitative evidence to support the assertion that teamwork improves the quality of customer service, increases customer satisfaction and leads to loyal customers. Hence,

H5*: Program member teamwork will positively improve the customer focus in the program*.

An important criterion of the outsourcing decision is the presence of skills in vendor organizations which are lacking in client firms (Lacity and Willcocks 2000). As technologies become more complex, the success of IT initiatives will depend less on the selected hardware and software and more upon the skills of the people who implement the initiatives (Strauss 2005). White and Leifer (1986) observed that different team member skills are necessary across different phases of the project development life cycle. Hard skills (technical, general) and soft skills (non-technical, tacit) enhance project outcomes (Langer 2007). The most successful companies will be those who have gained the ability to effectively manage their IT skills (Strauss 2005). Personnel development improves the competence of project management personnel by

offering the possibility of gaining knowledge and experience (Huemann et al. 2007). Professional development is a basic building block in the strategic management of product and service firms (Cleland 1991). Personnel development practices reinforced outsourcing relationships by ensuring that vendor staff understood and accepted accountability for meeting contractual obligations (Levina and Ross 2003). Hence,

H6a*: Personnel development practices will positively improve the program member satisfaction with the program.*

H6b*: Personnel development practices will positively improve the achievement of business objectives.*

Technically complex IS projects tend to require more complex outsourcing relationships in combination with a project specific methodology in order to achieve success (Gowan Jr and Mathieu 2005). Project methodology, is a critical requirement of well-performing IS projects (Gowan Jr and Mathieu 2005). In a study conducted by Gowan Jr and Mathieu (2005), they observed results that establish the importance of methodology in project success, particularly as it applies to large, enterprise-wide system upgrade projects. The degree of methodology use increased stakeholder satisfaction with project outcomes (Yang 1999). Methodology development and dissemination was necessary for consistent delivery of cutting edge solutions to client problems in IS outsourcing (Levina and Ross 2003). Hence we believe,

H7a*: Methodology development and dissemination will positively improve the program satisfaction.*

***H7b**: Methodology development and dissemination will positively improve the program operational effectiveness.*

Marketing literature has long espoused the importance of customer focus for the survivability of organizations. A customer focus is critical to the firm's survival during its embryonic state of emergence, retaining high value clients; and market learning process of emergent firms (Hadcroft and Jarratt 2007). In B2B relationships, firm's initial customer focus and orientation is a key antecedent to CRM success (Karimi 2001; Wright et al. 2002). We expect that,

***H8**: Program team's customer focus will positively improve the achievement of business objectives.*

2.5 Methodology

2.5.1 Data collection

To empirically validate our hypotheses, we collected data from 35 IT outsourcing vendors located in India. The vendors have proficiency in information systems development and maintenance of complex systems for their clients. Most of the vendors have headquarters in India while a few have offshore development centers in India. The vendors provide IT services for various domains such as banking and finance, tourism, engineering, telecommunications, automobile etc. The vendors range from start-ups with less than a hundred employees to global organizations with hundred thousand employees. The vendors have adopted program and project management practices and most have been assessed at CMM level 5. The organizational policies with respect to program management are thus perceived to be flexible yet measurable.

The data are from 88 IT outsourcing programs executed between 2002 and 2007 and involve a pair of program manager and project manager/leader from each program to avoid common method bias. The data includes survey data which was collected through multiple means. The firms were identified from a large database of IT firms compiled by National Association of Software and Services Companies (NASSCOM). Personal contacts of the author were utilized to approach program managers in 20 prominent firms (CMM level 5) in the database. Companies with high CMM certification level are more likely to practice program management practices. A part of the responses were obtained by personally handing a questionnaire to the respondent which was collected after few days while others were collected by conducting personal and phone interview consisting of questions from the questionnaire. We contacted HR departments of 30 firms in the NASSCOM database and solicited their assistance for our study. 16 firms agreed to our request and provided the contact of program managers. 20 program managers were contacted on the business-oriented social networking site LinkedIn and couple of them agreed to participate.

The questionnaire consisted of items measured on a on a 5-point Likert-scale ranging from 'totally disagree' to 'totally agree'. After the collection of responses from programs manager, we asked the program manager to identify a project manager/leader managing a key project in the program. The project managers were later interviewed to collect their response. We now describe how we measure the key constructs used in the model.

2.6 Instrument development

2.6.1 Program performance

Since there were no known measures of program performance from the vendor perspective in the context of ISD program, we modified the scale for this construct from new product development (NPD) programs. To differentiate between successful and unsuccessful programs, it was essential to first define "performance" in this context. Performance of a program pertains to the operational effectiveness of the projects (Chen et al. 2006; Kerssens-van Drongelen and de Weerd-Nederhof 1999); to its satisfaction with the technical output of the projects (Chen et al. 2006), and the realization of business objectives (Chen et al. 2006). We measured program performance as perceived by the program manager through the following indicators:

- Level of the operational effectiveness of the projects the program (5 items);
- Level of contribution of the program to the vendor's business objectives (4 items)
- Level of satisfaction with the technical output of the projects in the program (4 items)

2.6.2 Methodology development and dissemination

We separate methodology development and dissemination across two dimensions, methodology development and methodology dissemination. We identified the five project management methodologies (Gowan Jr and Mathieu 2005) and created five items which asked the respondents to rate the extent to which they were developed in the program. To measure methodology dissemination, we adopted and modified two items from information dissemination (Diamantopoulos and Siguaw 2006) to reflect the spread of methodology practices across the different project teams.

2.6.3 Customer relationships management – Key Customer Focus

Key customer focus for vendor programs involves an overwhelming customer-centric focus (Sheth et al. 2000), and continuously delivering superior and added value to selected key customers through customized services (Sin et al. 2005). Key facets of this dimension include customer-centric marketing, key customer lifetime value identification, personalization, and interactive co-creation marketing (Sin et al. 2005). Four items were identified from (Sin et al. 2005) and modified to measure key customer focus in vendor programs.

2.6.4 Personnel development

The main issues considered in personnel development in firms of recent industrialized economies are: human resource management, employee involvement, quality education and training, employee recognition and performance, and employee well-being and morale (Rao et al. 1999). Levina and Ross (2003) listed the constituent practices in personnel development in IS vendor firms. Nine items from Rao et al.(1999) were adapted to reflect the practices posited by Levina and Ross (2003) to measure personnel development in IS program team.

2.6.5 Teamwork behaviors

Among the various conceptualizations of teamwork behaviors, we selected the one formulated by Campion et al.(1996) and included dimensions of cooperation, communication and social support. Nine items were identified from Bartel (2001) and modified to measure interpersonal cooperation among program members. Ten items for communication and five items for mutual were identified from Hoegl and Gemuenden (2001) to measure communication and social support respectively.

2.6.6 Self competence

Self-competence is the valuative experience of oneself as a causal agent, an intentional being that can bring about desired outcomes through exercising its will Tafarodi and Swann (2001). In the context of program team, self competence of program members is the overall positive or negative orientation toward themselves as a source of power and efficacy. In the scale for self competence, items were adopted and modified from Tafarodi and Swann (2001) to measure program members' self competence. This scale had eight items, four of which was negatively worded, and was reverse-scored for later analysis.

2.6.7 Social competence

The social competence scale captured the perceived genuineness of the program member, the special concern of the program members to each other, and their mutual understanding. Six items were adopted and modified from the social competence scale utilized by Van Dolen et al.(2002).

2.6.8 Control variables

Several factors which might affect the formation of teamwork behaviors and performance parameters are controlled to purify real effect caused by the independent variables. Resource interdependence is common in project teams and was included as a control variable. In the scale for resource interdependence, items were adopted and modified from (Brown et al. 1998) to measure the interdependence of human and non-human resources such as technical expertise, administrative staff, facilities, project data and business process information. Couples of items were replaced with resources in the context of program management. This scale had six items and respondents were asked to identify the extent of sharing of the resource among the project

teams. Also firm size, number of projects in the program, program duration and program team size are included as control variables.

2.7 Demographic information

The demographic information of respondents is shown in Table 2. Of those respondents who provided gender information, 98.8% were male and 1.13% female for the program managers and 96.5% male and 4.54% female for the project managers. Most of the respondents for the program manager role included designations of 47 program managers, 35 account managers, 1 delivery manager, 2 senior managers, 1 technical director and 1 program director. For project manager role, respondents included designation of 80 project managers and 8 project leaders. Most of the firms were CMM 5 certified and had more than 10,000 employees. Overall, the pool of respondents and firms was well qualified to judge the issues related to competency development and program performance.

2.8 PLS analysis

Structured Equation Modeling (SEM) with Partial Least Squares (PLS) (Lohmöller 1989) analysis allows empirical assessment of the measurement model used in this study (Chin 1998). PLS is selected since it is not contingent upon data having multivariate normal distributions nor does it require the large sample sizes of other methods. Additionally, unlike LISREL which only supports reflective relationship PLS supports both types of relationships: formative and reflective. The program performance evaluation items examined in this study are formative. Latent variables attached to formative measures are the summation of the formative observed variables associated with them (Campbell 1960; Thompson et al. 1995). These observed

variables are not assumed to be correlated with each other or to represent the same underlying dimension (Chin 1998). Using ordinary least squares as its estimation technique PLS performs an iterative set of factor analysis and PLS applies a bootstrap approach to estimate the significance (t-values) of the paths. In this study, PLS-Graph Version 3.01 (Chin 1994) was used to verify the measurement and test hypotheses.

In addition, PLS is a latent structural equation modeling technique that uses a component-based approach to estimation that involves two steps. The first step is to examine the measurement model and the second step is to assess the structural model.

2.9 Measurement model

Item reliability, convergent validity, and discriminant validity test are often used to test the measurement model in PLS. Individual item reliability can be examined by observing the factor loading of each item. A high loading implies that the shared variance between constructs and its measurement is higher than error variance (Hulland 1999). Factor loading higher than 0.7 can be viewed as high reliability and factor loading less than 0.5 should be dropped.

Convergent validity is assured when multiple indicators were used to measure one construct. It can be examined by bivariate correlation analyses, reliability of questions, composite reliability of constructs, and variance extracted by constructs (AVE) (Fornell and Larcker 1981; Kerlinger 1986). Bivariate correlation can be calculated by Pearson correlation coefficient. Construct reliability can be assessed with Cronbach's alpha. To obtain composite reliability of constructs, the sum of loadings should be squared and then divided by the combination of the sum of

squared loading and the sum of the error terms (Werts et al. 1974). AVE, proposed by (Fornell and Larcker 1981), reflects the variance captured by indicators. If the AVE is less than 0.5, it means that the variance captured by the construct is less than the measurement error and the validity of a single indicator and construct is questionable (Fornell and Larcker 1981). For the convergent validity, the variance extracted for each construct must be larger than 0.5, and the item-construct correlations must all be more than 0.7. All these constructs showed except for (personnel development – AVE: 0.44) that the measurement had high convergent validity. Composite reliability of each construct was also above 0.7 which was acceptable. The Cronbach alpha of each construct was also above 0.7 which indicated high internal consistency.

