

# Managing the Intangible Aspects of a Project: The Affect of Vision, Artifacts, and Leader Values on Project Spirit and Success in Technology-Driven Projects

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## ABSTRACT ■

Successful projects are often characterized by a unique spirit. Phase one results, based on 193 employees partaking in 60 projects across organizations, support a model positing that leader building activities affect employees' emotions, attitudes, and behavioral norms that are focused on expected project outcomes, termed *project spirit*. Spirit affects employees' contextual performance behavior, which in turn affects success as proposed. Phase two cases, designed to ground these results in technology-driven project contexts, highlight the value of managing the project's intangible aspects captured by spirit. Quantitative and qualitative findings imply that leaders can be coached to execute behaviors that generate a project's spirit, which boosts contextual performance behavior and increases project success.

**KEYWORDS:** culture; contextual performance behavior; project-based work

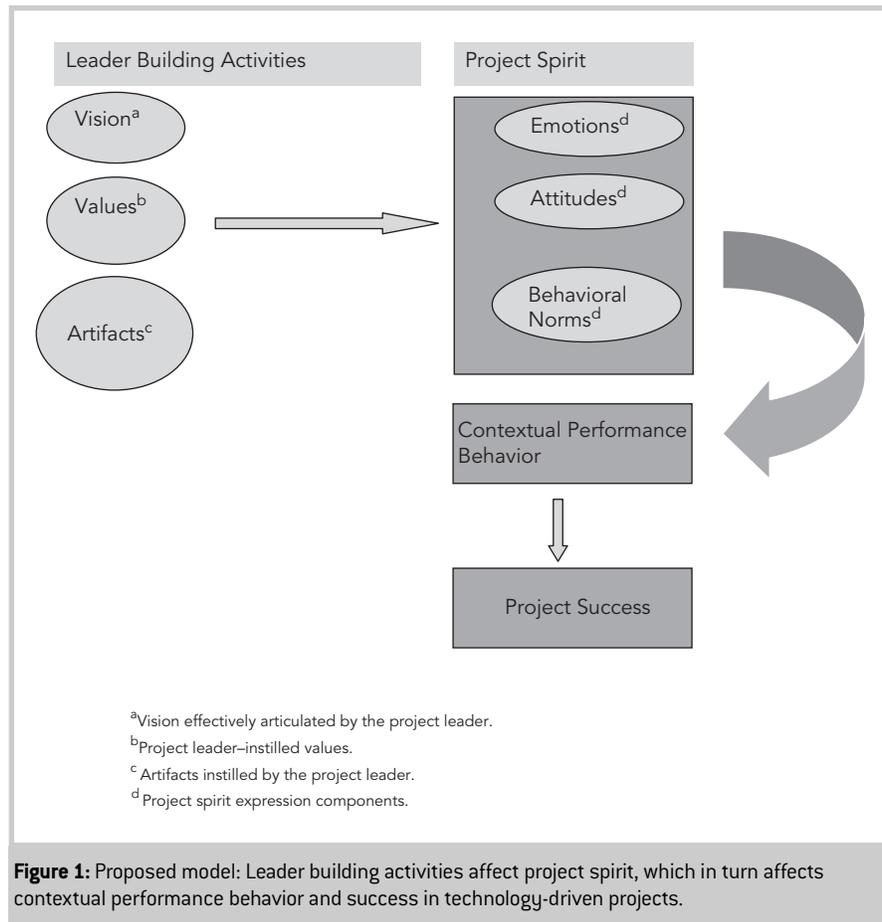
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## INTRODUCTION ■

In successful projects one can typically sense the energy and the excitement among participants. Project participants are committed to the project's mission, eager to invest extra effort, spontaneously take actions to support each other, and are proud to be part of the team. Spirit is the driver that unleashes untapped power imbedded in almost everyone (e.g., Bruch & Ghoshal, 2003; Magni, Proserpio, Hoegl, & Provera, 2009; Shenhar, 2004). Researchers make at least a tacit argument that positive business outcomes will arise from gains in spirit (Brannick, Salas, & Prince, 1997; Cavanagh, 2000; Duchon & Plowman, 2005; Giacalone & Jurkiewicz, 2003; Kinjerski & Skrypnek, 2004; Whitty & Schulz, 2007). Studies document leaders' roles in project success (e.g., Aronson, Reilly, & Lynn, 2008; Keller, 2006). Yet, what might be the activities leaders can execute to foster participants' spirit in project-based work? The industrial psychology literature (e.g., Kinjerski & Skrypnek, 2004) suggests possible levers of employee spirit in the workplace. However, these levers are not typically available to project leaders. What is lacking then in the literature is evidence on how participants' spirit can be triggered implicitly and how spirit might contribute to success in project-based work. In the current study, we center on the influence of informal levers leaders can exercise to direct team members' emotions, attitudes, and norms, termed *spirit* (Shenhar, Aronson, & Reilly, 2007), toward shared project goals. In conjunction we concentrate on the influence of spirit on contextual performance behavior and success outcomes (see Figure 1).

Since earlier work suggests that spirit in the workplace is related to employee characteristics (e.g., Toquam, Macaulay, Westra, Fujita, & Murphy, 1997), recruiting employees with unique traits might be considered. Though, making staffing decisions is an alternative that is not always viable, particularly in project settings, where factors such as personnel availability are paramount (e.g., Frame, 2003). The effects of other formal means to manage spirit, such as altering the nature of the task (e.g., Kinjerski & Skrypnek, 2004), are often beyond the project leader's control. Because of these constraints project leaders typically face, we set out to examine whether less explicit activities executed by the leader (and detailed below) can influence participants' spirit in technology-driven projects and ultimately enhance success.

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To accomplish this, we implement our study in two phases. In the first phase, we empirically investigate the influence of building activities, including project vision, leader values, and artifacts implemented by the leader, on spirit in technology-driven projects. In conjunction, we center on the influence of spirit on contextual performance behavior and project success. In the second phase, the quantitative analysis is followed by qualitative project case studies designed to ground the empirical results in the context of technology-driven projects. These project case studies are aimed at highlighting aspects of spirit and building activities that have an important impact on contextual performance behavior and success outcomes, but are difficult to describe using only empirical data. The cases are

intended to illustrate the importance of maintaining and managing a project's spirit, regardless of the level of spirit partakers (employees in project-based work) bring to the project and irrespective of the satisfying level of the technical challenge, in project-based work.

### Emotions, Attitudes, and Behavioral Norms Focused on Project Goals

In this section we define emotions, attitudes, and behavioral norms that are focused on project goals. We then depict the building activities we propose leaders can exercise to focus partakers' emotions, attitudes, and behavioral norms on project goals.

#### Emotions

In what they defined as *the passion zone*, Bruch and Ghoshal (2003)

described company employees that thrive on strong, positive emotions, such as joy and pride in their work. Employees' enthusiasm and excitement mean that attention is directed toward shared priorities. In this study, we define emotions as overt reactions that express feelings about events (Weiss & Cropanzano, 1996). Particularly, we are interested in the following categories of emotions: joy, excitement, passion, and enthusiasm. Besides being positive, emotions can be negative too, as we detail below. Despite their differences, emotions usually have an object, as Bruch and Ghoshal implied—something or someone triggers emotions. In a project setting, the project itself can be an emotional trigger. For example, each project is a first of its kind, a pioneering endeavor, which may turn new ideas into reality, thus triggering excitement!

In project settings, individual emotional states could converge into intense group emotions in several ways. First, employees who share common behavioral norms tend to have similar beliefs, leading to similar appraisals and emotions (Schein, 1992). Second, emotional contagion could be at work: individuals could unconsciously respond to others' emotional displays by imitating and exaggerating them. In this study, we are concerned with creating emotional arousal, meaning fostering positive emotions, such as excitement, passion, and joy, rather than negative emotions, such as anxiety that might exist due to a new project being challenging.

We recognize that individuals may have natural differences in their stable long-term tendencies to experience either positive or negative feelings across situations, termed *dispositional affect* (Watson, Clark, & Tellegen, 1988). Dispositional affect is distinct from emotions, which are intense, relatively short-term feelings in reaction to a specific environmental stimulus (Barsade, 2002), and the focus of our attention. For example,

some project participants might have a positive dispositional affect. Yet, these same individuals would also experience transitions in emotions (Greenberg & Baron, 2010) in reaction to specific encounters with the environment, ones that come and go depending on particular project conditions. As we illustrate later, the project manager can foster and arouse strong emotions among project members by infusing a meaningful, exciting vision that expresses the value of the product and its competitive advantage once completed.

### **Attitudes**

We define attitudes as an internal state that influences an individual's choices or decisions to act in a certain way under particular circumstances (Cannon-Bower, Tannenbaum, & Volpe, 1995). Our focus is on attitudes that have been shown to have a direct bearing on the team's interaction process and the ability of a person to flourish in a team. We include satisfaction and commitment in the current study. We define project partakers' satisfaction as the extent that participants are satisfied with co-project partakers, with the way partakers work together, and with working in the project. Affective commitment is the extent that project participants identify and are involved with the project (Allen & Meyer, 1996; Borman & Motowidlo, 1993; Gladstein, 1984). Our definition of project partakers' attitudes is rooted in earlier work (e.g., Kelly & Barsade, 2001; Locke, 1976) and results from the appraisal of a partaker's project-based experiences. Project partakers bring various loyalties to the project setting. Fostering a positive attitude among project participants, illustrated below, is a primary concern of the leader.

### **Behavioral Norms**

Successful projects create their own unique culture, which is nurtured by a set of values that are demonstrated and practiced by the project manager, as we discuss below. Culture in project settings refers to the social and cognitive environment, the shared view of reality, and

the collective belief and value systems reflected in a consistent pattern of behaviors among project members. The consistent pattern of behaviors is what we refer to as *behavioral norms* (Denison, 1996; Detert, Schroeder, & Mauriel, 2000; Schein, 1992). We argue that behavioral norms in project settings can and should be changed to achieve new and outstanding results (Kanter, 2000; Schein, 1990).

