

# Project Manager Leadership Role in Improving Project Performance

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**Abstract:** In spite of advances in the project management profession, research studies have shown that many projects fail, underlining the importance of the project manager's role as manager. Specifically, the manager's leadership role is of great importance in motivating people and creating an effective working environment in order for the project team to meet greater challenges in today's global economy. In this research study, using the literature review, important people-related factors of project performance are identified, then surveys and structured, personal interviews were used to develop a project manager leadership and management model, which helped to analyze underlying interactions among these factors and the role of leadership in project performance.

**Keywords:** Leadership, Projects, Interpretive Structural Modeling (ISM), Project Management (PM), Project Performance, Project Success

**EMJ Focus Areas:** Developing Engineering Management Professionals, Program and Project Management

Project Management Institute (PMI) commissioned a comprehensive research study to assess the project leadership style as a success factor on project performance (Turner and Müller, 2005). Turner and Müller—after reviewing general management literature on leadership starting from Confucius (500 BC) and Barnard (1938) to Dulewicz and Higgs (2003)—noted, based on several research studies, that leadership style and competence are key success factors to a manager's business performance; however, they did not find such correlation in the project management literature. Nonetheless, Turner and Müller suggested that different project leadership styles are appropriate at different stages of the project life cycle, and the project manager has a leadership role in creating an effective working environment for the project team. This second finding provides an opportunity to explore leadership's role in promoting project performance and is the basis for this study.

Though leadership style and competence are not directly related to project success, we contend that the leadership role is crucial to facilitating various project success factors that contribute to project performance. Further, we argue that a project manager's leadership roles and responsibilities toward a project team and stakeholders influence the project outcomes and performance. Literature has shown that several research studies focused on leadership styles, as Turner and Müller (2005) observed; however, specific leadership roles and responsibilities of the project manager toward project team members and their

role in project success is not addressed in project management literature. The purpose of this article is to address this gray area.

In this article our focus is to identify a set of people-related project performance factors, and to understand how these factors interact with one another. Using these inter-relationships, we develop a model to analyze the project manager's role in improving project performance. We start with a review of literature to document the importance of project leadership as a background for the research, and then identify a list of people-related project success factors. We then present the research methodology for collecting data to develop underlying relations among these factors. As a part of our analysis, we explore the structural linkages between these factors and provide a detailed discussion about these linkages. Further, we discuss how to use these linkages to establish management and leadership roles in improving project performance from research and practitioner's perspectives. Finally, we present limitations of the research study and suggest opportunities in the future research efforts.

## Literature Review

Projects are used as a means to achieve an organization's strategic goals. It is obvious that global spending on projects is in the order of many billions of dollars annually; however, in spite of advances in the project management (PM) discipline, the common experience suggests that many projects fail (Williams, 2005). Consequently, many current research efforts are focused on improving project success.

The term *project success* is considered different from *project management success*. Project success is measured against the overall objectives of the project whereas project management success is measured against the traditional gauges of performance such as completing project within time, cost, and meeting scope and quality (Cooke-Davies, 2002); however, whenever the term *success* is referred to in this study, it encompasses both the above definitions and is in line with Jugdev and Müller's (2005) notation of project success. Jugdev and Müller, based on extensive research, found that the definition of project success transitioned over a period of time from a narrow focus of completing a project within time, cost, and scope to expanding the focus by including stakeholder requirements.

Further, it is worthwhile clarifying at the outset that the subject of linking general management and leadership theories with project management leadership is well researched (Turner, 2006; Turner and Miller, 2005) and, therefore, was not part of this study. The scope of the literature review in this study was limited to project management-related publications on the subject.

In the context of project management, good leaders are required to assign appropriate importance to relationships,

communicate their values, and at the same time pay suitable importance to processes (Turner, 2006). Given the significance of project management processes and team members in project success, the project manager has to pay attention to both the management and leadership roles; the emphasis shifts from one role or the other based on the size and characteristics of the project.

#### *Importance of a Project Manager's Leadership and Management Roles*

Projects are usually unique and often are associated with unknowns, complexity, and uncertainty. Obviously, a project manager's role is more challenging than that of a typical, functional manager. In addition to working across functional and organizational environments—traditionally designed to support functional managers—the project manager has other challenges such as providing leadership without documented, formal authority, and working in matrix organizations where unity of command is an issue (Cleland, 1995). Consequently, project managers are perceived to be leading a diverse set of people with little direct control over the team members (Cleland and Ireland, 2002).