Discriminant validity focuses on testing whether the measures of constructs are different from each other (Messick 1980). It can be assessed by testing whether the correlation between pairs of construct are below the threshold value of 0.90 (Bagozzi et al. 1991) and whether the square root of AVE is larger than correlation coefficients (Chin 1998; Fornell and Larcker 1981). Another way to determine the discriminant validity is to verify the factor loading of indicators (Chin 1998). To have discriminant validity, indicators should have higher loading in interesting construct than other constructs. Because PLS graph (Chin 1994) only provide factor loading on one construct, procedures suggested by Smith et al. (2001) were used to generate cross-loading values.

Table 2.1 Demographic analyses

Variables	Categories	#	%
Gender	**For program manager**		
	Male	87	98.8
	Female	1	1.13
	For project managers		
	Male	85	96.5
	Female	4	4.54
Job position	**For program managers**	47	53.40
	Program managers	35	39.77
	Account managers	1	1.13
	Delivery managers	1	1.13
	Program director	2	2.26
	Senior manager	1	1.13
	Technical director	1	1.13
	For project managers		
	Project managers	80	90.9
	Project leader	8	9.09
# of employees	>100,00	3	3.40
	50, 000 – 100,000	3	3.40
	25,000-50,000	2	2.27
	<10,000	20	22.72
	<1000	10	11.36
Average program team size	>25	1	1.13
	10-25	18	20.45
	5-10	33	37.5
	<5	30	34.09
Program duration	5-8 years	13	14.772
	3-5 years	36	40.90
	1-3 years	1	1.13
	<1 year	38	43.18
No of projects in the program	50-100	2	2.27
	25-50	5	5.68
	5-25	45	51.13
	<5	36	40.90

Table 2.2 Reliability and Variance Extracted

Factors	Items	Factor Loading	Composite Reliability	Variance Extracted
Social competence	SO1 SO2 SO5 SO7	0.8 0.74 0.73 0.62	0.865	0.51
Self competence	SOC1 SOC2 SOC3 SOC4 SOC5 SOC6	0.80 0.70 0.72 0.73 0.68 0.65	0.817	0.53
Teamwork behaviors	IPCOOP COMM SUPP	0.87 0.87 0.90	0.81	0.52
Personnel development	HR1 HR2 HR3 HR4 HR6 HR7 HR8 HR9	0.74 0.72 0.65 0.56 0.64 0.61 0.59 0.75	0.863	0.44
Methodology development & dissemination	MDEVP1 MDEVP2 MDEVP3 MDEVP4 MDEVP5 MDEVP6 MDISS1 MDISS2	0.73 0.77 0.52 0.69 0.77 0.69 0.81 0.72	0.895	0.52
Key customer focus	CF1 CF2 CF3 CF4	0.73 0.59 0.74 0.78	0.80	0.51
Program - Business objectives	BO1 BO2 BO3 BO4	0.84 0.65 0.80 0.80	0.86	0.60
Program satisfaction	PS1 PS2 PS3 PS4	0.69 0.75 0.73 0.75	0.82	0.53
Program operational effectiveness	OE1 OE2 OE3 OE4	0.84 0.79 0.84 0.51	0.843	0.58

In table 1.2, the loading of all indicators are larger than 0.65 (except for few items), which indicated high, and significant. Composite reliability and Cronbach's alpha are also above 0.7 which indicated high internal consistency.

The discriminant validity is also assured because, 1) cross-loading table shows that all indicators have higher loading in interesting construct than in other construct, 2) correlation between pairs of constructs is below 0.9, and 3) the square root of AVE is larger than the correlation between constructs.

Table 2.3 Descriptive statistics

Variables	**Mean**	**Std**	**Skewness**	**Kurtosis**
Social competence	3.55	0.54	-0.66	2.05
Self competence	3.51	0.65	0.08	0.34
Teamwork behaviors	3.75	0.48	-1.14	4.04
Interpersonal cooperation	3.65	0.53	-0.74	2.40
Personnel development	3.61	0.65	-0.12	-0.67
Methodology development and dissemination	3.70	0.65	-0.46	0.04
Key customer focus	4.24	0.55	-0.24	-1.12
Program business objectives	4.14	0.56	-0.27	-0.42
Program satisfaction	3.89	0.53	-0.06	-0.64
Program operational effectiveness	4.14	0.59	-0.83	0.98

Table 2.4 Correlation table

Diagonal line of correlation is the square root of the AVE

	SelfC	SocC	HRD	Peff	PBobj	PSatis	CRM_KCF	MDD	Teamwork
SelfC	0.72								
SocC	0.495	0.71							
HRD	0.301	0.109	0.66						
Peff	0.544	0.282	0.562	0.76					
PBobj	0.382	0.346	0.438	0.664	0.77				
PSatis	0.324	0.251	0.525	0.517	0.605	0.72			
CRM_KCF	0.398	0.374	0.384	0.515	0.489	0.367	0.71		
MDD	0.498	0.304	0.621	0.738	0.558	0.514	0.606	0.72	
Teamwork	0.575	0.71	0.421	0.581	0.426	0.262	0.455	0.535	0.71

Revised model

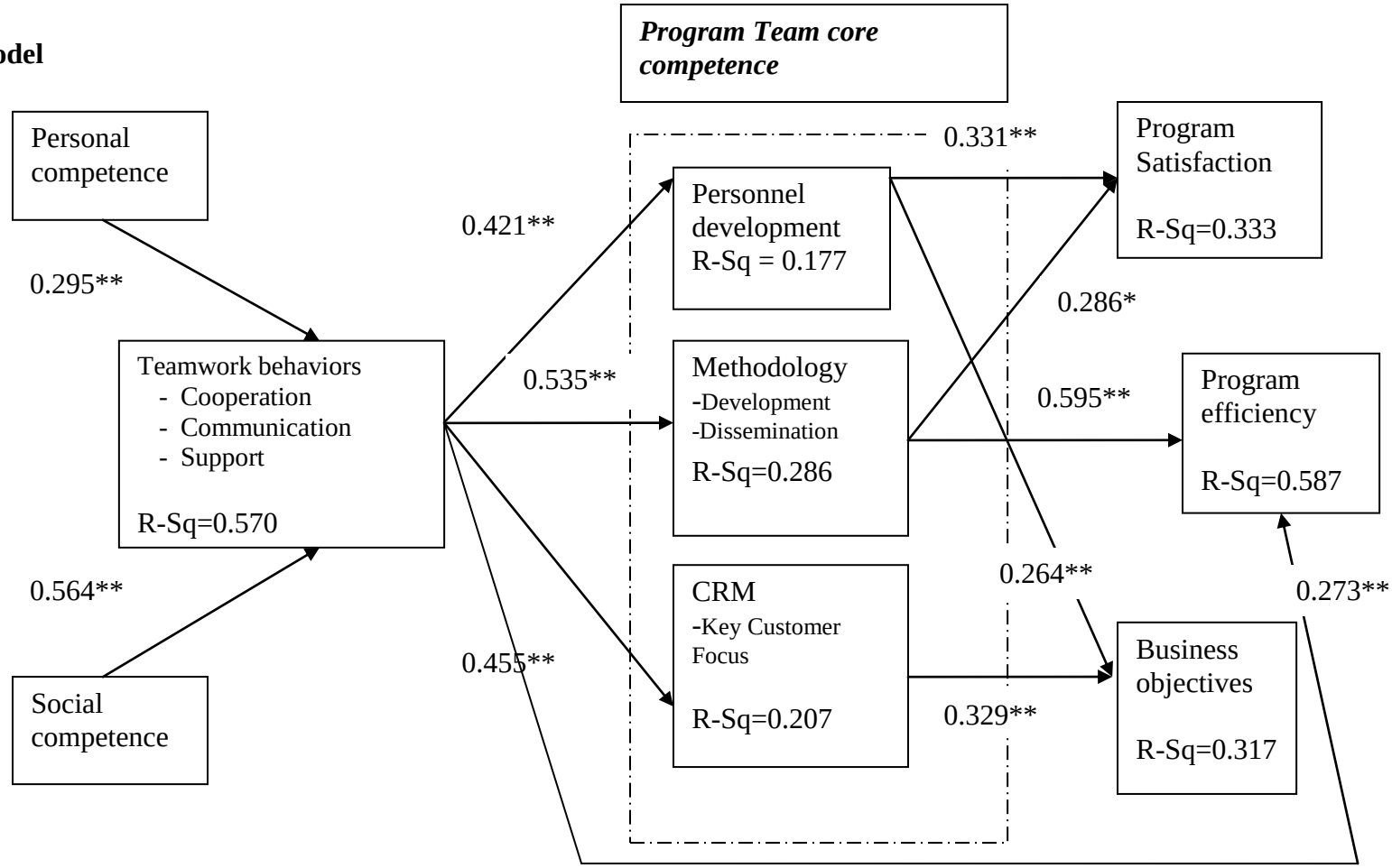

Figure 2.2 Path model

2.10 Structural model

2.10.1 Direct model

Basic information about each variable is given in Table 2.3, including means, standard deviation, skewness, and kurtosis. For each variable the skewness was less than 2 and the kurtosis less than 5, indicating no significant violation of normal distribution (Ghiselli et al. 1981). Fig 1.2 shows the path analysis. The test of the structural model includes estimating the path coefficients, which indicate the strengths of the relationships between the dependent and independent variables, and the R^2 value, which indicates the amount of variance explained by the independent variables. R^2 represents the predictive power of the model and interprets the same as a multiple regression. A bootstrap resampling procedure was used to generate t-statistics and standard errors (Chin 1998). The bootstrap procedure utilizes a confidence estimation procedure other than the normal approximation. In this study, resamples of 100 is chosen. The bootstrap procedure samples with replacement from the original sample set and continue to sample until it reaches the specified number of 100. Mediating effect was shown in the diagram. In order to further explore the data set, we examined the direct effect of teamwork behaviors on the performance outcomes; no significant effect was found except for direct effect of teamwork behaviors on program efficiency (coefficient = 0.273 and p-value <0.01). This means that personnel development and key customer focus fully mediate the relationship from teamwork behaviors and performance outcomes while methodology development and dissemination partially mediates the relationship from teamwork behaviors to program efficiency. Resource interdependence (coefficient = 0.196 and p-value <0.05), a control variable was significantly related to teamwork behaviors (not shown in the model).

