Effective IT Project Leadership

Effective project leadership, which goes beyond traditional project management, is essential for successfully deploying IT initiatives that are often overwhelmed with increasing levels of technology and business integration complexity. This research identified five distinct project leadership types (Administrator, Technologist, Business Integration Lead, Principal Lead and Consummate Lead) that can be matched to projects with different complexity levels. Together with the corresponding transformational and transactional behaviors essential for leaders, these five types provide a framework for effective project leadership.[1,2]

Successful IT Initiatives Require More Than Traditional Project Management

Organizations continue to face challenges as they seek to deploy and use emerging technologies such as artificial intelligence, 5G and 6G networks, robotics, blockchain and biometrics. The impact of IT on organizational success is reflected in the projected worldwide 2020 IT spending of $3.9 trillion, an increase of 3.4% over 2019.[3] This increase underlies the importance of IT initiatives (delivered via IT projects) for organizations. The continual emergence of new technologies provides new technological sophistication and creates profound organizational implications. New technologies often substantially increase both IT project uncertainty and ambiguity, and challenge organizations to create desired business outcomes. To be successful, organizations need proficient *project leadership* that goes beyond traditional IT project management.[4]

Project management and project leadership are contrasted in Table 1. <u>Project leadership is an evolution of traditional project management</u> to a role that requires an understanding of a project's core business process implications and the changes businesses must make to take advantage of new technologies.

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[3] McLellan, C. *IT budgets 2020: how the money will be spent, and who will spend it,* ZDNet, September 3, 2019, available at https://www.zdnet.com/article/it-budgets-2020-how-the-money-will-be-spent-and-who-will-spend-it/. This article includes Gartner's IT budget projection for 2020. See also: 1) Kappelman, L., Torres, R., McLean, E., Maurer, C., Johnson, V. and Kim, K. "The 2018 SIM IT Issues and Trends Study," *MIS Quarterly Executive* (18:1), March 2019, pp. 281-314, which shows that more IT initiatives are aligned with organizational mission and overall strategic goals; and 2) Peppard, J. and Ward, J. "Unlocking Sustained Business Value from IT Investments," *California Management Review* (48:1), October 2005, pp. 52-70, which discusses how IT projects are contributing to organizational success.

[4] The unique nature of IT projects and how to run effective IT projects are illustrated in: 1) Keil, M. and Mähring, M. "Is Your Project Turning into a Black Hole?" *California Management Review* (53;1), November 2010, pp. 6-31; and 2) Weiner, M., Mähring, M., Remus, U. and Saunders, C. "Control Configuration and Control Enactment in Information Systems Projects: Review and Expanded Theoretical Framework," *MIS Quarterly* (40:3), September 2016, pp. 741-771.

Table 1: Project Management and Project Leadership[5]

	Project Management	Project Leadership
Role	Tactician functioning within existing organizational parameters.	Strategist expanding organizational parameters.
Focus	Tasks and process of the project.	People and overall strategic goals of the project.
Source of Impact	Subject matter knowledge, expertise and experience.	Long-term overall vision, charisma and social capability for interpersonal and organizational relationship-building and communication.
Process	• Methodical planning with rational goals, resources, clarified roles and delegated tasks • Monitoring the progress of the project with quality standards, problem-solving and timely milestones.	• Articulating the strategic goals of the project and beyond the project • Providing empowerment and adequate resources in decision making and tasks • Handling conflict and overcoming challenges • Encouraging innovative problem solving.
Goals	Efficiency (and productivity) by *doing things right*. Meeting project milestones and demonstrating benefits defined by the organization.	Effectiveness by *doing the right things*. Demonstrating overall value and attaining long-term strategic goals for the organization.

Every industry around the globe is now operating in the "era of digitization," where organizational leaders must engage in IT projects to capitalize on information assets for strategic-level initiatives. Although those performing a project leadership role are often competent project managers, good project managers may not necessarily be effective leaders; the two roles are fundamentally different.[6] Nevertheless, project management and project leadership are complementary. Managerial roles tend to focus on how to supervise the project tasks while leadership roles focus on how to deploy IT and attain business value. Focusing on both management and leadership are necessary for successfully deploying the technology that results from an IT project, and requires addressing varying degrees of technology and business integration complexities.

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[5] The key project management and project leadership characteristics shown in Table 1 are based on: 1) Kotter, J. P. "What Leaders Really Do," *Harvard Business Review* (68:3), June 1990; 2) Strang, K. "Examining effective technology project leadership traits and behaviors," *Computers in Human Behavior* (23:1), January 2007, pp. 424-462; and 3) Toor, S. and Ofori, G. "Leadership versus Management: How They Are Different and Why," *Leadership and Management in Engineering* (8:2), April 2008, pp. 61-71.

[6] The distinction between leadership and management was discussed in detail using interview data in Toor, S. "Differentiating Leadership from Management: An Empirical Investigation of Leaders and Managers," *Leadership and Management in Engineering* (11:4), October 2011, pp. 310-320.

The context of an IT project can rapidly change due to organizational and technological complexities, and market forces. Coping with a changing project context requires an integration of managerial and leadership roles balanced with traditional technical management skills.[7] This integrative view expands upon the Project Management Institute's (PMI's) Project Management Book of Knowledge (PMBOK) talent triangle. The PMI's talent triangle comprises leadership, strategic management and technical project management.[8]

However, the nature of IT projects means they both modify existing technologies and likely apply emerging technologies in IT initiatives that enhance the operations of an organization. These "technology" aspects of IT projects add a layer of complexity and call for managerial and leadership skills that go beyond the PMI's talent triangle. This research indicates that there is a strong requirement to apply a more integrative and comprehensive project leadership framework (see Figure 1). This framework includes five types of project leadership (Administrator, Technology Lead, Business Integration Lead, Principal Lead and Consummate Lead), with leadership roles being assumed by one of more people—typically project manager, project champions, project sponsors or business counterparts. The framework also identifies the best fit between the five types and project complexity, taking account of both technology and business integration

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[7] For information about project leadership roles, see: 1) Muller, R. and Turner, R. "Leadership Competency profiles of successful project managers," *International Journal of Project Management* (28:5), July 2010, pp. 437-448; 2) Muller, R., Geraldi, J. and Turner, J. R. "Relationships Between Leadership and Success in Different Types of Project Complexities," *IEEE Transactions on Engineering Management* (59:1), March 2012, pp. 77-90; and 3) Turner, J. R., Muller, R. and Dulewicz, V. "Comparing the leadership styles of functional and project managers," *International Journal of Managing Projects in Business* (2:2), April 2009, pp. 198-216.

[8] For more information on the talent triangle, see *PMBOK Guide, Sixth Edition,* Project Management Institute, 2017.

complexity. This framework enables organizations to ensure the success of IT projects in today's dynamic business and technology environments.

Figure 1: IT Project Leadership Framework
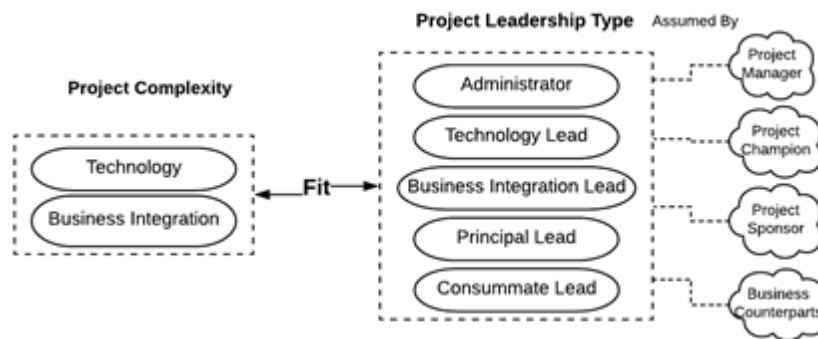
The need for such a framework is recognized by the information systems (IS) academic community.[9] A lack of proper project leadership often results in IT initiatives that don't deliver the expected business benefits, especially when the initiatives are directly related to a company's revenue. The impact of a lack of project leadership is illustrated by two frequently discussed failed IT initiatives: 1) the National Health Service's (NHS's) Electronic Health Record systems project in England; and 2) Denver International Airport's Automated Baggage System project.