Additionally, projects are managed using teams in a work environment that is complex for two reasons: first, each project is unique, and second, conditions for team selection and motivation are often far from ideal (Smith, 2001) as a typical organization structure presents problems in team selection, and in many organizations a project manager may not have the discretion to select the project team. Compounding the situation further, some of the project team members are engaged in more than one project. Kerzner (2006) observed that projects fail to meet time and cost targets due to poor morale, lack of motivation, poor human relations, poor productivity, and lack of commitment from employees. It is evident from Kerzner's observation that people-related issues play a crucial role in project performance, underlining the importance of a project manager's management and leadership roles.

It is important to understand the distinction between management and leadership, which is not always obvious. Management is usually focused on classical functions such as planning, organizing, and controlling. In general, management is concerned with making decisions about processes and functions in order to improve operational efficiency and effectiveness. Leadership, on the other hand, is about motivating and guiding people to realize their potential and achieve tougher and challenging organizational goals. Among leadership styles, situational leaders focus on various tasks and relationship behaviors (Hersey and Blanchard, 1996), and transformational leaders may inspire followers, meet their developmental needs, and encourage new approaches and more effort toward problem solving (Selzer and Bass, 1990). One may argue that transactional leadership style, which is based on an exchange of reward and work, is more suited to organizational processes, whereas transformational leadership is useful when one is concerned with relations.

Two factors linked with projects underline the importance of management and leadership roles in project performance. First, the project has to manage teams comprising of different disciplines, and second, projects are characterized with complexity, risk, unknowns, and uncertainties. Management functions such as organization, planning, and control are at the core of an efficient and effective use of resources in projects.

Leadership assumes similar importance due to project team composition and challenges associated with it. Referring to other studies (Briner et al., 1996; Cleland, 1999; Turner and Cochrane, 1993; Norrie and Walker, 2004) suggested that project management, by definition, is about implementing a change program. Consequently, leadership is considered a determinant of success as it provides vision and ability to cope with change (Kotter, 1990, 1999).

As Turner and Müller (2005) observed, many research studies have discussed the importance and/or style of project leadership in determining project performance (Wirth, 1992; Cleland, 1995; Day, 1998; Thamhain, 1999; Thite, 1999; Weiss and Anderson, 2003; Christensen and Walker, 2004; Keegan and Den Hartog, 2004; Leban and Zalauf, 2004); however, there is no definitive skill and leadership style mix that is appropriate for handling different types of projects, and project leadership orientation is not related to project structure (Lee-Kelly and Leong, 2003).

Keegan and Hartog (2004), presenting a different perspective, concluded that there are no significant differences between perceived leadership styles of line managers and project managers in terms of their transformational leadership behavior. Keegan and Hartog suggested that new leadership theories are to be developed for new forms of organizing with multiple forms of governance, commonly associated with project management.

#### *People-Related Project Management Enablers and Barriers*

It is common knowledge that all projects, by definition, have certain common characteristics and processes. Consequently, people-related management and leadership roles and responsibilities of the project manager, to a great extent, are common to projects.

In this section, we will use the literature review to identify people-related enablers and barriers of project performance. Among several factors of project success, top management support and a clear definition of a project's mission are identified as some of the important enabling factors. Early studies on project success identified success factors, which include clearly defined goals, top management support of resources, detailed plan and implementation processes, consultation with clients and stakeholders to determine expectations, monitoring and feedback, adequate communication with all the stakeholders including the project team, and ability to handle unexpected problems (Schultz, Slevin and Pinto, 1987; Pinto and Slevin, 1987). Likewise, a research study involving 500 development projects revealed that top management support, a clearly defined project mission, and a cohesive project team were considered predictors of project success (Larsen and Gobeli, 1989).

Inherent features of projects such as participation of multiple functions and acquisition of resources and support from various functional divisions underline the importance of top management support that translates into organization-wide support. Fedor, Ghosh, Caldwell, Maurer, and Singhal (2003) suggested that organizational support—viable with top management support—was positively associated with project success. Hartman and Ashrafi (2002), in their study of the IT industry, also identified four factors—clearly defined mission, top management support, detailed plan, and communication—as critical for success. These findings imply that the project manager must aim to garner support from top management and all the key stakeholders. Providing clarity in project mission is another key responsibility of the project manager in order to promote teamwork and collaborative effort.

A worldwide benchmark study of organizational project management practices involving more than 550 organizations (Mullaly, 2004) identified several key attributes and drivers of PM success and failure. They are establishing an environment of trust, creating transparency of decision making, creating consistent processes, ensuring understanding of expectations, and delivering results. Drivers of PM failure include failing to define processes and roles, failure to develop and use a project selection process, not mandating consistent processes, and failure to manage the attainment of organizational outcomes. With the exception of project selection that precedes projects, remaining factors of success and failure are related to the project team and are relevant for this study.

