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ABSTRACT

Program teams can greatly facilitate the successful implementation of client ISD programs. We examined the effects of conflict resolution on ISD 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 other's projects. Directions for management practice and future research are discussed.

Keywords

Program management, conflict resolution, communication, mutual support, effort, program performance.

INTRODUCTION

There is a transition in the criterion for the decision to outsource from a cost savings perspective to a strategic perspective. Subsequently, there has been a shift in the management of projects from operational focus to strategic focus for the information systems (IS) outsourcing vendors. IS vendor organizations are increasingly using program management teams to manage complex and interdependent projects (Gierra 2004). Programs are groups of projects, managed together to obtain benefits not available from managing them individually (Maylor, 2003). There are three kinds of IS vendor programs, development, maintenance and implementation (Iyengar, 2003). In this paper we focus on information systems development (ISD) programs. 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) and supplemental development costs due to delays (Dutoit and Bruegge 1998). 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). Some of the 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 (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 2002).

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"). 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).

Most empirical studies, 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 the mechanisms through which conflict resolution affects 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 ISD 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.

BACKGROUND

Conflict 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. 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. Deutsch (1969) 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.

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). Examples of promotive interaction behaviors from Johnson and Johnson (2005) include 1) Providing group members with efficient and effective help and assistance, 2) Exchanging needed resources, such as information and materials, and processing information more efficiently and effectively, 3) Providing group members with feedback to improve the subsequent performance of assigned tasks and responsibilities 4) Challenging group member's conclusions and reasoning to promote higher quality decision making and greater insight into problems 5) Advocating the exertion of effort to achieve mutual goals 6) Influencing each other's efforts to achieve the group's goals 7) Acting in trusting and trustworthy ways 8) Being motivated to strive for mutual benefit. These behaviors are a basic component of cooperation among groups (Johnson and Johnson 1998). Based upon the examples, we have conceptualized and broadly specify promotive interaction as consisting of three core behaviors, 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). These behaviors form an essential part of the cooperation process (Johnson and Johnson 1998). 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. 1.
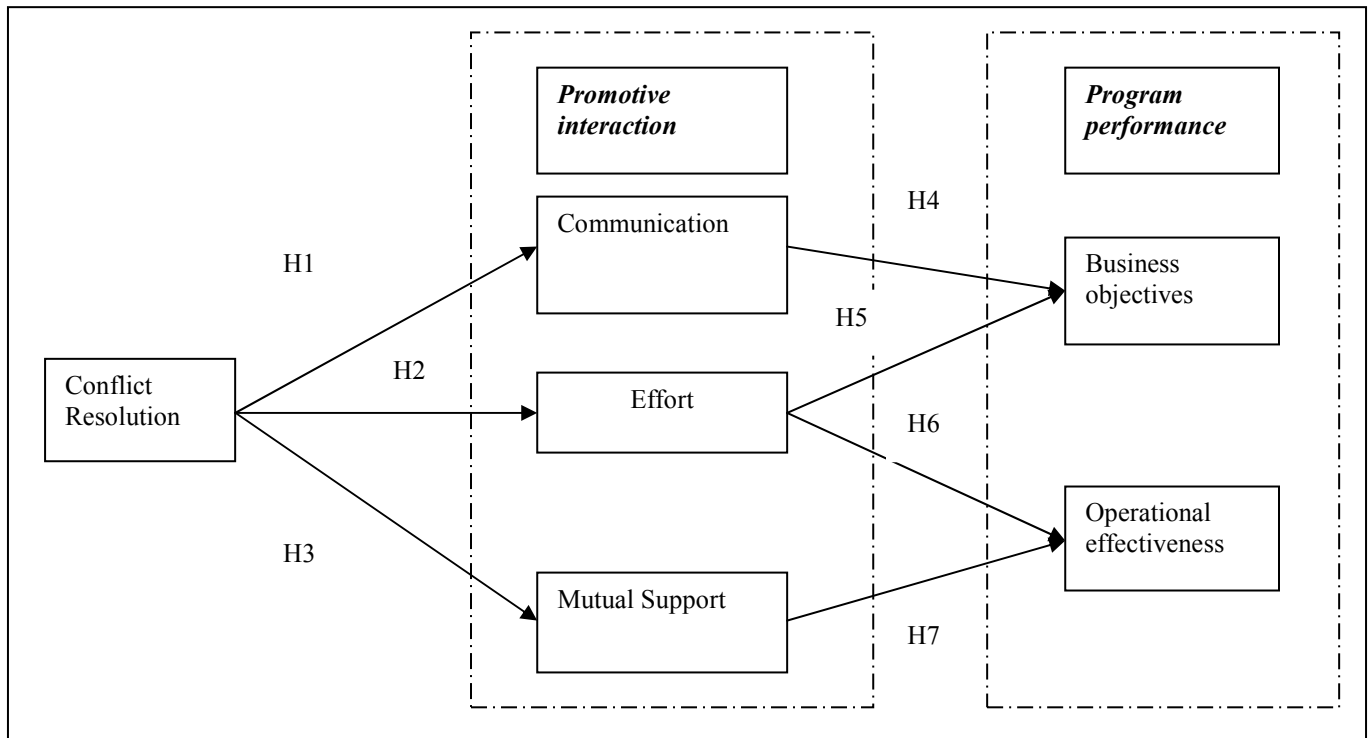

Figure 1: Research model

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). 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). 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 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). Hence this leads us to believe,

H2: Conflict resolution 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 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 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 2002). 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 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). Previous research demonstrated that behavior such as sharing ideas and information (Durham 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 will positively improve the operational effectiveness of the program.

