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Antecedents of Interdepartmental Conflict in Cross-Functional Enterprise Integration Project Teams

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Abstract

The rapid growth in enterprise integration projects has revealed weaknesses in the management of cross-functional IS development teams. Some of the problems identified in practice stem from conflict between departmental groups within these development teams. This paper proposes a research model intended to illustrate the major factors that lead to interdepartmental conflict, and the impact of that conflict upon project quality measures. The research draws on a structural model of conflict developed in the marketing literature and modified to reflect the characteristics of cross-functional enterprise integration projects. The results are likely to be of interest to both conflict and MIS researchers, and to IS and business professionals who are planning enterprise integration projects.

Keywords: conflict; cross-functional project teams; IS development; enterprise integration

1. INTRODUCTION

The effective management of enterprises increasingly requires integrated information that reflects a broad view of operations, incorporating data from many functional areas or across business processes. The integration of information systems is also central to the adoption of electronic commerce applications. These integration projects can take many forms that range from maintaining existing systems and integrating only the data (such as in data warehousing) through to integrating existing systems or replacing them with new integrated enterprise resource planning (ERP) systems. Projects to implement these types of systems depend heavily on collaboration between business and IS professionals - collaboration delivered chiefly through the use of cross-functional development teams.

Unfortunately many attempts to implement projects using cross-functional teams are hamstrung by "organisational politics". Although "organisational politics" is often blamed for failed and dysfunctional IS development processes, scrutiny of the descriptions often reveals that the core phenomenon is more accurately described as conflict between individuals and groups. Political manoeuvring may be invoked in response to conflict episodes but the

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conflict, not the politics, is the first-order condition. Although conflict was once typically discussed in a pejorative tone (Pondy, 1967; Brown, 1983; Eisenhardt and Zbaracki, 1992; Wall and Callister, 1995), researchers now consider conflict to be a process characteristic to be managed (Deutsch, 1969, 1973, 1990; Stern and El-Ansary, 1977; Robey, 1984 ; Kolb and Sheppard, 1985) and, under certain conditions, a potential source of benefit (Tjosvold, 1991; Frazier and Rody, 1991; Bucklin and Sengupta, 1993; Menon et al., 1996; Jehn, 1995, 1997; Eisenhardt et al., 1997). The ability of conflict to be both a positive and a negative force makes it a fascinating and important topic to study.

Enterprise integration projects typically involve a combination of specialists from business departments (e.g. marketing, accounting, etc.), IS departments (e.g. network administration, database administrators, etc.), and external consultants. To ensure the delivery of anticipated business benefits there must be a tight meshing between technologists and business specialists. This level of interdependence is typical of cross-functional IS development teams in general, and enterprise integration project teams in particular. Interdependence and task complexity (Lawrence and Lorsch, 1967), and pressure to come to an agreement Baron (1988) are central to the emergence of conflict. The high levels of interdepartmental interaction and co-ordination associated with cross-functional teams also provide opportunities for diverse goal and belief systems to come into contact (Tjosvold, 1991; Jackson, 1992) and thereby introduce additional opportunities for conflict to emerge (Smith and Berg, 1987).

Enterprise software projects are, for most organisations, highly non-routine activities. Jehn, (1995) found these non-routine types of activity to be most commonly associated with the beneficial effects of conflict. Software projects are also susceptible to the problems of embeddedness. Issues left inadequately explored at design time, and important positions inadequately defended, can result in systems with embedded weaknesses. These systems lack the flexibility to cope with changing business conditions and fail to deliver the required functionality for long term competitiveness. Too little conflict in a project team is an indication that team members either agree on all topics, or acquiesce to the demands of others. Either alternative is indicative of dysfunctional structures and/or processes. Maintaining adequate levels of conflict in these projects can help ensure that decisions are not made too easily and without consideration of important viewpoints.

Conflict has received only modest attention in the IS literature. This paper proposes a structural model of the emergence of conflict in enterprise software projects. The following sections review some of the relevant literature and present the proposed research model together with candidate hypotheses. The paper concludes with a brief discussion of the research contributions.