In the NHS case, the project leadership lacked the management skills required to respond to the changing technology scope and specifications of the project. In addition, leadership did not build relationships among the key constituents or resolve major points

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[9] See, for example: 1) Piotrowski, C. and Watt, J. D. "Developing Leaders: Examining the Role of Transactional and Transformational Leadership across Business Contexts," *Organization Development Journal* (29:3), December, 2011, pp. 51-66; and 2) Nauman, S., Khan, A. and Ehsan, N. "Patterns of empowerment and leadership style in project environment," *International Journal of Project Management* (28:7), October 2010, pp. 638-649.

of contention, including timelines, cost, changes in scope and progress. The Department of Health declined to report objective information about project progress to the U.K. Parliament while the government was reluctant to audit the project and openly evaluate the program. Project leadership failed to adequately communicate project progress and required changes.

In the Denver International Airport case, project leadership failed to engage all key stakeholders (e.g., project team, major airlines) while assessing, mitigating and addressing the risks arising from scope changes. Leadership disregarded the risk reports and forged ahead with the project, which led to inadequate resources.

These failures on the part of project leadership cost the NHS in England £10 billion (approximately $13 billion) and Denver International Airport $2 billion.[10]

The research reported in this paper reinforces the importance of project leadership. By building on the core principles of IT project management, this research clarified the leadership roles inherent in complex IT projects. It used a modified Delphi methodology for data collection and an integrated grounded-theory approach to analyze first-hand field data gathered in two panel sessions involving interviews with a total of 33 participants. (The research methodology, including the interview questions asked, is

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[10] For more examples of project leadership failures, see Widman, J. "IT's biggest project failures -- and what we can learn from them," *Computerworld,* October 9, 2008, available at https://www.computerworld.com/article/2533563/it-s-biggest-project-failures----and-what-we-can-learn-from-them.html.

described in Appendix A .)[11] The project leadership framework presented in Figure 1

was derived from data collected from the participants.[12]

The components of the framework is described in more detail below, beginning with

a classification of project complexity and then descriptions of the project management

and leadership roles necessary for different types of project complexity. This is followed

by a description of the roles and behaviors necessary for effective project leadership and

the different project leadership styles that arise from the roles and behaviors. Last is the

important description of the three guidelines for effective project leadership.

Project Complexity

In line with prior project management literature,[13] this research data showed that

organizations deal with multiple and evolving layers of complexity (technical and non-

technical) in IT projects. The variable complexity arises from the uniqueness of projects,

the levels of integration required, unforeseen challenges and changes, and the difficulty

of deploying the deliverable, as well as the coverage of a project and the number of

touch points. Three interviewees described project complexity as follows:

> *"For us, complexity is really referring to how difficult or unique the technology*
>
> *required on the project turns out to be."* CIO (A)

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[11] In keeping with the Institutional Review Board's (IRB's) anonymity guidelines, participants are identified by letters (A, B, etc.). Information about the anonymous participants' job titles and industry sectors are is included in Appendix A.

[12] The projects described during the interviews were highly diverse in scope (in terms of coverage and support), and the deliverables ranged from new IT applications to installations of off-the-shelf products.

[13] For discussions on project complexity, see: 1) Muller, R., Geraldi, J. and Turner, J. R., op. cit., March 2012; and 2) Muller, R., and Turner, J. R. "Matching the Project Manager's Leadership Style to Project Type," *International Journal of Project Management* (25:1), January 2007, pp. 21-31.

"Technologies on a project can always be more complex during the life of a project. New solutions may require more complex expertise." Director of IT (E)

"Complexity comes from not only the technology but also how many touchpoints there are on the project. Some projects need to be integrated into all facets of our organization, making it really complex." CIO (B)

To address the complexity of IT projects, organizations must ensure that project tasks are executed not only by using traditional *project management* techniques that ensure prompt delivery of the intended value, but also with *project leadership* that displays high levels of decision making, drive and influence.[14]

Synthesizing from previous literature, project complexity can be defined in terms of:

1) *Technology complexity:* The uniqueness and uncertainty of the technology, the frequency of technology scope changes and the interdependencies of the technology

2) *Business integration complexity:* The multitude and cross-functional nature of an organization's front- and back-end processes, the extent of interactions and transactions among organizational constituents, and the degree of transparency and amount of shared information.

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[14] For a good discussion of appropriate project managers' styles to control IT projects, see Gregory, R. W. and Keil, M. "Blending Bureaucratic and Collaborative Management Styles to Achieve Control Ambidexterity in IS Projects," *European Journal of Information Systems* (23:3), February 2014, pp. 343-356.

Project complexity was classified into four types (see Figure 2), determined by the technology and business integration complexities involved in an IT initiative, based on the research data.

Figure 2: Classification of Project Complexity

	Low ← Business Integration Complexity → High
High	**2. Underlying Technology Elements** ***Examples***: *focused on emerging technologies—artificial intelligence (AI), machine learning, virtual reality (VR)—or large-scale software applications—healthcare record systems, insurance claims systems*	**4. Integration of Technology and Business Elements** ***Examples***: *Projects enabling seamless and uninterrupted interactions and transactions for revenue generation—ERP, CRM, IoT, big data/data analytics for supply chain management*
Technology Complexity		
Low	**1. Process–driven Project** ***Examples***: *IT infrastructure management and maintenance projects—cloud migration of email, database servers and upgrades of applications*	**3. Synthesis of Business Elements** ***Examples***: *Projects encompassing multiple functions and business processes—collaboration application/portal, airline reservations, insurance claims*

Low   **Business Integration Complexity**   **High**

Different Types of Project Complexity Require Different Leadership Roles

Projects in each of the four quadrants shown in Figure 2 have different types of complexity, which determine the appropriate management and leadership roles needed for project success. Management roles focus on planning and delegating tasks for the project team and dealing with technology complexities, whereas leadership roles focus on ensuring a collaborative IT and non-IT partnership needed for integrating and changing business processes, advocating the project and catalyzing organizational

support for delivering business and strategic value.[15] In combination, these roles

constitute optimal project leadership and should be performed either by the project

manager or by other project stakeholders such as IT or non-IT executives, project

sponsors or champions.[16] These executives have overall accountability for the project

and are primarily concerned with delivering business value.[17] Project leadership

maintains the viability of the project by removing organizational barriers, securing

sufficient support, ensuring stakeholder involvement, and creating a culture for

cooperation and collaboration between the IT unit and the rest of the organization. Often,

project leadership roles are better performed by non-IT executives.[18]

Managerial roles are often concerned with "project administration." Tasks include

planning the initiative and using agreed milestones and goals to control it, allocating

resources, and guiding the project to completion on time and within budget. These roles

demand both business-s and IT-domain knowledge, as well as problem-solving and

people skills to reconcile issues and deal with challenges that occur throughout the

initiative.[19] For example, projects with low technology and business integration

complexity typically need "break-fixes" or 'upgrades' (Quadrant 1 in Figure 2), which