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 1: Organization and Program Characteristics

METHODOLOGY

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. Since collecting paired data at managerial level was challenging, we collected multiple sets of data from same firm where ever possible. There was a single set of respondents from 11 firms, 2 sets respondents from 12 firms, 3 sets respondents from 8 firms, 4 sets of respondents from 4 firms and 8 sets of respondents from 1 firm. The vendors have adopted program and project management practices and most have been assessed at Capability Maturity Model (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. 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 social networking sites 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.

Constructs and Measurement

Conflict resolution refers to program member's attitude toward the possibilities of resolving conflicts with the other program members was assessed by three items modified from (Frazier and Rody, 1991). A sample item included the following statement, "The discussions I have with program members on areas of disagreement are usually very productive".

Communication refers to program member's perception of exchange of information among team members was assessed by six items modified from (Hoegl and Gemuenden, 2001). A sample item included the following statement, "There was frequent communication within the program".

Mutual support refers to 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). A sample item included the following statement, "Program members helped and supported each other as best they could".

Effort refers to program member's perception of workload sharing and prioritizing of the team's task over other obligations was assessed by three items modified from (Hoegl and Gemuenden, 2001). A sample item included the following statement, "Every program member fully pushed the program".

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 (Kerssens-van Drongelen and de Weerd-Nederhof, 1999, 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);
  - A sample item included the following statement, "The program was completed within budget".
- Level of contribution of the program to the vendor's business objectives (4 items)
  - A sample item included the following statement, "The program was aligned with business strategy".

Measurement model

In this study, PLS-Graph Version 3.01 (Chin, 1994) was used to verify the measurement and test hypotheses. 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.

Item reliability, convergent validity, and discriminant validity test were used to test the measurement model in PLS. Individual item reliability is examined by observing the factor loading of each item. All items have loadings higher than the cutting point (0.5). Convergent validity can be examined by testing composite reliability of constructs, and variance extracted by constructs (AVE) (Fornell and Larcker, 1981, Kerlinger, 1986). The convergent validity is assured since, for each construct, the AVE is larger than 0.5, the composite reliability is more than 0.7. Finally, discriminant validity was 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 (Fornell and Larcker, 1981, Chin, 1998).

With regards to sample size, Gefen et al. (2000) advise that the minimum sample size for a PLS analysis should be the larger of (i)10 times the number of items for the most complex construct; or (ii) 10 times the largest number of independent variables impacting a dependent variable. In our model, the most complex construct has 6 items and the

largest number of independent variables estimated for a dependent variable is only two. Thus, our sample size of 88 is more than adequate for PLS estimation procedures.

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 COMM7 COMM8 COMM10	0.83 0.80 0.63 0.68 0.65 0.71	0.86	0.52
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

Table 2: Validity and Reliability

Basic Information					Correlation Matrix					
	Mean	Std. Dev.	M3	M4	1	2	3	4	5	6
1 CONFRES	3.93	0.71	-1.65	3.92	**0.80**					
2 EFFORT	3.77	0.75	-0.46	0.56	0.40	**0.84**				
3 SUPPORT	3.87	0.62	-0.55	0.95	0.62	0.51	**0.78**			
4 COMM	3.75	0.63	-1.36	2.42	0.67	0.59	0.72	**0.70**		
5 BUS OBJ	4.15	0.56	-0.27	-0.42	0.44	0.47	0.37	0.46	**0.78**	
6 OP EFFEC	3.93	0.59	-0.83	0.98	0.39	0.48	0.58	0.53	0.65	**0.76**

