Partnering on Construction Projects: A Study of the Relationship Between Partnering Activities and Project Success

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Abstract—Project partnering has generated considerable attention in the construction industry as a means for transforming hostile, adversarial owner-contractor relationships into a more collaborative, productive team. Empirical support for partnering, however, is limited. The present study used mailed questionnaire data to examine the relationship between specific partnering related activities and project success for 291 construction projects. All of the major partnering activities were found to be positively related to at least one of the measures of project success. The findings suggest that a comprehensive approach be applied to partnering on construction projects and that top management support for teamwork across organizations is critical to success.

Index Terms—Construction, construction projects, management, owner/contractor relationship, partnering, project success, teamwork-building.

I. INTRODUCTION

The adversarial relationship between owners and construction contractors creates an environment which jeopardizes the success of the construction industry as a whole [22].

Partnering is much more than a buzzword, a philosophy or an attitude. It is a structured management process that is effective on all sizes of construction projects to focus attention of all the parties on problem resolution, without prolonged disputes or litigation [2].

PROJECT partnering is generating considerable attention in the construction industry as a means for transforming hostile, adversarial owner-contractor relationships into a more collaborative team. The Associated General Contractors of America (AGC), the American Society of Civil Engineering (ASCE), and the Army Corps of Engineers (ACE) are aggressively championing partnering through educational programs, workshops, and training manuals [2], [14], [22]. Still, there is little empirical evidence behind the enthusiasm for the partnering movement. Converts are being recruited by persuasive examples of success stories and the simple confession that there has to be a better way of managing construction projects.

The present study begins to address this void by examining the relationship between different elements of project partnering and project success for more than 290 construction projects. Before reporting the results of the study, we will briefly discuss the rationale behind partnering, describe the partnering process, and outline the design of the study.

A. Design of the Study

The tendency for both owners and contractors to assume an adversarial posture with each other is based on the inherent conflict between owners’ costs and contractors’ profits. This is essentially a zero-sum game in which one party’s gain is the other party’s loss. This dynamic is even more complicated when one recognizes that it permeates the chain of relationships between contractors and subcontractors necessary to complete a significant construction project.

The apparent conflict of interest predisposes owners and contractors to be naturally suspicious of the motives and actions of each other. For the owners, this suspicion is often manifested by oppressively monitoring the contractor’s performance, challenging each and every request to make an adjustment in plans or budget, and forcing compliance by withholding funds. Contractors respond by exploiting loopholes in the contract to their own advantage and withholding or manipulating information [6].

Effective problem solving is undermined. Participants maintain an arms-length relationship. Risk is a “hot potato” to be transferred to the other party. When conflicts emerge they are often deferred up the hierarchy. This creates costly delays as well as sometimes questionable responses since upper management is often too removed from the project to make an effective decision.

Disputes often end up in court as either side realizes that the only way to protect their interests is through litigation. Contractors, in order to protect their profit margin, perpetuate this response by incorporating litigation costs and time delays into their bids. Contracts evolve into lengthy tomes that cover minute aspects of the project. Major attention is spent protecting self interests by developing the case for claims that will follow completion of the project. To some extent litigation becomes a self-fulfilling prophecy. The tragedy is that often small problems mushroom into major disputes due to failure to resolve them at their inception [2].

Project partnering is a formal management intervention designed to overcome the tendency to manage projects in adversarial fashion. We have defined project partnering as a method of transforming contractual relationships into a cohesive, project team with a single set of goals and established procedures for resolving disputes in a timely and effective manner [6].
Fig. 1. Project partnering framework.

Although project partnering can and has been applied to product and service development projects, our focus in this study is restricted to the management of construction projects which typically entail extensive contractual work.