2.11 Discussion

The purpose of our study was to examine and document, 1) the effects and antecedents of teamwork behavior in ISD programs, 2) the effects of outcomes of teamwork behavior on program performance parameters. As predicted, resource interdependence, personal and social competence explained 60.6% of the variance in teamwork behaviors. As posited, teamwork behaviors was observed to improve personnel development, methodology development and dissemination and customer focus in program teams which subsequently led to increase in program performance outcomes. Personnel development and methodology development and dissemination explained 33.5% variation in program satisfaction. Methodology development and dissemination explained 53.4% variation in program's operational effectiveness while customer focus and personnel development explained 30.9% of program attainment of business objectives.

2.12 Conclusion

Findings from the empirical study indicate that an IS outsourcing program team can improve its competencies, personnel development, methodology development and dissemination and customer focus by promoting teamwork among the program members. Through teamwork and learning, progressive internalization of program member's self and social competence will enhance the three team core competencies.

2.13 Contribution to theory

Past research has highlighted the role of teamwork in organizational learning in a group context. Our research has identified specific teamwork behaviors of cooperation, communication and

mutual support which promote team learning in the case of IS program teams. From the perspective of team competence literature, we extend the team competence framework (Kauffeld 2006) to include the relationships among the different team competences. We discover that self and social competence improve professional and methodological competence through teamwork. We empirically demonstrate the development and relationship among competencies as a result of learning. Even though specific learning mechanisms utilized in program environment are not investigated, our results are in agreement with Edmondson (2002) study which suggests that organizational learning is local, interpersonal, and variegated. We empirically support her findings which were based upon qualitative study.

Utilizing the underpinning of program management, we illustrate the equivalence of program team's core competences and IS vendor's organizational competences. With multiple program teams engaged in various outsourcing engagements, vendors develop firm level competence which is dynamic and derived from program team competence. The importance of program management in dissemination of business strategy and the resulting benefits in terms of organizational competence is explored. We extend Levina and Ross (2003)'s work and provide mechanisms for improving vendor's value proposition in outsourcing: the development of core competences.

2.14 Implications for research

Past research on IS outsourcing has largely ignored the vendor perspective. One objective of this study was to investigate some of the factors that affect teamwork and subsequent performance in program teams. A second objective was to examine the development of team competencies. The

results of the path analysis revealed several important findings. First, teamwork behaviors showed significant impact on the three competences. Second methodology development and dissemination, personnel development and customer focus were shown to have significant impact on different dimensions of program performance. Personnel development and dissemination was significantly related with achievement of program's business objectives and satisfaction of program members with the technical output of their projects. Human resource is a valuable asset and development of this resource is critical for the organization to function effectively. Our results confirm the importance of personnel development in ISD program execution and achievement of satisfactory technical parameters. From a long term perspective, personnel development impacted attainment of program business objectives such as deriving benefits from client engagement, meeting and contributing to corporate strategy. Methodology development and dissemination was discovered to positively impact operational effectiveness and satisfaction with projects technical parameters. Customer focus was found to be significantly related with business objectives. The key to winning future contracts lies in satisfying the client and, providing them with quality service. Customer focus is at the front line of vendor relationship management. Once contract is won, program is guided to its completion by the program manager, who maintains a close working relationship with stakeholders from the client organization, and ensures that the systems are effectively developed and deployed which provides them with quality service.

Previous research documented the importance of the group competences primarily in a qualitative setting. Our research has empirically validated the relationship among the different kinds of team competencies. We also provided a parsimonious set of scales to assess program

performance and three competencies in IS programs in the outsourcing context. Future research can take advantage of this instrument. This research also bought to fore the importance of program management in IS organization. As projects become large and complex and become increasingly embedded among programs, we believe research on program management is the next frontier in project management research.

2.15 Implication for practitioners

Teamwork among program teams is critical to the successful implementation of client programs by the vendor firms and to realize the value proposition from the outsourcing engagement. It is important for the program manager to foster a spirit of teamwork among the program. Even though the characteristics of ISD programs do not provide substantial opportunities for interaction among program members (other than resource interdependence), it is the responsibility of the program manager to highlight the higher level program goal dependence among the program members and the importance of their contribution to the program goals. Given the strength of the relationship of teamwork behaviors to the competence variables, program manager is advised to create opportunities for cooperation, communication and support such as collocation of project manager offices (especially when they are located onshore), team building activities and knowledge sharing sessions involving development methodology across projects, personnel development practices and customer interaction experiences. Program managers are advised to integrate social activities in program meetings which can promote social competence and also provide a congenial atmosphere for team members to openly share best

practices. The importance of resource sharing is not only important from cost savings standpoint but in promoting teamwork among program members.

2.16 Limitations and future research

There are several limitations in this research. Performance outcomes variable are from vendor perspective. Even though, the client being the primary stakeholder would be better suited to assess the success or failure of the program, obtaining client responses would had been quite difficult. Since the data is collected from offshore ISD program teams in India, it would be interesting to compare the results with on-shore program teams. Future research can investigate the potential differences for other kinds of outsourcing programs; maintenance and implementation. Another limitation of this research was that only one project manager was surveyed in each program. This study did not investigate specific learning mechanisms such as learning—exploitation and exploration (March 1991), first and second-order learning (Lant and Mezias 1992), single- and double-loop learning (Argyris 1982), and Learning I and Learning II (Bateson 2000) in program environment. Future research can specify the presence and utility of one mechanism over another. Another perspective to determine teamwork behaviors is the interdependence among program teams. In this study, we have controlled for resource interdependence. Further study is required to assess the role of interdependence in team interactions. Another avenue for future research is the investigation of additional teamwork behaviors such as cohesiveness, conflict resolution, coordination etc in improvement of team competences. Finally, the context of this study was IS development program in IS outsourcing

vendor organizations. Even though we believe that results may hold true in other kinds of IS programs, this can only be confirmed by additional studies.

2.17 Chapter 2 List of reference

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CHAPTER 3 MEDIATORS BETWEEN CONFLICT RESOLUTION AND IS PROGRAM PERFORMANCE.

3.1 Abstract

Program teams can greatly facilitate the successful implementation of inter-related client projects. We examined the effects of conflict resolution on IS program performance. A total of 88 responses from IS program managers from 35 IS offshore outsourcing vendors were solicited, obtained, and analyzed. The results indicated that conflict resolution can enhance the level of communication, mutual support and effort among IS program members. The results further suggested that program performance was improved by increasing communication, promoting mutual supportiveness among program members and augmenting effort towards each others projects. Directions for management practice and future research are discussed.

3.2 Introduction

IS vendor organizations are increasingly using program teams to manage complex projects (Gierra 2004). The objectives of project teams within the same program are often interdependent (Platje et al. 1994). The interdependencies between the project teams' result from shared attributes such as common client, potential similarity in technologies and platforms utilized, resource sharing and common outcomes. (Gerwin and Moffat 1997a; Gerwin and Moffat 1997b). The interdependencies between the projects may lead to conflicts among project managers due to different perceptions of the same situation, goal incongruency, or asymmetry of information,

resulting in rework and emergence of crisis (Kazanjian et al. 2000; Loch and Terwiesch 1998) and supplemental development costs due to delays (Dutoit and Bruegge 1998). In addition, strong emerging discord between different participants is found to correlate positively with project failures (Souder 1981). At the same time, it is widely recognized that diverse interests and perspectives are inevitable when members from different projects and functional areas work together in the program due to their varied orientations toward goals, interpersonal relations and important external stakeholders (Lawrence and Lorsch 1986). Additional factors contributing to conflicts in multi-team projects (or programs) emanate from divergent and conflicting team objectives and priorities, frequent changes in team goals, strategies, and management, lack of a team's willingness to meet the needs of the other team, communication barriers and attitudinal differences, geographical separation, complex reporting relationships, and competition for resources (Wurst et al. 2001). Some of the conflict causing obstacles which program teams encounter are 1) competition for resources, 2) intra-team disputes for one-upmanship, 3) personality clashes, 4) lack of cooperation, 5) conflicting goals (Crawford 2002b; Iyengar 2003; Tang and Walters 2006). Unresolved conflict can strain relationships and trust between parties (Gill and Butler 2003), could lead to the development of further conflict (Kezsbom 1992), have strong, negative effect on overall software product success and customer satisfaction (Gobeli et al. 1998). Therefore, conflict resolution between the project teams represents one of the key issues in successful management and implementation of programs (Crawford 2002a).

Research on understanding the role of conflict resolution and performance has been conducted in the areas of cross functional teams (Trimmer 2000), management teams (Amason et al. 1995), virtual teams (Montoya-Weiss et al. 2001), student teams (Jordan and Troth 2004) and IS

development teams (Barki and Hartwick 2001). Most empirical studies, including above have attempted to establish a direct link between conflict resolution and performance outcomes. While previous research has made important contributions to our understanding of the direct relationships between conflict resolution and team performance, research on understanding the mechanisms for the improvement in performance are lacking. Additionally conflict resolution has not been the subject of extensive study in the IS program management literature. We attempted to answer the question:

How does conflict resolution affect the performance of IS programs?

The purpose of this study is to build on previous research by developing and testing a path analytic framework which includes three outcomes of conflict resolution, that appear to mediate the effect of conflict resolution on program outcomes. The research methodology utilized survey data from 88 program teams in 35 IS outsourcing vendors.

3.3 Literature review

Past research has focused primarily on antecedents, mechanisms and outcomes of conflict resolution. Conflict resolution mechanisms are addressed in the broader area of conflict management. Rahim (2001) highlighted the difference between conflict resolution (which "implies reduction, elimination or termination of conflict") and conflict management (which "involves designing effective strategies to minimize the dysfunctions and maximize the constructive functions of conflict") . The beneficial role of conflict management on project success has been widely acknowledged (Barki and Hartwick 2001; Gobeli et al. 1998). Conflict

management mechanisms such as articulation of differences and a negotiation of alternatives (Robey et al. 1989; Walz et al. 1993) are required to deal with conflicts involving contradictory data regarding system requirements suggested by developers (Crowston and Kammerer 1998). Constructive conflict management mechanisms such as bringing multiple perspectives to improve the shared understanding of the issues, led to improved team efforts (Robey et al. 1989; Walz et al. 1993). Failure to resolve the differences between contradictory information suggested by the developers is likely to have negative consequences (Sawyer 2001). Should conflict be badly managed, and a consensus not reached, ill-feelings may fester, ambiguity over the requirements may increase and the ability to communicate openly may be inhibited (Robey et al. 1989; Walz et al. 1993). Differences in the level of conflict management were found to moderate the relationship between existing levels of team conflict and team performance (Sawyer 2001). Robey and Farrow (1982) examined the influence of the participatory dynamic on conflict and its resolution during IS development and observed that intensity of conflict was negatively associated with conflict resolution. They also detected that through user participation; user influence can be enhanced, which in turn results in conflict resolution and project success. Conflict resolution was noticed to be solely determined by user influence (Barki and Hartwick 1991). Conflict resolution was correlated positively with user participation, while negatively with the two conflict potentials: substantive dissension and emotional hostility (Yeh and Tsai 2001). The nature of stakeholder influence was established as processes that directly affected the decision-making involved in conflict resolution (Markus and Robey 1988; Newman and Noble 1990).