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[15] For a discussion of the effectiveness of empowering and directive leadership in software project team performance, see Faraj, S. and Sambamurthy, V. "Leadership of information systems development projects," *IEEE Transactions on Engineering Management,* (53:2), May 2006, pp. 238-249.
[16] For a discussion of using different organizational resources while dealing with challenges in IT projects, see Fichman, R. G., Keil, M. and Tiwana, A. "Beyond Valuation: "Options Thinking" in IT Project Management," *California Management Review* (47:2), September 2006, pp. 74-96.
[17] For more on ensuring business value, see Schibi, O and Lee, C. "Project sponsorship: senior management's role in the successful outcome of projects," *Proceedings of PMI Global Congress,* London, England, October 2015.
[18] For a discussion of the effective roles and responsibilities of project sponsors, see Miles, C. *The Project Champion: A Management Best Practice*, Small Business Trends, December 18, 2013 available at https://smallbiztrends.com/2013/12/what-is-a-project-champion.html.
[19] For more on matching effective project manager characteristics with project complexities, see: 1) Muller, R. Geraldi, J. and Turner, J. R., op. cit., March 2012; and 2) Muller, R. and Turner, J. R., op. cit., January 2007.

requires project leadership focused on operational tasks such as following well-understood guidelines. As stated by one participant:

"[Those in project leadership roles] should be able to build the work breakdown structure, define the scope, and administer the project. They need to plan a variety of [diverse] tasks and … make adjustments when necessary." Director of IT (D)

However, for IT initiatives that deviate from the norm due to greater technology and/or business integration complexity, project leadership needs to include a wider range of activities. These activities might include swiftly handling technology and business integration issues and problems, articulating the strategic vision and goals of the project, defining clear measures for success, creating and nurturing relationships with project stakeholders, and developing plans to deal with organizational changes and technology adversity.[20]

Projects with high technology complexity (Quadrants 2 and 4 in Figure 2) resulting from the sophistication of the underlying technology components need those in project leadership roles to have a high level of technology expertise. Such a leader will often come from the IT organization and is more likely to gain the team's respect and effectively lead the team to find solutions. This leader's role <u>focuses on working with the business to identify business problems arising from the technology complexity</u>, resolving these problems with technology-domain knowledge, and using innovative and out-of-the-box analytical and critical thinking skills. If someone without IT-domain knowledge

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[20] Specific project leadership characteristics are described in: 1) Mathis, K. "Six Ways to Give Proper Project Leadership," *Project Smart,* July 2013, available at http://www.projectsmart.co.uk/six-ways-to-give-proper-project-leadership.html; and 2) McGraw, K., <u>op. cit., 2009</u>.

is assigned to the leadership role for such a project, the project team should be given more autonomy in dealing with technology issues. A downside, however, is that the project team may question the competence of the non-IT leadership, causing the team to lose momentum and motivation. At worst, the project may fail, and the project team may lose organizational trust and credibility. Two participants expressed views on this topic:

"[Those in project leadership roles] should be subject-matter experts deep in that technology—[they need] deeper understanding of the technical aspects." CIO (B)

"[Project managers] should be able to get the respect from project team members as they can "smell" whether or not it makes sense from a technical development point. They look at it as acceptance criteria on the story ..." CIO (A)

On the other hand, projects with high business integration complexity but low technology complexity (Quadrant 3 in Figure 2) require those in project leadership roles to have effective communication and relationship-building skills. This type of project leadership provides a conduit between the project team and the many different business units. The role requires a proficient level of business expertise and knowledge of the business processes to be integrated or transformed as a result of the project. This leadership role also involves managing project expectations and creating an effective and flexible working environment, as indicated by the interviews:

"At [execution] deployment/delivery you need to be able to manage the users and key stakeholders. [Change] management is part of this whole process." CIO (B)

"… the ability to influence is important for [project leadership]. [Leaders] need to find ways to reach solutions with different parts of the organization." Director of IT (C)

"I prefer [project leadership] with strong relationships with [stakeholders] … [Leaders] can talk to necessary people at the proper levels. Part of talking is getting support and negotiating when necessary." Project Specialist (H)

For projects with high levels of both technology and business integration complexity (Quadrant 4 in Figure 2), organizations often assign multiple people to leadership roles. To ensure it has the required range of skills for such projects, an organization may, for example, assign a technologist adept at dealing with the complexity of the underlying technology, a business manager knowledgeable on business integration, and a champion or sponsor who can provide project promotion and support. In the words of the participants:

"It is [now] standard practice on projects in my organization to assign two project managers. Typically, [one] is … assigned by IT and [one] … by the business side. … There are many benefits from this [arrangement] as it creates a strong partnership between IT and the business. The business processes can become very complex, requiring strong business representation on the project." CIO (E)

"[The] technical lead or person … is dealing with … leadership [of] the technology aspects … while the business function manager or the person who is in charge of [requirements] or the things that you want to [deliver] for the business

function … [is] more interested in making sure that the system delivered [meets]

the needs of [business] people." Project Specialist (H)

The technologist and business manager focus on their respective areas of expertise, but it is <u>the project champion or sponsor</u> who oversees the entire project. The leadership activities of this third person are to:

- Facilitate coordination between the business and technology sides and resolve any conflicts

- <u>Build relationships</u> with the project's external constituents, and act as a spokesman and/or figurehead for the project

- Make (strategic) decisions regarding the allocation of budget and resources

- Engage in political maneuvering to push the project forward.

One participant put it like this:

"… Ideally there would be somebody from the business on the design team and

somebody [with a] technical or application development background or [someone

who] knows the business. … Then at the top of that stack [there would be a]

business person … somebody [who] has deep background [and knows] which

direction the business needs to go and … has … higher-level responsibility [for

governing/overseeing] … that major component of the business and [drives] the

project." Director of IT (D)

The above discussion indicates that organizations should assign leadership roles according to project complexity. To achieve this requires an understanding of the behaviors associated with each type of leadership role.

Project Leadership Roles and Behaviors

This research has identified the key project leadership roles and the behaviors associated with each role (see Table 2). The behaviors fall into two categories—transactional leadership (TR) and transformational leadership (TX)—which are distinct yet not mutually exclusive.[21] Both types of behavior are needed for project management and project leadership roles.

Table 2: Key Project Leadership Roles and the Associated Behaviors

Key Roles	Key Behaviors
• Planner • Resource allocator • Supervisor • Technology expert • Problem-solver • Organizational process expert • Communicator • Relationship architect • Liaison • Spokesperson • Negotiator • Crisis handler • Organizational catalyst • Change agent	• Defines and clarifies roles/tasks, allocates given resources, and monitors the progress of the project (TX). • Develops appropriate technical expertise to communicate effectively with business sides (TX). • Analyzes key business requirements and synthesizes consensus to address key business processes (TX). • Recognizes strategic business needs and articulates a shared strategic vision and the goals of the project (TR). • Promotes project team innovation and facilitates relationships with key stakeholders to manage expectations and negotiate organizational resources (TR). • Handles changes and adversity occurring from all aspects of projects with empathy (TR).

Key: TR = Transformational Leadership; TX = Transactional Leadership

As indicated in Table 2, the key project leadership roles are interrelated through a combination of project leadership behaviors over the course of IT projects. Prior studies

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[21] For more on the relevance of transformational and transactional leadership behaviors, see: 1) Antonakis, J., Avolio, B. and Sivasubramaniam, N. "Context and Leadership: An Examination of the Nine-Factor Full-Range Leadership Theory Using the Multifactor Leadership Questionnaire," *The Leadership Quarterly* (14:3), June 2003, pp. 261-295; 2) Judge, T. A. and Piccolo, R.F. "Transformational and transactional leadership: a meta-analytic test of their relative validity," *Journal of Applied Psychology* (89:5), October 2004, pp. 755-768; and 3) Keegan, A. and Den Hartog, D. "Transformational leadership in

have shown that these transformational and transactional leadership behaviors are central to the success of IT projects.[22] The transformational behaviors identified in these prior studies include articulating a compelling vision, displaying a strong conviction to the vision, promoting shared beliefs and vision with empathy, providing meaning to the work, creating the group identity, empowering the group with decision-making authority and encouraging innovation. Transactional behaviors found to be effective in prior studies include clarifying roles and responsibilities, and controlling and monitoring the project team's workflow, deliverables and performance using domain knowledge, positional power and performance-based rewards.