2. CONFLICT IN INFORMATION SYSTEMS DEVELOPMENT

Conflict in system development is usually a special case of interdepartmental or lateral conflict in organizations, where departments with different subgoals may intentionally or unintentionally interfere with one another's attempts to achieve subgoals ... The potential for conflict in system development is therefore great, and potential disagreements are likely to become manifest under conditions of high interdependence among group members in project meetings (Robey et al., 1989, p.1173).

2.1 Conflict defined

Conflict can be either latent or manifest (Robey et al., 1993). The research model in this paper is concerned with examining manifest conflict (i.e. observable conflict behaviour). Robey (1989, p. 1173) adopted the definition used by Schmidt and Kochan (1972) that conflict is “the interference by one individual or group in the attempts by another individual or group to achieve a goal.” Robey (1993, p. 125) defined conflict as “manifest disagreement among group members”. Wall and Callister (1995, p. 517) defined conflict as “a process in which one party perceives that its interests are being opposed or negatively affected by another party.”

Previous research into the emergence and impacts of conflict in IS development projects has adopted a unidimensional concept of conflict (Robey, 1989, 1993; Santana, 1997). Barki and Hartwick (1994) represented conflict and disagreement as a multidimensional concept of conflict but Robey (1994) argued this concept was actually two separate constructs. Elsewhere in the organisational and psychological literature there is a growing consensus that group conflict is multidimensional with one form of conflict being based on the **tasks** being addressed by the group members, and another form of conflict based on the **relationships** between group members (Guetzkow and Gyr, 1954; Wall and Nolan, 1986; Pinkley, 1990; Priem and Price, 1991; Jehn, 1995; Amason, 1996; Sessa, 1996). Jehn (1995, p.258) described the two types of conflict as follows:

Relationship conflict exists when there are interpersonal incompatibilities among group members, which typically includes tension, animosity, and annoyance among members within a group. Task conflict exists when there are disagreements among group members about the content of the tasks being performed, including differences in viewpoints, ideas, and opinions.

Most organisational conflict researchers now adopt the bidimensional concept of conflict. Jehn (1997) introduced a third conflict construct – process conflict – that pertained to the organisation of work activities. Although process conflict can be interpreted as a distinct construct, a more parsimonious description is that process conflict is a subtype of task conflict.

Conflict can be examined at many levels from individual through to interorganisational. Wall and Callister (1995) noted broad agreement among conflict researchers that the conflict process is similar at each level. Barclay (1991 p. 146 citing Seiler, 1963 and Katz and Kahn, 1978) maintained that an interdepartmental level of analysis was appropriate because conflict between individuals in interdepartmental dyads is role behaviour - the conflict "reflects their roles as representatives of their departments." Pelled and Adler (1994) adopted the same approach, maintaining that individuals within multifunctional teams behaved as representatives of their functional areas. Blake and Mouton (1984) argued that the representative role played by individuals was regulated by rules and norms determined by their affiliation with the group they represent.

The research model presented in this paper is concerned with conflict at the intergroup level, where several groups comprise a cross-functional IS development teams. A group is defined as being composed of individuals representing a particular interest (e.g. the interests of business or IS departments) within the project team.