M3: Skewness; M4: Kurtosis

The diagonal line of correlation matrix represents the square root of AVE
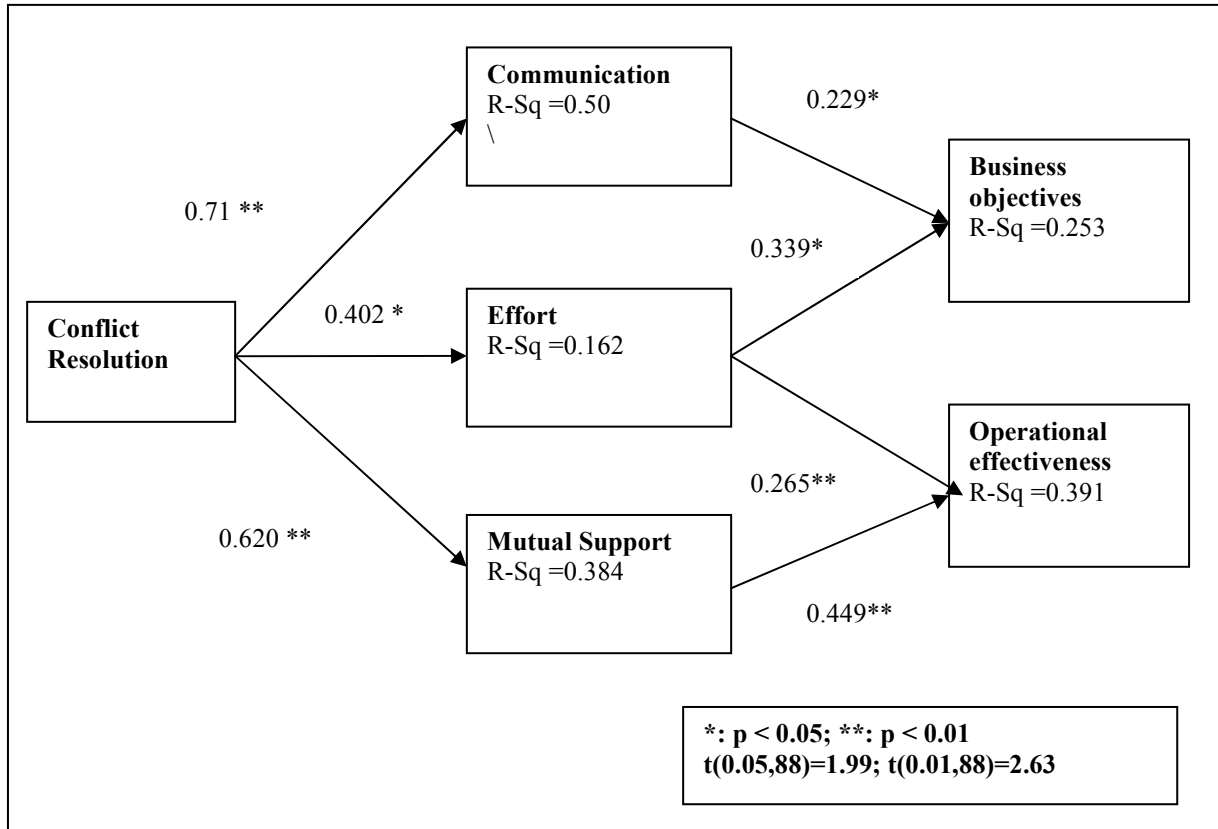
Table 3: Basic Information & Correlation Table

Figure 2: Path analysis

Data Analysis

As shown in Fig 2, all hypotheses are supported. Promotive interaction (communication, effort and mutual support) fully mediated the effects of conflict resolution on two dimensions of program performance.

The purpose of our study was to examine and document the effects of conflict resolution mechanism in outsourced ISD programs. 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 49.9% 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 25.3% of variance in achievement of business objectives. Effort and mutual support explained 39.1% 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 members and promoting mutual supportiveness to each other's projects.

DISCUSSION

Contribution to Theory

Theoretical underpinnings of this study was based upon Pondy (1967)'s organizational model of conflict which postulated the development of 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 interaction mechanisms (communication, mutual support and effort) which lead to cooperation. Further, we empirically illustrate the relationships.

The results of the path analysis revealed several important findings. First, conflict resolution is an important antecedent condition and explains significantly the presence of promotive interaction variables of communication, mutual support and effort. Second, theoretical perspectives on conflict aftermath were found to reasonably predict these 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 about the absence of literature dealing with this topic in IS project and program teams. The relevance of research findings in this area is hence justified. All relationships presented in this research were significant, although the details of their significance were not exactly in the terms of our hypotheses.

Managerial Implications

A limitation of this study is the generalizability of data to other contexts. Even though the data is collected from India, majority of the firms are multinational corporations with development centers distributed globally. This suggests limited generalizability of results and hence we recommend future research in other settings. Another limitation of this study is that data was collected from a convenience sample. In addition to developing theoretical understanding, support for the hypotheses may have important practical implications for structuring IS program teams. Reward structures could be based in part on how groups want to resolve their conflicts for mutual benefit (Hanlon et al., 1994). Program members work to resolve the conflict so that both benefit, not just their individual projects, and combine the best ideas to implement a solution that promotes mutual program goals.

Conflict resolution is of greater importance in program environment. Since program members consist primarily of 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 own project is of primary importance for the program member while contribution to other member's project is of secondary importance. Unless conflicts are resolved program members do 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. Conflict management training programs or formal dispute resolution consultation is required to train and assist program members. Since program environment is different from project environment, program managers need to take responsibility for securing and providing training in conflict prevention and resolution techniques to program team members.

Promotive interaction can be improved by requiring certain levels of cross-project training, or structuring groups. Program managers must be able to assign projects to project managers who possess the requisite skills, attributes, and behaviors that facilitate effective promotive interaction. Performance parameters for program members should include assessments of conflict resolution skills in addition to social and project management expertise.

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