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# Behavioral Competencies and Learning Methods for IT Project Management: An Exploratory Study

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## ABSTRACT

What do IT project managers consider to be the critical skills necessary for project success, and how have they developed those skills? The aim of this research has been to answer these questions. We interviewed 23 experienced IT project managers from 11 organizations, focusing first on what the managers perceived as their most critical project management skills, and then on how they had developed those skills. We also discussed their exposure to a wide variety of organizational development interventions. By focusing on how project managers actually learned critical skills, we have been able to uncover the importance of informal learning channels, often involving project experiences, for the development of IT project management skills.

## Keywords

IT project management, IT project management skills, IT project management knowledge, performance management, behavioral competencies, learning.

## INTRODUCTION

Organizations make substantial investments in the development of their IT project managers in the expectation that those managers, and the projects they lead, will be successful. This paper addresses the question of how organizations can best support IT project managers in gaining critical project management knowledge and skills. Traditionally, management development initiatives have included interventions such as formal training programs, performance appraisals, 360-degree feedback, and management coaching.

In this study, we focus on the skills that experienced IT project managers view as critically important in order to manage their projects effectively, and we explore the avenues by which these managers have developed these skills in the course of their careers. By examining both what the critical skills are from the perspective of experienced project managers, and how these managers have acquired these skills, we are able to provide recommendations on effective development and training programs for the next generation of IT project managers. The key objective of this study was to identify avenues of learning that organizations can utilize for improved facilitation of training for less-experienced project managers.

## LITERATURE REVIEW

### IT Project Management Skills

There is an extensive professional literature providing guidelines for best practice in project management. The Project Management Institute (2004) provides a series of professional certifications based on standards set out in its Project Management Body of Knowledge (PMBOK). The PMBOK sets out nine knowledge areas that are claimed to encompass the sum of knowledge recognized as good practice in the project management profession. In addition to these detailed knowledge areas, PMBOK also notes that effective project management requires an understanding of the application area, the project environment, general management knowledge and skills, and interpersonal skills.

Building on the knowledge standards in the PMBOK, the PMI has developed a framework of project management competencies (Project Management Institute, 2002), specifying three dimensions of competency required for effective project management performance. These dimensions comprise the declarative knowledge required (that is, the nine knowledge areas of the PMBOK), the procedural knowledge needed to apply the declarative knowledge (performance standards for each knowledge area), and the behavioral competencies necessary to support effective project management performance. The competency framework is comprehensive and the declarative and procedural knowledge competencies are generally accepted as essential components of any project manager's skill set. However, the 19 behavioral competencies, shown in the left hand column of Table 1, have been adapted from general managerial competencies listed in the competency dictionary developed

by Spencer and Spencer (1993), and have not been empirically tested for their specific applicability to project management work.

There is still little *empirical* research into the question of the specific behavioral competencies required by project managers to do their jobs (Morris, 2001). One particularly useful program of research in the construction industry (Dainty, Cheng and Moore, 2004; 2005) has led to the development of an empirically derived competency model, reporting a more tightly focused group of 12 core competencies, shown in the center column of Table 1, that are regarded as critical for effective construction project management performance. We have not found empirical work testing the applicability of these competencies to IT project managers, and while it seems reasonable to assume that the Dainty et al. (2004; 2005) set of skills would be required, additional competencies from the PMI list may also be important in the IT project context.

In addition to these studies examining overall competencies of project management, a handful of studies have examined the importance of specific skills for IT project management. Jiang, Klein and Margulis (1998) looked at whether skills previously specified as important for systems analysts were also important for IT project managers, and identified directing, managing and information seeking, all three of which are represented in Table 1, as key skills. A subsequent study by Jiang, Klein and Chen (2001) focused on the importance of leadership skills for successful project outcomes, reinforcing the importance of the team leadership competency in Table 1. In a study that examined competencies of IT professionals in general, Bassellier and Benbasat (2004) found that business competence, defined as organization-specific knowledge together with interpersonal and management knowledge, was a key skill for IT professionals whose work involves substantial contact with business clients. The organization-specific knowledge aspect of Bassellier and Benbasat's business competence category is broader than the definition of organizational awareness competence derived from Spencer and Spencer's (1993) competency dictionary, which refers simply to an understanding of the power relationships in the organization. Bassellier and Benbasat's (2004) definition also encompasses an understanding of organizational structure and the business impact of IT projects. Since IT project management work typically requires significant interaction with clients and other stakeholders in the organization, this broader view of organizational awareness is likely to be an important aspect of the necessary competencies, and we adopted the expanded definition shown in the right hand column of Table 1 for the organizational awareness competency.