Table 3: Project Leadership: Roles and Behaviors

Key Roles	Key Behaviors
• Planner • Resource allocator • Supervisor • Technology expert • Problem-solver • Organizational process expert • Communicator • Relationship architect • Liaison • Spokesman • Negotiator • Crisis handler • Organizational Catalyst • Change Agent	• Defines and clarifies roles/tasks, allocates given resources, and monitors the progress of the project (TX). • Develops appropriate technical expertise to communicate effectively with business sides (TX). • Analyzes key business requirements and synthesizes consensus to address key business processes (TX). • Recognizes strategic business and articulates a shared strategic vision and goals of the project (TR). • Promotes project team innovation and facilitates relationships with key stakeholders to manage expectations and negotiate organizational resources (TR). • Handles changes and adversity occurring from all aspects of projects with empathy (TR).

*TR – Transformational Leadership; TX – Transactional Leadership

The research data, which corroborates the findings of prior studies, shows that appropriately and consistently applying these leadership behaviors over the duration of a

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a project-based environment: A comparative study of the leadership styles of project managers and line managers," *International Journal of Project Management* (22:8), November 2004, pp. 609-617.
[22] Relevant insights from prior studies derived from: 1) Bass, B. *Transformational Leadership: Industrial, Military, and Educational Impact, Lawrence* Erlbaum Associates, 1998; 2) Bass, B. and Avolio, B. *Improving Organizational Effectiveness through Transformational Leadership,* Sage Publications, 1994; 3) Podsakoff, P. M, Todor, W. D. and Skov, R. "Effects of leader contingent and noncontingent reward and punishment behaviors on subordinate performance and satisfaction," *Academy of Management Journal* (25:4), December 1982, pp. 810-821.

project will enhance the likelihood of successfully completing tasks and delivering business value on time and on budget while meeting project objectives. These project leadership roles and behaviors go beyond traditional project management because they use implicit and explicit means to influence or induce stakeholders, including project team members, to attain the established goals. These leadership behaviors are necessary for project success because they address two different modes of motivation:

1. Transactional leadership behaviors are relevant for project planning and control roles. These behaviors keep the project on schedule and manage technology scope and organizational changes through transaction-based controlling and monitoring

2. Transformational leadership behaviors are relevant to the roles of synthesizing and integrating technology and business elements through inspirational, individualized motivation and intellectual stimulation.

Transactional leadership behaviors are important for project success by ensuring the appropriate allocation of resources, clarifying and advocating the project milestones and schedule, delegating detailed tasks to stakeholders and achieving the intended objectives. These behaviors go beyond traditional project management because they focus on motivating other organizational members to successfully accomplish their respective goals. While effective leadership behaviors tend to include the provision of implicit and explicit rewards, they also include delivering reprimands when project teams fail to meet milestones or goals. Perhaps most important is that transactional leadership behaviors are necessary for removing barriers relating to technology issues, staffing, budgets/finances, organizational changes, etc. Transactional leadership is necessary for defining project requirements and specifications and for harmonizing the efforts of

project stakeholders. Transactional project leadership also plays a role in helping the business understand how technology can change current organizational processes and in enabling the full value of the initiative to be attained.

Transformational leadership behaviors are also central in motivating team members. Motivation may include articulating the functionality of an underlying technology, helping team members to understand the value of their efforts in seeking technology solutions, and encouraging them to be creative when examining problems. Transformational project leadership thus promotes the excellence and quality of the solution and sets good examples for project team members to emulate.

Finally, transformational project leadership is instrumental in moving the project forward. This type of leadership behavior can relate the mission of the project to the overall organizational strategic goals, explain its impact on key stakeholders, make any necessary changes and communicate these ideas at all levels of the project, across all levels of the organization. By keeping stakeholders up to date, issues concerning the expectations and feasibility of the project can be addressed promptly, and a shared vision can be established. Transformational project leadership is also necessary in handling and negotiating different needs with empathy and tying these individualized needs to their respective projects. In addition, when a project faces a crisis and needs an organizational catalyst, transformational project leadership is needed to reiterate the vision and strategic importance of the project. One way to do this is to engage with, and have a good rapport with, project sponsors. Some degree of political maneuvering may also be necessary.

In summary, both transactional and transformational behaviors are essential because they have a significant impact on project stakeholders' actions and their ability to attain

project goals. The greater the complexity of an IT initiative, the greater the need for both types of behavior. Effective project leadership requires an organization to fuse the elements of transformational and transactional leadership into its practice for delivering IT projects.[23]

The Leadership Roles and Behaviors Give Rise to Five Project Leadership Types

Different combinations of the project leadership roles and behaviors described above give rise to different project leadership types. Although the roles (which are listed in Table 2) may change as a project progresses or if unforeseen obstacles arise, they converge into higher-level leadership roles that require a mix of leadership behaviors. This convergence was highlighted by how research participants described their firm's project leaders. For example, planner and resource allocation roles are key constituents of a larger role that transcends the entire project and requires controls and transaction-based leadership behaviors. From the analysis of participants' responses, we have identified the following five project leadership types:[24]

- *Administrator:* Controls and monitors the main process of the project

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[23] For more detail on the effectiveness of transformational and transactional leadership behaviors, see: 1) Bass, B. and Avolio, B., op. cit., 1994; 2) Judge, T. A. and Piccolo, R. F., op. cit. October 2004; and 3) MacKenzie, S., Podsaskoff, P. and Rich, G. "Transformational and Transactional Leadership and Salesperson Performance," *Journal of Academy of Marketing Science* (29:2), April 2001, pp. 115-134. According to Faraj S. and Sambamurthy, V., op. cit., May 2006, these leadership behaviors are more prevalent in, and indispensable for, IT projects because of their high levels of uncertainty. Quotes from our interviewees relating to the importance of having both transformational and transactional leadership behaviors in IT projects can be found in Appendix C.
[24] Quotes from our interviewees relating to the different leadership types are included in Appendix C.

- *Technologist:* Focuses on the technological aspects of the project using his/her knowledge in the development, creation, augmentation and implementation associated with an underlying technology

- *Business Integration Lead:* Manages the organizational impacts of the project using his/her knowledge and capability to understand the organization's elements of business integration.

- *Principal Lead:* Handles project complexities that arise from integrating the conflicting business and technology requirements, which requires compromising, mediation and extra coordination.

- *Consummate Lead:* Handles all phases and aspects of a complex project with strong technology expertise and organizational process knowledge.

Each project leadership type has the mix of leadership roles and behaviors needed to lead an IT project with a particular type of complexity (as classified in Figure 2). Table 3 shows how the five leadership types map to the four quadrants of Figure 2. The shaded areas in the table identify the project complexity where a leadership type can competently implement that project. For example, a project with the lowest complexity (Quadrant 1) may only require an Administrator project leadership type, while a Consummate Lead leadership type can implement projects in all four complexity quadrants.

