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**Goal Conflict and Communications in
Multi-Organizational Projects: A Two Cases Comparative Study**

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UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

Abstract

The purpose of this study is to examine how the level of goal conflict among the participant organizations in a multi-organizational project influences the level of communication among project team members. Two different multi-organizational projects cases were studied. Based on the data collected for the first case, a preliminary causal model was developed. The causal model was contrasted to the data collected for the second case. An additional assessment of the possible validity of the model in other contexts was performed through questionnaires completed by a panel of experts, and by comparison of the model structures to previous research findings in related areas. The contribution of this study is a proposed causal model describing the dynamics related to team communications induced in the work system by a high level of goal conflict in a multi-organizational project. The study findings suggest that these dynamics affect the level of trust, relationship conflict, communication and then performance, in a reinforcing feedback cycle. Implications for practitioners, limitations of the study and avenues for future research are discussed.

Keywords

Multi-organizational Projects, Goal Conflict, Trust, Relationship Conflict, Communications.

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

Introduction

The level and quality of communication between project team members has been associated with high levels of project team performance (Chiocchio, 2007). Communication between project team members can be particularly important when there is a high level of task interdependence between project team members (Andres and Zmud, 2002). The relationship between goal conflict, trust, relationship conflict and the level of communication in teams has been documented in the literature in a segmented way, non integrative way (Pelled, 1996; Butler, 1999; deDreu and Weingart, 2003; Dyer and Chu, 2003). However, to the best of my knowledge no research has been conducted on the mechanisms through which goal conflict might affect communications within a project team.

Goal conflict is not a rarity in current project teams, since more and more projects are executed by cross-functional teams or by completely different organizations in consortia, partnering and joint ventures (Kanzanjian et al., 2000; O’Sullivan, 2003). These organizations might bring their own goals for the project in response to their markets needs and competitive environments, and the achievement of one organization goals might be in contradiction with the goals that another participating organization might have for the project. This study attempts to start filling a gap in the project management literature focusing on “how’ the level of goal conflict might affect the quality and level of communications among project team members in a multi-organizational project.

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

To investigate the research question, I studied two multi-organizational projects cases in which high levels of goal conflict were present. Based on the data collected for the first case, I developed a preliminary influence model in which the cause-effect relationships between goal conflict and the level of communications among the project team members are described. That model was contrasted to the data collected in the second case.

To further assess the potential external validity of the proposed model, I requested a panel of experts to examine the degree to which the model reflects their own experiences in multi-organizational projects. I also compared the model developed with past research in project communication and the social –psychology fields. Finally, the implications of the model to practitioners and future researchers, as well the limitations of the study are discussed.

Research Methodology

The methodology adopted to investigate the research question consisted in analyzing two projects cases in which a significant level of goal conflict had taken place, in order to formulate a theory describing how the level of goal conflict affects the level of communication between the project teams' members in these projects. These cases studies were part of a larger study investigating how the level of goal alignment might affect multi-organizational projects performance. While analyzing the data collected, it became apparent that the level of communication was affected by the level of goal alignment and that the variation in those levels was the main mechanism through which the level of goal alignment (or its reciprocal, the level of goal conflict) affected project

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

performance. Hence, I decided to use part of the data collected in the cases to further investigate how the level of goal conflict affected the level of communication among the project team members in the cases studied.

The data was collected through a series of interviews with individuals who participated in the projects in different roles -managerial and operational- and from all the different organizations participating in the project – five persons per project. To make sure that all the interviews were conducted in a way that addressed the pursued line of inquiry and that the data collected through them were comparable, an interview protocol was prepared. The interviews were conducted as a fluid conversation rather than as a structured survey as suggested in the case study methodology developed by Yin (2003). During the conversation, questions were asked in a non-leading way to minimize possible bias. The interviews lasted between one and two hours, and they were recorded with the permission of the interviewees. Transcripts of the interviews were elaborated and compared to the original recordings to ensure their accuracy. In most cases, the interviewees were contacted later several times during the data analysis phase for the clarification of particular issues. After the preliminary model was completed, it was presented to the interviewees in a questionnaire. The questionnaire contained verbalized statements and graphics describing the dynamics induced by variations in the level of goal alignment between participants in a multi-organizational project, as derived from the cases' data analysis. The questionnaire asked the interviewees to assess the extent to which the statements and graphics reflected their experiences in the project. I used the data collected from the first case to elaborate a preliminary model, and the second as a

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

study replication as suggested by Yin (2003) to investigate the potential generalizability of the model.

The potential validity and generalizability of the findings were further assessed by a two steps process. First, I contacted a group of individuals with experience in multi-organizational projects in diverse sectors who were willing to cooperate with the study, but not willing to discuss a particular case. The model's assessment by the panel of experts was conducted using the same questionnaire protocol employed for the assessment of the model by the participants in the cases, including the model developed. Before sending the questionnaires, I requested the experts to send me evidence of their experience with multi-organizational projects. I included in the panel only individuals who had participated in more than two multi-organizational projects (six in total). The panel was asked to compare their experiences within multi-organizational projects to the verbalized model structure. The data collected was analyzed to show significant matches and discrepancies between the model structure and the experts' experiences. Several discrepancies were reported and their probable causes and impact on the model's structure and behavior were analyzed. These discrepancies might constitute alternative explanations about how the level of goal alignment affects the level of communications in multi-organizational projects, and are discussed in the future research section.