In project settings, behavioral norms emerge as an inevitable creation of the project leader. The decisions and actions of the leader, the topography, the physical and social environment nurtured by the leader in which participants find themselves, strongly shape the human interactions. From these interactions emerge an implicitly or explicitly agreed-upon set of objectives, states of affairs, behaviors, and outcomes that are deemed more important, worthy, and preferred than others (e.g., Aronson & Lechler, 2009). In projects, we are likely to see behavioral norms that value inclusion. Behavioral norms that emphasize inclusion place a value on cooperation, teamwork, involvement of the customer, and constructive conflict management. A value placed on quality should be apparent in the behaviors of project members as well. Such values reflect a healthy balance of people and task-related concerns, make people aware of what is important, and direct behavior to contribute to the project's competitive advantage and fulfill the project's vision.

We examined artifacts including social rituals and symbols we refer to later as building activities, implemented by the project leader, that shape members' expected behaviors—captured by the behavioral norms component of spirit. The content of the behavioral norms should be aligned with the degree that coordination and shared participation among workers are needed for task implementation (Cummings & Worley, 2009; Schein, 1992). For example, since project teams are often cross-functional and the

degree of coordination and joint involvement between these members in specific project tasks are important (Dyer & Song, 1998; Sicotte & Langley, 2000), we are likely to see effective project leaders instilling artifacts to create behavioral norms that value inclusion.

Taken together, since by its very nature a project is temporary and since every project is focused on a specific goal, the manifestation of this goal in terms of partakers' emotions, attitudes, and behavioral norms is what is termed *project spirit* (Shenhar et al., 2007). These elements of spirit are bound by a common vision that is focused on the project's expected achievements and nurtured by leader-instilled values and artifacts, detailed next. Our research hypotheses appear in the following section.

## **Research Hypotheses**

In this section, we discuss the building activities we posit leaders can implement to focus partakers' emotions, attitudes, and behavioral norms on expected project outcomes. We also discuss what we propose are the behavioral outcomes of project spirit that are paramount for successful project implementation.

### **Leader Building Activities Focusing Member's Emotions, Attitudes, and Norms on Expected Outcomes**

#### *Vision*

We concentrate on vision, since by focusing attention on a meaningful vision the leader operates on the emotional and spiritual resources of the project, rather than on its physical resources (Bennis & Nanus, 1997). Vision refers to the direction, goals, and mission of the project team (Cannon-Bower et al., 1995). It helps illuminate the core values and principles that will guide the team in the future. It gives a sense of direction. It evokes meaning and a deep commitment. It serves as glue to bind the team together. Effective visions are grounded in core values about which team members feel passionate (Whetten & Cameron, 2010). A project vision can be defined as a statement that

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expresses the value of the product and its competitive advantage. It articulates the state of affairs once the project is completed (Shenhar, 2004). The leader can convince members, via effectively communicating the project's vision, to look beyond individual or functional orientations to the importance of a technological innovation or new product as a team outcome. Participants are inspired to perform beyond normal expectations via a commitment to this vision, to perform enthusiastically beyond individual self-interests, to focus on the team's outcomes, and invest effort (Keller, 2006; Waldman, Javidan, & Varella, 2004), all of which are captured by the *expression-components* of project spirit. Our first hypothesis follows:

**Hypothesis 1 (H1):** Vision effectively articulated by the leader positively affects project spirit.

### Values

Participants in projects bring various talents, orientations, values, allegiances, and aspirations to the project setting. Leaders are called on to manage the interaction among partakers who collide at the project setting. We center on the leaders' values as manifested by the leaders' behavior, since successfully generating gains in spirit may be attributed to the leaders' ability to infuse their own values into their interactions with project members, so new behavioral norms are internalized, new behaviors are learned (Goffee & Jones, 1998; Saffold, 1988; Schein, 1996), and participant attitudes are transformed (Bass, 1985). Scholars do show that behaviors that differentiate one leadership pattern from another may be explained by assessing differences in the leader's value and belief systems. For example, transformational leaders report value systems that are distinguishable from other types of leaders. Transformational leadership behavior is linked with behavioral norms that encourage personal and professional development as well as

common good (Krishnan, 2001; Sarros & Santora, 2001). These leaders create excitement and alter follower attitudes as well (Barling, Weber, & Kelloway, 1996; Podsakoff, MacKenzie, Moorman, & Fetter, 1990; Rafferty & Griffin, 2006).

**Hypothesis 2 (H2):** Leader-instilled values positively affect project spirit.

### Artifacts

We refer to social rituals and symbols as *artifacts*. Social rituals are formally or semi-formally organized, regularly scheduled team events and social activities that engage people in specific information sharing and more so in specific actions, such as meetings, social events, training, and off-site team building activities. Managers sponsoring such rituals send a clear message that teamwork is important and intensive investment of time, energy, and acquisition of new ideas and skills that support teamwork are expected (e.g., Jassawalla & Sashittal, 1998). Rituals that involve customers, suppliers, and internal stakeholders can engender behavioral norms that value inclusion and openness to novelty. Symbols include layout and design of the work environment, the displayed documentation, dress code, motto, naming, and other concrete objects that signify the priorities and desired behaviors of project members (Schein, 1986). We are concerned with symbols used by project managers because they can represent the extent that free choice, equality, and entrepreneurial energy are expected. Taken together, we propose that leader-instilled artifacts will generate gains in project spirit.

**Hypothesis 3 (H3):** Artifacts instilled by the leader positively affect project spirit.

### Contextual Performance Behavior Outcomes and Success

#### Contextual Performance Behavior

The building activities implemented by leaders create spirit, which in turn fosters

behavioral outcomes that are paramount for successful project implementation. We center on the role of project spirit in engendering contextual performance behavior outcomes (Figure 1). Contextual performance behavior, also referred to in the literature as *citizenship behavior* (Motowidlo, 2000) and detailed later, captures collaborative efforts that go beyond prescribed roles. Collaboration commonly refers to the coming together of diverse interests and people to achieve a common purpose via interactions, information sharing, and coordination of activities (Jassawalla & Sashittal, 1998). Overcoming the problems created by physical and perceptual distances among functional groups, ensuring early involvement of all participants, and joint sharing of responsibility in ways that ultimately improve and accelerate project implementation are among the commonly described advantages associated with collaboration. Contextual performance behavior goes one step further and focuses on individuals who are willing to go above and beyond their prescribed roles to voluntarily help coworkers achieve group objectives and refrain from complaining or finding fault with other project participants (Chen, Chen, & Meindl, 1998; Koys, 2001). In a project setting, helping co-project partakers should free up the project managers to implement more important tasks (Aronson & Lechler, 2009). By not complaining when conditions are challenging, in terms of shifting goals, priorities, schedules, and unforeseen project problems, individuals can invest their time implementing the project productively (Reilly & Aronson, 2009).

Project spirit should positively influence contextual performance behavior in several ways. Employees' emotions, an expression of spirit, should have important workplace consequences for contextual performance behavior (Brief & Weiss, 2002; Pelled & Xin, 1999). Changes in managerial behavior can impact employees' emotional reactions and consequently their performance (Huy, 2002). Research

suggests that behavioral norms that value inclusion, a component of project spirit, are likely to engender collaboration and contextual performance behavior (Chatman & Flynn, 2001; Jassawalla & Sashittal, 1998; Moorman & Blakely, 1995). Finally, in terms of attitudes, affective commitment, one attitudinal expression of spirit, should engender contextual performance behavior (Carr, Schmidt, Ford, & Deshon, 2003; Cropanzano, Rupp, & Byrne, 2003; Ellemers, de Gilder, & van de Heuvel, 1998; Jassawalla & Sashittal, 1998). Job satisfaction, a second attitudinal component of spirit, is related at the unit level to collaborative and contextual performance behavior. The cooperative behaviors in turn influence performance (Koys, 2001; Podsakoff, MacKenzie, Paine, & Bachrach, 2000). Thus, our fourth hypothesis is:

**Hypothesis 4 (H4):** Project spirit positively affects contextual performance behavior.

#### *Contextual Performance Behavior and Its Influence on Success*

Contextual performance behavior includes voluntarily assisting coworkers in various ways, taking on additional assignments, keeping a positive attitude, and tolerating inconveniences at work (Organ, Podsakoff, & MacKenzie, 2006). Contextual performance behavior generally has two common themes: it is representative of employees' extra efforts that contribute to productivity, and it is not directly enforceable, meaning it is not technically required as a part of one's job. There are several models of contextual performance behavior, yet they all describe voluntary helpful patterns of behavior that are similar (Motowidlo, 2000), which as elaborated below, we expect ought to influence project success.

To capture these patterns of behavior, Organ (1990) identified various conceptually distinct dimensions of contextual performance behavior: helping behavior, civic virtue, and

sportsmanship. Helping behavior involves helping coworkers or preventing the occurrence of work-related problems. Helping behavior includes altruism, courtesy, peacekeeping, and cheerleading, in which a coworker may encourage a discouraged colleague. Civic virtue indicates that a team member responsibly participates in and is concerned about the team, and provides constructive suggestions for improving its effectiveness. Sportsmanship refers to the willingness on the part of a team member to tolerate circumstances that are not ideal without complaining.

Researchers assume that the special effort captured by contextual performance behavior contributes to performance, although a review of the literature suggests that hard evidence on this point is scarce and confined to particular work settings. Contextual performance behavior was related to several indicators of performance of sales units in an insurance agency (Podsakoff & MacKenzie, 1994), to overall unit profits in a restaurant chain (Koys, 2001), to the likelihood of meeting the sales quota in pharmaceutical sales teams (Podsakoff et al., 2000), and to indicators of both product quality and quantity of machine crews in a paper mill (Podsakoff, Ahearne, & MacKenzie, 1997). In sum, the scant empirical evidence supports the relationship between contextual performance behavior and important performance outcomes, though scholars (Organ et al., 2006) have urged investigating whether the conclusion from this research pertains to professional employees as well. In the current study, we focus on professionals partaking in project-based work and investigate the proposed effect of contextual performance behavior on project success.