In line with Mullaly's (2004) findings, Thamhain (2004a) suggested that many factors, which drive project performance, are derived from the human side. Among these factors, managing conflicts and problems in projects is an important determinant of project success. People skills focus on fostering a climate of active participation and minimal dysfunctional conflict implies an environment of trust, consistent processes without ambiguity, communicating expectations, and clarity in communications. Also, it is important to define roles and responsibilities of project team members without ambiguity (Day, 1998) to avoid conflict and encourage teamwork.

In his earlier study of 400 professionals, Thamhain (1999) identified the criteria for effective project team management. They include understanding the tasks and roles of the project team members; defining each team member's individual responsibilities, role and level of accountability; creating an environment of trust and support in problem solving; motivating team members; encouraging open, effective communication; and providing appropriate communication tools, techniques, and systems. With a specific focus on team leadership effectiveness in technology-enabled project environment, Thamhain (2004b) found that satisfying personal and professional needs of team members will have the strongest effect on team performance, and identified some other factors, which include ability to resolve conflict, mutual trust and respect, and communications across organizational lines. Among the factors discussed, trust

is an outcome of various management and leadership activities such as creating clarity with openness and transparency in communications and aligning actions with words.

Close communication is considered critical to the success of fast track projects and a clear, concise statement of project objectives is considered important (Day, 1998). Underlining the importance of communication, Fedor et al. (2003) suggested that leadership could either facilitate or constrain the free flow of information and ideas. Likewise, Weiss (2001), in his study of e-businesses, identified several barriers and drivers to project success. Barriers include poorly defined processes and communication; drivers are effective project leadership, ability of leaders and team members to articulate and communicate problems and solutions effectively, and a collaborative, fun culture that promotes satisfaction. These findings suggest that defining roles and responsibilities, and effective communication can lead to collaboration and trust; therefore, these factors are seen as enabling factors for project success in general and conflict management in specific.

Communication and collaboration are considered important enabling factors by other studies as well. In the context of problems attributing to failures associated with large projects, Potts (2000) linked the severity of these problems to the ability to form teams effectively, provide appropriate leadership, understand how to persuade, select an appropriate negotiation style, achieve good communication, and develop full problem solving behavior. Potts further argued that these "soft skills" make a considerable difference to project effectiveness and efficiency.

Citing several research studies, Turner and Müller (2005) argued that success factors vary over different stages of the project life cycle. In a related and a much earlier study of variations in critical success factors in project life cycle stages (Pinto and Prescott, 1987), client acceptance of functions at an early stage of planning was found to be significantly related to project success underlining the importance to determine stakeholder expectations early in the project. Likewise, after a comprehensive literature review of critical success factors of projects from the 1960s to present, Jugdev and Müller (2005) recommended that project managers should, early in the project, identify success

**Exhibit 1. Literature Review Findings**

People-Related Factor	Reference
Create clarity in communication	Weiss (2001), Thamhain (1999, 2004a) Mullaly (2004), Day (1998), Schultz, Slevin, and Pinto (1987), Potts (2000), Fedor et al. (2003), Jugdev and Müller (2005), Hartman and Ashrafi (2002)
Define roles and responsibilities	Weiss (2001), Thamhain (1999, 2004a), Mullaly (2004), Pinto and Slevin (1988), Day (1998), Hartman and Ashrafi (2002)
Communicate expectations	Weiss (2001), Thamhain (1999, 2004a), Potts (2000), Mullaly (2004), Day (1998), Schultz, Slevin, and Pinto (1987), Hartman and Ashrafi (2002), Pinto and Prescott (1987)
Employ consistent processes	Thamhain (2004a), Smith (2001), Mullaly (2004), , Hartman and Ashrafi(2002)
Establish trust	Thamhain (1999), Mullaly (2004), Day (1998), Thamhain (2004a)
Facilitate support	Thite (1999), Thamhain (1999), Fedor et al. (2003), Schultz, Slevin, and Pinto (1987)
Manage outcomes	Thite (1999), Rad (2002), Mullaly (2004), Fedor et al. (2003), Cleland (1995), Schultz, Slevin, and Pinto (1987), Jugdev and Müller (2005)

indicators which address the needs of key stakeholders, assess them using simple measures, and develop and maintain good and effective communication with key stakeholders.

### Summary of Literature Review

Using all the references and research studies discussed above, we developed a summary list of significant people-related project performance factors.

In developing this list, we identified common factors, and coined new phrases for some of these factors. Each of these factors is expanded below.