Finally, following the Reppening and Sterman (2002) suggestion for theory development from case studies, findings were contrasted with past research in the social-psychology and project management fields, to assess to what extent the findings can be generalized to different contexts and experiences.

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

Case 1 Description and Data Analysis.

The first case analyzed in this study (case 1) is a project accomplished by a major aerospace company (Partner 1) that the Department of Defense contracted to develop an aviation control system, including hardware and software elements. For confidentiality reasons, I cannot disclose the names of the partners involved. Partner 1 hired an advanced research organization (Partner 2) to incorporate state-of-the-art technology into the system. In addition, Partner 1 hired a military organization that is also an end user of the system developed (Partner 3). At the moment the project started, Partner 3 was beginning to perform some of the Partner 2's specialty jobs, and Partner 2 has started to perceive Partner 3 as a potential competitor. Project team members worked in their respective organizations offices, located across the US, so the project team was in fact a "virtual team" supported by telecommunication technologies and periodical "face to face" meetings. These particular combinations of roles, priorities and relationships between partners (see figure 1) impacted the level of goal alignment, with consequences to the execution of the project.

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

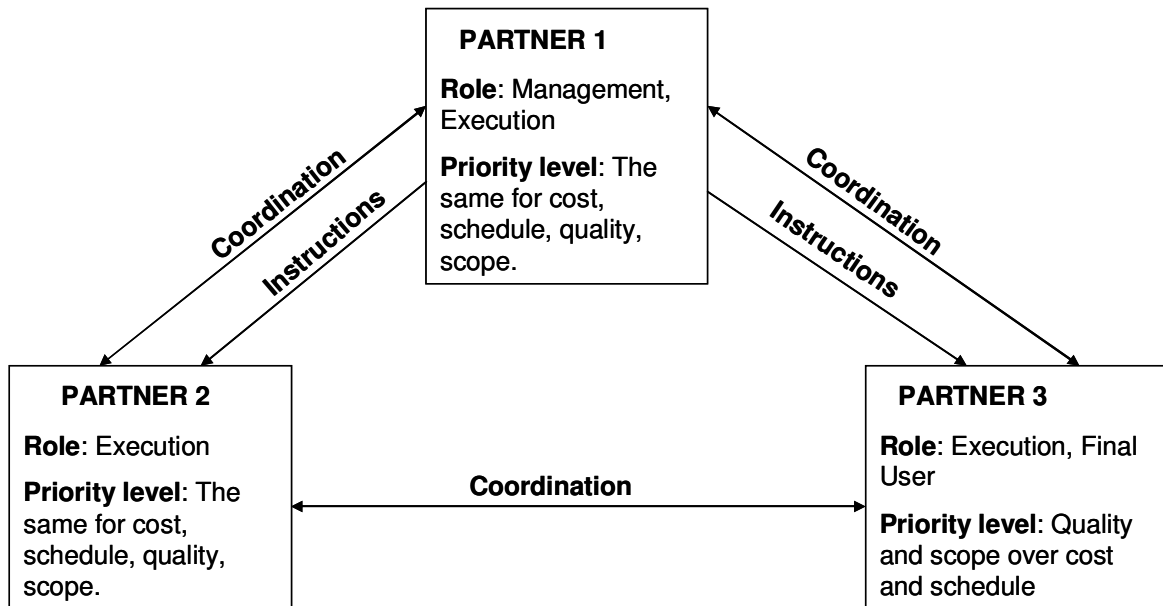


Figure 1: Partners' Roles, Relationships and Priorities' Levels in Case 1

Because the project scope was driven by hardware requirements, it had to change along with changes in hardware design. In the trade-off between scope and schedule, schedule was almost always sacrificed for scope. However, Partner 3, as an end user, wanted to go beyond the specified scope to satisfy to the largest extent possible its requirements for the project. That scope pressure was a consequence of defining requirements at a high level, leading to a certain degree of ambiguity and lack of a clear or shared interpretation of the project's requirements among the participating organizations.

Moreover, there was a perception among Partner 3's project team members that some features were taken out of the final product in order to avoid addressing some quality issues and to prevent further delays. That situation led to unfulfilled expectations

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

and some degree of frustration among some Partner 3's project team members, who would have liked to see all the features included in the product as soon as possible. On the other hand, Partner 2 was pressing to include scope not directly related to end user needs, but favored the development of certain technologies that Partner 2 had an interest in. That also contributed to Partner 3's level of frustration.

There was a significant misalignment concerning project quality goals. Partner 3's project team members wanted to maximize quality for the end user, sometimes beyond cost or schedule considerations. On the other hand, Partner 1 was interested in delivering a product with the quality specified by the customer, but also considering cost and schedule. Partner 1 wanted to maximize profits and to continue doing business with the customer. Partner 2 was interested in delivering a quality product according to their interpretation of customer's requirements. Hence, there was neither a common understanding of quality, nor any common criteria for the quality-cost-schedule trade-off.