We posit that the nontraditional contextual performance behavior ought to be related to project outcome criteria, in terms of client satisfaction, project effectiveness, business success, and increase in know-how (Pinto & Slevin, 1988a). These success criteria are

frequently mentioned in the literature, are detailed in the methods section, and are important for several reasons in the context of our investigation of contextual performance behavior in project-based work. Contextual performance behavior ought to enhance project success by reducing friction between functional members who are implementing the project. Courtesy on behalf of project partakers can create a positive environment among project participants that can spill over to project customers, fostering client satisfaction with the process with which the project was completed. Courteous project partakers might inform each other about non-routine demands, allowing them to take steps to mitigate problems. Project participants who voluntarily disseminate their functional expertise to fellow project partakers beyond what is formally required, referred to as *helping behavior*, further expose their associates to diverse information that should lead to improved performance (Katz & Tushman, 1981). Such increased information sharing should further help project partakers catch downstream problems such as manufacturing difficulties or marketing mismatches, before they happen, when these problems are generally smaller and easier to fix (Brown & Eisenhardt, 1995). It is plausible that project participants who eagerly help each other out, beyond what is required, would not have to turn to their project managers for assistance, leaving the project managers free to carry out more important tasks, such as obtaining needed personnel and securing financial support. Further, in the demanding project setting, in which resources and goals are uncertain and customer demands are evolving, the less time project participants consume complaining or finding fault with project colleagues, as we refer to as *sportsmanship*, the more time they can invest in more productive purposes. Finally, *civic virtue*, in the form of sharing information beyond the call of duty and providing

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constructive suggestions, should drive effectiveness, in that it should ensure that the project will meet all technical specifications, and contribute to project know-how. Accordingly, we propose that contextual performance behavior on the part of project partakers shall contribute to project success.

**Hypothesis 5 (H5):** Contextual performance behavior positively affects project success.

### Method

This research applies a sequential mixed method that has two phases. In the first phase, we conduct an empirical investigation that tests the research model (Figure 1), illustrating its value in explaining how spirit influences success and how spirit can be generated in technology-driven projects. In the second phase, we present three case studies to ground the empirical results in the context of technology-driven projects and to highlight the value of managing spirit. The aim of these project case studies is to draw attention to aspects of spirit and building activities that have an important impact on behavior and success outcomes, but are difficult to describe using only empirical data.

#### Phase 1—Empirical Investigation

##### Sample

Data for the empirical study were collected from 193 core members and project managers in 60 projects. The core members were responsible for specific tasks throughout the entire implementation of the project. Each of the participating organizations had a primary company contact responsible for identifying a project located within his or her organization to participate in the study. It was also the responsibility of the primary contacts to distribute surveys to the leader and one survey to each of two core members of the identified project. Participation on the part of the project members was voluntary, and the response rate was 91%. Project

leaders were instructed to assess project success and the building activities (vision, values, artifacts). Project members were asked to assess project spirit and contextual performance behavior.

The respondents were instructed to choose a completed project. Our sample included a range of successful and unsuccessful projects, but our data were skewed toward successful projects. Some unsuccessful projects were possibly not included because they were never completed. Such restriction in range tends to impact correlations more than regression weights, however (Aronson, Reilly, & Lynn, 2006), so we feel that this restriction did not seriously bias our results. Finally, to ensure a reasonably comparable level of familiarity with the projects across the sample, project members were instructed by the contact person to choose a project with which they were intimately familiar and involved throughout its implementation. Additionally, studies conducted in project settings routinely use retrospective methods for reasons of feasibility (e.g., Meyer & Utterback, 1995; Tatikonda & Montoya-Weiss, 2001). To improve the accuracy of retrospective reports, respondents were asked by the contact person to select recent projects, to eliminate the elapsed time between the events of interest and the collection of data.

We sampled a variety of industries, including manufacturing, software, and telecommunication. The participating project members worked on new product development projects (39%), IT implementation projects (32%), and engineering projects (29%). We did not expect these projects to differ with respect to project spirit and contextual performance behavior, the focus of our study, since all sampled projects were technologically challenging projects. Nonetheless, to test for differences in project type, we performed analyses of variance (ANOVAs) with the spirit and contextual performance behavior constructs as dependent variables and project type (R&D, IT, Engineering) as the independent variable. No significant

differences were found between the project type with respect to the variables of interest in the current research.

All projects had a budget that was over half a million dollars, and their durations were at least four months each. The average project duration was one year. The projects consisted, on average, of five core members who were responsible for specific tasks throughout the entire implementation of the project. Furthermore, on average, five departments were involved in implementing the projects. The majority of the projects (80%) in our sample were organized in a matrix structure (either functional, balanced, or project matrix), 15% were organized as stand-alone projects, and 5% were directly integrated in the line organizations, which was consistent with what we expected to investigate in project settings. A similar distribution of project management structures is reported in previous work (e.g., Larson & Gobeli, 1989; Might & Fischer, 1985).

#### Measures

**Leader building activities.** We assessed the building activities, vision, values, and artifacts, using items adapted from Shenhar and colleagues (2007). All the items measuring building activities were rated by the respondents on a 7-point scale ranging from strongly disagree (1) to strongly agree (7; see Appendix for complete list of items).

Vision was assessed using three items (Appendix):

- There was a clearly articulated, meaningful, and exciting vision that expressed the project's expected value and outcomes.
- The vision inspired team members beyond usual organizational practices and process.
- The vision focused team members on creating value to the customers and the company.

All items were summed to arrive at an overall score for vision by project. Cronbach's alpha value was 0.64.

Artifacts (social rituals and symbols) were assessed using the following six items:

Social rituals:

- Team members participated in social events initiated by project leaders or a team member.
- Team members participated in off-site team building activities initiated by project leaders.
- Team members participated in unique ceremonies that were specific to the project.

Symbols:

- Project team members used a unique dress code or other symbols.
- Project team members were addressed on a first-name basis or by nicknames.
- The project had its own logo.

Items on both scales were summed to arrive at an overall score for artifacts by project. Cronbach's alpha value was 0.91.

Leader values were assessed using the following items:

- The project leader values going beyond self-interest for the good of the project.
- The project leader values quality.
- The project leader values creativity.
- The project leader values professional development.
- The project leader values open communication.

All items were summed to arrive at an overall score for leader values by project. Cronbach's alpha for leader values was 0.65.

With two exceptions for vision and leader values, all alpha values in the current study are above the generally acceptable level of 0.70 (Nunnally, 1978). It is noteworthy that alpha values below Nunnally's criterion of 0.70 are reported in the literature. For comparative purposes, similar alpha values to the ones obtained in our study for vision and leader values have been documented by several researchers (e.g., Atwater, Waldman, Atwater, & Cartier, 2000; Stewart, Fulmer, & Barrick, 2005), providing overall support for the

consistency of the measures used in the present research.

**Project spirit.** As expressed by partakers' emotions, attitudes, and behavioral norms for inclusion, project spirit was assessed using several scales. All the original scale items were slightly modified to accommodate the setting by inserting the word "project" (Appendix). We assessed emotions using items from Weiss and Cropanzano (1996). We assessed partaker attitudes using items adapted from Ellemers and colleagues (1998) and Gladstein (1984).

To capture behavioral norms for inclusion, we adapted constructive items used by Cooke and Lafferty (1989).

The items assessing spirit appear next (see Appendix for complete list of items):

Emotions:

- Team members were enthusiastic during project implementation.
- Team members were optimistic during project implementation.
- Team members felt mostly happy during project implementation.

Attitudes:

- Team members were satisfied with their co-team members.
- Team members were very satisfied with working in the project setting.
- Team members were guided by project goals.
- Team members identified with fellow team members.
- Team members were proud to be part of the team.

Behavioral norms for inclusion:

- While focusing on project goals:
  - Taking initiative on the part of team members is expected.
  - High quality work on the part of team members is expected.
  - Creativity on the part of team members is expected.
  - Including customers, suppliers, and other functional groups early in the implementation process is expected.

A confirmatory factor analysis (CFA) using the Maximum Likelihood (ML) estimation showed that attitudes,

emotions, and behavioral norms for inclusion all loaded on one factor called spirit, and the respective factor loadings were 0.87, 0.82, and 0.78. All the items were rated by the respondents on a 7-point scale ranging from strongly disagree (1) to strongly agree (7). All the project spirit items evaluated by the respondents were summed by respondent. Then all respondents' summed evaluations were aggregated to the project level to arrive at an overall score for spirit. Cronbach's alpha for spirit was 0.81.

**Contextual performance behavior.**

Project partakers' contextual performance behavior was assessed using items developed by Podsakoff et al. (1997; Appendix): The project itself served as the referent for the contextual performance behavior measure. Since the data gathered from project participants was concerned with the project, the original items were slightly modified to accommodate the setting by replacing the words "machine crew" with the word "project" (Appendix). The items assessing the three contextual performance behavior dimensions were rated by the respondents on a 7-point scale ranging from strongly disagree (1) to strongly agree (7). A project's overall score on contextual performance behavior was the average of all the items aggregated to the project level. Cronbach's alpha value was 0.86.

**Project success.** To assess project success we used the following items, adapted from Pinto and Slevin (1988a; Appendix):

- The project was completed on time or earlier.
- The project was completed within or below budget.
- The product met all customer requirements.
- The customer was highly satisfied.
- The product improved the customer's performance.
- There is a great chance that the customer will return for additional business.
- The project resulted in business success for the company that implemented it.

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- The project increased the profitability of the organization implementing it.
- The project had a positive return on investment.
- The project increased market share or outreach among customers/users.
- The project will lead to additional new business or new products or services.
- The product has the potential to create new markets or new customers/users.
- The project created new technologies or new capabilities for future use.