Table 3: Project Leadership Types

Roles		Behaviors		Leadership Type	Project complexity where a project leadership type fits and can be effective			
Management Roles	Leadership Roles	Transactional	Transformational		Quadrant 1	Quadrant 2	Quadrant 3	Quadrant 4
				Administrator	▓			
				Technologist	▓	▓		
				Business Integration Lead	▓		▓	
				Principal Lead	▓			▓
				Consummate Lead	▓	▓	▓	▓

Administrator Leadership Type

Relying largely on transactional behaviors to be an efficient planner, resource allocator and supervisor, the Administrator leadership type focuses primarily on directing the project's progress. An Administrator ensures that each phase is executed as planned and within parameters set by the organization. This leadership type, referred to as "checklist" by most participants, is highly organized, project-process driven and capable of handling well-defined projects. The data also indicates that the Administrator leadership type is needed in the project planning phase: defining the scope, assigning the personnel, determining timeframe, allocating the funding/budget and outlining where to get the resources. Administrator type leaders are expected to effectively track project progress, monitor and control the project, and provide timely updates to sponsors and senior management. They are also expected to officially deploy the completed project.[25]

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[25] This research used the Project Management Institute's five-phase project lifecycle (pre-initiation and initiation, planning, execution, monitor and control, and deployment and closing).

Technologist Leadership Type

The Technologist leadership type is a technology expert who possesses technology-domain knowledge and understanding of the development, creation, augmentation and implementation requirements associated with the technology aspects of the project. Using transactional and transformational behaviors, this type is a problem-solver and communicator. Technologists methodically overcome challenges associated with technology ambiguity and complexities by solving problems and prompting team members to seek innovative solutions. Thus, the Technologist leadership type is appropriate for leading IT projects with complex underlying technology elements. The research showed that, underscore{irrespective of the level of project complexity (see Figure 2),} the Technologist leadership type is needed across all phases of an IT project, in particular, during the pre-initiation and deployment phases. At the pre-initiation phase, Technologist leaders examine technological feasibility and build a business case for the project. During deployment, they handle technical issues that come to light during roll out.

Business Integration Lead Leadership Type

The Business Integration Lead leadership type is suitable for projects that require multiple business processes to be synthesized or transformed. As an organizational process expert, this type understands the organizational impact of a project and how to manage the organizational minutiae. Relying heavily on transformational behaviors, this type articulates the technology impacts on current business processes, ensures required buy-ins, secures important resources, and helps the project stay on course by smoothing the path through organizational layers and any organizational obstacles.

As with the Technologist leadership type, we found the Business Integration leadership type is necessary during the project planning phase. The knowledge domains of both these types are needed for defining technology requirements, assessing business integration issues and creating risk mitigation plans. Both leadership types are also necessary for handling unexpected issues that may arise during execution.

Principal Lead Leadership Type

The Principal Lead leadership type handles project complexities arising from integrating the business and technology requirements at the organizational level. Using transactional and transformational behaviors to negotiate and handle crises, this type oversees and mediates the relationships between the IT and the business sides. Principal Leads continually promote the importance of the project for overall organizational goals, "green light" the necessary work to move the project toward completion, and make key decisions and compromises on the budget, resources and external stakeholder involvement. Some of the research participants mentioned the importance of Principal Leads during execution and for change management, especially when changes during execution involved multiple stakeholders or required integration that cut across multiple areas of the organization. Note that some participants highlighted the importance of the Technologist, Business Integration Lead and Principal Lead leadership types during both the project execution and the monitor and control phases of an IT project. This seems reasonable, given the need to address both known and unforeseen technological concerns linked to business integration and change issues.

Consummate Lead Leadership Type

    The Consummate Lead leadership type provides impetus to the project, and has the capability to create <u>catalytic moments</u> for a project team and project stakeholders. Consummate Leads solve problems and help others work together toward the overall goal of the project. As a change agent and organizational catalyst who uses transformational behaviors, this type tackles all facets of project leadership while effectively leveraging project sponsors and handling stakeholders. Consummate Leads also use transactional behaviors to keep projects progressing. Overall, the abilities of this type equip them to take the leadership role during all phases of a project. Interestingly, the research participants reported that this leadership type was rare in practice.[26] Moreover, all the organizations interviewed used multiple project managers who represented the different leadership types to compensate for their shortcomings in leadership types.

Three Guidelines for Effective Project Leadership

    The key to achieving the objectives of an IT project is to match the appropriate project leadership type to project complexity. Ensuring that the "right" project leadership is in place is crucial for the efficient management of an organization's overall portfolio of projects. Based on the research findings, we provide three guidelines for organizations on how to match projects with the right project leadership.[27]

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[26] Six out of the nine participants in the final panel (see table in Appendix A) indicated that the Consummate Lead leadership type did not exist in their organizations, while others stated that such a lead existed but was extremely difficult to hire or retain

[27] Quotes from interviewees relating to each of the guidelines are included in Appendix B.

Guideline No. 1

Understand the technology and business integration complexities of a project at different phases. Then identify and allocate appropriate project leadership type(s) capable performing the required core roles and with the necessary behaviors.

As illustrated in Figure 2, a project's complexity is determined by technology complexity and business integration complexity. To ensure project success, organizations need to define the scope and boundaries of these two areas. They must then identify the most suitable project leadership type for navigating the project's complex technology needs and integrating with existing systems or potentially redesigning business processes.

To choose the most effective leadership type for a project, organizations should carefully analyze the degree of technology and business integration complexities, evaluate how the different project leadership types can perform the specific roles required for a project (see Table 2), and consider the behaviors (transformational and transactional) needed to effectively perform those roles. As a project progresses, there may be a need for the capabilities of a different project leadership type(s). Depending upon the complexity and challenge of the project, the most appropriate leadership type at any project phase should possess the necessary technology and business process analysis knowledge, and/or the stakeholder management skills, that correspond to the leadership roles and behaviors needed at that phase. Organizations must ensure they have people able to carry out the required leadership roles in-house, or identify external sources of leadership.

Guideline No. 2

Embrace flexibility (or be willing to improvise) in dealing with project leadership. Be willing to seek diverse sources of project leadership over a project's lifecycle.

As illustrated in Figure 1, project leadership roles may be performed by a variety of people (project managers, project champions, project sponsors, business counterparts). Moreover, effective project leadership may depend on the complementary capabilities of multiple project leadership types. Assigning project leadership responsibilities to two or more individuals can help partition the workload and improve leadership effectiveness. For example, having a non-IT leader (often the CEO) serving as a transformational leader and another (often the COO) serving as a transactional leader helps focus execution in both the technology and process phases of projects. Persisting with project leadership that lacks the appropriate competencies to perform the roles and behaviors necessary for the level of complexity may cause project stagnation, resulting in late or unexpected outcomes, or project failure.

Organizations that lack appropriate leadership types may assign the leadership role to someone who only has some of the required capabilities. For example, project sponsors with a clear vision on how a project should be executed and a good understanding of a project's business objectives can be a driving force. And a Principal Lead can provide necessary leadership to keep a project on course. A project sponsor, for example, can help the project team to refocus by bringing clarity and commitment, while also collaborating with and empowering the project manager.

Guideline No. 3

Discern differences in project leadership types, train organizational members in requisite roles and behaviors and cultivate them to be Consummate Leaders.

To properly match leadership roles with behaviors requires an organization to identify the roles and behaviors needed for various project complexities. The organization can hire or develop people who can fulfil the Administrator and Technologist leadership roles, which require mostly transactional behaviors. The capabilities of these people can then be developed so they can fulfil the Business Integration Lead and Principal Lead roles by providing them with opportunities to learn a) the relational, communication and collaboration skills required for a business liaison role and b) the transformational behaviors necessary to inspire and motivate project stakeholders while overseeing the projects and leveraging available resources. Assessing which project leadership types the organization needs should be an integral part of the IT governance processes. It is also a particularly important task in the ever-evolving role of the CIO, who is responsible for ensuring that information planning objectives for all functional areas are aligned to meet the overall strategic goals of the firm.