The perception of unfulfilled expectations regarding quality and scope by Partner 3 increased the level of animosity between Partners 2 and 3's project team members. Comments from a partner about quality issues in the work performed for another partner, caused the affected partner to comment on work performed by the other, creating a dynamic of mutual criticism that generated bitterness and reduced mutual trust.

The participating organizations conducted mutual project reviews. The level of animosity generated by the lack of quality and scope goal alignment sometimes led to conflicts in the reviews and, in many cases, the pointing out of non-significant issues. When a partner called attention to some defects, the affected partner would answer focusing on non-significant problems in the other partner's work. In some cases these

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

conflicts went out of proportion, causing delays. Review conflicts also took effort and time from productive work, negatively impacting the progress in project tasks.

The analysis of the data collected for case 1 was oriented to elaborate a cause-effect model attempting to describe how the level of goal conflict might affect the level of communication between project team members in each case study, following the “causal model” case data analysis methodology proposed by Yin (2003).

In case 1, the high level of conflict regarding the quality goals between Partners 2 and 3 generated low morale among the project team members belonging to those organizations. The not fulfilled expectations regarding the achievement of project goals, in particular of Partner 3’s expectations about quality and scope goals, led to a partners’ perception that they could not expect the same level of effort and commitment toward the project goals from the other partner, thereby reducing the level of trust between them. Disparate quality goals also led to comments from one partner about quality issues in the work performed by the other partner, then caused the affected partner to comment quality issues associated to the first partner work, creating a dynamic of mutual criticism that generated bitterness in the relationship and reduced the level of communication.

The level of trust affected both frequency and content of communication between Partners 2 and 3. People started to think about the possible reactions of the other partners to the communications and hesitated about what to communicate and how to do it. The perceived lack of transparency in communications affected the level of trust. Despite those limitations, the project team tried to keep the level of trust and communications high by involving every party in all communications, in order to reduce the perceived

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

secrecy or lack of transparency. On the other hand, the level of communications between Partner 1 and partners 2 and 3 was good along the project execution.

Communication issues introduced schedule slippage, because documentation that partners had to deliver to other partners did not arrive on time. That caused the recipient partners to delay the execution of the associated tasks. Sometimes the delays in receiving input from other partners made a partner to work with preliminary information, which was changed later, introducing rework producing schedule slippage, schedule pressure and quality problems. Communications problems also affected the accuracy of the content of the information exchanged and the quality of the products. Finally, the low level of communications impacted the understanding of inter-organizational working processes, affecting the deployment of resources on timely basis.

The level of animosity originated by the level of goal conflict led sometimes to conflicts in the reviews, in many cases pointing out to non- significant issues. When a partner called attention to some defects, in occasions the affected partner attacked back on non relevant issues. Reviews' conflicts also take effort and time from productive work, negatively impacting the progress in project tasks. The created quality and schedule problems required the deployment of problem solving efforts, which in many cases included goals tradeoffs -the level of achievement of certain project performance parameters had to be reduced to allow the achievement of another performance parameter. The level of goal conflict affected partners' perception of the degree to which their goals were considered for the tradeoffs. These discrepancies in the tradeoff criteria generated even more animosity between Partners 2 and 3, reducing even more the level of communication.

Proposed Causal Model

Based on the analysis of the data collected in case 1, a causal model intended to describe how the level of goal conflict affected the level of communication in case 1 is presented below (figure 2). The “+” sign indicates a positive relationship between the variables (for example, the higher the level of goal conflict leads to a higher level of relationship conflict between the project team members). On the other hand, a “-” sign indicates a negative relationship.