All items (Appendix) were rated by the respondents on a 7-point scale. Overall success was a summary of all the items aggregated to the project level. Cronbach's alpha for the success measure was 0.76.

### Results

In this research, the variables were conceptualized at the project level (group level). To justify aggregation of the data obtained from individual project members to the project level, we calculated intraclass correlations ICC(1) and ICC(2) (Klein, Conn, & Sorra, 2001; Klein & Kozlowski, 2000). ICC(1) represents the percent of the variance in individual rater's responses to scale items (e.g., responses to project spirit or contextual performance behavior scale items), which can be explained by this individual's membership in a certain project.

ICC(2) indicates the reliability of the project mean for this scale. Aggregation tests revealed that ICC(1) values for the study variables ranged between 0.20 and 0.25. Thus, on average, over 20% of the variance in individual-level responses to these scales was explained by project membership. ICC(1) values were similar to those reported in other studies (e.g., Schneider, White, & Paul, 1998). The ICC(2) values for these scales ranged between 0.93 and 0.95. Glick (1985) recommended a cutoff of 0.60 for ICC(2). Taken together, these results support aggregation of the data to the project level.

### Descriptive Statistics

Means standard deviations and correlations between all the study variables are reported in Table 1. The correlations do not alone provide a full test of the hypothesized relationships, but they are generally consistent with the expected pattern of results. All three leader building activities are significantly related to project spirit. Spirit is significantly related to contextual performance behavior, and contextual performance behavior is significantly related to project success. Interestingly, the mean for artifacts was low. We believe that several items assessing artifacts were ambiguous, making it challenging for respondents to provide a more positive rating and lowering the overall mean on artifacts. For example,

the item "Team members participated in social events initiated by project leaders or a team member" should in the future be separated into two items: "Team members participated in social events initiated by project leaders," and "Team members participated in social events initiated by a team member." Future research will address this issue.

### Hypothesis Testing

We tested our propositions using several regression analyses. The first regression analysis was conducted using overall project success as the dependent variable (Table 2). Our model proposes the significant direct influence of contextual performance behavior on project success. To demonstrate that a direct significant influence on project success exists only for contextual performance behavior, we needed to enter all the variables (vision, leader values, artifacts, spirit, and contextual performance behavior) into the regression model and to find significant results only for contextual performance behavior (Cohen, Cohen, West, & Aiken, 2003). Together, vision, leader values, artifacts (social rituals and symbols), spirit, and contextual performance behavior explained 17.4% ( $F = 2.608$ ,  $p < 0.05$ ) of the variance in project success. As predicted, contextual performance behavior was significantly related to overall success ( $\beta = 0.309$ ,  $p < 0.05$ ).

	Mean	Standard Deviation	1	2	3	4	5	6
1. Vision	5.057	0.537	0.640					
2. Leader values	3.983	0.418	0.315**	0.653				
3. Artifacts: rituals; symbols	3.018	1.234	-0.046	0.154	0.912			
4. Project spirit	4.321	0.492	0.239*	0.469**	0.291*	0.813		
5. Contextual performance behavior	5.425	0.629	0.288*	0.376**	0.245*	0.667**	0.861	
6. Overall success	5.616	0.794	0.127	0.256*	0.140	0.341**	0.408**	0.760

Note.  $N = 60$  Technology-driven projects (Listwise). Cronbach's alpha values are along the diagonal.

\*Correlation is significant at the 0.05 level [2-tailed].

\*\*Correlation is significant at the 0.01 level [2-tailed].

**Table 1:** Means standard deviations and correlations between all model variables.

Predictor	B	SE	Beta	T	sig
Vision	-0.074	0.170	-0.054	-0.439	0.663
Leader values	0.110	0.231	0.064	0.477	0.635
Artifacts: rituals; symbols	0.058	0.072	0.099	0.806	0.423
Project spirit	0.105	0.240	0.072	0.436	0.664
Contextual performance behavior	0.353	0.180	0.309	1.967	0.050
F-Ratio for the Regression 2.608*					
R = 0.417      R <sup>2</sup> = 0.174					
* <i>p</i> < 0.05.					

**Table 2:** Regression using project success as the dependent variable.

Predictor	B	SE	Beta	T	sig
Vision	0.145	0.118	0.121	1.231	0.223
Leader values	0.058	0.162	0.038	0.357	0.722
Artifacts: rituals; symbols	0.037	0.050	0.071	0.728	0.469
Project spirit	0.761	0.139	0.598	5.491	0.000
F-Ratio for the Regression 13.377***					
R = 0.678      R <sup>2</sup> = 0.459					
*** <i>p</i> < 0.001.					

**Table 3:** Regression using contextual performance behavior as the criterion.

These results support our hypothesis that contextual performance behavior predicts project success (H5).

A second regression analysis was conducted using contextual performance behavior as the criterion (Table 3). Our model also posits the significant direct influence of spirit on contextual performance behavior. Similarly, to demonstrate that a direct significant influence on contextual performance behavior exists only for spirit, we had to enter the variables (vision, leader values, artifacts, and spirit) into the regression model, and expect to find significant results only for spirit (Cohen et al., 2003). Together, vision, leader values, artifacts (social rituals and symbols), and spirit explained 45.9% ( $F = 13.377$ ,  $p < 0.001$ ) of the variance in contextual performance behavior. As predicted,

project spirit was significantly related to contextual performance behavior ( $\beta = 0.598$ ,  $p < 0.001$ ). These results support H4—project spirit positively affects contextual performance behavior.

Using Baron and Kenny's (1986) procedure, we also tested whether contextual performance behavior fully mediates the relationship between project spirit and overall project success. According to Baron and Kenny, a variable (M) mediates the relationship between an independent variable (X) and a dependent variable (Y) if: (a) X is significantly related to Y; (b) X is significantly related to M; (c) after X is controlled for, M remains significantly related to Y; and (d) after M is controlled for, the X–Y relationship is zero. Steps (b) and (c) are the essential steps in

establishing mediation, and step (d) is only necessary to prove a fully mediated effect. We tested (a), (b), (c), and (d) using three regressions.

As seen in Table 4, project spirit (X) significantly affected the dependent variable, overall project success (Y), in Model a ( $p < 0.01$ ). Project spirit (X) significantly affected the mediator variable, contextual performance behavior (M), in Model b ( $p < 0.001$ ). The mediator, contextual performance behavior (M), significantly affected the dependent variable (Y) in Model c ( $p < 0.01$ ), and the effect of project spirit on overall project success was less in Model c than it was in Model a—the beta for project spirit was attenuated from 0.341 ( $p < 0.01$ ) in Model a to 0.125 ( $p > 0.05$ ) in Model c. These results provide support for a fully mediated effect—after

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	Beta	F	df	R Square
DV: Project Success Project Spirit MODEL A	0.341	8.949**	1, 68	0.116
DV: CPB Project Spirit MODEL B	0.667	54.456***	1, 68	0.445
DV: Project Success CPB Project Spirit MODEL C	0.325 0.125	7.101**	2, 67	0.175

Note. DV = dependent variable; CPB = contextual performance behavior.  
 \*\* $p < 0.01$ .  
 \*\*\* $p < 0.001$ .

**Table 4:** Regression results testing contextual performance behavior as a mediator between project spirit and project success.

M is controlled for, the X–Y relationship is zero.

Finally, regression analysis was conducted using project spirit as the dependent variable (Table 5). Together, leader building activities—vision, leader values, and artifacts (social ritual and symbols)—explained 27.5% ( $F = 8.112$ ,  $p < 0.001$ ) of the variance in project spirit. As predicted, leader values and artifacts had significant beta weights ( $\beta = 0.387$ ,  $p < 0.01$ ;  $0.237$ ,  $p < 0.05$ ), providing support for H2 and H3. The beta weight for vision was not significant, though the zero order correlation for vision with spirit was significant. We reran this regression based on

84 projects ( $n = 261$ ) that had complete data on leader building activities and spirit variables. Together, leader values, artifacts, and vision explained 30.5% ( $F = 12.743$ ,  $p < 0.001$ ) of the variance in project spirit. The beta weights for leader values, artifacts, and vision were all significant ( $\beta = 0.378$ ,  $p < 0.001$ ;  $0.260$ ,  $p < 0.01$  and  $174$ ,  $p < 0.10$ ), providing additional support for hypotheses H1–H3.

### Phase 2—Taking a Closer Look: Three Project Case Studies

In the quantitative part of the study, we found general empirical support for a model in which project leader building

activities, which support instilling a project vision and artifacts, are guided by this individual's values and affect partakers' emotions, attitudes, and behavioral norms that are focused on expected project outcomes, termed project spirit. Furthermore, project spirit was found to affect partakers' contextual performance behavior and, through contextual performance behavior, to affect project success. The qualitative part of the study follows. The first objective of the case studies is to ground the model (Figure 1) in the context of technology-driven projects through more detailed description. The second objective of the case studies is to highlight aspects of spirit, and building activities that have an important impact on behavior and success outcomes but are difficult to describe using only empirical data.

This section begins with a description of the case study methodology, followed by background descriptions of three technology-driven projects and a summary table. Next, we ground the concepts of the model in the reality of the project cases. The final part of the case study section focuses on several key themes that help provide a better understanding of spirit, leader building activities, behavior outcomes, and success in technology-driven projects.

#### Case Study Methods

We began with a sample of 193 technology-driven projects we had identified that had at least three core project

Predictor	B	SE	Beta	T	sig
Vision	0.120	0.105	0.127	1.141	0.258
Leader values	0.460	0.134	0.387	3.432	0.001
Artifacts: rituals; symbols	0.096	0.044	0.237	2.190	0.032
F-Ratio for the Regression 8.112***					
R = 0.525      R <sup>2</sup> = 0.275					
*** $p < 0.001$ .					