As project leaders accumulate experience on IT projects, they will gain the competencies needed for multiple leadership roles and the associated behaviors. Organizations should actively help their project leaders to learn or gain these competencies. For example, they could run group-based leadership development

workshops or training sessions featuring project leaders from all business functions, and provide individual counseling or project shadowing with proven project leaders.[28]

Specifically, group-based project leadership workshop/training is effective in developing a team of transformational project leaders, who can share leadership duties for projects with varying degrees of complexity. Understanding how to properly handle technology and business integration complexities requires coordination among numerous points involving project team members and stakeholders.

Individual counseling may also be an effective way of developing transformational project leaders. However, individuals' characteristics may affect their abilities to adapt to and execute certain leadership behaviors.[29] Assigning an established and successful project leader to counsel or coach a project manager, and provide 360-degree feedback on project leadership effectiveness (compared to peers in other projects), will enable that project manager to develop the capabilities needed for an effective project leadership role. Most of the IT executives we interviewed believe that the development of project leadership talent is both necessary and possible.

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[28] These leadership development activities align with participant E's quote relating to Guideline 3 (see Appendix B). See also Barling, J., Weber, T. and Kelloway, E. "Effects of Transformational Leadership Training on Attitudinal and Financial Outcomes: A Field Experiment," *Journal of Applied Psychology* (81:6), December 1996, pp. 827-832. This study found that these types of leadership development activities were effective in improving transformational behaviors. Leadership workshops were also found to be the most appropriate and cost-effective leadership development approach in Kelloway, E., Barling, J. and Helleur, J. "Enhancing transformational leadership: The roles of training and feedback," *Leadership and Organization Development Journal* (21:3), May 2001, pp. 145-149.

[29] For an explanation of how an individual's characteristics affect the ability to develop leadership behaviors, see Vera, D. and Crossan, M., "Strategic Leadership and Organizational Learning," *Academy of Management Review* (29:2), April 2004, pp. 222-240.

Concluding Comments

The era of digitization is characterized by profound changes in businesses brought about by the application of IT. The influence of emerging technologies is far wider than the traditional focus of using IT for reducing operating costs. The increasing appetite for IT projects that support revenue-generating initiatives creates a need to move beyond traditional IT project management tools and techniques. The growing organizational implications of IT initiatives and the complexities of the underlying technologies mean that the scope and complexity of IT projects are increasing. In particular, attaining demonstrable business results from IT initiatives means managing the increased interdependencies between an organization's IT and business units, and in turn this requires IT project leadership that focuses on more than oversight, probing and critiquing. The research data, and multiple examples of unsuccessful projects, has shown that a lack of project leadership, in concert with ineffective project management, can lead to serious financial and strategic repercussions for organizations.

Building on The Project Management Institute's talent triangle, this study: :

1. Clarified the concept of project leadership and provide five distinct, mutually inclusive, and practical project leadership types characterized by project roles and behaviors.

2. Emphasized the need for high interdependence, alignment and integration among IT and business stakeholders for effective IT project leadership.

3. Validated and extended extant academic project management studies and practices.

4. Presented a comprehensive classification of project complexity (See Figure 2) and shown how the five leadership types map to the four quadrants of the figure. This classification provides a holistic model of project leadership that embraces a more integrative approach to project management and enables an organization to identify the appropriate project leadership role(s) for different levels of project complexity.

This research shows that accurately identifying the technology and business integration complexities of projects and assigning the appropriate project leadership type(s) (that encompass the required roles and behaviors) will significantly improve an organization's ability to achieve the strategic aims of their IT initiatives. On the other hand, when inadequate or inappropriate project leadership causes projects to be in danger of failing, organizations should take prompt action and proactively replace the current project leadership with other capable organizational members. These replacements can provide the necessary leadership and reinvigorate the project.

Finally, organizations should develop and nurture different project leadership types by providing learning opportunities such as leadership workshops, training sessions or mentorship. These development opportunities will enable organizational members (including IT project managers) to improve both their capabilities for leadership roles and the behaviors required for future IT projects. The overall aim should be to develop an in-house supply Consummate Leaders, which at present are few and far between.

Appendix A: Research Methodology

The research design and methodology are based on a grounded theory for data-analysis integrated with a Delphi data collection technique.[30] This modified Delphi technique, which requires the involvement of subject matter experts, provides a solid framework for data collection from a panel of participants. It also allows for comparisons across multiple panels focused on deriving a general, abstract understanding of the phenomenon while testing insights gleaned from the participants.[31]

Using a Delphi technique, the research identified IT professionals with project management experience. IT professionals from the Portland chapter of the Society for Information Management (SIM-PDX) were asked to participate, and a total of 32 IT professionals from 27 different organizations volunteered their time to be interviewed for the first panel.[32] All participants were IT executives, holding positions ranging from CIO to project specialist.

For the first panel, 27 interviews were conducted (one for each organization), which helped control the potential for collaborative ("group think") responses and ensured a more rigorous approach to the data collection process. These interviews lasted for approximately 20 to 30 minutes.

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[30] The research methodology followed that advocated by: 1) Brady, S. R. "Utilizing and Adapting the Delphi Technique for Use in Qualitative Research," *International Journal of Qualitative Methods* (14:5), December 2015, pp. 1-6; and 2) Charmaz, K. C. *Constructing Grounded Theory: A Practical Guide through Qualitative Analysis,* Sage Publications, 2014, which discusses and advocates the use of a more robust data analysis technique in Delphi and Grounded theory. See also Schmidt, R. "Managing Delphi surveys using nonparametric statistical techniques," *Decision Sciences,* (28:3), July 1997, pp. 763-774.

[31] See: 1) Creswell, J. W. *Research design: Qualitative, quantitative, and mixed approaches,* Sage Publications, 2003; 2) Eisenhardt, K. M. "Building theories from case study research," *Academy of Management Review* (14:4) October 1989, pp. 532-550; and 3) Strauss, A. and Corgin, J. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques,* Sage Publications, 1990.

[32] For detailed insights into this method, see: 1) Brady, S. R., op. cit., December 2015; 2) C., K., op. cit., 2014; 3) Creswell, J. W. op. cit., 2003; and 4) Schmidt, R. op. cit., July 1997.

The purpose of the first panel was to identify IT professionals who met two specific criteria: 1) they had extensive project management experience (at least 10 years); and 2) they were currently in management positions that required them to oversee multiple projects, typically simultaneously. These criteria were met by 13 IT professionals, who were invited to participate in the second panel sessions; however, only nine of these 13 completed the second panel process. (Information about the participants in both panel sessions, the size of their organizations and industry sectors, and the reasons for exclusion from the panels, is given in the table below.)