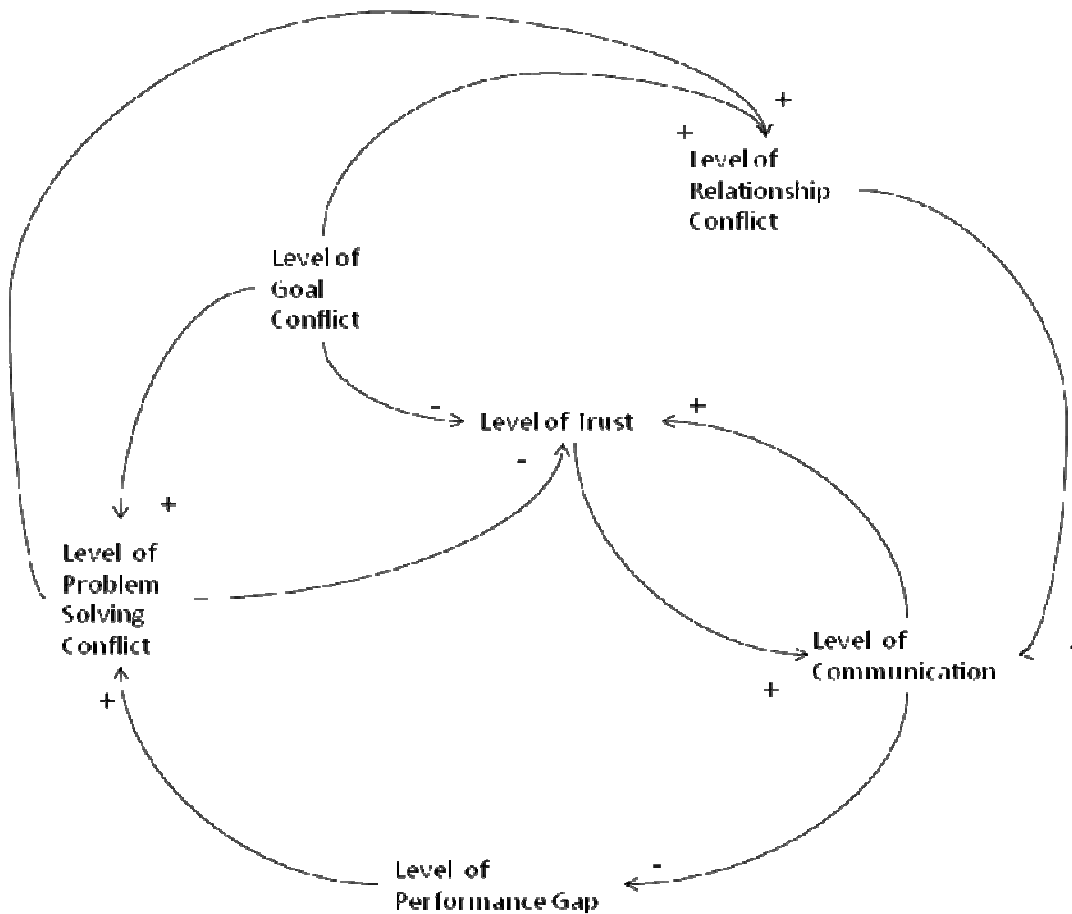


Figure 2: Proposed Cause-Effect Model Describing How the Level of Goal Conflict Affected the Level of Communications between Partners in Case 1.

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

In the proposed model, the high level of goal conflict affected the degree to which partners perceived that their expectations concerning project outcomes were fulfilled. The fact that one partner perceived that its goals were not considered led to conflicts in the relationship and to a reduction in the level of trust -the partner in question did not assume that the other partners would work in the best interest of the project, but in their own interest. The low level of trust affected the openness of the communications, as well as their frequency, because partners perceived that the content of their communications could be used against their interest. On the other hand, the level of communication affected the level of trust, because it affected the perceived “transparency” of the partners’ intentions for the project.

The project was structured in a way that the level of interdependence between the partners was very high (partners depended in a significant degree of other partners’ work outcomes to perform their work). Therefore, a high level of coordination was required, and the effect of a low level of communication on project performance was significant. The performance gaps generated by the low level of communication required problem solving efforts from the project team members, which included in many cases deciding on goals tradeoffs. The level of goal conflict affected the degree to which partners perceived that the tradeoffs made considered their goals for the project, and then the level of mutual trust among the partners, as well as the level of relationship conflict -or animosity, as several project team members described it- between the project team members belonging to Partners 2 and 3. The level of relationship conflict affected again the level of communication and performance. It can be seen in the model that the mechanism through which the level of goal conflict affected the level of communication

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

in the studied project is a reinforcing feedback cycle, which might progressively improve or deteriorate the level of communication and performance if no counterbalancing intervention is performed. The proposed causal model can be summarized in the following propositions:

1-The level of goal conflict affects the degree to which partners perceive that their goals concerning project outcomes are being considered. Partners perceiving that their goals are not being considered leads to conflicts in the relationship between them and to a reduction in the level of trust.

2-The level of trust affects the openness of the communications, as well as their frequency. On the other hand, the level of communication affects the level of trust, generating a feedback cycle of mutual reinforcement between the levels of trust and communication.

3-The performance gaps generated by the low level of communication require problem solving efforts from the project team members, including in many cases deciding on goals tradeoffs.

4-The level of goal conflict affects the degree to which partners perceive that the tradeoffs made considered their goals for the project, and then the level of mutual trust among the partners as well as the level of relationship conflict, and again the level of communication and project performance, in a reinforcing feedback cycle.

Case 2 Description and Analysis: an Assessment of the Proposed Cause-Effect Model.

Following Yin (2003) case study methodology, I replicated the study on a different case to assess the extent to which the developed model would fit to a different multi-organizational project.

The second case analyzed involved the design and construction of an offshore oil production facility project. In that project two medium-sized oil production companies were associated with a large gas transportation and distribution organization. The production organizations were responsible for the oil production, and the gas transportation organization was responsible for sending the oil production onshore. An engineering, procurement, and construction (EPC) contractor -which was not a member of the association- was hired to design, purchase the materials and build the facility, under the supervision of a project team constituted by members assigned by the partners (figure 3). However, all communication between the project team and the EPC contractor were conducted through one of the production partners. As in case 1, the project team members worked from their respective organizations' facilities.

The project entailed the development of a series of oil fields and oil transportation facilities. In the contract agreement, the transportation organization's revenues were constituted by a fixed fee for the first field and by a percentage of the oil-produced revenues in future fields. The production organizations obtained their revenue from the sale of oil produced.