Conflict management styles such as confrontation, give and take was found to increase satisfaction among project members while forcing was found to decrease satisfaction (Gobeli et al. 1998). In a study conducted by Barki and Hartwick (2001), conflict management styles such as problem solving, asserting, avoiding, compromising and accommodating were significantly related to ISD outcomes from a sample which included responses from IS staff , while problem solving and asserting styles were significant in the user sample.

3.4 Theoretical background

The goal of this research is to uncover the effects of conflict resolution on working relationships of team members. Formally, conflict resolution is defined as the extent to which disagreements are replaced by agreement and consensus and acceptable to an entire group (Robey et al. 1989). Resolution does not imply that one party forces a solution on another party (Robey et al. 1989). As Weitz and Jap (1995) argue, constructive conflict leads to amicable resolutions that "often act as a source of novelty for the relationship, forcing it into new terrain that, if handled successfully, can strengthen the interpersonal relationship and cultivate greater trust, communication and relationship satisfaction, stability, and personal growth" (p.315). Sheth (1973), in an industrial buying setting, states that conflicts resolved in a rational manner should lead to final joint decisions that must also be rational. When conflict resolution mechanisms involve domination and confrontation, the outcomes are counter-productive and the fabric of inter-organizational relationship is strained (Mohr and Spekman 1994).

Pondy (1967)’s model of organizational conflict conceptualizes conflict as a series of episodes with each episode including stages of latency, feeling, perception, manifestation, and aftermath.

These episodes constitute the crux of relationship among participants. If the conflict is fairly resolved to the satisfaction of all participants, then the foundation for a more cooperative relationship may be established; or the participants, may focus on latent conflicts not previously perceived and dealt with. Conversely, if the conflict is subdued but not resolved, then there is a possibility of conflict becoming aggravated and culminate in severe form until they are rectified or until the relationship dissolves. Zeitz (1980) also sees conflict as innate and mutually interdependent with cooperation in a given interaction within a social system. Resolution of conflict provides the basis for continued normal operation, but potential conflicts between groups is always present. In the same vein, Deutsch (1969) originally proposed that conflict could have two consequences to a relationship. On the one hand, it could aggravate and become destructive, resulting in serious consequences such as the dissolution of the relationship. On the other hand, resolution of the conflict could be used as a mechanism for bringing differences of opinion and dissatisfactions to the attention of the other party, allowing for some sort of mutual adjustment of the relationship in a constructive or functional way that improves the quality of the relationship.

Ring and Van de Ven (1994) theorize that cooperative inter-organizational relationships can be considered as "socially contrived mechanisms for collective action, which are continually shaped and restructured by actions and symbolic interpretations of the parties involved" (p. 96). Anderson and Narus (1990) demonstrate that as partners perceptions of cooperation increases, so does the perceived functionality of conflict. Conflict is perceived to be helpful in achieving partners' objectives. Cooperation has been considered as key to building a more functional relationship (Calabrese 1997; Song et al. 1996). Similarly, the way the actors interact in a relationship building process also impacts the cooperation. Studies suggest that presence of

reward structures and perceptions of fair treatment leads to an increased amount of cooperation and joint actions (Griffin and Hauser 1996; Menon and Jaworski 1997). When fairness characterizes professional interactions, participants have the ability to challenge and question each other's decisions and activities (Choo 1999; Mirchandani and Lederer 2005). With this empowerment, problems can be worked out of cooperative interactions; so they run smoothly, thus continuing a pattern of cooperation in the relationship. Research in social psychology and retailing also supports the relationship between conflict resolution strategies and episodic outcomes (Blodgett et al. 1997). The manner in which customers are treated during a conflict resolution process, e.g., with courtesy versus rudely, and the perceived fairness of the tangible outcome of a dispute affect the intentions of customers to do business in the future with their retailer in a dispute and are less likely to engage in negative word-of-mouth behavior (Blodgett et al. 1997). In our context, we expect that the outcomes of conflict resolution sequences in which program members feel that their grievances have not be addressed will result in lower levels of positive relationships while the outcomes of sequences in which members feel that their grievances are appropriately addressed will result in higher levels of perceived positive relationships.

Promotive interaction is considered vital in building positive and supportive relationships among the diverse parties (Johnson and Johnson 1998; Johnson and Johnson 2005). Promotive interaction is the verbal promotion and facilitation of each other's learning through effective support and encouragement, exchanging information, clarification of ideas, providing feedback, and challenging each other's reasoning and conclusions (Johnson et al. 2000). It is also a basic component of cooperation among groups (Johnson and Johnson 1998). Based upon the

definition, we have conceptualized promotive interaction as consisting of three elements, communication (which provides a means for the exchange of information among team members), mutual support (display mutual respect, grant assistance when needed, and develop other team members' ideas and contributions) and effort (workload sharing and prioritizing of the team's task over other obligations). It is widely agreed upon in the literature that the flow of communication within teams influences the success of innovative projects (Griffin and Hauser 1992). It is extensively acknowledged in literature that team support will improve team performance (Bishop et al. 2000; West 2004). The effort that team members exert on their common task influences the success of the project (Hackman 1987).

The chain of relationships suggested by the literature provided the basis for our research model; this is shown in Fig. 3.1.

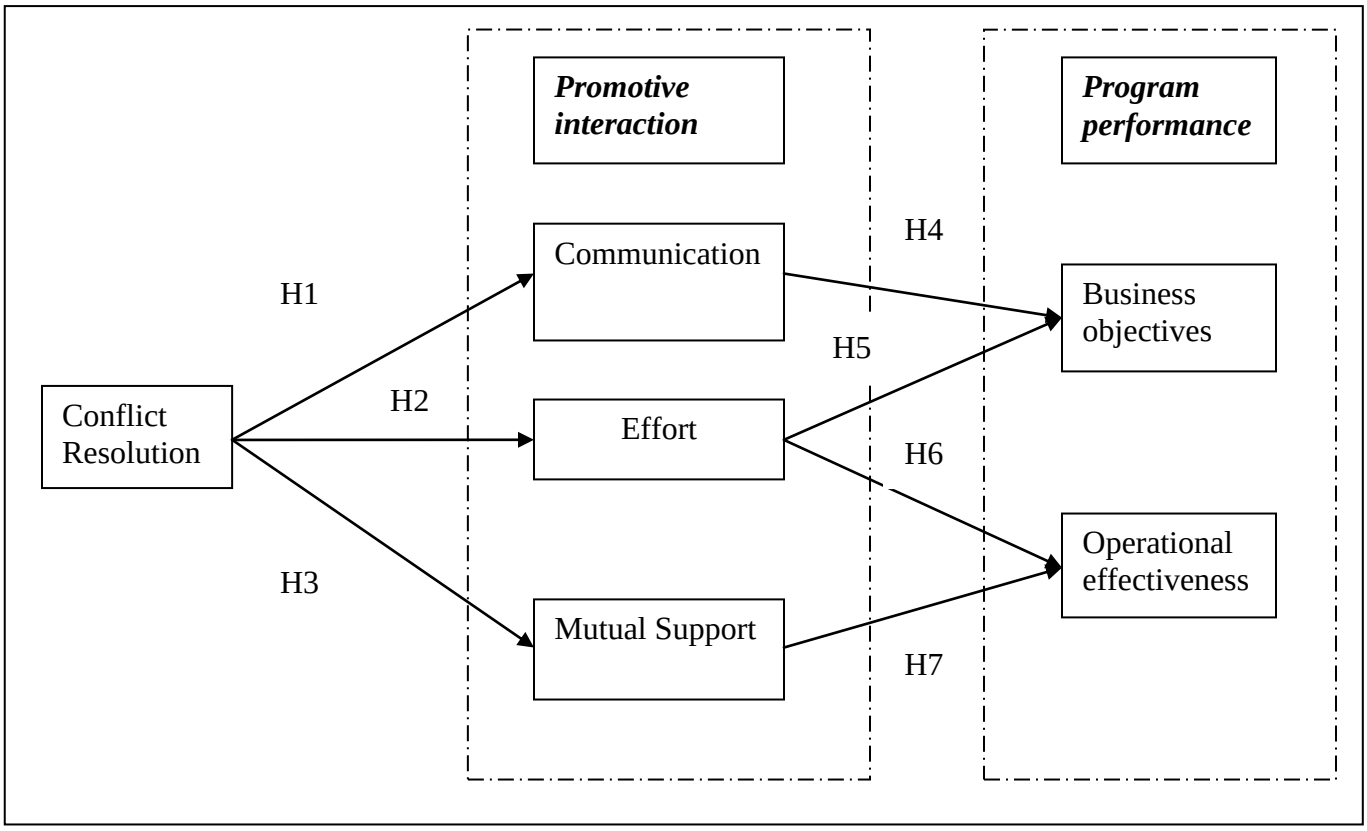

Figure 3.1 Theoretical model

3.5 Hypotheses

Program teams are heterogeneous like cross functional teams in the sense that team members belong to different projects in the program (Lovelace et al. 2001). An example of conflict among a program team could be opposing perspectives of members when program manager makes program level decisions such as resource allocation or setting deadlines. Should conflict be badly managed, and a consensus not reached, ill-feelings may fester, ambiguity over the requirements may increase and the ability to communicate openly may be inhibited (Robey et al. 1989; Sawyer 2001; Walz et al. 1993). Conflict resolution leads to new ideas and a more receptive climate (Souder 1987). Similarly, others argue that where there are barriers to communication, this can

create confusion, misunderstanding, and reduce the opportunity for healthy constructive discussion (Barclay 1991; Menon and Varadarajan 1992).Hence we believe that,

H1*: Conflict resolution in the program team will positively improve communication among program members.*