**Table 5:** Regression using project spirit as the dependent variable.

participants. We concentrated on NASA Mars Pathfinder, Mars Climate Orbiter, and Lunar Prospector, since they operated in a similar environment and represented similar project types on some of the most common dimensions for project categorization (Shenhar & Dvir, 1996, 2004), and we wanted to assess the influence on leader building activities and spirit expression-components, while controlling for project type and key environment factors. These three projects were categorized as high-tech projects. In high-tech projects, all or mostly all new but existing technologies are used (see Shenhar & Dvir, 2004). While an effective project manager may be the source for a project team's spirit, there are other possibilities, like the satisfying nature of the technical challenge of high-tech projects or the opportunity for new learning on the job. We felt that, by concentrating on the views of partakers in successful and failed technology challenging projects, we could illustrate the importance of maintaining and managing a project's spirit, regardless of the level of spirit partakers bring to the project and irrespective of the satisfying level of the technical challenge. Although not addressed in the current study, as with most deep space projects, schedule, cost, and technology have limited margins, making Mars Pathfinder, Mars Climate Orbiter, and Lunar Prospector blitz-critical projects. Time and budgets became fixed, and any error in either of these areas meant cancellation for the project. The cases were all categorized as system on the dimension of complexity. As is the case with all deep space missions, they are a collection of interactive elements and subsystems that must perform a wide range of functions under extreme conditions. All the projects were successful projects, except for Mars Climate Orbiter. Some methodological strengths of the current research design are that we were able to hold constant key environmental factors, since all projects were carried out within the NASA culture. Additionally, Mars Climate Orbiter, a failed project, and the

successful Mars Pathfinder and Lunar Prospector projects provide us with the opportunity to establish a well-designed investigation and to center on several major questions that were guided by our empirical findings: What is the value of leader building activities in maintaining and managing spirit in these technology challenging projects? Additionally, what was the level of spirit in the failed Climate Orbiter? Was it any different from, for example, what project participants we interviewed encountered on the Mars Pathfinder project, which successfully landed a probe on the surface of Mars?

The researchers interviewed individuals identified by participants as important contributors. In each project we interviewed a program director, project-team leader, engineer, and two team members. The interviews were semi-structured, following Merton, Fiske, and Kendall's (1963) approach. The core questions focused on the following underlying topics guided by our empirical study: the project's vision, values, artifacts (social rituals, symbols), spirit, and contextual performance behavior outcomes.

The purpose of these interviews was to understand the project and the impact that spirit had on behavior outcomes and success, as well as how project spirit was generated and maintained. Two researchers were present at each interview. Both took notes independently and typed them up each

night. Any inconsistencies were discussed and resolved. Researchers' impressions were kept separate from the interviewees' impressions, and all data were included in the write-ups, even when not specifically requested in the interview guide (Eisenhardt, 1989; Yin, 1984). Interview notes from the two researchers were compared to highlight differences and produce a master set of interview notes. Next we followed the "memoing" process (Glaser, 1978) to record patterns that the researchers noted within each project site and across project sites to identify the matches between the empirical pattern and the case study predicted pattern (Yin, 1984). Our presentation of the case studies begins with brief background descriptions of each project. Summary tables (Tables 6–8) of the cases that illustrate project goals, examples of the leader building activities, behavior outcomes, and elements of spirit are also included. In the final section, we focus on several key themes that emerged from the case studies that were not well represented by the empirical results, but are important for understanding spirit and the value of leader building activities for managing spirit in technology-driven projects.

### **Three Case Studies: General Background**

#### *Successful Mars Pathfinder*

In 1993, Congress approved a plan proposed by NASA's Space Science

Project	Industry	Goal
Mars Pathfinder Successful <sup>a</sup>	Space	To design, test, and develop a Lander and Rover to launch and safely land on the surface of Mars
Mars Climate Orbiter Failed	Space	To provide information about the cycles of water, carbon dioxide, and dust on Mars
Lunar Prospector Successful <sup>a</sup>	Space	To design, test, and develop a system that would orbit the moon to obtain scientific data

<sup>a</sup>Projects were successful in that they had met all their reported goals.

**Table 6:** Project, industry, and goals.

Project	Vision Elements (Explicit or Implicit)	Values Derived from the Team Leader's Style	Team Events—Meetings (artifacts)	Team Social Events and Rituals (artifacts)	Symbols (artifacts)
Mars Pathfinder Successful <sup>a</sup> Spirit was managed	To gather mountains of data to advance the scientific understanding of Mars and our solar system, while doing things differently, and building faith in low cost space. "Management fostered a focused vision for the project."	"Management believed in being an example for the team, . . . that leadership begins at the top, and so does team spirit. . . . During the project, we changed about 10 percent of the staff. . . . They weren't willing to make that commitment to pulling this project off." "Leadership lacked a balance between confidence and arrogance." Members felt it was difficult to achieve team spirit, since they were pressured to perform as management wanted or they were not valued." Management did not infuse a sense of responsibility among members for the mission's success. "As requirements crept, no one [from management] stood up and said No, or that it was not in line with the original scope and strategy of the project."	Meetings were kept short (sometimes only 15 minutes), to the point, and offered the opportunity for team members to address issues or concerns.  Links, e.g., with contractors and upper management, were limited or faint. Leaders were defined as capable. With a low-cost, schedule-driven mission, there was a "desire to succeed. It also resulted in not being able to afford broad testing . . . Therefore the project built a 'protective shield' to outside opinion . . . or expert involvement."	The [project manager] . . . would declare a happy hour, and . . . members of the team would go out for drinks. This activity became a festive event that helped develop camaraderie." On-the-job training was provided during the course of the project.  "Leadership lacked a collegial relationship with team members," stated the project leadership processor. Formal training was lacking. As inexperienced members were added, they did not receive any mentoring in what they were tasked.	"The colocation allowed for the crossing of line organizations, and the fact that everybody was there as an integrated cohesive unit, as a team, doing something new, really contributed to the high-level spirit." Events centered on naming.  Some JPL (The Jet Propulsion Laboratory) management relocated to Lockheed Martin for the project. Other symbols were not reported by project interviewees.
Mars Climate Orbiter Failed Spirit not managed	To design, test, develop, launch, and operate an orbiter that would collect weather data from Mars and act as a relay station for five years, assisting in data transmission to and from the Mars Polar Lander (MPL). Project manager: "There was a drive to do good science, but the drive to develop MCO at . . . minimum cost fostered the strategy."	Deputy mission manager stated that the project manager was successful because he tried to motivate people to do the job he felt they were capable of doing. The project manager was very involved and never afraid to "pick up a wrench" to guarantee project success.	Lunar Prospector believed that vendor involvement was critical to mission success. "We had a staff meeting to address objectives for the week every Monday, and every Wednesday we had a subsystem review so engineers could address the issues in real time."	"Throughout the project, it was the team that nurtured the project spirit." "When . . . Lunar Prospector was selected, Martin, winner of the other two Discovery proposals, had a large dinner party for all of the people involved." Training was received prior to the project start or on-the-job.	Lunar Prospector developed project logo stickers and patches, which appeared on everything from notebooks to janitor's barrels, and a motto. The project manager believed that colocation was critical. The team was collocated in one building, called a pod.
Lunar Prospector Successful <sup>a</sup> Spirit was managed	To design, test, and develop an orbiter that would obtain scientific data not gathered by Apollo and demonstrate the philosophy of "faster, better, cheaper." "Lunar Prospector was the vision of one man, the [principal investigator]."	Deputy mission manager stated that the project manager was successful because he tried to motivate people to do the job he felt they were capable of doing. The project manager was very involved and never afraid to "pick up a wrench" to guarantee project success.	Lunar Prospector believed that vendor involvement was critical to mission success. "We had a staff meeting to address objectives for the week every Monday, and every Wednesday we had a subsystem review so engineers could address the issues in real time."	"Throughout the project, it was the team that nurtured the project spirit." "When . . . Lunar Prospector was selected, Martin, winner of the other two Discovery proposals, had a large dinner party for all of the people involved." Training was received prior to the project start or on-the-job.	Lunar Prospector developed project logo stickers and patches, which appeared on everything from notebooks to janitor's barrels, and a motto. The project manager believed that colocation was critical. The team was collocated in one building, called a pod.

<sup>a</sup>Projects were successful in that they had met all their reported goals.

**Table 7.** Illustrating the building activities of spirit instilled by the leader in each project.

Project	Emotions <sup>a</sup>	Attitudes <sup>b</sup>	Behavioral Norms <sup>c</sup>	Behavior <sup>d</sup> Outcomes
Mars Pathfinder Successful Spirit was managed	One objective “was to do a high-performance mission with a fixed budget and schedule. Mars Pathfinder was much cheaper than anything like it in the past, and it carried an excitement that was unmatched.”	The PM clearly stated that “the key success factor was the people. They consistently exhibited their commitment to the goals.”	“The people that were going to be there at landing were there during the design [creating a culture of inclusion] . . . It grew into the tightest, most high-spirited group of people.” “People were more concerned with being honest and meeting the goal, than trying not to rock the boat.”	“When selecting members, management wanted people that were going to be with the project from beginning to end. . . . When people heard about the opportunities, responsibility, and authority people were getting, they were asking to be a part of the project.” Not having enough people, but dedicated people, meant people worked extra hard to get the job done and do it right. This may have taxed the time and capabilities of the team. Management empowered the team, but the team had limited experience and depth.
Mars Climate Orbiter Failed Spirit was not managed	People put their hearts and souls into the project with a lot of time and even overtime, while maintaining an incredible enthusiasm. The program manager described them as “just a bunch of space nuts.”	From management on down, they wanted to show everyone that this could be done. People devoted their lives, weekends, and time, the program manager stated.	The culture in MCO was described as “can-do, driven, self-reliant, we know how to do it, we’ll get there, and confident.” Yet, lack of key members’ involvement (e.g., scientists) from the start of the project and others who “were not brought to the project until just before launch” diminished a culture of inclusion.	People went the extra mile and had faith that their team members would do the same, demonstrating contextual performance behavior. The team was especially assembled because of their unique capabilities, and members were retained because they brought value to the project.
Lunar Prospector Successful Spirit was managed	One of the mission objectives was to “stimulate public interest in planetary exploration,” which fostered excitement. There was a “feeling of being part of something that was different.”	The principal investigator stated constantly, “if you were not having fun you should get off the program and go somewhere else.” And, his colleague added, “we all had fun.”	c1: “Colocation was critical . . . having everybody within shouting distance made communication personal and instantaneous,” fostering a culture of inclusion. “The willingness to try a different way of doing business” shows the value placed on learning and experimentation, too.	