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

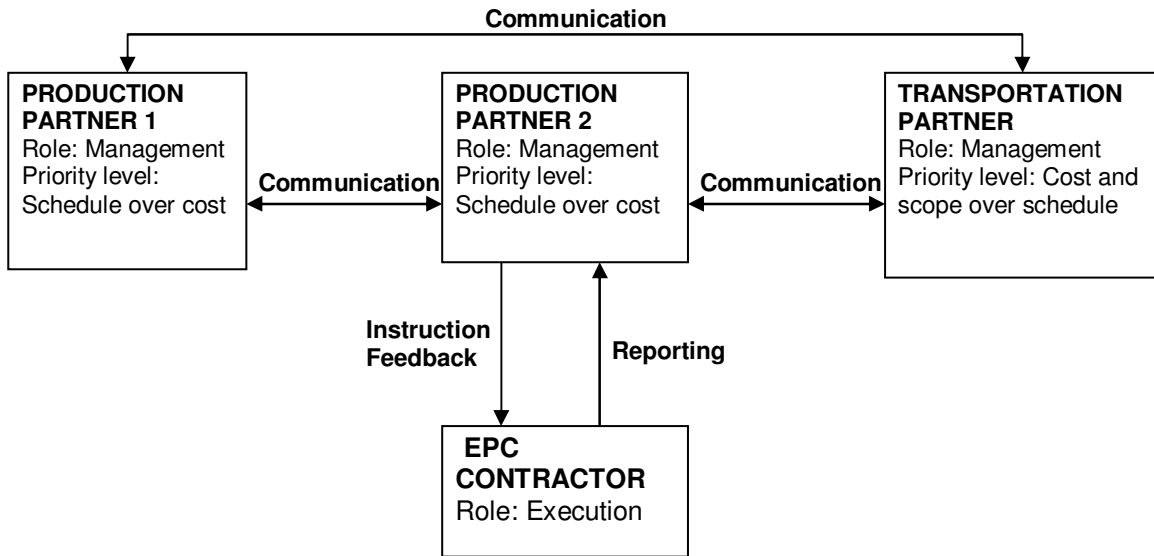


Figure 3: Partners’ Roles, Relationships and Priorities’ levels in Case 2

In an environment of rising oil prices, these contractual agreements induced misalignment among partners regarding the project cost and schedule goals. The production organizations were interested in completing the project as soon as possible to take advantage of the high prices, and they were willing to pay an extra price to get the facility producing as soon as possible. On the other hand, the transportation organization did not have the oil prices incentive. Hence the transportation organization was not willing to assume more costs in order to get the facility producing earlier. Conflicts appeared when the producing partners tried to accelerate the project to capture high oil prices at the expense of assuming higher costs.

The transportation organization’s focus on minimizing costs affected its behavior in the project, and the perception that project team members had about its intentions for the project. The production organizations’ project team members perceived that the

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

transportation organization would not cooperate with problem solving strategies if higher costs were involved.

In general, there was alignment concerning the project scope among the participant organizations. Nonetheless, disagreement was observed concerning the technical features that could support a swift start of oil production -as favored by the production organizations -and the pursuing of other features that would support the long-term operability of the facilities-as favored by the transportation organization which would own the installations.

The low level of alignment concerning cost and schedule goals affected working relationships between the participating organizations. The goal conflicts that emerged made the production organizations wonder about the transportation organization intentions for the project and vice versa, thereby affecting the level of trust. Trust deteriorated to a very low level during the project execution. The project in question was the first time the participating organizations had worked together. Hence, the only time they had for developing a working relationship was during the contract negotiation process, which lasted a relatively short period of time, and had very limited project team member participation. Despite the fact that there was a significant flow of communication, in many cases that flow was not characterized by the individuals interviewed as constructive communications, because they became cautious and guarded, reducing transparency and further reducing the level of trust, in a reinforcing cycle that diminished the level of trust and communication along the project duration.

During the project execution, several problems occurred -in particular, vendors of large components of the facilities failed to deliver equipment or materials on schedule-

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

and then adjustments to the project plan had to be done. For making the adjustment to the project plan a high level of communication was required to coordinate between the different partners the strategy to deal with the impact of the changes, and to assess the required tradeoffs. Therefore, the low level of communication had an impact on project performance, because it reduced the ability of the project team to analyze problems and to make the required decisions. As a consequence, decisions were delayed -and sometimes had to be elevated to the consideration of higher levels of management- which amplified the problems' effect on project performance -in particular, on schedule performance. These delays created additional problems that required more adjustments to the project plan and budget, leading to another reinforcing cycle of deteriorating performance.

An assessment of the validity of the model developed for a different multi-organizational project context was performed evaluating to what extent the data collected in the second case fits the model developed with the first case. That evaluation is presented in table 1, in which each verbalized model cause effect link is contrasted with the relevant case 2 data.