Project partnering is based on the assumption that the traditional win–lose, adversarial relationship between owner and contractor degenerates into a costly lose–lose situation for all the parties involved. Furthermore, partnering assumes that the parties share sufficient common goals to warrant a more collaborative relationship. For example, both contractor and owner are interested in completing the project on time and safely. Neither party wants rework. Both parties would prefer to avoid costly litigation. Each party is ultimately interested in reducing costs without compromising quality. The existence of such common goals and the prohibitive costs associated with the adversarial approach provide the basis for transforming a competing, adversarial situation into an integrative, collaborative situation [2].

Partnering is more than a personal revelation or a simple handshake, but a formal attempt at instituting processes and activities designed to alter the working relationship between different parties working on a construction project. It typically entails a considerable up-front investment in time and resources to forge a team identity among participants from the different organizations and the institution of mechanisms designed to sustain and expand collaboration over the course of a project.

Proponents suggest that successful partnering endeavors depend upon customizing activities to meet the specific needs and opportunities of the participants and the project involved. Still, our research reveals that there are several core elements associated with the partnering process [6]. These elements are summarized in Fig. 1.

The key strategy behind project partnering is building a foundation for collaboration between potential adversaries before disputes and problems arise. This typically begins with the principals from the different firms getting together and establishing the goals and guidelines for initiating the project partnering process. Team-building sessions are held prior to implementation of the project involving key players from different firms, e.g., engineers, foremen, specialists, lawyers, and other staff. These sessions may range in length from one-day to five-day intensive workshops. Consultants are often used to facilitate these sessions as well as the overall process. Although the exact content of these sessions will vary greatly, they tend to begin by combining lectures with exercises that illustrate the principles of effective communication, teamwork, and negotiation [12]. Focus is then shifted to implementation of the designated project. Counterparts from the different organizations discuss characteristics of good and bad project management, jointly establish a set of common objectives, identify potential problems areas, and develop guidelines for how they wish to resolve disputes without violating the written contract or jeopardizing the integrity of the project partnering endeavor. These sessions generally conclude with a common charter for the project, agreements on performance criteria and how they will be measured, and procedural rules for resolving conflicts and disagreements.

During these team-building sessions, participants sometimes establish provisions for continuous improvement. Under normal circumstances the responsibility for improvement or cost saving initiatives lies primarily with the contractor who assumes the burden of proposal development and its costs with the owner acting as a skeptical judge. Partnering assumes that continuous improvement is a joint effort to eliminate waste and barriers to improvement. During the session participants may agree upon areas and objectives for improvement (i.e., cost savings over the life of the project of 4%, less than 4% cost growth). Not only are objectives agreed upon but provisions for continuous improvement are established. For example, an incentive for improvements may be 50/50 split of the savings to partners. Likewise, a formal review process for improvement proposals is established that provides quick, early assessments which avoid wasted effort and costs of poor proposals.

In some cases, participants confront the issue of equity and what is a fair profit for the different contributors. This typically includes a frank discussion of expectations and some
basic agreement as to what is a reasonable profit margin for the contractors as well as financial obligations of the owner. The purpose of this discussion is to develop a shared concept of “fair dealing” which will govern interactions between participants. Establishing normative pressures for fair dealing is critical to sustaining cooperative relationships and violation of such norms is a decisive factor to the dissolution of partnerships [17].

The collaborative spirit generated by the team-building sessions are sustained during the project through a number of different mechanisms that support partnering principles. For example, all parties regularly engage in joint evaluation of the project including an assessment of each others’ adherence to the principles of collaboration. Likewise, the agreed upon ground rules for resolving problems are adhered to. Escalation guidelines are implemented so that problems are solved in a timely, efficient manner at the lowest appropriate level or they are “escalated” to the next management level. Procedures for continuous improvement are implemented so that owners respond quickly to proposals and share the risk as well as the savings from such improvements.