The behavioral competencies outlined in the PMI's competency framework, together with Bassellier and Benbasat's business competence, provide a starting point for examining skills required for IT project management. However, it is likely that some of the required competencies are industry and role-specific (Dainty et al., 2005; Morris, 2001) and so further investigation of the requirements for effective performance in the IT field is required. We do not yet know which aspects of the competency framework are essential for IT project managers. Thus, one aim of the current research was to investigate which skills experienced project managers regard as critically important components of their project management toolkit.

### **IT Project Management Skill Development**

Understanding the specific skills required for effective IT project management is only the first step. We also need to learn about how best to support the development of project managers in these areas. Two surveys of experienced project managers across a range of industries report that very few organizations have implemented in-house training development programs in the project management area, relying instead on on-the-job experience to develop their project managers (Carbone and Gholston, 2004; Conger, 2004). Indeed, there has been a somewhat unquestioning assumption in industry that project managers can be promoted based on their technical ability and that they will somehow absorb the necessary project management skills during their time on projects in a more technical capacity (Carbone and Gholston, 2004; Nellore and Balachandra, 2001). Yet managerial and inter-personal skills are generally rated of higher importance than technical skills for project managers across all industries (El-Sabaa, 2001). This is of particular concern in the IT arena because the special nature of IT projects - in particular, their high levels of uncertainty, their primary focus on conceptual work, the wide variety of stakeholders, and the lower levels of continuity of project personnel from one project to the next - means that managerial skills are likely to be essential for effective project management.

While organizations may not be initiating project management training, the dramatic increase in project managers holding the PMI Project Manager Professional certification noted by Gray and Larson (2008) - from fewer than 3,000 in 1996 to over 200,000 in 2005 - suggests that individual project managers are taking an increasingly proactive approach to their own professional development. The extensive training and certification opportunities provided by professional associations such as the PMI can address the development of the declarative knowledge base, but procedural knowledge and behavioral competence typically require a more situated learning approach, embodying practice, feedback and reflection (Eraut, 2000).

**Table 1. Behavioral competencies for project managers**

[\*Expanded definition encompassing Bassellier and Benbasat's (2004) business competence]

Project Management Institute (2002)	Dainty et al. (2004; 2005)	Definitions for the current study derived from Spencer & Spencer (1993)
Self control	Composure/self control	Maintains control over emotions and avoids negative actions under stress
Team leadership	Team leadership	Leads others in a team; is able to develop the sense of team purpose and direction to achieve team goals
Directiveness/assertiveness	Directiveness/assertiveness	Shows ability to make others comply with own wishes through direction, setting of performance standards, and confrontation of non-performance
Achievement orientation	Achievement orientation	Sets own standards for excellence in works and strives to meet them
Analytical thinking	Analytical thinking	Systematically understands situations by breaking them into smaller parts in a step-by-step causal way
Flexibility	Flexibility	Is able to adapt to and work effectively with a variety of situations, individuals, or groups
Teamwork & cooperation	Teamwork & cooperation	Works cooperatively as part of a team and fosters teamwork
Initiative	Initiative	Is proactive in taking action to avoid problems or create opportunities
Information seeking	Information seeking	Actively seeks out in-depth information through research and with others
Conceptual thinking	Conceptual thinking	Builds a larger understanding of a situation by identifying patterns that are not obviously related, seeing the larger picture
Impact & influence	Impact & influence	Demonstrates ability to influence others to support own agenda
Customer service orientation	Focus on client needs	Focuses efforts on understanding and meeting the client's needs
Interpersonal understanding		Is sensitive to, listens to, and wants to understand other people
Relationship building		Works to build relationships with people who are, or might someday be, useful in achieving work-related goals
Developing others		Shows the intent to teach others or foster their work development
Organizational awareness		Understands the organizational structure and power relationships in own and client organizations; understands business impact of IT and IT projects*
Self confidence		Expresses confidence in ability to deal with challenging situations and in handling failures constructively
Concern for order, quality and accuracy		Strives to maintain or increase order in the work situation
Organizational commitment		Is able and willing to align with the needs, priorities and goals of the organization