Organizational conflict is defined as interference in goal achievement efforts (Schmidt and Kochan 1972). When people work in a conflict-free environment, they are more likely able to concentrate on the job (Chan et al. 2003). Patterns of poor conflict management encourage people to not contribute to the team's effort (Sawyer 2001). According to cooperative learning theory, constructive conflict resolution enhances the effectiveness of cooperative efforts (Johnson and Johnson 1998). Constructive conflict management would use the differing perspectives among participants to improve the shared understanding of the issues, leading to improved team efforts (Pondy 1967; Robey et al. 1989; Walz et al. 1993). Hence this leads us to believe,

H2*: Conflict resolution in the program team will positively improve effort among program members.*

Constructive conflict resolution makes for genuine commitment among team members (Vries 2005). Positive feelings, attitudes, and perceptions of workplace peers, subordinates, and supervisors may facilitate an environment more conducive to individual willingness and openness for organizational change involvement and supportiveness (Madsen et al. 2005). Conflicts arise in team when differing perspectives are not integrated and team members engage

in personal accusations that stifle mutual support (Aritzeta et al. 2005). Team-oriented groups are more likely to behave synergistically and in supportive ways which reduce conflict and create a comfortable interpersonal climate within a team (Jehn 1997). Just as mutual support builds a more functional relationship, the way parties interact in the relationship building process will impact supportiveness. Perceptions of fair treatment and constructive conflict management will encourage team members to support joint actions and participate in teamwork. Hence,

H3*: Conflict resolution in the program team will positively improve mutual support among program members.*

The importance of communication for the successful implementation of programs (Cline 2000) and across different business functions and departments is also well documented. Substantial academic research directed on new product success emphasizes the need for efficient communication among departments, particularly between R & D and marketing (Song and Parry 1997). In the context of IT project management, communication is the binding factor that 'keeps everything working properly' (Schwalbe 2000). Fricke et al. (2000) observed that management support in the form of communication is one of the key program success factors. This support can be seen in terms of implementing the reasonable amount of projects, allocating resources suitably, setting clear goals and project priority, and assigning project manager properly. Hence,

H4: *Communication among program members will positively improve the achievement of business objectives.*

Team effort has long been considered important in new product development programs (Cooper and Kleinschmidt 1993; de Brentani 1995; de Brentani and Cooper 1992). The individual and collective effort that members put forth on their assignment is critical to success of cross functional sourcing teams (Trent 1998). The difference between successful and unsuccessful project performance can be attributed to the effectiveness of the project team in terms of its team effort (Crawford 2002a). This proposition reflects the fundamental assumption that, independent of other factors such as task-relevant knowledge and skills, the level of effort brought to bear on a task influences performance (Hoegl and Gemuenden 2001). In a study conducted by Weingart (1992), results from data of 56 student groups indicate that effort, among other variables such as planning and coordinating of tasks, has a significant influence on team performance. Hence,

H5*: Program members' effort will positively improve the achievement of business objectives.*

H6*: Program members' effort in the program will positively improve the operational effectiveness of the program.*

Past research has shown that when implementing decisions, the support of executive peers is highly desirable (Korsgaard et al. 1995). At the executive level, the lack of peer support on key issues may lead to decision paralysis, missed opportunities, or implementation failures (Enns and McFarlin 2003). Team support has been empirically associated with an improvement in team performance (Bishop et al. 2000; Drach-Zahavy and Somech 2001). Previous research demonstrated that behavior such as sharing ideas and information (Durham et al. 1997; Janz et al. 1997), providing instrumental assistance (Janz et al. 1997), and emotionally supporting each other (Bishop et al. 2000) raised team performance.

H7*: Program members' support in the program will positively improve the operational effectiveness of the program.*

3.6 Methodology

3.6.1 Data collection

To empirically validate our hypotheses, we collected data from 35 IT outsourcing vendors located in India. The vendors have proficiency in information systems development and maintenance of complex systems for their clients. Most of the vendors have headquarters in India while a few have offshore development centers in India. The vendors provide IT services for various domains such as banking and finance, tourism, engineering, telecommunications, automobile etc. The vendors range from start-ups with less than a hundred employees to global organizations with hundred thousand employees. The vendors have adopted program and project management practices and most have been assessed at CMM level 5. The organizational policies with respect to program management are thus perceived to be flexible yet measurable.

The data are from 88 IT outsourcing programs executed between 2002 and 2007 and involve a pair of program manager and project manager/leader from each program to avoid common method bias. The data includes survey data which was collected through multiple means. The firms were identified from a large database of IT firms compiled by National Association of Software and Services Companies (NASSCOM). Personal contacts of the author were utilized to approach program managers in 20 prominent firms (CMM level 5) in the database. Companies with high CMM certification level are more likely to practice program management practices. A part of the responses were obtained by personally handing a questionnaire to the respondent which was collected after few days while others were collected by conducting personal and

phone interview consisting of questions from the questionnaire. We contacted HR departments of 30 firms in the NASSCOM database and solicited their assistance for our study. 16 firms agreed to our requested and provided the contact of program managers. 20 program managers were contacted on the business-oriented social networking site LinkedIn and couple of them agreed to participate.

The questionnaire consisted of items measured on a on a 5-point Likert-scale ranging from 'totally disagree' to 'totally agree'. After the collection of responses from programs manager, we asked the program manager to identify a project manager/leader managing a key project in the program. The project managers were later interviewed to collect their response. We now describe how we measure the key constructs used in the model.

3.7 Instrument development

3.7.1 Conflict resolution

Program member's attitude toward the possibilities of resolving conflicts with the other program members was assessed by four items modified from (Frazier and Rody 1991). These items capture reports of the effectiveness (or lack thereof) of redress in past disputes, but they are also likely to reflect the program member's view toward future prospects. The negatively worded items were reverse-scaled.

3.7.2 Communication

Program member's perception of exchange of information among team members was assessed by ten items modified from (Hoegl and Gemuenden 2001). These items capture reports of the

quality of communication within a team terms of the frequency, formalization, structure, and openness of the information exchange. The negatively worded items were reverse-scaled.

3.7.3 Mutual support

Program member's perception of display of mutual respect, granting of assistance when required, and development of other team members' ideas and contributions was assessed by five items modified from (Hoegl and Gemuenden 2001) . The negatively worded items were reverse-scaled.

3.7.4 Effort

Program member's perception of workload sharing and prioritizing of the team's task over other obligations was assessed by four items modified from (Hoegl and Gemuenden 2001) . The negatively worded items were reverse-scaled.

3.7.5 Program performance

Since there were no known measures of program performance from the vendor perspective in the context of ISD program, we modified the scale for this construct from new product development (NPD) programs. To differentiate between successful and unsuccessful programs, it was essential to first define "performance" in this context. Performance of a program pertains to the operational effectiveness of the projects (Chen et al. 2006; Kerssens-van Drongelen and de Weerd-Nederhof 1999); and the realization of business objectives (Chen et al. 2006). We measured program performance as perceived by the program manager through the following indicators:

- Level of the operational effectiveness of the projects the program (5 items);
- Level of contribution of the program to the vendor's business objectives (4 items)

3.7.6 Control variables

Several factors which might affect the formation of promotive interaction and performance parameters are controlled to purify real effect caused by the independent variables. Resource interdependence is common in project teams and was included as a control variable. In the scale for resource interdependence, items were adopted and modified from (Brown et al. 1998) to measure the interdependence of human and non-human resources such as technical expertise, administrative staff, facilities, project data and business process information. Couples of items were replaced with resources in the context of program management. This scale had six items and respondents were asked to identify the extent of sharing of the resource among the project teams. Also firm size, number of projects in the program, program duration and program team size are included as control variables.

3.8 Demographic information

The demographic information of respondents is shown in Table 3.1. Of those respondents who provided gender information, 98.8% were male and 1.13% female for the program managers and 96.5% male and 4.54% female for the project managers. Most of the respondents for the program manager role included designations of 47 program managers, 35 account managers, 1 delivery manager, 2 senior managers, 1 technical director and 1 program director. For project manager role, respondents included designation of 80 project managers and 8 project leaders. Majority of the firms were CMM 5 certified and had more than 10,000 employees. Overall, the pool of respondents and firms was well qualified to judge the issues related to competency development and program performance.

3.9 PLS analysis

Structured Equation Modeling (SEM) with Partial Least Squares (PLS) (Lohmöller 1989) analysis allows empirical assessment of the measurement model used in this study (Chin 1998). PLS is selected since it is not contingent upon data having multivariate normal distributions nor does it require the large sample sizes of other methods. Additionally, unlike LISREL which only supports reflective relationship PLS supports both types of relationships: formative and reflective. The program performance evaluation items examined in this study are formative. Latent variables attached to formative measures are the summation of the formative observed variables associated with them (Campbell 1998; Thompson et al. 1995). These observed variables are not assumed to be correlated with each other or to represent the same underlying dimension (Chin 1998). Using ordinary least squares as its estimation technique PLS performs an iterative set of factor analysis and PLS applies a bootstrap approach to estimate the significance (t-values) of the paths. In this study, PLS-Graph Version 3.01 (Chin 1994) was used to verify the measurement and test hypotheses. In addition, PLS is a latent structural equation modeling technique that uses a component-based approach to estimation that involves two steps. The first step is to examine the measurement model and the second step is to assess the structural model.

Table 3.1 Demographic analysis

Variables	Categories	#	%
Gender	**For program manager**		
	Male	87	98.8
	Female	1	1.13
	For project managers		
	Male	85	96.5
	Female	4	4.54
Job position	**For program managers**	47	53.40
	Program managers	35	39.77
	Account managers	1	1.13
	Delivery managers	1	1.13
	Program director	2	2.26
	Senior manager	1	1.13
	Technical director	1	1.13
	For project managers		
	Project managers	80	90.9
	Project leader	8	9.09
# of employees	>100,00	3	3.40
	50, 000 – 100,000	3	3.40
	25,000-50,000	2	2.27
	<10,000	20	22.72
	<1000	10	11.36
Average program team size	>25	1	1.13
	10-25	18	20.45
	5-10	33	37.5
	<5	30	34.09
Program duration	5-8 years	13	14.772
	3-5 years	36	40.90
	1-3 years	1	1.13
	<1 year	38	43.18
No of projects in the program	50-100	2	2.27
	25-50	5	5.68
	5-25	45	51.13
	<5	36	40.90

3.10 Measurement model

Item reliability, convergent validity, and discriminant validity test are often used to test the measurement model in PLS. Individual item reliability can be examined by observing the factor loading of each item. A high loading implies that the shared variance between constructs and its

measurement is higher than error variance (Hulland 1999). Factor loading higher than 0.7 can be viewed as high reliability and factor loading less than 0.5 should be dropped.