Proponents agree that for partnering to be successful it must have the visible, unwavering support of all levels of management [3], [5], [8]. The project managers must walk their talk and consistently display a collaborative as opposed to confrontational response to problems. This is especially true early on in the project when the partnering agreement will be tested by how participants react to the first major disagreement that emerges. Top management must consistently and visibly champion the partnering principles of openness, trust, and teamwork. Senior partners must continually emphasize the big picture, project objectives, and a win–win scenario. They must realign both the formal and informal reward system to recognize those who support and contribute the partnering process.

Does partnering work? As noted at the beginning, firm empirical evidence is lacking. What is available are a number of anecdotal success stories, many involving only partially completed construction projects [4], [10], [12], [16], [18]. Probably the most widely publicized completed project is the Bonneville Navigation Lock Project in which $1.8M in savings were attributed to partnering [14], [20]. On a lesser scale, Eckert reported that $250,000 was saved through partnering on a $3.5M renovation project of a chemistry lab [7]. Baker surveyed seven owners and 11 contractors engaged in partnering endeavors who reported estimated cost savings for the owners of 10–11% and increases in profit for the contractor of 4–9% [3]. A Construction Industry Institute (CII) Task Force endorsed project partnering after surveying more than 50 existing partnering relationships [15].

Perhaps the most rigorous research on partnering to date has been conducted by Weston and Gibson [21]. They compared the performance of 16 partnered projects with 28 nonpartnered projects. They reported that the average cost growth for the partnered projects was 2.78% which was 6% less than the average cost growth for the nonpartnered projects. They attributed this difference to the reduction in change orders, fewer claims, and more value engineering occurring in the partnered projects. It should be noted that all of these projects involved the Army Corps of Engineers and were awarded on a competitive, low bid basis. Contractors were invited to engage in the process and partnering occurred strictly on a volunteer basis.

One problem with the Weston and Gibson research is that they simply bifurcated projects into partnered versus nonpartnered. While the Corps of Engineers are developing a relatively standardized approach to partnering, variation in activities within partnered projects is likely to exist and certainly is evident in non-Corps projects. For example, some partnering efforts do not include formal provisions for continuous improvement. Others avoid discussing equity and what is a fair profit. Some partnering efforts are restricted primarily to up front team-building sessions. So differentiating projects according to partnered versus nonpartnered may be problematic in that no uniform approach exists. Likewise, while the research is noteworthy by providing tangible evidence as to the value of partnering, it fails to assess different elements of partnering.

The purpose of present study was to examine the relationship between specific elements of partnering and project success. These elements include whether project participants engaged in the following activities prior to implementation of the project: team building, identification of potential conflict/problem areas, establishment a problem solving process, creation of a common project charter, establishment of a fair profit assumption for the contractor, used consultants as project facilitators, and established provisions for continuous improvement. Furthermore, the extent to which top management of the different firms supported teamwork across organizational boundaries is examined. In doing so, we will obtain a better understanding of the relationship between partnering and project success as well as the role that different partnering elements play.

There are many factors that influence project success and may mediate or affect partnering efforts. One such factor is whether the participants have worked on similar projects together in the past. Previous work experience may reduce the need to engage in team-building sessions or to formalize work procedures. As such we will take into account previous work experience in examining the relationship between project success and project partnering.

II. Method

A. Sample and Procedure

Data were collected by means of a questionnaire which was mailed to randomly selected members of the project Management Institute (PMI) in both Canada and the United States. PMI is the professional association for practitioners of project management with over 17,000 members worldwide. Membership is divided across four broad business groups: construction, services, resources, and manufacturing. Each group is further differentiated into specific industries, i.e., legal, ferrous mining, petroleum, etc. Since we were primarily interested in construction projects data collection was
focused on the construction membership. At the same prior experience indicated that some of the PMI members in the other industrial groups (i.e., telecommunications, engineering service, chemical manufacturing) were also actively involved in construction projects. Therefore, a two-prong collection strategy was used. First, 800 questionnaires were sent to every fourth member listed under construction, while 400 questionnaires were mailed to every fifth member listed under industries in which we believed there was a strong likelihood that construction projects would be involved. Initial mailing yielded a 32% response rate. Ninety-three of the responses were eliminated because the respondent had no direct involvement in a significant construction project in the past three years and/or due to missing data. This study is based on the remaining 291 respondents who answered a series of questions concerning a recently completed construction project that they had worked on. A summary of sample and project characteristics are reported in Table I.