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

Model Proposition	Associated Case 2 Data
<p>The level of goal conflict affects the degree to which partners perceive that their goals concerning project outcomes are being considered. Partners perceiving that their goals are not being considered leads to conflicts in the relationship between them and to a reduction in the level of trust.</p>	<p>Conflicts developed when the producing partners tried to accelerate the project to capture high oil prices at the expense of higher costs. The transportation organization’s focus on minimizing costs affected its behavior in the project. The production organizations’ project team members perceived that the transportation organization would not cooperate with problem solving strategies if higher costs were involved. The goal conflicts concerning the acceleration of the project execution made the production organizations wonder about the transportation organization intentions for the project and vice versa, thereby affecting the level of trust. Trust deteriorated to a very low level during the project execution. Despite the level of trust affected the working relationships between the project team members from the transporting and production organizations, no high level of personal relationship conflict or “animosity” was reported.</p>
<p>The level of trust affects the openness of the communications, as well as their frequency. On the other hand, the level of communication affects the level of trust, generating a feedback cycle of mutual reinforcement.</p>	<p>The volume of communications between the transporting and production organizations was high. However, in many cases that flow was not characterized by the individuals interviewed as constructive communications, because, due to the deteriorating level of trust, communications between the transporting and production organizations became cautious and guarded. The guarded and cautious communications reduced the perceived transparency of the partners’ intentions by the other partners, further reducing the level of trust, in a reinforcing cycle that diminished the level of trust and communication along the project duration.</p>
<p>The performance gaps generated by the low level of communication require problem solving efforts from the project team members, including in many cases deciding on goals tradeoffs.</p>	<p>The low level of communication reduced the ability of the project team to analyze problems and to make the required decisions. The accumulation of problems generated by the delays in the decision making process did not allow the project team to be proactive in problem solving, then creating more schedule problems that needed</p>

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

	to be worked out by the project team.
The level of goal conflict affects the degree to which partners perceive that the tradeoffs made considered their goals for the project, and then the level of mutual trust among the partners as well as the level of relationship conflict, and again the level of communication and project performance, in a reinforcing feedback cycle.	These additional schedule problems required more adjustments to the project plan and budget, and communications problems caused again delays in decision making leading to another reinforcing cycle of deteriorating performance.

Table 1: Contrast between the Proposed Causal Model and the Data Collected for Case 2

As can be seen in table above, the data collected in case 2 fit to a significant degree to the cause-effect model elaborated from the data collected in case 1, despite the different contexts in which both projects were executed. In both cases the level of goal conflict affected the level of trust between the partners, and the level of trust affected the level of communication. Moreover, the level of communication also affected the level of trust, because partners could not clarify the intentions of other partners for the project due to the low level of communication.

In both cases the level of communication affected project performance, although in different ways. In case 1 the level of communication affected directly the coordination of work between project team members belonging to the different partners, affecting quality and schedule performance. In case 2 the level of communication affected the project team decision making capabilities, leading to schedule problems. Those performance problems required more problem solving and decision making effort, which were again affected by the low level of communication, in a reinforcing feedback circle of

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

deteriorating project performance. On the other hand, despite the level of trust affected the working relationships between the project team members from the transporting and production organizations, no high level of personal relationship conflict or “animosity” was reported, as it was the case in case 1. Further replications of this study might improve the model and allow assessing to what extent this cross-cases discrepancy observed is caused by contextual or structural factors. In the next section, I will discuss the study findings in the form of the proposed model’s cause-effect links to the light of past related research.

Findings Discussion and Model Comparison to Past Related Research.

The first causal link of the proposed model refers to the negative relationship between the level of goal conflict and the level of trust between the partners in a multi-organizational project, and the positive relationship between the level of goal and relationship conflict between the partners. In the cases studied, when partners perceived that the other partners were trying to accomplish only their own goals and not the project goals, the level of mutual trust declined. Trust has been associated with the notion of interdependence between partners in collaborative situations (Dasgupta, 1988). Therefore, trust can be understood in terms of partners’ ability to form positive expectations concerning the collaboration objectives and the other partner’s behaviors regarding these objectives. A basic condition for trust formation is that these expectations can be formed and fulfilled (Gulati, 1995; Rousseau et al. 1998).

Rousseau et al. (1998) identify three forms of trust (1) calculative -depending on the ability to assess trustworthiness based on past experiences or other sources of

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

information- (2) identity or knowledge-based -derived from knowledge of partners and emotional attachment developed along repeated interactions- and (3) institutional -based on factors such as organizational culture or legal frameworks. Rousseau et al. propose that calculative trust plays a more important role during the initial stages of collaborative relationships. Partners assess the trustworthiness of other partners during the early interactions and from past experiences, or from the partner's reputation. After a certain number of interactions, partners start to confirm -or disconfirm- their expectation about other partners' behaviors. Then, knowledge-based trust starts to replace calculative trust.

The previous discussion suggests that trust building involves a cyclical process. Every time partners work together to achieve a certain objective, they take a risk from expectations about the anticipated other partners' behaviors and collaborative outcomes. Each time expectations about behaviors and outcomes are met, the trusting attitudes are reinforced, increasing partners' willingness to accept the risks involved in the collaboration and the positive expectations about future interactions. When a goal conflict is present, as in the case of the cases analyzed in this study, these positive expectations could not be easily formed. Moreover, if a partner is perceived as being pursuing only their own goals for the project, the expectations of the other partners about that partner's behavior would not be met, deteriorating the level of trust.