<sup>a</sup>Implicit or explicit vision elements (from Table 7) engendering the emotional expression component of spirit.

<sup>b</sup>Leader values (from Table 7), manifested in the leaders’ style, shape the attitudinal component of spirit.

<sup>c</sup>Social rituals (from Table 7, e.g., meetings; training) emerge as powerful building activities available to the project leader for molding the behavior norms expression component of spirit.

<sup>d</sup>Symbols (from Table 7) including colocation, naming, logos, evident in the projects we studied, signify the project’s priorities and desired behaviors and norms of its members, we refer to as culture, which emphasizes inclusion (e.g., values cooperation, involvement of the stakeholders, quality, learning).

<sup>e</sup>The project leader can regulate the behavior outcomes of project partakers, by shaping spirit through a change in the building activities this person executes.

**Table 8:** Spirit expression components and behavior outcomes.

## Managing the Intangible Aspects of a Project

Enterprise for better, faster, cheaper planetary missions called the Discovery Program. Mars Pathfinder was chosen to set out to broaden the understanding of Mars and show that Better, Faster, Cheaper could be done successfully. As a project, Mars Pathfinder was to design, test, and develop a Lander and Rover to launch and safely land on the surface of Mars, at the time one of the most complex planetary exploration projects in space science history. With three years for development and a cost no greater than \$280 million, Mars Pathfinder was to show a simple, low-cost system, at a fixed price for placing a science payload on the surface of Mars at 1/15 the cost of Viking.

From its start, Mars Pathfinder had objectives that gave it unmatched constraints and science objectives that would return an unparalleled amount of data to the largest science community associated with a NASA mission. In 1997, Americans across the country were glued to their television to see the first pictures from Mars, marking this one of NASA's most celebrated, historic, and accomplished days in its history. With all of Mars Pathfinder's interest and success, it is not the landing on Mars that marked its success (Viking I and II accomplished this); it is the means by which it was accomplished that made it unique, innovative, and electrifying. To be successful, the Mars Pathfinder team had to do business differently from traditional and standard operating procedures.

Mars Pathfinder worked to develop a unique culture centered on a leaner staff, reduced overhead, empowered team members, a willingness to do things in new ways, and a management team that believed in a team of capable, self-directed members. To build this, authoritative structures were minimized. The team was handpicked, many being experts in their field, coupled with the ability to be a generalist and be multi-disciplined. These individuals varied in age and experiences, *but all brought with them a level of*

*energy and creativity to carry the project from beginning to end.* The leadership was committed to the goal, and all actions were in line with the goals of launching every day. This meant having a clear vision and making sure that vision was part of every action. Mars Pathfinder was successful at being on time, on budget, and on target.

### *Failed Mars Climate Orbiter*

In 1993, NASA started the Mars Surveyor Program to develop a series of missions to study Mars. A Mars Program Office was established and given the responsibility of defining the objectives of these Mars exploration missions. Chartered under this office would be two missions with biennial launching opportunities (Mars Climate Orbiter and Mars Polar Lander). The Jet Propulsion Laboratory (JPL) created the Mars Surveyor Project '98 (Mars '98), which would be responsible for these missions. One of these missions, the Mars Climate Orbiter (MCO), was a strategic project that would help build a sustained position in space exploration with recent successes in Mars exploration (Mars Pathfinder and Mars Global Surveyor). MCO would build upon those successes and lay the groundwork for several planned Mars exploration missions over the next 15 years. MCO was a tangible product of a spacecraft, orbiter, and scientific instruments that required a significant level of insight and creativity, both technically and managerially, built around a core of talented, experienced people to produce a valued product.

As a project, MCO was to design, test, develop, launch, and operate an orbiter that would collect weather data from Mars and act as a relay station for five years, assisting in data transmission to and from the Mars Polar Lander (MPL). Jointly developed with the MPL and 300 people from JPL and Lockheed Martin, they had a 37-month development schedule, with spacecraft launch masses of a medium-light class launch vehicle, and a financial cap of about \$184

million (covering development of the spacecraft, scientific payloads, and the ground operations system). As a project, MCO was a high-tech project with development of one-of-a-kind single flight systems. While some of the technology was new, much of it existed at the time the project was initiated. What was unique was how the technology was brought together in a single spacecraft.

On September 23, 1999, MCO would begin its orbiter insertion maneuver, but shortly after beginning orbit insertion, the signal was lost from MCO, and on September 24 search for the orbiter was abandoned. On September 30, a JPL peer review committee reported that small forces of velocity changes reported by the spacecraft engineers for use in orbit insertion were low and the likely causes of the MCO loss. On October 6, a MCO Mission Failure Investigation Board was appointed by NASA to independently look into all aspects of the failure of the mission. On November 10, the Board released their report that identified the root cause for the loss of the MCO spacecraft as the failure to use metric units in the coding of a ground software file.

While the root technical cause was a coding of metric units in the software, the overarching cause of the MCO failure was a strategy designed to cost and not capability. This can be attributed to the pressures and challenges of BFC, which resulted in cuts in areas that later proved to be key in contributing to MCO's failure. With all of its constraints, the MCO team had an unmatched drive to be successful. Unfortunately, *not managing team spirit resulted in team members overworking themselves.* Because of cost constraints, *peer reviews were de-emphasized*, there was *not an active involvement from experts*, dual development was used on subsystems for multiple missions, the number of people on the project was kept below minimum, *expertise for key subsystems was unavailable to the project*, *testing*

was streamlined in key areas, and key policy was reduced. Designing to capabilities may have revealed that this project could not have been done under the specified budget.

#### *Successful Lunar Prospector*

Lunar Prospector was the first competitively selected mission in the NASA Discovery Program, developed to produce frequent, low-cost missions to explore the solar system. It was a spin-stabilized spacecraft designed to map the surface composition and magnetic field of the Moon and begin investigating some of the moon's surface features, structure, and composition not investigated during Apollo.

As a project, Lunar Prospector was to design, test, and develop an orbiter that would obtain scientific data and demonstrate the philosophy of "faster, better, cheaper." With a development time of almost three years and a total project cost of \$63 million, Lunar Prospector involved 75 to 100 people from organizations such as NASA, University of California–Berkeley, Lockheed-Martin, and Lunar Research Institute. From the perspective of interviewees, Lunar Prospector culture was one of a small project built into a large organization. Throughout the project, it was the project team and not the parent organization, Lockheed Martin, that fostered and nurtured the project spirit. The rituals and ceremonies that existed fostered and maintained project spirit. Most team members we interviewed also indicated that the success of the mission and their knowing that they were a critical part of it contributed to the spirit. Lunar Prospector ended on July 31, 1999, when the spacecraft was jettisoned into a crater near the south pole of the Moon as part of an experiment to confirm the existence of water ice. The mission ran for 19 months and successfully completed all of its objectives. The data collected has allowed for the construction of a detailed map of the surface composition of the Moon, and results were ten times better than ever planned, noted interviewees.

#### **Case Findings—Spirit, Leader Building Activities, Behavior Outcomes, and Success**

In this section, to ground the model in the context of technology-driven projects, we tabulate sample views of participants we interviewed in the technology-driven projects (Tables 7–8). We begin by highlighting the value of leader building activities and spirit, which have an important impact on behavior and success outcomes that support our model but were difficult to describe using only our empirical findings.

Our case results illustrate the merit of fostering a focused vision for the project. The successful projects we studied had implicit or explicit vision elements that articulated the state of affairs once the project was completed (Shenhar, 2004), which fostered the emotional expression component of spirit. For example, in the successful Mars Pathfinder, one manager noted: "In order to create a relentless pursuit of the competitive advantage, management fostered a focused vision for the project and made sure that this vision was part of everyone's approach" (Table 7). "Team members believed in the project vision and thus became self-directed to achieving the strategy." According to participants in the successful Mars Pathfinder, "Mars Pathfinder . . . carried an excitement that was unmatched." Similarly, Mars Prospector interviewees noted that the mission objectives fostered excitement (Table 8). At the failed Mars Climate Orbiter, there was a drive to do good science, but the drive to develop MCO at a minimum cost fostered the strategy. To accomplish the most science for the least dollar, the project was designed around cost and not the science (Table 7), which had implications for participants' emotions. Team enthusiasm at the failed MCO was rooted in these people's interests, rather than the project's vision. The MCO program manager described the participants as, "just a bunch of space nuts" (Table 8), supporting this contention.