Fifty-five percent of the respondents were either principal engineers, directors of project management programs, or project managers in their firm. Seventeen percent were members of top management (i.e., president, vice-president, or division managers), whereas 10% were managers in functional areas such as marketing and finance. The remaining respondents were either specialists or consultants.

Both small and large size firms are represented in the sample. For example, 50% of the respondents reported that they worked for small firms with less than 70 employees. Conversely, 30% of the sample worked for large firms with over 1000 employees. Similarly, one-third of the respondents reported that their firm had less than five significant construction projects underway while another third indicated that their firm was currently working on more than 20 major construction projects.

Respondents were asked to analyze a recently completed construction project in which they worked closely on. These projects varied in size and scope. Examples include a 90,000 ft² aircraft maintenance hangar, a 100,000 ft² food process plant, an urban mass transit system, outfitting two 1700 ft deep water wells, renovating a 20-unit apartment building, and a grassroots aluminum production plant. The average duration of the project was 22 months with 38% reporting that the project took a year or less to complete while 41% indicated that their project took over two years to complete. The average estimated total cost of the project was $10,753,000 with half of the respondents estimating that the project cost was less.
than $8,550,000. Roughly a half of the project contracts were awarded according to an open, competitive, low bid process.

Forty percent of the sample worked for the organization that was the prime contractor on the project while only 6% operated as sub-contractor. Twenty-six percent of the respondents represented the “owners” of the project while 8% were project architects. The remaining respondents were auditors, inspectors, and other specialists.

B. Measures

The questionnaire was pre-tested on a group of seven construction managers to check for consistency of comprehension. Respondents were also asked to indicate on the survey the extent to which they were confident they understood the questions. Only 1% of the respondents indicated that they were not confident and these responses were removed from the sample.

1) Project Success: Measuring project success in large scale studies has proven to be problematic. Data collection procedures (mailed questionnaire) and the need to generate a large enough sample to draw meaningful comparisons prohibited the use of multirater evaluations of success or hard performance data which have been used in other studies [1]. Respondents were simply asked to evaluate their project according to: a) meeting schedule, b) controlling costs, c) technical performance, d) customer needs, e) avoiding litigation, and f) overall results. Single item Likert scales were used for each criteria with a 1–5 response range anchored at either end by “successful” and “unsuccessful.” Although other researchers have relied on similar perceptual measures of success [9], [11], [18], individual appraisals do not provide a strong basis of measurement. The results of this study should therefore be considered exploratory.

2) Principals Worked Together Before: Whether principals from the different organizations had previous work experience together was measured by respondents’ yes/no response to the question: key people from both organizations had worked together before.

3) Partnering Variables: Partnering dimensions were obtained by a series of single item questions that asked the respondent to indicate whether such an activity occurred. Below are the questions used to measure individual partnering variables.

a) Team building session: Before the project began key people met to build a collaborative relationship among the owner and contractor teams.

b) Conflict identification: Before the project began key people from both organizations identified potential conflict/problem areas.

c) Problem-solving process established: Before the project began a documented process was in place for joint resolution of problems quickly.

d) Consultants were used: Outside consultants were used to facilitate the relationship between key participants from both organizations.

e) Joint project charter: Did the key parties involved formulate a formal charter/agreement that stated shared objectives and responsibilities?

f) Fair profit assumption: Was a fair profit for the contractor an assumption of the project?

g) Provisions for continuous improvement: Did the project include provisions for continuous improvement? Respondents simply indicated “yes” or “no” to the above questions. Recognizing that not all of the respondents were likely to be in position to assess each of these factors, they were given the option of responding “don’t know.” These responses were omitted from relevant analyzes.