- *Create clarity in communication.* Defining project goals and likely project outcomes clearly and early in the project is critical, and failure to do so would lead to identifying some of the project requirements at a later stage. This would cause changes to the project plan resulting in time and cost overruns.
- *Define roles and responsibilities.* At the outset, defining roles and responsibilities of project team members without ambiguity is imperative for improving performance and managing conflicts. This practice will lead to effective use of the project team members and help functional departments extend their support.
- *Communicate expectations.* Defining project outcomes and establishing what is expected from all the stakeholders will eventually eliminate perceived and actual incidences of not delivering expected results. This is specifically true with stakeholders within and outside the project who are not routinely involved with projects.
- *Employ consistent processes.* Developing and deploying consistent and formal project management processes assist in improving operational efficiency, managing risk, and reducing ambiguity. Ultimately, these processes would lead to project management maturity.
- *Establish trust.* An environment of trust is influenced by the organizational culture which promotes transparency and openness in their communications. Trust among the project team members to work cohesively would lead to knowledge sharing and collaboration.
- *Facilitate support.* Top management support translates into willingness of everyone in the organization to support the project. Obtaining support is a challenge in traditional organizations where functional managers control resources.
- *Manage outcomes.* Clearly defined project mission and objectives would help us develop a formal evaluation of project outcomes to determine project success. It promotes performance, motivation, recognition, and synergy in teams.

### Research Methodology

We employed two research methods in this study. Interpretive Structural Modeling (ISM) was used to collect data from several project management professionals in order to develop a model for a project manager's management and leadership role. Independent of this approach, a different group of project management professionals were asked to respond to an openly structured questionnaire to identify relationships among these factors independent of the model developed using ISM. We expect the results from both the studies to compliment and validate each other. Further, we can compare and contrast the results from these two studies. To be consistent, we have chosen professionals of similar project management experience for both these methods.

### ISM Methodology

We utilized Interpretive Structural Modeling (ISM) developed by Warfield (1973) to identify relationships among the factors shown in Exhibit 1. ISM is a process that helps individuals or groups in structuring their tacit or collective knowledge into a model of interrelationships to enhance the ability of understanding complexity. The methodology helps to identify structure within a system of related elements, and provides opportunity to analyze it from different perspectives. For this purpose, ISM analyzes relationships among a group of elements and resolves them in a graphical representation of their directed relationships and hierarchical levels. The elements may be objectives of a policy, goals of an organization, factors of assessment, and the like (see Appendix A).

In the present context, ISM was used to analyze relationships among these seven factors (see Exhibit 1) and present direct relationships among them graphically in hierarchical levels. We used people-related project performance factors to develop an understanding of the shared underlying mental model in which these factors operate.

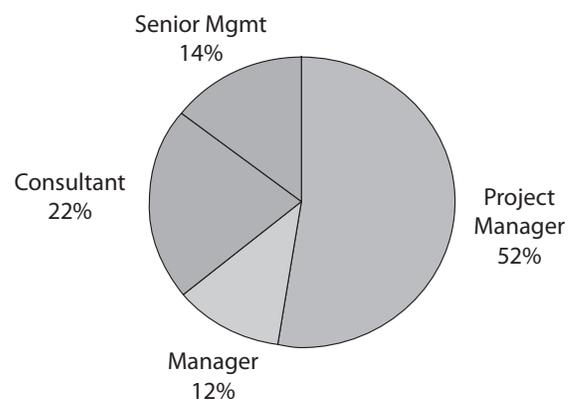
### Structured Questionnaire and Interview

Independent of ISM research methodology, a structured questionnaire was used to interview project management professionals to validate ISM research results. Participants in the study were asked to respond to these questions in the context of projects in which they are currently involved. We presented the same set of factors shown in Exhibit 1 in postcards and asked respondents to specify only direct relationships among them from the standpoint of improving project performance.

### Data Collection

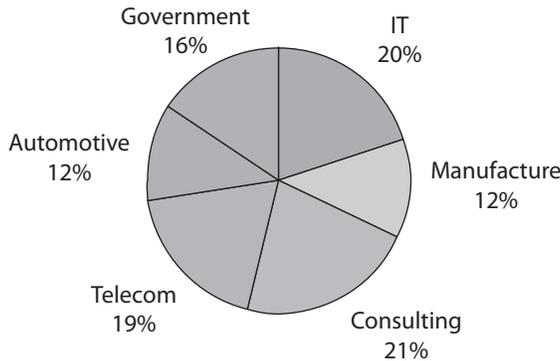
Project management professionals and practitioners were contacted using email and telephone. A total of 69 project management professionals participated in the study of which a majority of them (78%) participated in the ISM methodology, and the remaining in the second research method. Demographic profiles of both the groups are quite similar. On an average, respondents have 11 years of project management experience. Of those who participated in the study, 52% of the respondents are project managers (see Exhibit 2). Consultants (22%), senior management (14%), and managers (12%) represent the remaining respondents. Respondents represented various segments of the economy: 16% are from the government, 21% from consulting, 20% from IT, and 19% from telecom industries (see Exhibit 3).

Exhibit 2. Respondent Profile



All the respondents were asked to rank these factors in the order of priority from the perspective of completing the project successfully (see Exhibit 4).