Our case analysis shows that inculcating the leader's values, as apparent in this individual's behavior, is a potent device for cultivating the attitudinal expression component of spirit, which had behavior and success implications. For example, the manager of the successful Mars Pathfinder described his efforts to foster participant commitment, an attitudinal expression of spirit: "Management believed in being an example to the team. . . . During the project, we changed about 10 percent of the staff. . . . It wasn't a matter of skill, they just didn't fit in with the environment. . . . They weren't willing to make that commitment to pulling this project off" (Table 7). The deputy mission manager in the successful Lunar Prospector attributes participants' commitment to the project manager's actions: "The [project manager] was successful because he tried to motivate people to do the job he felt they were capable of doing. The [project managers] were very involved and were never afraid to 'pick up a wrench' to guarantee project success." It stands out that partaker contextual performance behavior in the successful Mars Pathfinder and Lunar Prospector projects was due to their increased commitment; for example, "people [in Lunar Prospector] went the extra mile and had faith that their team members would do the same" (Table 8). According to partakers in the failed MCO, "Management did not infuse a sense of responsibility for the success of the project" (Table 7). The project leadership processor added that "leadership [at MCO] lacked a balance between confidence and arrogance." Team members mentioned that "as requirements crept, no one [from management] stood up and said No, or that it was not in line with the original scope and strategy of the project." Members also felt "it was difficult to achieve team spirit since they were pressured to perform as management wanted them to, or they were not valued on the project," which had behavioral outcome implications (Table 8).

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Taken together, molding the attitudinal expression component of spirit, as illustrated in high levels of effort among partakers, appeared to pay off, in that Mars Pathfinder and Lunar Prospector were completed at unprecedented speed and were successful projects.

Our case findings illustrate the value of project managers implementing *social rituals*, including formal meetings and training that emphasize desirable behaviors, to mold the cultural expression component of spirit, as evident in both successful projects (Tables 7–8). Sponsoring such social rituals sends a clear message on the extent that teamwork is important and intensive investment of time and energy, and acquisition of new ideas and skills that support teamwork are expected. Rituals that include customers, suppliers, and internal stakeholders can engender a culture of inclusion, as illustrated in the successful Mars Pathfinder and Lunar Prospector projects we investigated. According to participants in the successful Mars Pathfinder, “The people that were going to be there at landing were there during the design [creating a culture of inclusion]. . . . It grew into the tightest, most high-spirited group of people” (Table 8).

The successful Lunar Prospector project had a staff meeting to address objectives for the week every Monday, and a subsystem review so engineers could address the issues in real time, every Wednesday (Table 7). Additionally, training was received prior to the project start or on-the-job in both successful projects. By encouraging regularly scheduled training programs, the project manager can build commitment to product quality, a characteristic captured by a culture of inclusion. Additionally, team social events in the successful projects helped strengthen the culture component of spirit. Mars Pathfinder partakers described how the project manager “would declare a happy hour, and . . . members of the team would go out for drinks. This activity became a festive event that

helped develop camaraderie,” bolstering a culture of inclusion, an expression component of spirit. According to project partakers, it seems that these social rituals (Table 7) were not instilled in the failed MCO project we investigated, in order to manage the cultural component of spirit. For example, in terms of team events and meetings, the MCO interviewees indicated that links with contractors and upper management were limited or faint, that the project built a protective shield to outside opinion, and training was limited. Additionally, the lack of key members’ involvement (e.g., scientists) from the start of the project and others who “were not brought to the project until just before launch,” diminished a culture of inclusion, an expression component of spirit (Table 8).

Our case project results show that the project manager can introduce *symbols*, including layout and design of the work environment, and other concrete objects to signify the desired behaviors of project members and to shape the culture expression component of spirit. Introducing such symbols represents the extent that equality, synergy, and open communication are expected by the project leader. According to project partakers, the extent that the successful Mars Pathfinder and Lunar prospector projects were fully colocated was greater than what interviewees reported existed in the failed Mars Climate Orbiter (Table 7). Colocation in the successful projects resulted in the reduction of distance, both spatial and perceptual among participants, exemplifying the value placed on equality and open communication, prerequisites for effective inter-functional cooperation, engendering the culture of inclusion expression of spirit, leading to high levels of contextual performance behavior (Table 8). Additionally, the use of other symbols to manage spirit was reported only by participants in the successful projects (Table 7). For instance, an engineer described one of the events

that centered on naming, this way: “Mars Pathfinder found ways to take things out of the rigor of the everyday process of NASA’s very straight-laced organization and put some . . . fun into the process.” David, who created the landing operations simulations, was called the Gremlin, and the seven women who worked on the wiring that tied the spacecraft together were called the Seven Dwarfs. In a similar way, the successful Lunar Prospector “developed project logo stickers . . . , which appeared on everything from notebooks to janitor’s barrels, and a motto.” Such symbols were not reported by the failed MCO interviewees. Thus, the unique *artifacts* instilled by leaders in the successful projects afford one explanation for the dissimilarity in participants’ behavioral patterns, in comparison to this cultural expression component of spirit in the failed project in our sample. The case study findings suggest that failing to instill building activities that generate spirit weakened the behavioral norms for the inclusion component of spirit and taxed the capabilities of the failed MCO team.

### General Discussion

We found general quantitative and qualitative support for a model in which project leader building activities, which support instilling a project vision, artifacts, and are guided by this individual’s values, affect partakers’ emotions, attitudes, and behavioral norms that are focused on expected project outcomes, termed project spirit. Furthermore, project spirit was found to affect partakers’ contextual performance behavior and, through contextual performance behavior, to affect project success. Our two-phase study’s findings suggest that leaders can be trained to execute informal behaviors that generate a project’s spirit, which in turn boosts contextual performance behavior and enhances project outcomes.

Several researchers have focused on spirit in the individual within an organization (e.g., Cavanagh, 2000; Delbecq,

2000), others on a work group or department—a segment of the organization (Duchon & Ashmos Plowman, 2005), and still others have tried to measure spirit throughout the organization (Giacalone & Jurkiewicz, 2003). This is the accepted way to divide such research efforts (Klein & Kozlowski, 2000), and accordingly, we centered our attention on spirit in projects, and empirically examined its influence on behavioral outcomes and success. Our empirical study supports the idea that the project's spirit is a manifestation of the project's goal in terms of participants' attitudes, emotions, and behavioral norms—termed the *expression-components* of project spirit (Shenhar et al., 2007). Our empirical findings reinforce the importance of managing the intangible aspects of a project captured by spirit, which incorporates more than just emotions and attitudes captured in earlier work (Bruch & Ghoshal, 2003), apart from managing its tangible components, in order to meet the reported projects' goals. This contention would find support in earlier work (e.g., Pinto & Slevin, 1988b; Thamhain, 2004). Our qualitative data supports this argument as well. The project case studies suggest that regardless of the level of project spirit among partakers due to the nature of project tasks or the characteristics of partakers, to maintain, not to mention foster, project spirit, spirit needs to be proactively managed, as detailed below.

The more complex representation of spirit in project settings, in comparison to earlier work (Brannick et al., 1997; Kinjerski & Skrypnek, 2004; Whitty & Schulz, 2007), should enhance our understanding of the ways to create, intervene in, and manage participants' spirit in order to drive project outcomes. By focusing spirit expressions on project expected outcomes, the project manager can regulate principal behaviors of participants in project-based work that appear to be directly related to valuable project outcomes. Interestingly, the literature suggests

several formal levers that can trigger employee spirit (e.g., Kinjerski & Skrypnek, 2004; Toquam et al., 1997). Yet, due to the constraints typically facing project leaders in terms of personnel availability, our findings suggest that leader building activities are valuable informal levers for managing participants' spirit, which in turn we show influences contextual performance behavior and is a vehicle for success.

It is noteworthy that the novel combination of qualitative and quantitative methods used in this study should also be of interest to organizational researchers. The study began by using an existing model of project spirit, leader building activities, and behavioral and success outcomes (Shenhar et al., 2007) as a starting point for the research. The first part of the study presented a quantitative test of the model and showed that the model was useful in explaining how spirit influences success and how it can be generated in technology-driven projects. The second part of the study selected three technology challenging projects for in-depth qualitative analysis, while controlling for key environmental factors, such as organizational culture, and holding constant project type. These case studies generated a number of examples that served to ground the theoretical concepts in the realities of technology-driven projects. The case studies offered examples that fit well with the model, but also highlighted themes that were invaluable in understanding the importance of maintaining and building spirit in the realities of the technology-driven and challenging project context, but were not fully illustrated by the empirical results. Had we done the qualitative study first, we could not have explored the themes that emerged from the quantitative study to the same extent that we have here. Had we only conducted the qualitative study, we could not have understood whether the model had validity and meaning in the technology-driven project context. In the following section we highlight

the achievements of the current research and focus on managerial implications as well as future research.

## Managerial Implications and Future Research

Our results demonstrate that the building activities implemented by leaders have a significant influence on project spirit, as reflected in partakers' attitudes, behavioral norms, and emotions. In particular, the project leader can implement new *social rituals*, such as formal meetings, training workshops, ceremonies, and off-site team-building retreats, which emphasize desirable behaviors to mold the behavioral norms component of spirit. Sponsoring such social rituals sends a clear message on the extent that teamwork is important and an intensive investment of time and energy, and acquisition of new ideas and skills that support teamwork are expected. Rituals that include customers, suppliers, and internal stakeholders engender behavioral norms that value inclusion and encourage input from all partakers. By encouraging regularly scheduled training programs, the manager can build commitment to the quality of the product too. The project leader can introduce new *symbols* as well, including layout and design of the work environment, dress code, and other concrete objects to signify the desired behaviors of project members and to shape the behavioral norms component of spirit. Introducing such symbols represents the extent that equality, synergy, and open communication are expected by the project leader. Additionally, a project leader who demonstrates values that encourage professional development and teamwork, and who emphasizes quality is likely to transform the attitudinal component of spirit. Fostering a positive attitude is a primary concern for the leader, since partakers bring various orientations, allegiances, and aspirations to the project setting. Finally, results based on complete data gathered in phase one for leader building

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activities and spirit variables illustrate the importance of creating visions, developed especially for the projects being implemented, in transforming partaker emotions, resulting in high levels of excitement, which in turn directs attention toward shared priorities, in terms of contextual performance behavior and bolsters project success outcomes.