Convergent validity is assured when multiple indicators were used to measure one construct. It can be examined by bivariate correlation analyses, reliability of questions, composite reliability of constructs, and variance extracted by constructs (AVE) (Fornell and Larcker 1981; Kerlinger 1986). Bivariate correlation can be calculated by Pearson correlation coefficient. Construct reliability can be assessed with Cronbach's alpha. To obtain composite reliability of constructs, the sum of loadings should be squared and then divided by the combination of the sum of squared loading and the sum of the error terms (Werts et al. 1974). AVE, proposed by (Fornell and Larcker 1981), reflects the variance captured by indicators. If the AVE is less than 0.5, it means that the variance captured by the construct is less than the measurement error and the validity of a single indicator and construct is questionable (Fornell and Larcker 1981). For the convergent validity, the variance extracted for each construct must be larger than 0.5, and the item-construct correlations must all be more than 0.7. All these constructs showed that the measurement had high convergent validity. Composite reliability of each construct was also above 0.7 which was acceptable. The Cronbach alpha of each construct was also above 0.7 which indicated high internal consistency.

Discriminant validity focuses on testing whether the measures of constructs are different from each other (Messick 1980). It can be assessed by testing whether the correlation between pairs of construct are below the threshold value of 0.90 (Bagozzi et al. 1991) and whether the square root of AVE is larger than correlation coefficients (Chin 1998; Fornell and Larcker 1981). Another

way to determine the discriminant validity is to verify the factor loading of indicators (Chin 1998). To have discriminant validity, indicators should have higher loading in interesting construct than other constructs. Because PLS graph (Chin 1994) only provide factor loading on one construct, procedures suggested by Smith et al. (2001) were used to generate cross-loading values.

Table 3.2 Reliability and Variance Extracted

Factors	Items	Factor Loading	Composite Reliability	Variance Extracted
Conflict resolution	CR1 CR3 CR4	0.83 0.67 0.88	0.85	0.64
Effort	EF1 EF2 EF3	0.84 0.82 0.88	0.88	0.72
Communication	COMM1 COMM2 COMM3 COMM5 COMM7 COMM8 COMM9 COMM10	0.77 0.78 0.62 0.62 0.66 0.65 0.62 0.74	0.87	0.50
Support	SUPP1 SUPP2 SUPP3 SUPP4 SUPP5	0.84 0.67 0.82 0.80 0.74	0.88	0.61
Business objectives	BO1 BO2 BO3 BO4	0.84 0.68 0.77 0.81	0.86	0.61
Operational effectiveness	PROGEF1 PROGEF2 PROGEF3 PROGEF4	0.86 0.58 0.78 0.80	0.84	0.58

In table 3.2, the loading of all indicators are larger than 0.65 (except for few items), which indicated high, and significant. Composite reliability and Cronbach's alpha are also above 0.7 which indicated high internal consistency.

For the convergent validity, the correlation between indicators in the same construct is high, the variance extracted for each construct is larger than 0.5, and the item-construct correlation are all more than 0.6. All the above evidence shows that the measurement has high convergent validity.

The discriminant validity is also assured because, 1) cross-loading table shows that all indicators have higher loading in interesting construct than in other construct, 2) correlation between pairs of constructs is below 0.9, and 3) the square root of AVE is larger than the correlation between constructs.

Table 3.3 Descriptive Statistics

	Mean	Std. Deviation	Skewness	Kurtosis	Std. Error
CONFRES	3.9280	.71196	-1.645	3.917	.508
EFFORT	3.7689	.74682	-.458	.560	.508
COMM	3.7529	.63279	-1.361	2.423	.511
SUPPORT	3.8705	.62370	-.546	.953	.508
BUS OBJ	4.1494	0.56	-0.27	-0.42	.569
OP EFFEC	3.9310	0.59	-0.83	0.98	.555

Table 3.4 Correlation Table

	Conflict	Effort	SUPPORT	COMM	PBo	PEff
Conflict	0.80					
Effort	0.40	0.84				
SUPPORT	0.62	0.51	0.78			
COMM	0.67	0.59	0.72	0.70		
PBo	0.44	0.47	0.37	0.46	0.78	
PEff	0.39	0.48	0.58	0.53	0.65	0.76

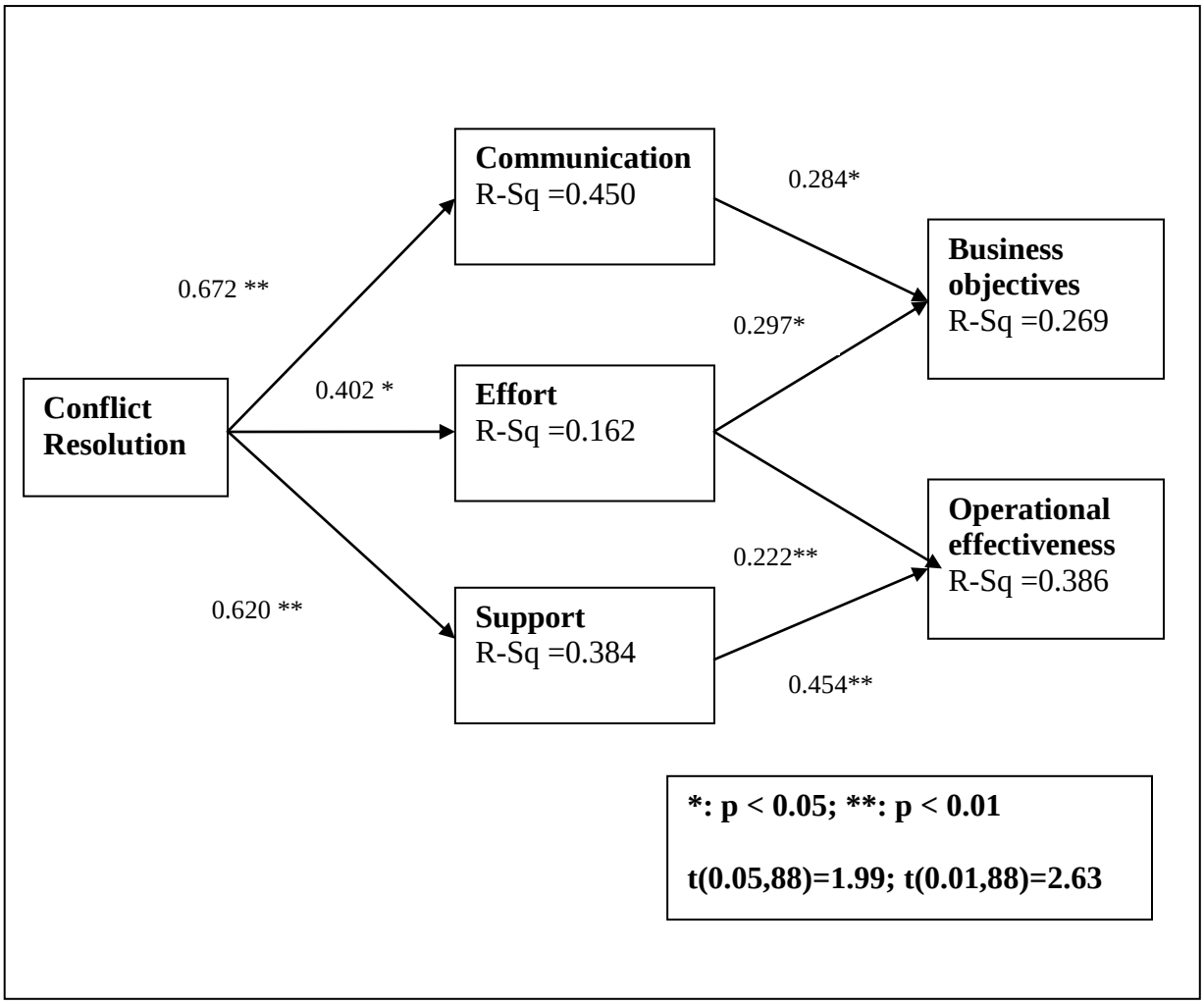

Figure 3.2 Path Model

3.11 Structural model

3.11.1 Direct model

Basic information about each variable is given in Table 2.3, including means, standard deviation, skewness, and kurtosis. For each variable the skewness was less than 2 and the kurtosis less than 5, indicating no significant violation of normal distribution (Ghiselli et al. 1981). Fig 2.2 shows the path analysis. The test of the structural model includes estimating the path coefficients, which indicate the strengths of the relationships between the dependent and independent variables, and the R^2 value, which indicates the amount of variance explained by the independent variables. R^2 represents the predictive power of the model and interprets the same as a multiple regression. A bootstrap resampling procedure was used to generate t-statistics and standard errors (Chin 1998). The bootstrap procedure utilizes a confidence estimation procedure other than the normal approximation. In this study, resamples of 100 is chosen. The bootstrap procedure samples with replacement from the original sample set and continue to sample until it reaches the specified number of 100.

In order to further explore the data set, we examined the direct effect of conflict resolution (coefficient = 0.23 and p-value > 0.05) on business objectives. Additionally the direct effect of conflict resolution (coefficient = 0.007 and p-value > 0.05) was investigated for effect on operational effectiveness; no significant effect was found for both direct effects. From these results we can conclude that promotive interaction (communication, effort and mutual support) fully mediates the effects of conflict resolution on two dimensions of program performance. Resource interdependence, a control variable was significantly related to effort (RI coefficient =

0.207 and p-value <0.05), support (RI coefficient = 0.248 and p-value <0.01), and communication (RI coefficient = 0.273 and p-value <0.01).

3.12 Conclusion

The purpose of our study was to examine and document the effects of conflict resolution mechanism in outsourced ISD program. As predicted, conflict resolution was observed to produce improvement in communication, mutual support and effort among program members. This is consistent with previous research. Conflict resolution explained 45% of variance in communication, 16.1% of variance in effort and 38.4% of variance in mutual support. Low explanation of variance in effort towards other program member projects could be explained by the fact that projects in outsourced ISD programs has fairly independent goals. Resource interdependence partly explained variance (4%) in effort. Communication and effort explained 27% of variance in achievement of business objectives. Effort and mutual support explained 38.6% variance in operational effectiveness.

Findings from the empirical study indicate that an IS outsourcing program team can improve its performance by resolving conflicts; encouraging communication and effort among program and promoting mutual supportiveness to each other's projects.

3.13 Contribution to theory

Theoretical underpinnings of this study was based upon Pondy (1967)'s organizational model of conflict which postulated the development of more cooperative relationships among participants as a result of conflict resolution. Further theoretical support was derived from a dialectical view

of conflict (Zeitz 1980) and cooperative organizational relationships (Ring and Van de Ven 1994) which highlight cooperation as an outcome of conflict resolution initiatives. Through this study, we extend the organizational model of conflict by specifying intermediate promotive interactive mechanisms (communication, mutual support and effort) which lead to cooperation. To achieve this, we draw support from cooperative learning theory (Johnson and Johnson 1998) which emphasizes the role of promotive interaction in building cooperative efforts among team members. Further, we empirically illustrate the relationships.