One additional partnering variable—Top Management Supported Teamwork—was measured by combining two Likert scales. Respondents rated the extent top management of their firm and top management of the other firms involved supported teamwork across organizations on 1–5 item scale beginning with “very little extent” and ending with “very large extent.” The intercorrelation between these two items was r = 58.

C. Method of Analysis

Multiple regression analysis was used to assess the relative effects of the partnering variables on project success. Previous work experience was entered first and then a stepwise procedure was used to determine the relative importance of the partnering variables. In the case of the categorical variables, they were dummy coded (yes = 1, no = 0).

The means, standard deviations, and intercorrelations of the success and predictor variables are presented in Table II. The moderate intercorrelations among the success variables reinforce the point made by others that project success is a multidimensional construct and support the present decision to consider them as related but separate variables. Examination of the correlations between the partnering variables support the earlier point that not all of the partnering related activities are likely to occur on a given project. For the most part, these intercorrelations are moderate to low, suggesting, for example, that just because participants participated in preproject team building session does not mean that they established procedures for resolving conflicts or provisions for continuous improvement. Furthermore, the correlations indicate that multicollinearity should not be a serious concern with the possible exception of the high correlation between team building session and identification of potential conflict (r = 56). Tests for collinearity for these variables as well as other predictors will be performed in conjunction with the regression analysis.

III. Results

The multiple regression results are shown in Table III which include significant regression coefficients and their t values as well as the adjusted variance explained of the final equation for each of the six success measures. Significant results were obtained for each of the success measures. Variance explained ranged from a high of 34% for overall results to a low of 19% for technical performance. Partnering variables explained 26% of the variance in satisfying customer needs and 21% of the variance of meeting schedule. The other predictive equation explained 25% of the variance in controlling cost and 28% of the variance in avoiding litigation. The effect of previous
work experience and the relative contribution of each of the partnering variables will be discussed in turn.

To control, in part, for the assumed advantage of projects in which principals had previous work experience together, this factor was entered first in each of the regression equations. However, previous work experience was a significant factor for only three of the success measures. This variable was strongly related to avoiding litigation, but only weakly related to overall results and controlling cost.

The establishment of a problem-solving process before the project began was the only partnering variable to be significantly related to all the success measures. Top management support for teamwork involved was a significant predictor for all the success measures except technical performance. Furthermore, top management support was the strongest predictor in each of these cases.

The identification of potential problem areas before the project began was significantly related to controlling cost, technical performance, customer needs, and overall results, but not for meeting schedule and avoiding litigation.

Establishing up front the assumption of a fair profit for the contractor was significant for satisfying customer needs, avoiding litigation, and overall results, but not for meeting schedule, technical performance, or controlling cost. Conversely, establishing in advance provisions for continuous improvement was significantly related to three of the six success measures: meeting schedule, controlling cost, and technical performance.

Conducting a team-building session prior to initiation of the project was significantly related to only meeting schedule and avoiding litigation. As noted earlier, the effect of this variable may have been masked by high correlation with identification of potential areas of conflict which is one of the activities generally included in such team-building sessions. Multicollinearity tests did not reveal this to be a issue.

Establishing a joint project charter that states shared goals and responsibilities was significantly related to only one success measure—technical performance. Finally, the use of external consultants was not significantly related to any of the success measures.

Overall, the results suggest that different elements of the partnering process do contribute to project success and that they affect different aspects of project success. Still, the moderate variance explained suggest that other factors are critical to construction project success, especially when considering technical performance, and meeting schedule.