2.2 Conflict in the IS literature

Conflict research in the IS literature has concentrated on the relationship between conflict and conflict resolution (Robey and Farrow, 1982; Robey, 1984; Robey et al., 1989; Barki and Hartwick, 1994) and on the impact of conflict and conflict resolution on project success (Robey et al., 1993). Although primarily concerned with the outcome of conflict in IS development, some of this research has examined *participation* and *influence* as contextual factors associated with the emergence of conflict in IS projects. The studies by Robey et al. and Barki and Hartwick, each identified participation as a significant factor in understanding conflict in "traditional" IS development. The context of the research model proposed in this paper is intended to be cross-functional teams, however, rather than general IS development. In general IS development there can be considerable variance across projects in the extent to which different organisational groups are involved. The IS group, for example, might provide both leadership and development expertise to a project and require only minimal involvement of a user group. Alternately a user group might initiate and manage a project largely without the input of the IS group within their organisation. The relative level of participation in each of these examples would likely play a major role in determining the nature and extent of interdepartmental conflict in these project groups. The research model envisaged in this paper, however, is of greater relevance to those projects in which the level of participation over the term of the project is shared between departments or interest groups i.e. the project team is genuinely cross-functional. Because each group (i.e. business and IS groups) in these teams is integral to the development process, there will be less variance in the level of participation of participant groups than in either IS-led or user-led development projects. Participation and user involvement are therefore less useful as independent variables in this model than in the prior work described above. The decision to focus only on cross-functional teams is an attempt to simplify the development context and to thereby limit the complexity of the research model. Attempts to expand the model and/or its context of application should be guided by further theoretical development and by empirical testing of work done so far.

The IS conflict research has demonstrated that group influence plays an important role in the generation of conflict. Despite the findings in Robey et al. (1989; 1993) that influence bore a positive relationship with conflict, Barki and Hartwick (1994) found a strong negative relationship. In the context of a short-term, discrete project team it is difficult to determine *a priori* the impact of influence upon conflict. The model in this paper follows from other structural models of interdepartmental conflict (e.g., Barclay, 1991, Pelled and Adler, 1994) and excludes individual and group characteristics from consideration. Wall and Callister (1995) similarly noted that personality and individual differences are likely to have only a minor impact on interpersonal conflict.

2.3 Conflict in the organisational literature

There has been surprisingly little research into the antecedents of task and relationship conflict (Amason, 1996) with a large part of the literature preferring to concentrate on the consequences of conflict. The models in the prior IS literature were more concerned with the determinants of project success than with antecedents for conflict – only 16% of the variance in conflict was explained by the model in Robey et al. (1993). The foundation upon which the current research model is Barclay (1991), who developed and tested a model of interdepartmental conflict in the context of organisational purchasing. Barclay's model explained 62% of the variance (using PLS) in manifest conflict – considerably higher than

many contemporary conflict models. The model has since been adapted to examine interdepartmental conflict in product development (Menon et al., 1997) and in the process of formulating marketing strategy (Menon et al., 1996). The model is robust to changes in context, and indicates some measure of general applicability to conflict that arises within situations that require interdepartmental co-ordination.

Barclay (1991) postulated antecedents at three levels: overall organisational, departmental, and interdepartmental. Despite a large sample size he found that the only significant sources of conflict in this context were (in order of decreasing effect size) communication barriers (+ve), jurisdictional ambiguity (+ve), suboptimising incentives (+ve), centralisation of authority (+ve), and formalisation (-ve). Barclay concluded that the main sources of conflict were contextual, rather than characteristics of individuals or departments (in accord with the literature cited above).

Two studies that examined the influence of conflict on outcomes are Jehn (1995) and Amason (1996). These two studies are described briefly here because they both use a bidimensional concept of conflict and they both examine conflict within the context of teams. Amason (1996) examined the impact of cognitive conflict (task conflict) and affective conflict (relationship conflict) on the performance of top management teams. This study found that cognitive conflict was associated with improved decision outcomes (decision quality, understanding, and affective acceptance), whereas affective conflict appeared to reduce decision quality and affective acceptance. Jehn (1995) examined conflict within both management teams and work groups using a combination of survey and qualitative methods. She found that task type moderated the impact of conflict on performance. Task conflict was negatively related to performance for routine tasks, but was positively related for non-routine tasks. Relationship conflict had no effect on performance. Both task conflict and relationship conflict were negatively associated with individual satisfaction.

The research model described in the following section draws from each of these studies.

3. THE RESEARCH MODEL

3.1 Specification of the model

This research model distinguishes between two types of conflict (from Jehn, 1995):

Task conflict refers to disagreements among project team members about the content of tasks being performed, including differences in viewpoints, ideas, and opinions.

Relationship conflict refers to interpersonal incompatibilities among project team members, which typically includes tension, animosity, and annoyance.