The empirical results based on complete data for leader building activities and spirit variables supported the proposed influence of vision on project spirit, yet the strength of this relationship was not as we had expected. Future research will focus respondents to address more clearly whether the project had a specific unique project vision, and improve the reliability of this measure. We expect that specific visions, developed especially for the projects being implemented, will indeed transform partaker emotions, resulting in high levels of excitement, which in turn will direct attention to shared priorities in terms of contextual performance behavior and influence project success outcomes (Shenhar, 2004). It is noteworthy that the project case study findings, presented in phase two of our research, proved invaluable in supporting this contention. Our case study results (Table 7) illustrate the value of leaders fostering a focused vision, a vision that is part of project partaker's approach, in which team members enthusiastically become self-directed to achieve the strategy.

Additionally, while the satisfying nature of the technical challenge or the opportunity for new learning that exists in high-tech projects may be alternative sources of spirit in projects, our empirical and qualitative examination suggests that the importance of technically trained and interpersonally skilled leaders, who possess the autonomy to shape project spirit, is hard to overemphasize. Here our qualitative results prove to be extremely valuable. The case study data provide additional support for our argument that regardless of

the level of project spirit among participants due to the nature of the technical challenge or the participants' characteristics, in order to maintain and foster project spirit, it is beneficial to proactively manage spirit. The failed Mars Climate Orbiter was a technology challenging project. The MCO case we describe was also staffed with partakers who had initially high levels of spirit. It is noteworthy that leader building activities to manage MCO's spirit were not executed (Table 7). According to participants in the failed MCO project, "Management did not infuse a sense of responsibility among partakers" (values), links with contractors and upper management were faint (team events and meetings), and "leadership lacked a collegial relationship with team members" (team social events and rituals). The case study findings suggest that failing to instill building activities that create the project's spirit, diminished the behavioral norms for inclusion component of spirit, led to an extreme level of confidence, and taxed the capabilities of the team.

Future research might further empirically investigate the effect of project-specific dimensions, such as technology uncertainty and the required pace (Shenhar & Dvir, 2004), on the role played by leader building activities in the creation of project spirit. Our empirical findings were based on a final sample of 193 core members participating in 60 projects. A larger sample of projects would enable analyzing moderators of the identified relations between our model variables. An increase in sample size would enable testing our proposed model using structural equation modeling (e.g., LISREL VIII; Jöreskog & Sörbom, 1993) as well. Yet, compared to other studies (e.g., Cohen & Bailey, 1997), our sample was larger than the average sample reported for projects (average  $n = 45$ ).

In the empirical study we conducted during phase one, we obtained ratings on model variables from project leaders and core project members.

Project leaders were instructed to assess project success and the building activities (vision, values, artifacts). Project members were asked to assess project spirit and contextual performance behavior. While the project case data support our empirical findings, future quantitative research should consider gathering data from additional sources, such as the customer, the senior manager overseeing the project, or the supplier. For example, responses for the building activities could be provided by the leader, and the ratings for contextual performance behavior and spirit variables could be provided by core project members, as in the current research. In conjunction, the success ratings could be provided by the senior manager overseeing the project or by the customer. Another variation of this approach is to obtain complete data from multiple sources, so that the interrater reliability and response bias issues can be examined directly. It is noteworthy that the kinds of information sought in the present survey (phase one) with respect to project success tended to be more objective in nature than many surveys used in research in the social sciences. Implicit theories, cognitive schema, and other cognitive frameworks applied by respondents to social-perceptual stimuli (e.g., Aronson & Reilly, 2006; Avolio, Yammarino, & Bass, 1991) may not apply to the same extent with our survey. Thus, responding to questions regarding project success should be based on objective data. Interestingly, our data on building activities support the relative lack of response bias. Our results show discriminant validity between dissimilar constructs with moderate correlations between the leader building activity variables, and these building activity variables are differentially related to project success.

### Conclusion

Taken together, leaders can play a critical role in shaping project spirit by carefully selecting participants based

on their beliefs that not all organizational members will function effectively in unique project settings. While participants' traits, the satisfying nature of the technical challenge, or the opportunity for new learning that exists in high-tech projects may be alternative sources of spirit in projects, our quantitative and qualitative examinations suggest that the importance of technically trained and interpersonally skilled leaders, who possess the autonomy to shape project spirit, is hard to overemphasize. Our two-phase study suggests that success in creating a project spirit, which is focused on expected project outcomes, may be attributed in a large part to the leader's ability to infuse his or her values and to instill artifacts, including symbols and social rituals, into the daily interactions with project participants. Our empirical and qualitative findings suggest that leaders can be trained to execute behaviors that generate a project's spirit, which in turn boosts contextual performance behavior and enhances project success outcomes. ■

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Implications are for identifying levers available to the project leader to alter culture and motivate workers, and how they affect success in project-based work. His work appears in several journals including *R & D Management*, *International Journal of Selection and Assessment*, *Journal of Engineering and Technology Management*, *Journal of High Technology Management Research*, *International Journal of Technology Management*, and in several book chapters. He serves as a reviewer for numerous TIM journals. He spearheaded the Stevens' Institute Review Board for the protection of human subjects in research. Prior to joining the Stevens' faculty, he was employed at Bakara Ltd., Israel, where he conducted research in the areas of training and selection and provided software instruction to clients. A 2009 book to which he contributed a chapter on managing contextual performance received the R.Wayne Pace Book of the Year Award from the Academy of Human Resource management.

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**Aaron J. Shenhar** is a professor of project and program management and Research Fellow at Rutgers Business School, and currently is the CEO of the SPL Group, an education and consulting organization dedicated to aligning projects and business. Until 2008 he was the Institute Professor of Management and the founder of the project management program at Stevens Institute of Technology. Previously he was at various positions at the Universities of Minnesota and Tel-Aviv, and recently, at Rutgers Business School. He holds five academic degrees in engineering and management from Stanford University and the Technion in Israel. He was the first recipient of the Project Management Institute Research Achievement Award, recipient of the IEEE Engineering Manager of the Year Award, and was recently named a PMI Fellow.

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With more than 150 publications, which were cited at least 3,500 times and published in journals such as *Strategic Management Journal*, *Management Science*, *Sloan Management Review*, *Research Policy*, and *IEEE Transactions on Engineering Management*, his writings have influenced project and technology management research and education throughout the world. He also served as consultant to major companies such as Intel, 3M, Honeywell, NASA, and IAI, as well as the aerospace industry in its Program Excellence Award. He is coauthor of the 2007 book, *Reinventing Project Management: The Diamond Approach to Successful Growth and Innovation*, published by Harvard Business School Press. The book was among the best five top business books of the year.

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## Appendix

### Items

#### *Project Success*

- The project was completed on time or earlier.
- The project was completed within or below budget.
- The product met all customer requirements.
- The customer was highly satisfied.
- The product improved the customer's performance.
- There is a great chance that the customer will return for additional business.
- The project resulted in business success for the company that implemented it.
- The project increased the profitability of the organization implementing it.
- The project had a positive return on investment.
- The project increased market share or outreach among customers/users.
- The project will lead to additional new business or new products or services.
- The product has the potential to create new markets or new customers/users.
- The project created new technologies or new capabilities for future use.

#### *Contextual Performance Behavior*

Participants in my project:

##### *Helping behavior*

- Help each other out if someone falls behind in his or her work
- Willingly share their expertise with other project participants
- Try to act like peacemakers when other project partakers have disagreements
- Take steps to try to prevent problems with other project participants
- Willingly give of their time to fellow project partakers who have work-related problems
- "Touch base" with other project participants before initiating actions that might affect them
- Encourage each other when someone is down

##### *Civic virtue*

- Provide constructive suggestions on how the project team can improve its effectiveness
- Are willing to risk disapproval to express their beliefs about what is best for the project team
- Attend and actively participate in project meetings

##### *Sportsmanship*

- Always focus on what is wrong with our situation, rather than the positive side (reversed)
- Consume a lot of time complaining about trivial matters (reversed)

### **Project Spirit Items by Expression Component (Emotions, Attitudes, Behavioral Norms)**

#### *Emotions*

- Team members were enthusiastic during project implementation.
- Team members were optimistic during project implementation.
- Team members felt mostly happy during project implementation.

#### *Attitudes*

- Team members were satisfied with their co-team members.
- Team members were very satisfied with working in the project setting.
- Team members were guided by project goals.
- Team members identified with fellow team members.
- Team members were proud to be part of the team.

## Managing the Intangible Aspects of a Project

### **Behavioral Norms**

While focusing on project goals, project members were expected to:

- **Include customers, suppliers, and other functional groups early in the implementation:**
  - Cooperate and think in terms of the project group satisfaction
  - Deal with others in a friendly, pleasant way
  - Show concern for people
  - Motivate others with friendliness
  - Resolve conflicts constructively
  - Help others to grow and develop
  - Be a good listener
  - Give positive rewards to others
  - Take time with people
  - Encourage others
- Take initiative:
  - Take on challenging tasks
  - Pursue a standard of excellence
  - Think ahead and plan
- Produce high-quality work:
  - Do even simple tasks well
  - Work for the sense of accomplishment
  - Maintain their personal integrity
- Be creative:
  - Explore alternatives before acting
  - Think in unique and independent ways
  - Communicate ideas

### **Leader Building Activities (Vision, Artifacts, Leader Values)**

#### ***Vision***

- There was a clearly articulated, meaningful, and exciting vision that expressed the project's expected value and outcomes.
- The vision inspired team members beyond usual organizational practices and process.
- The vision focused team members on creating value to the customers and the company.

#### ***Artifacts***

##### *Social rituals*

- Team members participated in social events initiated by project leaders or a team member.
- Team members participated in off-site team building activities initiated by project leaders.
- Team members participated in unique ceremonies that were specific to the project.

##### *Symbols*

- Project team members used a unique dress code or other symbols.
- Project team members were addressed on a first-name basis or by nicknames.
- The project had its own logo.

#### ***Leader Values***

- The project leader values going beyond self-interest for the good of the project.
- The project leader values quality.
- The project leader values creativity.
- The project leader values professional development.
- The project leader values open communication.