The data collected from the first project revealed a high level of animosity between the project team members belonging to different organizations. That animosity can be characterized as a relationship conflict, because it involves perception of other people, including their motives and actions, leading to interpersonal tension (Simons and Peterson, 2000). In their meta-analysis of studies concerning the relationship between

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

task conflict, relationship conflict, team performance and job satisfaction, deDreu and Weingart (2003) found a significant positive relationship between task conflict and relationship conflict. That relationship fits our proposed model in which a high level of goal conflict induces a higher level of relationship conflict between project team members in a multi-organizational project. Moreover, Simons and Peterson (2002) found that the relationship between task and relationship conflict is moderated by the level of trust between team members. A lower level of trust was found associated to a stronger correlation between task and relationship conflict. In the first case studied, the low level of trust that resulted from the high level of goal conflict might have contributed to amplify the effect of that goal conflict on the level of animosity between the project team members as reported in the interviews.

The second causal link proposed in the model refers to the impact of trust on the level of communication between the project team members. The positive relationship between trust and communication in teams has been documented in the literature (Butler, 1999; Dyer and Chu, 2003). Trust has been found to encourage partners to share information because the partners' expectations that the information shared could be used against their interest are low. On the other hand, the level of communications seems to affect the level of trust. Bstieler (2006) examined the antecedents of trust formation and the effect of trust on new product development partnerships. That study findings support the significant impact of communications on trust formation. Timely and reliable information exchange permits partners to capture and understand other partners' thoughts, context and needs concerning the project, facilitating the achievement of high levels of trust. In addition, a high level of communication fosters the development of the

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

knowledge component of trust suggested by Rosseau et al. (1998). Hence, it seems that trust and communications develop a dynamic of mutual reinforcement, in which trust between project team members allows openness in communications, and a high level of communications permits the development of positive expectations about other partners' objectives and behaviors, leading to higher levels of trust.

The third causal link refers to the influence of the level of relationship conflict between project team members and the level of communication between them. Relationship conflict has been found in previous research positively related to low levels of communication in teams' contexts (Pelled, 1996). More recently, DeDreu (2006) found that collaborative problem solving in a team decreases at high level of task conflict.

The fourth causal link in the proposed model refers to the effect of the level of communication between partners on the level of project performance, and the necessity of the deployment of collaborative problem solving by project team members due to the performance gaps generated by the low level of communication. Andres and Zmud (2002) suggest that project teams with high levels of task interdependence require higher level of information exchange in order to clarify roles, assignments, project requirements, and progress. In project teams with a low level of communication, productivity has found to be reduced because of the efforts required to establish shared mental models concerning task requirements, which are needed for successful effort integration (Straus and McGrath, 1994). Moreover, the progress of a team member was often held up while waiting for an output produced by other team member (Saavedra et al., 1993). Recently, Chiochio (2007) found a positive relationship between the level of communication and

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

coordination and project teams' performance. In the cases discussed in this study, the low level of communication affected the coordination of interdependent work and the decision making process within the project team. These problems generated schedule and quality problems that had to be resolved with collaborative problem solving and decision making. However, the level of goal conflict also affected those tasks. As mentioned above, DeDreu (2006) found that collaborative problem solving in a team decreases at high level of task conflict. The problem solving and decision making exercises conducted by the project teams in the cases studied implied additional goals' trade-offs. Due to the goal conflict present, these trade-off -in which some project objectives had to be modified to allow the achievement of other objectives- reinforced the perception in some partners that their goals for the project were not being considering. That led to decreasing even more the level of trust and communication, in a reinforcing feedback cycle of lower trust, lower communications, increasing performance gaps, more trade-offs required, not fulfilled expectations about project goals and again, even lower levels of trust and communication.

Implications for Management

This study's findings have several relevant implications for project management practitioners. These implications are discussed below:

1. According to the study findings, a high level of goal conflict among partners in a multi-organizational project might significantly affect the level of trust, communications between project team members belonging to different partners

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

- and as a consequence projects' performance. Therefore, project and senior management of the organizations involved should be aware of possible changes in the business environment that could induce variations in the level of goal alignment among the project partners, and then on the level of goal conflict within the project team. In the case of detected misalignment, project goals should be renegotiated in order improve the level of goal alignment. The renegotiated project goals should be clearly stated to the project team, and supported by the senior management of the organizations involved.
2. The study findings suggest the importance of the level of trust between partners in multi-organizational project performance. Moreover, the study findings highlight the importance of the level of initial trust between partners, which could start a virtuous feedback cycle of trust formation and high level of communication. Management responsible for the execution of multi-organizational projects should implement practices that could enhance the initial level of trust among the project team members, such as involving the project team in the project negotiations phase, where project team members can learn about other partners' intentions, resources and constraints for the project. Moreover, some face-to face contact and team building interventions could also be helpful to improve the initial level of trust, especially in the case that project team members have not worked together before, or when they will not be located in the same physical facilities.
 3. Engineering and project managers should consider specific measures to enhance the level of communication between the project team members belonging to the different organizations participating in the project, in order to facilitate the

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

information exchange required by the interdependent tasks and the coordination of the resource deployment as required to perform collaborative tasks, to make clear when, how and by who tasks should be performed. These measures- such as specific dates and agendas for meetings, communication templates and protocols, master plans and workflow systems, should be implemented and their use supervised by the project management.