The model is concerned with interdepartmental conflict, specifically conflict between groups from the IS function on the one hand, and groups representing business units or departments on the other. The unit of analysis is intended to be the project team. The research model proposed here is an adaptation and extension of Barclay's structural model of interdepartmental conflict in organisational buying and is shown in Figure 1.

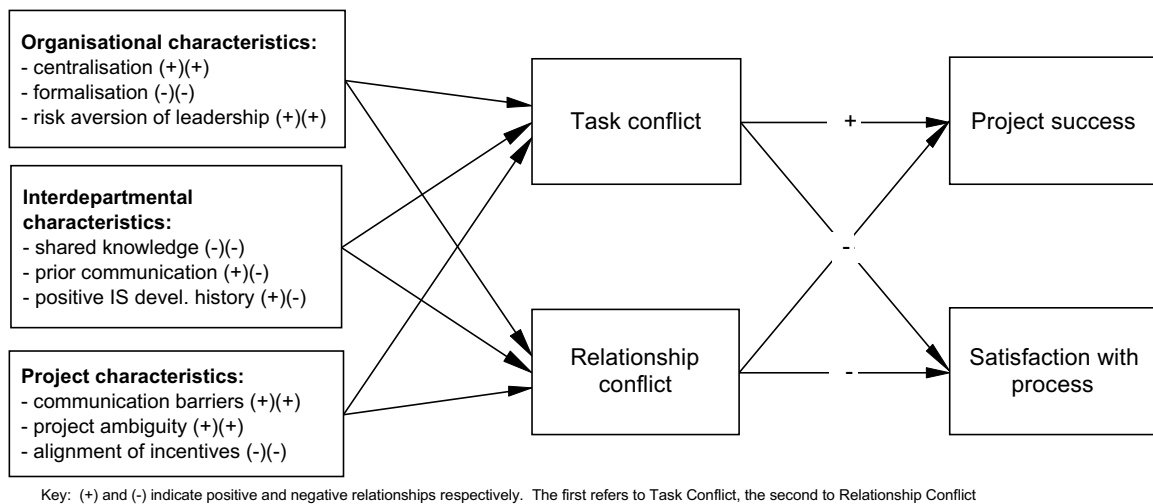


Figure 1. Proposed research model

Several assumptions are made in adapting Barclay's model to explain IS development phenomena. As noted in a previous section, there is considerable evidence that the conflict process is similar across levels and domains (Wall and Callister, 1995). The major concern with adapting a structural model of conflict is the generality of the contextual factors. Barclay's original model was successfully adapted to investigate conflict in a product development setting (Menon et al., 1997) and in the formulation of marketing strategy (Menon et al., 1996). Although the process of developing an information system is quite different from that of developing a marketing strategy or new product, each of these processes share several characteristics: ambiguous design problems; cross-functional co-ordination; the solution often calls for creativity and innovation; and the application domain is characterised by uncertainty. It seems reasonable to suggest that Barclay's model is likely to be relevant to learning about interdepartmental IS development processes. Only additional research can validate the proposed independent variables or suggest alternatives.

The major changes to Barclay's original model since its publication have been the dropping of departmental characteristics (Menon et al., 1996; Menon et al., 1997) and the adoption of a two dimensional concept of conflict (Menon et al., 1996). The prior literature indicates clearly that conflict is best thought of as having a task component and a relationship component, and this approach is adopted in the proposed research model.

As noted earlier, this research model is concerned with the structural conditions that give rise to two forms of conflict – task conflict and relationship conflict. The antecedent conditions exist within a hierarchy of levels in each organisation (Wall and Callister, 1995). At the highest level, organisation-wide conditions promote or hinder the manifestation of conflict between departments and set the tone for normal operations within the organisation. The second level of antecedent conditions occurs at the level of interdepartmental interactions. These interactions prior to the commencement of the IS project provide a context in which each of the relevant departments enters the project relationship. Members from each department bring with them expectations and preconceptions based, at least in part, on their

joint histories. The lowest level of conditions is the project team where the structure of the team directly impacts the interactions between team members.