**Exhibit 3.** Industry Profile



**Exhibit 4.** Priority Order of the People-Related Factors

People-Related Factor—Order of Priority
1. Define roles and responsibilities
2. Communicate expectations
3. Create clarity in communication
4. Establish trust
5. Employ consistent processes
6. Facilitate support
7. Manage outcomes

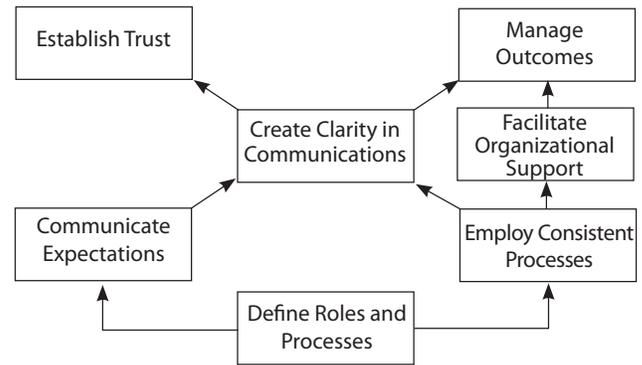
*Define roles and responsibilities* factor is accorded the highest priority followed by *communicating expectations* and *clarity in communications* as second and third in priorities respectively. *Establishing trust* is ranked fourth. *Managing outcomes* is ranked last and justifiably so as it is the final step among all seven factors in managing performance of projects.

**Research Results**

Using the research data collected from those who participated in the ISM research method, and by following the steps described in Appendix A, we developed the project manager model (see Exhibit 5). The contextual relationship for this structure was

“leads to” and each arrow is read as “leads to.” The intermediate computations and the raw data are shown in Appendix B.

**Exhibit 5.** Project Manager Model



We asked the second group of project managers to identify direct relationships among all seven factors without using the structured approach of ISM. Participants were encouraged to identify factors that each one influences and is influenced by. Thus, each factor has both incoming and outgoing arrows. Outgoing arrows are considered as causal relationships, whereas incoming arrows are seen as results or effects (see Exhibit 6).

Considering that the total number of connections denotes the importance or priority of the factor, the top three elements are similar to the priority order shown in Exhibit 6. These results also show that all the factors are interrelated; however, we can still develop an arbitrary rule to classify them into three groups, namely givens (independent variables), means, and ends (dependent variables). It is fair to say that if a factor has causal connections of 75% or more of the total connections, it is considered a “given or independent variable.” Likewise, if a factor has effect connections of 75% or more of the total connections, it is considered an “end or dependent variable.” Using this rule, all seven factors are grouped in Exhibit 7 where each factor is placed in one of the three groups based on the number of outgoing (causal) and incoming (effect) arrows.

Findings shown in Exhibit 7 are in general agreement with the results shown in Exhibit 5. ISM research results, therefore, are in conformance with the results obtained using the second research method. More importantly, these results do not contradict with the ISM results.

**Exhibit 6.** Research of the Second Research Method

People-Related Factor	# Causal Connections	# Effect Connections	Total Connections
Define roles and processes	54	10	64
Communicate expectations	21	33	54
Create clarity in communications	37	12	49
Employ consistent processes	24	16	40
Facilitate support	20	18	38
Manage outcomes	3	42	45
Establish trust	6	36	42

**Exhibit 7.** Classification of People-Related Factors

Givens	Means	Ends
Define roles and processes Create clarity in communications	Communicate expectations Facilitate support Employ consistent processes	Manage outcomes Establish trust

**Results Analysis and Discussion**

We focused on three results of the study. First, ISM results, captured in Exhibit 5, show relations among the selected and important critical factors of project success. Second, based on the research data, we have developed a prioritized list of the same set of factors, which is shown in Exhibit 4. Finally, we have developed a list of givens (independent variables), means, and ends (dependent variables) using inferences from the second study as discussed above. The commonality among these three results is that we have used the same set of people-related factors, and this common feature provides an opportunity to integrate these results.

A review of the results presented in Exhibits 4, 5, 6, and 7 reveal some common findings. For instance, *defining roles and responsibilities* is considered the most important factor by all three results. The results shown in Exhibits 5 and 7 indicate that *defining roles and responsibilities* is an independent variable that drives almost all other factors either directly or indirectly. Likewise, *managing outcomes* and *establishing trust* are the resultant factors that can be accomplished once all other identified variables are in place—they are considered the end results.