It might seem that project managers are receiving little organizational support for development of project-specific procedural knowledge and competencies, but most of the required competencies discussed earlier are similar to generic management competencies rather than being specific to the project management job, and thus organizations may rely on more general management and leadership interventions to provide the necessary development training for their project managers. Interventions for developing management and leadership skills in employees typically include both formal training programs to develop key competencies and on-going developmental support initiatives aimed at supporting continuous individual development (McCauley and Hezlett, 2001). Formal management training programs cover a range of generic competencies, such as general management skills and interpersonal skills, believed to be important for managers to develop. On-going developmental practices, such as 360-degree feedback, coaching and mentoring, modeling and apprenticeship, and communities of practice, are aimed at supporting employees in their continuous development in the workplace, and are particularly useful for supporting change in behaviors and transforming understanding in order to guide future action.

In contrast to the formal approaches to management and leadership development, some researchers (Conger, 2004; Kempster, 2006; McCall Jr., 2004) argue that leadership skills must be learned through on-the-job experience. However, as McCall Jr. (2004) notes, "People don't automatically learn from experience." The challenge is to provide support to ensure that managers do in fact learn as much as they can from their normal work experiences (Davies and Easterby-Smith, 1984). Thus, apprenticeship opportunities coupled with support and feedback to encourage reflection and sense-making of the leadership apprenticeship are regarded as valuable approaches for leadership development (Day, 2001; Kempster, 2006).

## The Current Study

The research reviewed above has highlighted a framework of knowledge, skills and behavioral competencies that are required for project managers, but it is still unclear which aspects of this framework are of critical importance for effective IT project management. In addition, we know little about how best to support project managers in developing the required competencies. Thus in the present study, we focused both on exploring the skills that experienced IT project managers regard as critically important components of their project management toolkit, and how they developed these skills during their careers. Our key objective was to understand how individual learning from project experiences can best be facilitated, and we used the following questions to guide our investigation:

- Which of the skills that experienced project managers have gained during their career do they see as critically important for their project success?
- How have experienced project managers learned these key skills?
- What management developmental interventions (such as training programs, coaching, and mentoring) have managers experienced and how have these contributed to their learning?

## METHODOLOGY

This research was an in-depth, multiple case study investigation, with the objective of exploring individual project managers' learning. The nature of the study is exploratory and descriptive, because, while there is plenty of literature on learning and development of generic management and leadership skills, little attention has been paid to the specific challenges of developing IT project management competencies. The PMI's project manager competency development framework (2002) with the expanded definition of organizational awareness, shown in Table 1, provided an initial research model.

### Sample

We used a two-stage purposive sampling approach to identify experienced IT project managers for this study. Eleven organizations representing wide variation in terms of type of organization (both specialist IT firms and organizations with IT departments carrying out internal projects) and type of IT project (for example, software development, package implementation, infrastructure upgrades, and internet and intranet projects) were invited to participate. Within each organization, we identified key informants at the CIO, program executive, or senior project manager level and sought nominations from these key informants of one or two expert project managers within their firm. We then used a snowball approach to seek further participants from the initial set of nominated project managers.

In total, we interviewed 23 project managers from the eleven organizations. The respondents were experienced project managers, mostly in the 40-49 age group, with an even gender split (12 male and 11 female). They had typically worked for several different companies during their project management careers, and drew their learnings from across their experiences with these different companies. The respondents had wide experience across a range of project types, including in-house development, web development, infrastructure upgrades, and customized package implementation work, with varying team sizes, budgets and durations.