Panel Participants, Company Size and Industry Sector

		ID	Size (Number of employees)	Industry	Title	Experience (Years)
1st Panel	**2nd Panel**	A	>1000	Tech: Soft & Hardware	CIO	15
		B	<250	Tech: Soft & Hardware	CIO	12
		C	500-1000	Tech: Soft & Hardware	Director of IT	11
		D	>1000	Education	Director of IT	10
		E	>1000	Healthcare	CIO	16
		F	250-500	Healthcare	CIO	12
		G1	250-500	Government	Director of IT	12
		G2	250-500	Government	Project Specialist	10
		H	>1000	Oil & Gas	Project Specialist	18
	Did not finish Panel 2	I1	>1000	Healthcare	Project Specialist	11
		I2	>1000	Healthcare	Project Coordinator	12
		J	>1000	Healthcare	Program Manager	14
		K	250-500	Tech: Soft & Hardware	Project Specialist	12
	Reason for exclusion*					
	2	L	<250	Healthcare	Director of IT	14
	1,2	M	<250	Healthcare	Director of IT	5
	2	N	<250	Retail	Director of IT	17
	1	O1	<250	Tech: Soft & Hardware	VP of Development	8
	1	O2	<250	Tech: Soft & Hardware	Project Specialist	5
	1	P	>1000	Tech: Soft & Hardware	CIO	8
	2	Q1	<250	Tech: Soft & Hardware	CIO	13
	1	Q2	<250	Tech: Soft & Hardware	Project Specialist	7
	1	R	250-500	Government	Project Specialist	9
	1	S	250-500	Government	Director of IT	8
	1	T	>1000	Tech: Soft & Hardware	CIO	7
	1	U	500-1000	Government	Director of IT	7
	1	V	<250	Tech: Soft & Hardware	Project Specialist	8
	1	W	<250	Tech: Soft & Hardware	Director of IT	8
	2	X1	<250	Education	CIO	14
	2	X2	<250	Education	Project Specialist	12
	1,2	Y1	>1000	Oil & Gas	Director of IT	9
	1,2	Y2	>1000	Oil & Gas	Project Specialist	9
	1	Z	500-1000	Publishing	Project Specialist	6
	1	ZZ	<250	Semi-Conductor	Sr Project Manager	8
	* 1 = Lack of experience; 2 = Not overseeing multiple projects					

The nine IT professionals, from eight different organizations, who participated in the second panel completed separate interviews. The semi-structured interviews were framed around project management techniques, leadership selection and the importance of leadership in projects for IT initiatives (the interview questions are listed in the table below). This series of questions was designed to prompt participants to describe, explain and contrast their experiences in dealing with both effective and ineffective project leadership.

Semi-structured Interview Questions

1. Could you please provide some background regarding your experiences in the information technology (IT) field, especially as they relate to dealing with IS projects? Positions you've held and years of experience?
2. Can you briefly describe the variety or types of IT projects you have managed or overseen?
2a. Can you briefly describe the project management methodologies you have worked with?
3. How important is the leadership of the project manager on your IT projects? How would you define leadership? Project leadership? If defining what leadership is NOT would help, please do so.
3a. Can you give us a list of characteristics that you consider essential for effective leadership? Also, please take us through one of the projects you've just mentioned and explain how effective leadership affected various stages on that project?
3b. Contrast these characteristics and tell us what you feel are characteristics that should definitely not be possessed by a solid leader, as you've just defined? The authors are assuming the opposite in most cases for what you've just told us for effective leaders, please elaborate if that is not the case and give additional characteristics where you feel necessary.
3c. Please walk us through an unsuccessful project and explain how leadership contributed to the issues on that project.
4. Can you estimate how many types of IT projects you have managed or overseen? Have they been small, medium, or large? Also, please define for us how you or your organization has defined project sizes (small, medium, large).
5. How successful were the project(s) you've described?
6. How about your unsuccessful projects, what occurred on these efforts?
7. Looking at what you've said about your successful and unsuccessful efforts and your walk-through earlier, how would you characterize the impact of project leadership on the success/non-success on these projects?
8. How does the size of these IT projects impact the management/leadership required on these projects?

Note: Only questions 1, 2 and 3 were asked in Panel 1; All questions were asked in Panel 2

During the second panel interviews, the interviewer acted primarily as a facilitator of the questioning process and followed leads as they emerged during the interviews. Sometimes, unforeseen areas of discussion emerged, such as aspects of the importance

of IT project complexity that were not covered by the original questions. This is in line with grounded theory approaches that allow for the discovery of potentially related areas during the data collection process. The second panel interviews lasted between about 50 and 85 minutes.

The two sets of panel interviews were conducted on-site and by teleconferences over a period of 32 months. Overall, the research design and number of interviews conducted met the standard guidelines of grounded theory and Creswell's (5 to 25 interview subjects) and Morse's (at least six interview subjects) suggested for this kind of qualitative research.[33] The source data collected from over 21 hours of interviews was transcribed into 550 pages of textual data. The two panels provided detailed descriptions of the management of 23 different projects.

The analysis of the source data, followed grounded theory guidelines with the goal of finding explanations of how project leadership is described, emerges, is played out and is evaluated in the overall actions that occur in projects. A three-stage coding process was employed.[34] In the first *open coding* stage, each interview transcript was subjected to a within-case analysis to identify emerging categories. The coding process was initially framed around project management techniques, leadership selection and the importance of leadership within IT projects. With this open coding process, initial categories for leadership types and roles began to emerge. The transcripts were analyzed multiple times to identify tentative labels for large groupings of data.

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[33] Creswell, J. W. *Qualitative and Research Design: Choosing among Five Traditions,* Sage Publications, 1998; Morse, J. M. "Designing funded qualitative research" in Denzin, N. K. and Lincoln, Y. S. (Eds.), *Handbook of Qualitative Research,* Sage Publications, 1994, pp. 220-235.
[34] See Charmaz, K. C., op. cit., 2014,

The second *axial coding* stage identified relationships among the categories found in the first stage. In the third coding stage, applied *between-case comparisons* to identify similarities and differences among the participating organizations. During this stage, the similarities in the traits of roles played by effective project managers across the eight organizations that participated in the second panel were examined. Consistent patterns across the organizations, independent of control variables were detected. These between-case comparisons provided a convergent systematic account of a series of traits and roles identified as being crucial for effective project leadership.

To increase the external and internal validity of the data, techniques advocated by Yin were applied[35] by applying controls for business size, industry sector and experience Following. According to Yin, there is a trade-off between validity and data richness when employing grounded theory approaches, and to apply the techniques a pattern-matching methodology was applied—or example, when asking participants to define their concept of a large IT project. These definitions could vary according to the participants' company or industry sector, but pattern matching was employed to identify similarities or differences in the various participants' discussions on large IT projects.

Finally, a confirmatory post-research interviews with 15 IT executives and project managers to validate the findings (the semi-structured interview questions asked are listed in the table below) was conducted. The participants of the confirmatory interviews had not participated in either of the earlier panel session interviews and were asked for their opinions on the viability and benefits of the project management roles and

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[35] Yin, R. K. *Case Study Research: Design and Methods,* Sage Publications, 2003.

leadership types identified in the research. More specifically, the interviewees were

asked to rate the viability of these roles for different levels of project complexity.

Semi-structured Confirmatory Interview Questions

1. Could you please provide some background regarding your experiences in the information technology (IT) field, especially as they relate to dealing with IS projects? Positions you've held and years of experience?
2. Can you describe the IT project leadership structure you employ on IT projects?
3. Is leadership on IT projects in your organization given to a single individual or multiple individuals? Please describe.
3a. If you employ a single or multiple leadership role(s), why is that the case?
3b. What projects would you use to employ a single leader or multiple leaders/managers?
4. How would you describe IT project complexity?
4a. Does project complexity play into leadership role assignments on projects? How?

Appendix B: Quotes from Study Participants

Set out below are quotes from study participants' in their responses to

transformational project leadership behaviors, transactional project leadership behaviors,

the four project leadership types and the three guidelines.