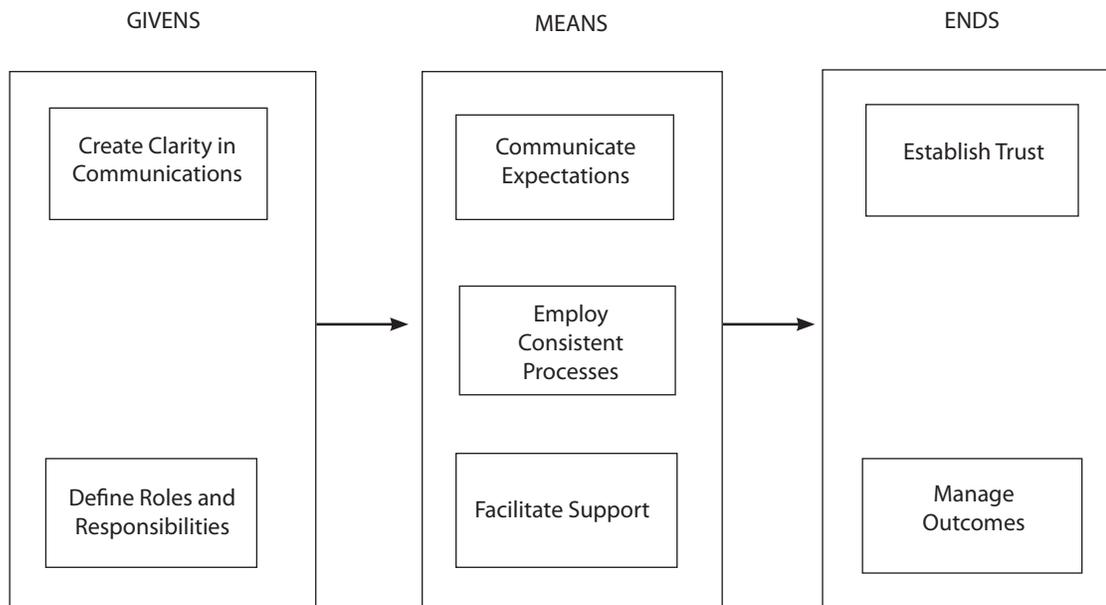
A minor difference is that ISM shows that communicating expectations would lead to creating clarity in communications, whereas the second research indicates that creating clarity is an independent variable that leads to, among other things, communicating expectations. We take the position that creating clarity in communication by defining likely project outcomes early in the project would also help us define and communicate expectations from all the key stakeholders.

From the standpoint of considering these people-related factors as enablers and barriers, developing a model that consists of givens, means, and ends would allow us to understand how each of these factors can act either as an enabler or a barrier to project success. For example, absence of a factor would make it a barrier, whereas presence of it would serve as an enabler for project success. To explore this point of view, we have combined the results and summarized them in Exhibit 8 for discussion and conclusions.

*Givens*, as shown in Figure 4, from a management point of view, are seen as factors that either exist or do not exist. In our model, clarity in communications and defining roles and responsibilities are givens. *Ends* tend to be the elements that are dependent on other factors in the model. Results show that establishing trust and managing outcomes are the *ends*. In relative terms, the *means* can be controlled, manipulated, or developed to form the link between the *givens* and the *ends*. Communicating expectations, employing consistent processes, and facilitating support within the organization are the factors that can be moderated or enhanced in order to accomplish the ends.

We used the model in Exhibit 8 to discuss the possibility of these factors acting as enablers or barriers. For instance, we can argue that a robust practice of clarity in communications would help the project manager to communicate expectations at the outset of a project. On the contrary, if the project manager fails to communicate with clarity, it is unlikely that she/he would be able to communicate what is expected from all the key stakeholders. Thus, *clarity in communication* can act as an enabler or a barrier. This line of thinking demonstrates the dual role of all these factors either as enablers or barriers.

**Exhibit 8.** Project Performance Model



Our research results have a number of important implications. It is critical that project managers define roles and responsibilities of all the stakeholders, including project team members. Further, project managers must establish a communication process that facilitates open and transparent communication that is characterized by clarity. Further, employing formal and consistent processes, facilitating support from key functions and senior management, and communicating expectations must take place prior to developing a system of monitoring and managing outcomes. While communicating expectations would help define project outcomes for monitoring, formal processes and support from the organization external to the project team would support in managing these outcomes. Finally, establishing trust is a gradual process that demands openness, transparency, and clarity in communication. Trust would in turn lead to collaboration and teamwork.

Nielsen (2004) found that a relationship between trust and performance remains somewhat elusive in collaborative relationship. Citing several researchers, Nielsen suggested that trust has a positive, though limited and indirect, impact on performance. Our research agrees with Nielsen's findings (see Exhibit 5).

### *Leadership Role*

Projects, by definition, are unique and often associated with uncertainties and unknowns. It is reasonable to assume that in project management, it is not *if* the plans will change, it is *when*, *what will change*, and *by how much*. When changes are significant in a project, which is often the case, the leadership role assumes greater importance. Leadership has its efforts directed toward convincing people about the need to change, aligning them to a new direction, and motivating people to work together to achieve project objectives under difficult and demanding work environments. Figure 4 depicts these roles by identifying the underlying relationships among critical attributes of the project manager.