4. The contribution of this study is the description of the dynamics related to trust and communications induced in the work system by a high level of goal conflict in a multi-organizational project. These dynamics affect the level of trust, communication and then performance, in a reinforcing feedback cycle that can be virtuous if the level of goal conflict is low and the initial level of trust among the project team members belonging to the participating organizations is high. In that case, the low level of goal conflict leads to a high level of trust and communication, improving performance and reducing the need for trade-offs to achieve the project objectives. On the other hand, if the level of goal conflict is high, that might induce a low level of trust and communication and significant performance gaps, requiring trade-offs to achieve at least some of the project goals. These trade-offs might increase the level of goal conflict, reducing even more the level of trust and communication, in a spiral of deteriorating performance. Project managers should be aware of the possible development of these dynamics, and of the possibility that those dynamics might generate non-linear responses in the project system, since reinforcing cycles are involved. Project managers should assess the necessity and viability of interventions to

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

modify these dynamics, because if a cycle of deteriorating trust and communication is present project performance could be severely affected.

Study Limitations and Further Research

This study presents several limitations. First, the case study research methodology, while useful to answer “how” research questions; imposes limitations for the generalizability of the studies’ findings (Yin, 2003). Like experiments, case studies are generalizable to theoretical propositions, and not to populations (Yin, 2003). This study is based on only two replications and therefore is exploratory, and its findings are only preliminary. Hence, the only way to assess to what extent the theory developed in this study about how the level of goal conflict affect project communication in multi-organizational projects is valid for other multi-organizational projects is to perform a similar study on more cases. Then, as more replications are performed, more data would be collected and more confidence could be allocated to the resultant theoretical propositions.

Second, despite the fact that the support for the model propositions was in average above 80% among the panel of experts, some interesting suggestions concerning the proposed model were made by the panel members that need to be addressed in future studies. A suggestion was to analyze the probable distinction between interpersonal trust and inter-organizational trust, and how that distinction might affect the proposed causal model. Another suggestion was to analyze to what extent and under what circumstances goal conflict might derive into a positive factor for creative problem solving in multi-organizational project teams. A positive relationship between intergroup conflict and

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

enhanced problem solving capabilities has some support in the literature (Jehn,1995; Jehn and Mannix, 2001). On the other hand, research findings also suggest that relationship or affective conflict in the form of interpersonal animosity lead to anxiety that might inhibit cognitive processing and then problem solving processes (Staw et al., 1981; Roseman et al., 1994). Those are issues that deserve particular attention in future replications of this study.

Third, due to the sensibility of the subject explored in this study – even litigations were upheld in one of the project- confidentially issues emerged, and only interviews’ data was collected. We had no access to the projects’ documentation. The use of data collected during the interviews without being triangulated with other data sources might have introduced biases because interviews data was based only on interviewees’ recollection of past events. Future research should include longitudinal studies where the researcher can observe the project team members while executing the project and can have access to the project documentation. In that way, the researcher could observe the development of the dynamics generated by the level of goal conflict and how those dynamics might affect the level of communication among project team members.

Fourth, in both cases the project teams were not collocated. Project team members worked from their organizations of origin facilities, located in different cities across the US. Project team members only met in person from time to time, relying in electronic media for most of the communications. In other words, the projects teams functioned as “virtual teams”. Lack of co-location was also mentioned by the case 1’s interviewees as a factor affecting communications between the project team members belonging to the different participating organizations. The effect of lack of co-location in virtual teams has

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

been thoroughly researched (Strauss and McGrath, 1994; Andres, 2002). In some cases, people misunderstood messages -due to different speech, or email taken in a way the sender did not intend. Non-verbal signals were also important. Lack of personal contact seems to have had an effect on trust. It seems that, according to the interviewees, the fact that the parties were not co-located to some extent prevented the project team members from the different participant organizations to develop a working relationship. Moreover, the social identity theory (Suzuki; 1998; Tajfel and Turner, 1986) suggests that the lack of collocation of the team members belonging to the different organizations involved in a multi-organizational project might increase the perceived differences between the members of those organizations. The lack of co-location might have accentuated the perception of real cultural differences- e.g. civil vs. military in case 1- and goal conflicts between the team members, not allowing the development of a project team membership. The absence of a team membership would affect the project team members' willingness to communicate and cooperate between them. This study needs to be replicated with co-located project teams, to assess to what extent the lack of co-location might favor or hinder the development of the project dynamics generated by the level of goal conflict affecting trust and communication in multi-organizational projects as described here. The possible moderating effect of cultural differences between the organizations involved in the project on the development of trust and communication under goal conflict situations also deserves further exploration.

UMUC Working Paper Series – Number 2009-012
Goal Conflict and Communications in Multi-organizational Projects:
A Two Cases Comparative Study

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UMUC Working Paper Series – Number 2009-012
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A Two Cases Comparative Study

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A Two Cases Comparative Study

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