These antecedent conditions do not exist independently of each other. The interdepartmental characteristics may be shaped by the organisational characteristics and the project characteristics may in turn be shaped by factors at both of the higher levels. Strong relationships between these variables at different levels could confound the subsequent analysis of research data. The original Barclay model was tested for indirect paths and there were no significant indirect effects found for the variables retained in the model from that study. The studies that have enhanced the model since that time have not demonstrated relationships between the independent variables. Because the proposed model is a modification of existing models, testing for correlations among the antecedents and interaction effects should necessarily be part of the initial data analysis. The discussion below, however, is limited to the anticipated direct effects.

The following sections describe the variables that comprise the research model together with candidate hypotheses that could be empirically tested. The dearth of structural models in the literature that explain both task and relationship conflict means there is little guidance for some of the hypothesised relationships described below (particularly for relationship conflict). For some constructs the direction of influence appears to be the same for both task and relationship conflict, whereas for others the effects appear to be opposed. Empirical testing is obviously required to strengthen the current understanding of these relationships.

3.2 Organisation-level variables

The organisation-level factors in the proposed model are centralisation, formalisation, and the risk aversion of the organisation's leadership.

3.2.1 Centralisation

Centralisation refers to the vesting of decision-making authority in the central managerial core of an organisation. As Aiken and Hage (1968) originally specified the construct, centralisation was composed of two subconstructs - participation in decision making and hierarchy of authority. Previous conflict studies (e.g. Barclay, 1991; Menon et al., 1996; Menon et al., 1997) have not included the participation in decision making subconstruct. Centralisation (in these studies) is therefore, more correctly, a measure of hierarchy of authority. Prior research has shown that centralisation can reduce group cohesion (Evans and Dion, 1991), create a climate for tension and conflict (Menon et al., 1997), and heighten conflict between departments (Dewar and Werbel, 1979; Pfeffer, 1981). Barclay (1991) found that centralisation of authority promoted interdepartmental conflict in a buying context. Menon et al. (1997) also found centralisation of authority to be a significant contributor to interdepartmental conflict in new product development. Menon et al. (1996) found that centralisation of authority increased dysfunctional task conflict but had no impact on functional task conflict in the context of marketing strategy. Decentralised decision making authority has been shown to improve communication, resource exchanges, and co-operation among functional groups (Tjosvold, 1985). The anticipated effect of increased centralisation of decision authority is therefore to increase the incidence of conflict between departments.

H1: Task conflict increases as the level of centralisation increases.

H2: Relationship conflict increases as the level of centralisation increase

3.2.2 Formalisation

Formalisation is the extent to which rules and procedures are standardised and formally codified. Work environments in which business processes are characterised by detailed standard operating procedures would be considered highly formalised. The impact of formalisation on performance, and on a variety of personal and organisational characteristics, has been mixed in the literature (Menon et al., 1996). Barclay (1991) found that formalisation tended to mitigate conflict but noted that formalisation might also promote conflict in some circumstances. Individuals might regard the imposition of formal rules and procedures as a reduction in autonomy and control. The consequent frustration could lead to increased conflict, perhaps directed towards other departments. This contention has some empirical support (Child, 1973). Menon et al. (1996) found that formalisation reduced dysfunctional conflict but did not have a significant impact upon functional conflict. As the roles and tasks within an organisation become more defined, so too do the responsibilities of departments and the relationships between them. Higher degrees of formalisation at the interface between departments may reduce the number of opportunities for conflict episodes, help create a climate of interdepartmental co-operation, and provide established methods for resolving disputes. Overall the evidence available suggests that, on balance, the effects of higher levels of formalisation will be to reduce interdepartmental conflict.

H3: Task conflict decreases as the level of formalisation increases.

H4: Relationship conflict decreases as the level of formalisation increases.