### IV. DISCUSSION

Before pursuing the implications of the findings it is important to note their limitations. First, this study was unable to capture the dynamic nature of construction projects. The present study focused only on whether partnering activities took place. As a consequence how these activities interacted with other factors to influence project performance were not explored. Second, in order to more fully assess the impact of partnering its elements need to be examined within the context of more elaborate models of project success. Such models would be based on previously established determinants of project success and should include such factors as control systems, clout of respective managers involved, clarity of project objectives as well as such factors as the weather and labor relations which affect the success of a project [1], [19]. Finally, one should be reminded that individual perceptions of success do not provide a firm basis for evaluation and that the results of this study should be considered exploratory. Future research which combines multirater evaluations with objective indicators of project performance is needed to amplify the reported findings.

Recognizing these limitations, several conclusions can be drawn from this study of more than 280 construction projects.

First, the results provides empirical support for the anecdotal enthusiasm for the partnering movement. Partnering was found to contribute to both the hard and soft side of project management. Specific partnering elements like establishing problem solving procedures and provisions for continuous improvement were linked to controlling cost, meeting schedule, and to a lesser extent, technical performance. Likewise, partnering activities were also positively related to satisfying customer needs, avoiding expensive litigation, and overall results. These findings support the arguments made by advocates that partnering can contribute to more productive, collaborative working relationships between owners and contractors. Although the results did not involve specific cost savings, the findings
suggest that engaging in partnering activities is well worth the investment of time and money.

Second, although some of the partnering elements were more significant than others, collectively the findings support a comprehensive approach to partnering. All of the partnering activities were found to be related to one or more of the success measures. This suggests that attempts at partnering should not be restricted to one or two activities, but that the full range of partnering activities should be applied to all aspects of a project.

Closer examination of the findings suggest that partnering endeavors should be well grounded on technical and task related issues. Too often team-building activities involve artificial exercises that generate a strong, but temporary, sense of camaraderie. This “team feeling” quickly vanishes once participants are confronted with tough problems and complex challenges. The findings underscore the value of project participants meeting before the project begins to identify actual areas of conflict. This is likely to help focus participants’ attention to critical areas and reduces potentially costly misunderstandings. Moreover, not only should potential problems be flagged, but it is more important that participants establish ground rules in advance for resolving conflicts and disagreement. The key is to prevent small problems from mushrooming into large ones that may jeopardize the working relationship between owner and contractors.
The significance of top management support of teamwork across organizational boundaries is consistent with the admonitions of proponents of partnering. Advocates repeatedly warn that top management must consistently and visibly endorse the principles of partnering both with word and action. Without such support, participants may quickly resort to traditional adversarial modes of behavior. For example, top management should review litigation costs of confrontation with front line managers. Although senior management typically understands these costs, front line supervisors have a tendency to see only the impact of a problem on their immediate situation. Such a review can sometimes temper hard line responses and encourage more collaborative problem solving. This is especially true early on in a project where the partnering agreement will be tested by the first disagreements that emerge. Top management needs to be vigilant and actively encourage that such conflicts are resolved collaboratively.

While the findings support the partnering movement within the construction industry, future research is needed to both affirm and extend the present findings. One partnering activity which we failed to examine was the extent to which participants engaged in joint evaluation of the partnering process. The frequency and basis for joint evaluation should be included in future partnering research. Such research should not only be directed at construction projects, but also other interorganizational endeavors (i.e., joint ventures, consortia, etc.) where partnering may apply.

Partnering is a complex, dynamic process, and attention to how the different activities and elements interact to influence project success is needed. This should lead to understanding why some partnering efforts fail while others succeed and the identification of critical preconditions necessary for success. Such research requires more rigorous procedures than the present study as well as in-depth case studies that can provide insights not generated by statistical analyses.

Overall, the results of this study reinforce the point that partnering is more than just a handshake, but rather represents a considerable up-front investment in time and energy toward establishing the foundation for teamwork and institutionalizing agreed upon procedures and provisions for resolving disputes and sustaining collaborative problem-solving. Such activities need to be buttressed by active top management support and a continued commitment to teamwork.

REFERENCES