Transformational Project Leadership Behaviors

Organizational Catalyst and Change Agent: identifying and articulating the

purpose and outcome of the project and its contribution to the overall

organizational goals:

> *"[The PM] should be able to go around and map out business processes while*
>
> *finding key touch points … appropriate integrations are seen and addressed*
>
> *correctly."* Director of IT (G1)

"The PM should be able to navigate different channels and resolve the differences/discrepancies in the alignment, buy-in, etc. of [project stakeholders]." Project Specialist (G2)

Communicator and Spokesman: promoting collaboration among all stakeholders for the project goals:

"Should be able to inform executives, sponsors, team personnel, and all manner of stakeholders when something happens on a project or when some things need to be addressed in their own due course." Director of IT (G1)

Negotiator and Promoter: providing and caring for the needs of all key stakeholders:

"Should be seen as the individual whom all stakeholders can go to with issues and concerns ... primarily because they are seen as being able to address their issues and concerns." CIO (B)

Problem-Solver and Crisis Handler: demonstrating confidence/expectations toward members for excellence, quality and high performance; challenging members to be creative and innovative in problem-solving:

"Should be able to make team members feel supported rather than stifled or micromanaged." CIO (A)

"Should be able to go out and acquire resources needed for the project ... and thus make changes and be willing to bring in others when necessary." CIO (F)

"An active project manager would sense [obstacles] and would challenge [project stakeholders] on the estimate or would … help them work up a more useful estimate." CIO (F)

"Ability to stay calm under pressure … especially when things get difficult or uncertainties arise." Project Specialist (H)

Transactional Project Leadership Behaviors
Technology and Business Domain Knowledge Expert:

"… domain knowledge is important … we run projects dealing with medical equipment and devices. How can a lead effectively manage the process if they have no clue about the technology? You can use someone like that, but it just adds more time to the process. And if they can't [figure it out], the project probably fails." CIO (B)

"Should be able to integrate both the business requirements and the technical requirements. Not one or the other." CIO (E)

"Should be able to get the respect from project team members as they can "smell" whether or not it makes sense from a technical development point of view]. They look at it as acceptance criteria on the story." CIO (A)

Planner, supervisor and gatekeeper: clarifying, roles, tasks and expectation for project team members; and monitoring the project:

"They have to have a better understanding of the IT. How the technology works, what [it] should be doing and the needs of the people working on the technology." Director of IT (D)

Project Leadership Types
Administrator Leadership Type:

"The project manager is known for ... addressing ... projects [in] command-and-control mode. He went into command-and-control mode and turned the project around effectively." Director of IT (D)

"... any generic project manager can work down a list of things. But to me, that role is largely administrative or semi-clerical, but not a whole lot of value." Director of IT (G1)

"A passive project manager is OK if you are looking for administrative support ... just someone you can trust to follow your set of directions." Project Specialist (G2)

"Most of our project managers are 'here's your scope, you get the job done' or 'here are your resources' or 'you tell us what you need and follow the steps and get the job done.'" CIO (F)

"I normally say the smaller project is where I put the less experienced or green folks ... they are really focused on learning and executing the methodology and

the process ... getting them to think outside the box is impossible since they just

aren't comfortable with the basics yet." CIO (F)

"I tend to put PMs with little experience on more clearly defined projects ... this

way it makes things easier for them. They need more direction so the more

structure you give them the better ... almost like a checklist of things to follow."

Administrator Leadership Type (Planning):

"...you just take verbatim estimates and timelines and forecasts [etc.] ... and your

job is ... to take ... those estimates and put them all into a plan and then present

it,[and] say ... this is what the project looks like—that's a passive project

manager. ... any generic project manager could be able to do that. But to me, that

role is largely administrative or semi-clerical, [and] not a whole lot of value."

CIO (E)

Technologist Leadership Type:

"They have to have a better understanding of the IT. How the technology works,

what [it] should be doing and the needs of the people working on the technology."

Director of IT (D)

Technologist Leadership Type (Pre-initiation and Initiation):

"I think initiation is one of the most ambiguous phases. So one of the skills we

need project managers to do is to write or lead the writing [of technical details] ...

where we're trying to lay out basically, the scope, schedule and resources so that

other people can understand it. ... Now, that information has to be explained to a

business and IT team, so that people can start to write requirements and move on down through the phases.” Director of IT (C)

Technologist Leadership Type (Planning):

“The project manager (IT side) will do ... an assessment on risk, which [takes account of] the complexity or novelty and size, how many, the number of software engineering hours.” CIO (E)

Technologist Leadership Type (Monitor and Control):

“We had a technical team [lead] responding [to processing] requirement changes as quickly as possible. So when somebody calls in and says xxx doesn’t work ... we had people able to turn technical things around quickly.” Director of IT (G1)

Technologist Leadership Type (Deployment):

“The business function manager or the person who is in charge of the things that you want to actually meet for the business function” Project Specialist (H)

Business Integration Lead Leadership Type:

“[Project managers] should be able to integrate both the business requirements and the technical requirements. Not one or the other.” CIO (E)

“[With the project] ... we were going to impact a lot of areas, not just technology, the operational and financial processing of all the stations across the country. ... I was the project manager, but I needed others to help manage certain parts of the project. ... It really was too much for just one person to handle.” Project Specialist (I1)

Business Integration Lead Leadership (Planning):

"… there would be two separate project plans … the software development plan would be a subset of the overall business plan and the business plan would … include things like deployment, education, support, any kind of prerequisite work or discovery cases [etc.]. All those things would be run by the business project manager." CIO (E)

"A business project manager will give you some alignment and some buy-in…But the business project manager could help navigate channels for the project." CIO (E)

Business Integration Lead Leadership Type (Deployment):

"The business function manager or the person who is in charge of the things that you want to actually meet for the business function" Project Specialist (H)

Principal Lead Leadership Type:

"The [principal lead] sets out the guiding principle, the direction, the [high level] strategy, [and] identifies resources that go into each team. When something happens in a project manager's scope of authority that is going to change the direction of the project, [it] has to go to the [principal lead who] makes a business-focused decision." CIO (E)

"… I've watched development teams [struggle], where I had constraints, where I put people that did not have the technical background. … I just don't think they

have the confidence and complete respect of the technologists. … I've seen the other end as well, where strong technical leaders just struggle with organizational implementations. My best projects have utilized leads that can complement each other." Project Specialist (H)

Principal Lead Leadership Type (Execution):

"Execution—the heat's on, all four burners on the stove are burning and you need to actively manage that. At that point, you're kind of past executive support, you're past sponsorship; you're kind of on your own. It's really up to you [and your leads] to deliver. … But largely, you're on your own at that point." CIO (E)

Principal Lead Leadership Type (Monitor and Control):

"[She] will tinker with structure all the time, because [her] eye is on the critical path and [she's] trying to beat that." CIO (E)

Consummate Lead Leadership Type:

"There is a component of intellectual curiosity. They are tinkering with the structure all the time … [trying to] solve problems, come up with solutions … to do this they really need to understand all aspects of the project." CIO (B)

"It's not easy finding a complete project manager. You really have to be comfortable with yourself. Most people have strengths and weaknesses, but a good project manager knows their own weaknesses [but knows how to not make it an issue for] the projects they work [on]." Director of IT (C)

Guideline 1

Guideline No. 1:

"[My] fear [when assigning projects] is in placing project managers good at certain things but not necessarily with the skills actually required [for] the project, [which is just] a wasted resource." Director of IT (G1)

Guideline No. 2:

"[With the changes and] multi-dozens of millions of dollars [in this] three-year project ... [after] about two months we realized that the program manager and the project manager weren't working. So we switched it. ... the [new] project manager ... is known for ... addressing ... projects [in] command-and-control mode. He went into command-and-control mode and turned the project around effectively." Director of IT (D)

Guideline No. 3:

"We wanted her to expand her role. Understanding the project's fundamentals—the structure where we were going, the boundaries that [needed] executing on these projects or phases of the project—she became very knowledgeable in design development and execution of the program ... So it is a teachable thing." CIO (A)

"... I can read a book on how to be a scrum master [but] unless I have the practical experience ... how do you create an environment where you are not only educating but you are giving ... practical [advice or] experience through projects, assigning tasks, [etc.] [in a way] that folks can learn and [be trained about] what goes on, and try [things out themselves]? ... that's the training I try to [provide]." CIO (E)