3.2.3 Risk aversion of leadership

The risk aversion of an organisation's leadership refers to the unwillingness of top managers to "accept occasional failures as a normal part of business" (Menon et al., 1997, p. 190). Such risk aversion is anticipated to induce departments into conflict because each will be trying to avoid responsibility for failures, particularly in the course of completing non-routine tasks where there may be ambiguous divisions of responsibilities. This variable was not part of Barclay's original model but was included in Menon et al. (1997) who found that top managers' risk aversion was positively correlated with interdepartmental conflict. The high costs and learning curve effects of complex IS projects suggest that organisations in which senior managers are prepared to accept initial setbacks will be better prepared to cope with the problems that beset many enterprise integration projects. In a generally risk averse environment, teams charged with an inherently risky undertaking are likely to experience heightened tension that could lead to increased conflict between project participants. In a less risk averse environment, however, the climate of risk-related tension is likely to be lower, decreasing the propensity for conflict. The overall anticipated effect of risk aversion on IS projects is to increase the level of conflict experienced.

H5: Task conflict increases as the level of risk aversion increases.

H6: Relationship conflict increases as the level of risk aversion increases.

3.3 Department-level variables

The second level of independent variables occurs at the level of interdepartmental interactions (between the groups involved in the project team) prior to the commencement of the project. The pre-project departmental interaction factors are *shared knowledge*, *history of successful IS development* and *prior communication*.

3.3.1 Shared knowledge

Shared knowledge is a construct that has emerged in parts of the IS literature as a determinant of IS performance in organisations (Reich, 1992; Reich and Benbasat, 1996; Nelson and Coopridner, 1996; Chan et al., 1997). Nelson and Coopridner (1996 p. 411) defined shared knowledge as “an understanding and appreciation among IS and line managers for the technologies and processes that affect their mutual performance”. Keen (1988 p. 52) noted that the “relationship between IS and business managers has to be one of mutual understanding - not of the details of each other's activities, knowledge, and skill bases, but of the other's needs, constraints, and contribution to an organisational venture partnership.” Feeny and Willcocks (1998, p. 17) wrote that:

... relationships between IS and, say, marketing [are] dependent not on marketing expertise that rivals that of marketing professionals, but rather on convincing those professionals that you understand their goals, concerns, language, and processes and are trying to help them achieve those goals.

Shared knowledge is defined in the proposed model as the extent to which team members from information systems departments and business departments understand each other's objectives, constraints, language, technologies, and processes. The construct is intended to capture aspects of the relationship between the IS departments and the business departments, as they interact in the normal course of business. Higher levels of shared knowledge will lead departments to be more sensitive to each other's concerns, constraints, and objectives, and thereby to reduce interdepartmental conflict in situations in which they are brought into interaction.

H7: Task conflict decreases as the level of shared knowledge increases.

H8: Relationship conflict decreases as the level of shared knowledge increases.

3.3.2 History of successful IS development

In many organisations the relationship between the IS departments and business departments is determined to a large extent by their mutual histories. IS departments in particular are judged by their business counterparts on the basis of their ability to deliver and maintain effective information systems solutions and to meet time and resource constraints. IS departments that are perceived to have failed to deliver on project promises generally do not have the confidence of business departments when new IS projects are proposed. This condition seems to persist regardless of changes in IS personnel. Although the credibility of IS departments has been discussed in prior literature (Ross et al., 1996; Bashein and Markus, 1997) there is little empirical work to guide its inclusion in the proposed model. A positive history of IS development should help to promote the positive exchanges that contribute to

task-related conflicts and reduce the distrustful bickering that might be indicative of relationship conflict.

H9: Task conflict increases as the level of positive IS development history increases.

H10: Relationship conflict decreases as the level of positive IS development history increases.