Project work packages and associated tasks require people from multiple disciplines—working with a high degree of coordination—to accomplish a task within project constraints. Because project management employs a multidisciplinary approach, it needs people from different functions. Each person brings specific expertise and experience to the project team (Gray and Larson, 2005), which contributes to making the team a complex and challenging entity to manage. As a consequence, defining each project team member's role is critical to the project's performance and outcome. For this reason, it is essential that roles and processes be clearly defined in order to achieve stability and order. Defining the roles and processes would logically lead to developing formal processes that would facilitate an understanding of the organizational requirements needed to internally and externally support the project.

Consistent processes make it easy to manage a diverse group of people and transient teams. Due to a project requiring that members represent different functions, and the complex nature of project tasks, it is important that the project manager obtain support from the organization. Without such formal definition and approval of roles, projects would lack support from functional managers. The resulting conflicts of interest—both the internal and the external—would hinder project performance.

Openness and transparency in communication are essential to nurture human relationships; predictability and openness are important factors in establishing trust (Gray and Larson, 2005).

By defining processes and roles, project managers can establish both predictability and openness with all the team members. This adds to clarity in communication, and project managers can establish an environment of openness and transparency by outlining expectations from all the stakeholders. As a part of clarity, it would be beneficial to define and establish expectations from all the stakeholders early in the project in order to avoid both perceived and actual incidences of not delivering expected results. Openness and transparency, in turn, instill trust among the project team and in their leader. It is interesting to note that establishing trust usually takes time but projects are time-bound; this fact heightens the project manager's challenge.

Trust encourages project team members to collaborate, network, and innovate. Ring (1996) analyzed trust at the interpersonal level and found it a precursor to forming ongoing networks. Although it should evolve mutually, trust is more important for leaders as they try to motivate others to accomplish a vision and achieve project goals. By establishing trust, leaders can manage changes and mitigate conflicts, a deterrent to project performance and transforming project stakeholders into a cohesive project team.

Because people are motivated by challenges and opportunities to further their career goals, those who are assigned to project teams are almost always interested in accomplishing personal and professional goals in addition to completing their project responsibilities. This means that project managers should understand the personal aspirations of their project team members and support them in their aspirations. As leaders, project managers play an important role in motivating and guiding people to simultaneously grow as professionals and complete their project responsibilities. This model facilitates such leadership behavior.

Project outcomes—derived from a clearly defined project mission and objectives—would help develop a formal evaluation in order to determine project success. Defining these outcomes and evaluating individual and team performance against them would motivate team members to perform better, thereby promoting excellence and synergy. Obviously, managing these outcomes would not be possible without a clear definition of roles and processes, support from the organization, and effective communication.

Finally, a clearly defined project mission—a responsibility of the project leadership—when translated into measurable project outcomes, becomes an important people-related factor. Nonetheless, not many organizations have a formal process of evaluating project performance. Usually, the perception of failure and success is based on unspoken and personal indices. As a result, assessments by different people about the success of the same project would be different (Rad, 2002). There is a need for a set of performance indices that formalize the process and make explicit what is implicit in these seemingly subjective evaluations. Without defining them, managing outcomes becomes difficult.

### **Limitations and Suggestions for Future Research**

In this study, we have interviewed 69 project management professionals from a wide range of industries in the U.S. This study can further be expanded to increase the data size and diversity of participants. Further, the model should be used in various projects in different industries to validate and confirm these results. The underlying assumption shared by respondents was that these factors were examined in the context of a traditional project team; therefore, these results are not applicable for

geographically dispersed project teams, which present additional problems due to cultural diversity, communication challenges, and other issues related to global projects. Additionally, the leadership and technology roles could be different based on the disposition of project characteristics and the industry in which the project is executed. Likewise, leadership roles could be industry-specific due to differing industry-specific work cultures and competitive environments. Future research efforts should consider project leadership roles for different types of projects and different industries.

## Conclusion

The study showed that defining project processes and roles is the first and most important step for managing and leading projects successfully. This will lay the foundation to create clarity, communicate expectations, and employ consistent processes. The ultimate aim of the project manager is to establish trust in managing outcomes—and project leadership plays a critical role in establishing trust. The research effort also identified management actions that are prerequisite to defining and monitoring project outcomes. Given that technology tools assist knowledge sharing, team development, efficiency, and effectiveness, motivating factors that can lead to knowledge sharing, team development, and innovation are dependent on the project leadership role in establishing trust and open communications.