3.14 Implication for researchers

One of the major goals of this research was to develop a deeper understanding of how conflict resolution impacts the program team. With support from survey data, we tried to study the outcomes of conflict resolution and their impacts, on performance outcomes. Our contribution to research is manifold. Conflict resolution in program teams is vital to the successful implementation of client programs. The results of the path analysis revealed several important findings. First, conflict resolution and promotive interaction, were shown to have a significant impact on program performance. Second, theoretical perspectives on conflict aftermath were found to reasonably predict the outcomes of conflict resolution. Past research has highlighted the positive impact of conflict resolution but the mechanisms through which conflict resolution impacted performance were lacking. We have mentioned before the absence of literature dealing with this topic in IS project teams. The relevance of research findings in this area is hence justified. Since the focus of this study was on the outcomes of the resolution process, and not the strategies itself, future research can investigate the impact of specific resolution strategies on conflict

resolution and promotive interaction in the program environment. Future research could study the influencing (moderating) role of other variables not considered in this investigation in the linkage between resolution and promotive interaction. The inclusion of interdependence variables in the sample might also help disentangle the varying impact of conflict resolution on different promotive interaction variables.

3.15 Implication for practitioners

In addition to developing theoretical understanding, support for the hypotheses may have important practical implications for structuring IS programs teams, especially in India and other collectivist cultures. Reward structures could be based in part on how groups want to resolve their conflicts for mutual benefit (Hanlon et al. 1994). Teams and members work to resolve the conflict so that both benefit, not just themselves, and combine the best ideas to implement a solution that promotes mutual program goals.

Promotive interaction can be improved by requiring certain levels of cross-project training, or structuring groups such that project managers serve as back-up for other managers. Teamwork-related skills (Stevens and Campion 1994; Stevens and Campion 1999) such as social skills and project management skills seem particularly relevant in dispersed settings. It is essential that managers emphasize social and project management skills along with team members' domain-relevant skills (e.g., programming skills, hardware expertise, skills regarding the software's application field) when selecting applicants to join the organization, when assigning individuals to work in low-proximity teams, and when crafting training and development schemes.

3.16 Chapter 3 List of references

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CHAPTER 4 DISCUSSION AND CONCLUSIONS

4.1 Introduction

One of the major objectives of this research was to develop a deeper understanding of how team competencies are improved through learning in teamwork behaviors. Focusing on IS programs, we tried to study the antecedents of teamwork and the impacts, at the end of program. Although today many authors acknowledge the beneficial aspects of teamwork, there is lack of research to investigate the effect of teamwork on the development of team competencies. Human interaction is an inherent element of human nature, and as such we posed it can be utilized for team improvement by inducing teamwork behaviors. We proposed that in evaluating the productivity of teamwork behaviors, we should focus on understanding the self and social competencies of the team members.

In the area of group research, there is a need for better understanding of the relationship among variables that might shed their influence on the group interaction process. At the same time, group member interactions have an impact on the ongoing relationship. The theoretical consideration of team work behaviors as competency promoters has not gone unnoticed in the literature on social psychology at large, but there is little research to date on measuring such benefits. This research contributes to the consideration of teamwork behaviors as team development mechanisms. The concept of team competency as a combination of individual competency behaviors might, in fact, extended to the concept of organizational competency. In the second essay we discovered intermediate variables of promotive interaction; communication, mutual support and

effort which contribute to the development of cooperative relationships resulting from conflict resolution initiatives in program teams.

Further, the findings of the first essay could be summarized along two major areas, antecedents and consequences of teamwork behaviors. The findings of the second essay could be summarized along the area of consequences of conflict resolution in program teams. We will, thus, assemble our conclusions along these major groups.

4.2 Discussion of findings

4.2.1 Antecedents of teamwork behaviors

In our review of the literature we already saw that only a few empirical studies explicitly considered the issue of the antecedents of teamwork behaviors. This area of research has received scant attention in the literature on project teams; the first essay tries to remedy this situation. We posited the importance of social psychology and team competence framework to explain the teamwork behaviors. Social and self competency was found to successfully predict improvement in teamwork behaviors of cooperation, mutual support and communication. Our results here give general support to social psychology literature and team competence framework. Regarding antecedents, the role of these variables was more interesting than we anticipated. Social competence explained higher variation in teamwork behaviors as compared to self competence. This suggests that at program level, interpersonal skills are more important than individual skills. This is consistent with the findings from R&D programs where even though functional expertise is important in solving product development issues, interpersonal skills are even more important as they enable a team to function effectively, thereby facilitating task accomplishment.

4.2.2 Consequences of teamwork behaviors

We could characterize the consequences of teamwork behaviors as short and long term oriented. In terms of long term consequences, the improvement in three program team competencies was visible. The three competencies were personnel development, methodology development and dissemination and customer focus. Interpersonal cooperation was enhanced by member self and social competencies in the presence of resource interdependence. This finding is consistent with arguments from previous research that to improve human resource development (HRD) strategies it will be necessary to identify: managerial competencies which are consistently associated with improved organizational performance. IS development is a cooperative activity where experts from different domains are necessary. Past research has identified that a climate fostered by openness of communication is conducive for development of ideas for improvement in methodology. Projects in a program typically have different stakeholders in the client organization. To appropriately manage client relationship over the course of program tenure requires an integrated focus among the project managers. Analyzing the impact of teamwork behaviors on the team competencies, it is evident that knowledge sharing resulting from teamwork related interactions might result in the improvement of personnel development. Future research could study the operationalization of knowledge sharing practices and mechanisms in successful program teams. Long term consequences of teamwork behaviors were the improvement of program performance parameters via the enhancement of competency variables.

4.2.3 Consequences of conflict resolution

Regarding consequences, the first observation that can be made is that conflict resolution is an important antecedent condition and explains significantly the presence of promotive interaction variables of communication, mutual support and effort. Promotive interaction was significantly related to two dimensions of program performance: achievement of business objectives and operational effectiveness. All relationships presented in this research were significant, although the details of their significance were not exactly in the terms of our hypotheses. There are some implications from the observation. Conflict resolution is of greater importance in program environment. Since program members are also project managers, and have significant work experience, there are possibilities for development of conflicts such as inadequate allocation of resource to some members, ego and personality differences. Performance of individual projects is most importance for the program member while contribution to other member's project is of secondary importance. Unless conflicts are resolved, program members may not feel a need to participate in promotive activities. At any rate, what has appeared here is the importance of conflict resolution in explaining promotive behavior among program team members.

4.3 Managerial contributions

Program management is a people-centric activity. To be effective, program manager needs to empower its team members, not bind them with the dynamics of their individual projects and responsibilities. Program managers need to seek team member's' participation in program implementation by highlighting the importance of teamwork in performing their individual

projects, providing the opportunity to learn from shared experience, and delegating authority for them to execute any necessary action for effective performance.

Since disagreements about program related issues create conflict and affect members' perspectives about the direction of the program, program managers need to engage in activities aimed at promoting and generating support for the program. Success in these efforts is not guaranteed unless program members possess strong interpersonal skills, which allows them to drive positive relationships with other members and program manager. Program managers also need to understand the internal dynamics of program teams and take suitable actions to manage these relationships. Since project managers require strong social competence as well as self competence, special care should be taken when selecting/assigning managers to particular programs. Although project managers are selected and promoted based upon their experience in successfully executing projects; it is not always possible to consider their interpersonal skills while constructing the program team. Evidence indicates that selecting the appropriate members can have significant benefits for the team. Since program environment is different from project environment, program managers need to take responsibility for securing and providing training in teamwork to program team members. Particular skills that program members need to develop include: conflict resolution at program and project level, knowledge sharing and communication for disseminating project status, new findings, methodology development, client engagement practices and negotiation. Training in social and project management skills can lead to better program functioning which, in turn, can result in the program reaching its goals. It is also important that program managers consider, develop and communicate the criteria used for performance evaluation at program level. Program members may be uncertain about how they

are evaluated at program level; program manager need to convey clear performance parameters. Given our results, these parameters should include assessments of social competence as well as project management expertise.

APPENDIX A: IRB DOCUMENTS

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901, 407-882-2012 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Notice of Exempt Review Status

From: **UCF Institutional Review Board**
FWA00000351, Exp. 5/07/10, IRB00001138

To: **Neeraj Parolia**

Date: **July 18, 2007**

IRB Number: **SBE-07-05097**

Study Title: **The antecedents and consequences of interpersonal cooperation in IS program teams.**

Dear Researcher:

Your research protocol was reviewed by the IRB Chair on June 18, 2007. Per federal regulations, 45 CFR 46.101, your study has been determined to be **minimal risk for human subjects and exempt** from further IRB review or renewal unless you later wish to add the use of identifiers or change the protocol procedures in a way that might increase risk to participants. Before making any changes to your study, call the IRB office to discuss the changes. **A change which incorporates the use of identifiers may mean the study is no longer exempt, thus requiring the submission of a new application to change the classification to expedited if the risk is still minimal.** Please submit the Termination/Final Report form when the study has been completed. All forms may be completed and submitted online at https://iris.research.ucf.edu.

The category for which exempt status has been determined for this protocol is as follows:

2. Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey or interview procedures, or the observation of public behavior, so long as confidentiality is maintained.
   (i) Information obtained is recorded in such a manner that the subject cannot be identified, directly or through identifiers linked to the subject, **and/or**
   (ii) Subject's responses, if known outside the research would not reasonably place the subject at risk of criminal or civil liability or be damaging to the subject's financial standing or employability or reputation.

The IRB has approved a **consent procedure which requires participants to sign consent forms.** Use of the approved, stamped consent document(s) is required. Only approved investigators (or other approved key study personnel) may solicit consent for research participation. Subjects or their representatives must receive a copy of the consent form(s).

All data, which may include signed consent form documents, must be retained in a locked file cabinet for a minimum of three years (six if HIPAA applies) past the completion of this research. Any links to the identification of participants should be maintained on a password-protected computer if electronic information is used. Additional requirements may be imposed by your funding agency, your department, or other entities. Access to data is limited to authorized individuals listed as key study personnel.

On behalf of Tracy Dietz, Ph.D., UCF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 07/18/2007 12:55:56 PM EDT

Joanne Muratori

Informed Consent form for participants

Dear Program Manager/Project Manager:

You are being asked to participate in a survey designed to gather information on the role of interpersonal cooperation among program members on program outcomes. This research project is designed for research purposes and your individual responses are intended solely for the research team. Responses will be reported in summary, statistical form. No Identifying information is requested in the survey.