3.3.3 *Prior communication*

Prior communication refers to the extent of contact between business and IS departments prior to the commencement of the project. Barclay (1991) used a construct called *interdependence* with items that measured not only interdependence but also contact between departments. Interdependence usually has a positive relationship with conflict (the more groups rely upon each other the greater the opportunities for disagreement) but contact between departments can reduce conflict (greater familiarity can lead to higher levels of trust, anticipation, etc.). Barclay suggested the issues of construct validity might explain his observed small negative relationship between his measure of interdependence and conflict. Menon et al. (1996) adopted interdepartmental connectedness as a measure of contact between departments and found a significant positive relationship with functional conflict. Increased communication provides additional opportunities for disagreement concerning work processes, increasing the amount of task conflict occurring in interdepartmental interactions. At the same time, an expectation of continuing future interaction could increase the preparedness of departments to collaborate and minimise non task-related disagreements. To the extent that prior patterns of communication set norms of conduct with respect to interdepartmental interactions, these norms might be expected to spill over into the project setting and reduce the incidence of relationship conflict.

H11: Task conflict increases as the level of prior communication increases.

H12: Relationship conflict decreases as the level of prior communication increases.

3.4 *Project-level variables*

The final level of antecedent conditions is the project itself. The project-level factors are *communication barriers*, *project ambiguity*, and *alignment of incentives*.

3.4.1 *Communication barriers*

Barriers to communication reduce the ability of departments to manage situations in which conflict might arise (Thomas et al., 1972). In this model, communication barriers refers to constraints that limit the extent to which communication can occur between departments involved in the project. These barriers may be physical, related to timing of activities, or personal characteristics. Barclay (1991) found communications barriers to be one of the main causes of conflict. This factor was also a significant cause of dysfunctional conflict in Menon et al. (1996).

H13: Task conflict increases as the level of communication barriers increases.

H14: Relationship conflict increases as the level of communication barriers increases.

3.4.2 Project ambiguity

Project ambiguity refers to the ambiguity - uncertainty and confusion - surrounding the conduct of the project. The factors that contribute to project ambiguity are taken largely from the project management and software risk literatures. Barki et al. (1993) collated and tested the risk variables identified in their review of the IS risk literature. Pinto and Slevin (1987) likewise reviewed the broader project management literature in developing their list of critical success factors for project implementation. The factors identified in each of these papers are listed in Table 1. These risk factors and many of the critical success factors relate directly to project uncertainty. It is this project uncertainty that is intended to be captured by the project ambiguity construct in the proposed model.

Table 1 Project risk and critical success factors

Barki et al. (1993)	Pinto and Slevin (1987)
1. technological newness	1. clearly defined goals
2. application size	2. competent project manager
3. expertise	3. top management support
4. application complexity	4. competent project team members
5. organizational environment	5. sufficient resource allocation
	6. adequate communication channels
	7. control mechanisms
	8. feedback capabilities
	9. responsiveness to clients

Project ambiguity can lead to manoeuvring among the participant groups to take a leadership role or move the project in a direction that best satisfies the objectives of one group or another. In the presence of task uncertainty, project team members can perceive prior agreements to be invalid or open to renegotiation. If there is no clear prescription for action, situations are likely to be interpreted by team members according to the standards and beliefs of the departments that they each represent. Feelings of ambiguity could lead also to task-related frustration that could in turn result in heightened conflict between project participants.

H15: Task conflict increases as the level of project ambiguity increases.

H16: Relationship conflict increases as the level of project ambiguity increases.

3.4.3 Alignment of incentives

Alignment of incentives refers to the extent to which project participants are rewarded on the basis of measures of project success. Rewarding departments for attending to their own objectives can lead to competition between departments and hence to conflict. Reward mechanisms that focus attention on individual effort can lead to perceptions of the organisation as an unfriendly place in which to work (Barclay, 1991) and may encourage resentment between departments. Menon et al. (1997) demonstrated that market-based rewards decreased conflict and increased co-operation between departments. Barclay (1991) found misalignment of incentives to be one of the top three causes of interdepartmental conflict. Project-related incentives are also often suggested in the practitioner literature as conducive to positive IS project outcomes.

- H17: Task conflict decreases as the alignment of incentives increases.
H18: Relationship conflict decreases as the alignment of incentives increases.