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## Appendix A

ISM analyzes a system of elements and resolves these in a graphical representation of their directed relationships and hierarchical levels. The elements may be *objectives of a policy, goals of an organization, factors of assessment*, etc. The directed relationships can be in a variety of contexts (referred to as contextual relationships), such as Element (i) "is greater than"; "is achieved by"; "will help achieve"; "is more important than"; Element (j). The following is a brief description of the different steps of ISM:

**Identification of Elements:** The elements of the system are identified and listed. This may be achieved through research, brainstorming, etc. In the present study, we used literature review.

**Contextual Relationship:** A contextual relationship between elements is established, depending upon the objective of the modeling exercise.

**Structural Self Interaction Matrix (SSIM):** This matrix represents the respondents' perception of element-to-element directed relationship. Four Symbols are used to represent the type of relationship that can exist between two elements of the system under consideration. These are:

- V ... for the relation from element E<sub>i</sub> to E<sub>j</sub>, but not in the reverse direction;
- A ... for the relation from E<sub>j</sub> to E<sub>i</sub>, but not in the reverse direction;
- X ... for an interrelation between E<sub>i</sub> and E<sub>j</sub> (both directions);
- O ... to represent that E<sub>i</sub> and E<sub>j</sub> are unrelated.

**Reachability Matrix (RM):** A Reachability Matrix is then prepared that converts the symbolic SSIM Matrix into a binary matrix. The following conversion rules apply:

- If the relation  $E_i$  to  $E_j = V$  in SSIM, then element  $E_{ij} = 1$  and  $E_{ji} = 0$  in RM
- If the relation  $E_i$  to  $E_j = A$  in SSIM, then element  $E_{ij} = 0$  and  $E_{ji} = 1$  in RM
- If the relation  $E_i$  to  $E_j = X$  in SSIM, then element  $E_{ij} = 1$  and  $E_{ji} = 1$  in RM
- If the relation  $E_i$  to  $E_j = O$  in SSIM, then element  $E_{ij} = 0$  and  $E_{ji} = 0$  in RM

The initial RM is then modified to show all direct and indirect reachabilities, that is if  $E_{ij} = 1$  and  $E_{jk} = 1$  then  $E_{ik} = 1$ .

**Level Partitioning:** Level partitioning is done in order to classify the elements into different levels of the ISM structure. For this purpose, two sets are associated with each element  $E_i$  of the system - A *Reachability Set* ( $R_i$ ) that is a set of all elements that can be reached from the element  $E_i$ , and an *Antecedent Set* ( $A_i$ ), that is a set of all elements that element  $E_i$  can be reached by.

In the first iteration, all elements, for which  $R_i = R_i \cap A_i$ , are Level I Elements. In successive iterations, the elements identified

as level elements in the previous iterations are deleted, and new elements are selected for successive levels using the same rule. Accordingly, all the elements of the system are grouped into different levels.

**Canonical Matrix:** Grouping together elements in the same level develops this matrix. The resultant matrix has most of its upper triangular elements as 0, and lower triangular elements as 1. This matrix is then used to prepare a Digraph.

**Digraph:** Digraph is a term derived from **Directional Graph**, and as the name suggests, is a graphical representation of the elements, their directed relationships, and hierarchical levels. The initial digraph is prepared on the basis of the canonical matrix. This is then pruned by removing all transitivities, to form a final digraph.

**Interpretive Structural Model:** Replacing all element numbers with the actual element description generates the ISM. The ISM therefore, gives a very clear picture of the system of elements and their flow of relationships.

## Appendix B

- 1) Elements identified can be seen in Exhibit 1.
- 2) The contextual relationship is "leads to"
- 3) The SSIM is the following

```

Element A:  X A A A A O O
Element B:  X X A A A O V
Element C:  X X X V V V V
Element D:  X X X X O O V
Element E:  X X X X X V V
Element F:  X X X X X X V
Element G:  X X X X X X X
    
```

- 4) The reachability matrix is

```

Element A:  1 0 0 0 0 0 0
Element B:  1 1 0 0 0 0 1
Element C:  1 1 1 1 1 1 1
Element D:  1 1 0 1 0 0 1
Element E:  1 1 0 0 1 1 1
Element F:  0 0 0 0 0 1 1
Element G:  0 0 0 0 0 0 1
    
```

- 5) Level partitions

Level	Element
1	A, G
2	B, F
3	D, E
4	C

- 6) Canonical matrix

Element A:	Level 1:	1 0 0 0 0 0 0
Element G:	Level 1:	0 1 0 0 0 0 0
Element B:	Level 2:	1 1 1 0 0 0 0
Element F:	Level 2:	0 1 0 1 0 0 0
Element D:	Level 3:	1 1 1 0 1 0 0
Element E:	Level 3:	1 1 1 1 0 1 0
Element C:	Level 4:	1 1 1 1 1 1 1

The resulting digraph and the ISM are shown in the paper.

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