Your responses will be kept confidential using a numerical coding system. Only the research team will have access to your responses.

Your participation is voluntary. You do not have to answer any question(s) that you do not wish to answer. Please be advised that you may choose not to participate in this research, and you may discontinue participation at any time without consequence. There are no other direct benefits or compensation for participation. This survey will take approximately fifteen (15) minutes if done in a single attempt. There are no anticipated risks associated with participation.

If you have any questions or comments about this research, please contact Neeraj Parolia, MIS Dept, College of Business, Orlando FL, USA, Ph: 407-823-4863. Questions or concerns about research participants' rights may be directed to the Institutional Review Board (IRB), University of Central Florida (UCF), 12201 Research Parkway, Suite 501, Orlando, Florida 32826-3246, Telephone: (407) 823-2901, E-mail: IRB@mail.ucf.edu.

Sincerely,

(Neeraj Parolia), July 4, 2006

_____I am 18+ years old.

_____I have read the procedure described above.

_____I voluntarily agree to participate in the procedure.

_____I would like to receive a copy of the procedure described above.

_____I would not like to receive a copy of the procedure described above.

_____/_____

Participant Date

UCF University of Central Florida IRB
IRB NUMBER: SBE-07-05097
IRB APPROVAL DATE: 7/18/2007

APPENDIX B: SURVEY ITEMS

Client Program Management Survey for Program Manager

Code: Date:

The purpose of the questionnaire is to understand the interactions among a client program management group. The term "program members" in this questionnaire refers to "project managers or leaders" who are managing various projects in the same program in which you are a program manager. Please fill in the survey based upon a recent program which you managed in past **six months or currently managing**. Please do not omit any questions.

Please read each of the statements below. Please best describes your opinion by marking the appropriate box with an O. You have to circle one choice for each column. Please mark only one box for each statement.

METHODOLOGY DEVELOPMENT MDEVP1-6					
For each of the processes listed below, identify the extent to which they were developed in the program (1: least developed, 5: most developed).	**Least developed ←**				**Most → developed**
Individual project definitions	1	2	3	4	5
Risk assessment	1	2	3	4	5
Cost calculations	1	2	3	4	5
Compliance planning	1	2	3	4	5
Risk management	1	2	3	4	5
Testing and verification	1	2	3	4	5
METHODOLOGY DISSEMINATION MDISS1-2	**Strongly disagree ←**				**Strongly → agree**
We are effective at disseminating methodology practices throughout our program.	1	2	3	4	5
System development methodologies are disseminated at all levels in this program on a regular basis.	1	2	3	4	5
CRM – Key Customer focus (CRM-KCF)	**Strongly disagree ←**				**Strongly → agree**
Through ongoing dialogue, we work with our client to customize our offerings.	1	2	3	4	5
Program members provide customized services and products to clients.	1	2	3	4	5
Program members make an effort to find out the customer needs.	1	2	3	4	5
When program members find that customers would like to modify a product/service, the departments involved make coordinated efforts to do so.	1	2	3	4	5
For each HR practice listed below, identify the extent to which it is present in your program. (5: maximum, 1: minimum) PERSONNEL DEVELOPMENT HR1-9	**Minimum presence ←**				**Maximum → presence**
Extent to which quality related training (internal quality methodologies project management methodology) is given to employees.	1	2	3	4	5
Availability of resources to employees for training in the program.	1	2	3	4	5
Opportunities of promotion are available to the employees.	1	2	3	4	5
Assigning mentors to junior staff.	1	2	3	4	5
Extent to which employees are held responsible for their output.	1	2	3	4	5
Extent to which employee morale is measured.	1	2	3	4	5
Extent to which training in specific skills (technical and soft) is given to employees.	1	2	3	4	5
Extent to which employees are recognized for superior performance.	1	2	3	4	5
Extent to which the employee well-being is measured.	1	2	3	4	5
PROGRAM PERFORMANCE	**Strongly disagree ←**				**Strongly → agree**
Program efficiency PROG EFF 1-5					
The program was completed within budget	1	2	3	4	5
No gridlock in the program—all the projects done on time	1	2	3	4	5

The program provided all the functionality that it was supposed to provide.	1	2	3	4	5
The program provided quality service that it was supposed to provide.	1	2	3	4	5
The program effectively utilized available resources.	1	2	3	4	5
Business objectives BUS OBJ 1-4					
The program was able to meet expected goals.	1	2	3	4	5
The program was able to provide expected benefits.	1	2	3	4	5
The program was able to meet organizational expectations	1	2	3	4	5
The program was aligned with the business's strategy.	1	2	3	4	5
Program satisfaction PROG SATIS 1-4					
Program members were satisfied with accuracy of projects	1	2	3	4	5
Program members were satisfied with sophistication of projects	1	2	3	4	5
Program members were satisfied with integration in projects	1	2	3	4	5
Program members were satisfied with customization in projects	1	2	3	4	5
For each resource listed below, identify the extent of sharing among all project teams in the program. (1: least extent, 5: greatest extent) RESOURCE INTERDEPENDENCE RIND1-6	Least Extent ←				Greatest → Extent
1. facilities;	1	2	3	4	5
2. administrative personnel (non-technical);	1	2	3	4	5
3. data;	1	2	3	4	5
4. technical expertise;	1	2	3	4	5
5. hardware/software;	1	2	3	4	5
6. Process information.	1	2	3	4	5

Demographic data:

Please provide the following information about yourself and the organization.

Which best describes your position: _____Program Manager, _____ Account Manager, _____Program director, _____ Other

How many projects is a part of this program: _____

How many project managers/leaders are there in the program: _____

The average size of project teams in your organization: ___ <=7 members,____ 8-15,____16-25 ____ >26

What is the duration of this program: _____

How many years of work experience do you have? ____

**** Thank you so much for taking the time to complete this questionnaire. ****

Client Program Management Survey for Project Manager Code: Date:

For the program for which you just answered the questions please answer the following questions for one project within this program. The term "program members" in this questionnaire refers to "project managers or leaders" who are managing various projects in the same client program in which you are a program manager. Please do not omit any questions.

Please read each of the statements below. Please best describes your opinion by marking the appropriate box with an O. You have to circle one choice for each column. Please mark only **one** box for each statement.

SELF COMPETENCE SeC1-8	Strongly disagree ←				Strongly → agree
Program members are highly effective at the things they do.	1	2	3	4	5
Program members are almost always able to accomplish what they try for.	1	2	3	4	5
At times, program members find it difficult to achieve things that are important to them.	1	2	3	4	5
Program members sometimes deal poorly with challenges.	1	2	3	4	5
Program members perform very well at multiple things.	1	2	3	4	5
Program members fail to fulfill their goals.	1	2	3	4	5
Program members are very talented	1	2	3	4	5
Program members wish that they were more skillful in their activities.	1	2	3	4	5
SOCIAL COMPETENCE SC1-6	**Strongly disagree ←**				**Strongly → agree**
Program members connected to the each other's life/experiences	1	2	3	4	5
Program members revealed personal information to their colleagues.	1	2	3	4	5
Program members paid special attention to each other	1	2	3	4	5
Program members went out of their way	1	2	3	4	5
Program members were truly out of the ordinary	1	2	3	4	5
Program members were genuine	1	2	3	4	5
INTERPERSONAL COOPERATION IPCOOP1-9	**Strongly disagree ←**				**Strongly → agree**
Program members take time to listen to other member's problems and worries.	1	2	3	4	5
Program members rarely take a personal interest in other members.	1	2	3	4	5
Program members frequently do extra things that won't be rewarded, but which make cooperative efforts with others more productive.	1	2	3	4	5
Program members pass on information that might be useful to projects of other members.	1	2	3	4	5
Program members willingly help others, even at some cost to personal productivity.	1	2	3	4	5
Program members rarely take others needs/feelings into account when making decisions that affect others.	1	2	3	4	5
Program members try not to make things more difficult for other members at work.	1	2	3	4	5
Program members go out of his/her way to help co-workers with difficult assignments.	1	2	3	4	5
Program members offer to help other members who have heavy work loads.	1	2	3	4	5

COMMUNICATON COMM 1-10	Strongly disagree ←				→ Strongly agree
There was frequent communication within the program.	1	2	3	4	5
The program members communicated often in spontaneous meetings, phone conversations, etc.	1	2	3	4	5
The program members communicated mostly directly and personally with each other.	1	2	3	4	5
There were mediators through whom much communication was conducted.	1	2	3	4	5
Project-relevant information was shared openly by all program members.	1	2	3	4	5
Important information was kept away from other program members in certain situations.	1	2	3	4	5
In our program, there were conflicts regarding the openness of the information flow.	1	2	3	4	5
The program members were happy with the timeliness in which they received information from other program members.	1	2	3	4	5
The program members were happy with the precision of the information received from other program members.	1	2	3	4	5
The program members were happy with the usefulness of the information received from other program members	1	2	3	4	5
EFFORT EFF1-4	**Strongly disagree ←**				**→ Strongly agree**
Every program member fully pushed the program.	1	2	3	4	5
Every program member made the program their highest priority.	1	2	3	4	5
Program members put much effort into the program.	1	2	3	4	5
There were conflicts regarding the effort that program members put into the program	1	2	3	4	5
MUTUAL SUPPORT SUPP1-5	**Strongly disagree ←**				**→ Strongly agree**
Program members helped and supported each other as best they could.	1	2	3	4	5
If conflicts came up in the program, they were easily and quickly resolved.	1	2	3	4	5
Discussions and controversies were conducted constructively.	1	2	3	4	5
Suggestions and contributions of program members were discussed and further developed.	1	2	3	4	5
Program members were able to reach consensus regarding important issues	1	2	3	4	5
CONFRES1-4	**Strongly disagree →**				**← Strongly agree**
The discussions I have with program members on areas of disagreement are usually very productive.	1	2	3	4	5
I generally try to avoid discussing with program members any differences of opinion that I have with them.	1	2	3	4	5
My discussions of areas of disagreement with program members tend to create more problems than they solve.	1	2	3	4	5
The discussions I have with program members on areas of disagreement increase the effectiveness and strength of our relationship.	1	2	3	4	5

Demographic data: Please provide the following information about yourself and the organization.

Which best describes your position: _____ Project leader, _____Technical leader, _____ Module leader, _____Sr. Software Engineer, _____ Other

How long have you been part of this program: _____

How many team members are there in the project belonging in this program: _____

How many years of work experience you have: _____

**** Thank you so much for taking the time to complete this questionnaire. ** If you would like a copy of the report, please mention to the interviewer**