3.5 Outcome measures - success and satisfaction

Specification of outcome measures is always problematic in a general model describing processes in IS development. The focus upon project success and group member satisfaction is somewhat arbitrary, and follows simply from prior conflict studies. The relevant outcome measures from the perspective of an organisational IS group may well be very different from those of a user or management group.

3.5.1 Project success

The research literature has shown mixed results with respect to the impact of conflict upon group performance. Part of the confusion stems from the different types of groups being studied. In a study of strategic decision making groups, Amason (1996) found that task-related conflict was positively correlated with group performance whereas affective conflict was detrimental to group performance. In studies of work groups and management teams, Jenn (1995) found no association between relationship conflict and group performance whereas task conflict was, under some circumstances, beneficial to individual and group outcomes. Specifically, the relationship between task conflict and individual performance and between task conflict and group performance was found to be curvilinear i.e. there is a positive relationship up to a certain level of task conflict, beyond which performance declined. An interesting outcome was that this threshold of task conflict was much higher for groups performing non-routine tasks than for routine tasks. Porter and Lilly (1996), however, found the impact of task-related conflict upon the performance of project teams to be always negative. An important difference between these two studies is that Jenn was observing actual teams in a work setting whereas Porter and Lilly were observing students in an academic setting. The measures of project success envisaged here are objective performance measures relative to the project plan, budget, etc. Such measures can be of limited value in some circumstances, however, and other performance measures could be substituted (e.g. sponsors' perceptions of project success, etc.).

- H19: Project success increases as the level of task conflict increases.
H19a: There is a curvilinear relationship between task conflict and project success such that low levels of task conflict will be associated with low levels of project success, high levels of task conflict will be associated with high levels of project success, and very high levels of task conflict will be associated with moderate levels of project success.
H20: Project success decreases as the level of relationship conflict increases.

3.5.2 Satisfaction with project process

The other outcome measure presented in the model is satisfaction with the development process. Jehn (1995) found that both task and relationship conflict reduced the satisfaction of group members with the group. Following Jehn the anticipated measures of satisfaction for this model would be individual group members perception of satisfaction with the group (e.g. satisfaction with other team members, willingness to work in the group again, etc.).

H21: Satisfaction with the group process decreases as the level of task conflict increases.

H22: Satisfaction with the group process decreases as the level of relationship conflict increases.

4 EXPECTED CONTRIBUTION OF THE RESEARCH MODEL

The causes and impacts of conflict in general, and in IS projects in particular, are poorly understood. The mixed findings in the literature demonstrate that conflict in organisations is a complicated topic. By building on the foundation provided by other researchers, the research model could be used to clarify prior research and to guide future research and model development.

The research model can also help contribute knowledge to IS and business managers about to embark on cross-functional IS development projects. By taking into account the characteristics of their organisations and the normal interactions between the target departments, project managers may be able to better understand the climate for conflict and anticipate the forces that will influence the emergence of conflict. Project team design may then take these considerations into account, and project management practices developed to manage the anticipated conflict and perhaps encourage task conflict. The findings from case study research using the model could illuminate some practices that project managers have found useful for dealing with intra-project conflict, and preventing task disagreement from turning into relationship conflict (Brehmer, 1976). This area is particularly important because many IS professionals have limited experience in dealing positively with conflict (Salaway, 1987).

Hopefully IS researchers and doctoral students will find the proposed model useful for designing and conducting research into managing cross-functional processes and structures. As noted in the anonymous reviewers comments, the independent variables described in the paper are equally applicable to general IS development. A factor model that purported to explain conflict in general IS development would also need to include the relative level of participation of the interest groups in the project team (following the work of Robey and Barki et al described in §2.2). Expansion of the model to cover other types of IS development may well be a useful exercise for future research. A useful extension of the model would be to also examine task impacts. Activities during the conduct of a project may be differentially susceptible to conflict episodes (either task or relationship). For example, the conflict implications of process engineering in an ERP project may be very different from activities related to configuring the software in the same project. Research into task impacts as well as appropriate conflict management activities for each activity could be especially useful to enterprise system developers.

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