### Data Collection Procedures

The semi-structured interviews with individual project managers relied largely on the critical incident method (Flanagan, 1954), which has been demonstrated to be effective in surfacing tacit knowledge and in getting beyond respondents' espoused theories (in the present case, about what and how they have learned) to reveal actual practice (in the present case, practice about actual learning) (DuBois, 2002; Klein, Calderwood and MacGregor, 1989; Taylor, 2005). Interviews lasted approximately 45-60 minutes. Interviews were tape recorded with the permission of the participants and transcribed. The transcripts were returned to participants for checking and confirmation.

We provided the interview guide to participants ahead of time, because we believed that they would be able to give more meaningful responses if they had time to reflect on the questions. In addition to collecting basic demographic data and details about project experience, the interviews covered three main areas. In the first part, we encouraged respondents to focus on key incidents in their current projects where they had applied knowledge or skills differently from the way they would have approached these incidents early in their careers. We examined these incidents with the respondents to understand what skills were now being applied and what, specifically, these experienced project managers now do differently from what they did earlier in their careers. The second stage of the interviews focused on how the respondents learned the key skills they had

identified. Again, we focused respondents on identifying the specific learning events that first triggered a change in the way they approached the area under discussion. Finally, we asked project managers about a variety of interventions that are used by organizations to develop and improve personnel performance. For each intervention we discussed respondents' experience with the intervention, and how helpful it had been in terms of their overall development as a project manager.

After thirteen interviews had been completed, we conducted a preliminary analysis, following the procedures described in more detail below. We were surprised to find from this initial analysis that the predominant learning method reported for all competencies was reflection on experience, and that formal training was rarely identified, even with respect to the concern for order, quality and accuracy competency, which relies heavily on declarative and procedural knowledge about project management methodologies. This finding might have reflected the lack of organizational support for project managers' training, but, when we examined the management development initiatives, most of the project managers had participated in training that would be expected to be relevant for the critical learnings that they described. Moreover, most of the project managers reported that they found these management development initiatives at least somewhat useful. However, we realized that in many cases we could not tell whether the formal training had occurred before or after the critical learning experience.

In order to address this gap, we modified the interview protocol to incorporate the capture of an event history calendar - a timeline of key events. Event history calendars draw on autobiographical memory research, and have been shown to enable respondents to reconstruct the time sequence of past events more completely and accurately, thus usefully augmenting the critical incident method to maximize the quality of retrospective reports (Belli, 1998). In the remaining ten interviews, we first established the respondent's timeline of key career events, and then asked the respondents to locate their critical learning experiences and management development initiatives on their career timeline.

### Analysis Procedures

The initial research model, derived from the PMI's project manager competency development framework (2002), provided support for an interpretive prior-research-driven thematic analysis (Boyatzis, 1998; Miles, 1985; Ritchie and Spencer, 1994). The analysis proceeded in three stages, corresponding to the three research questions that guided our investigation. We first extracted the key learnings identified by each project manager as critical elements in their efforts to ensure project management success, and derived a definition for these learnings, couched in the participant's own words. Respondents typically spoke of three or four key learnings that they had found critical, providing a total of 89 learnings from this set of project managers. We used the framework of competencies shown in Table 1 to categorize the learnings into the underlying competencies that they reflected. Just over two-thirds of the key learnings encompassed more than one competency, and one respondent identified a competency related specifically to IT technical knowledge, which was not covered by the framework. Thus we expanded the framework to include 20 competencies with 182 instances of these competencies.

For the second question, examining how managers had learned their critical skills, we allowed the categories of methods of learning to emerge naturally from the data, resulting in seven learning methods, as shown in Table 2.

**Table 2. Learning methods and number of respondents learning with each method**

Learning method	No. of PMs learning a critical skill with method (out of 23)
Reflection on experience	23
Observation of other PMs	11
Formal training	8
Coach or mentor	8
Performance feedback	6
Communities of practice	2
Independent learning	2

For the third question about the developmental interventions experienced by the respondents, we summarized those interventions experienced by each participant, and their perceptions of the usefulness to their overall development. Finally, for the ten interviews with event history timelines, we plotted the occurrences of training and critical learning experiences on a timeline in order to determine the sequence of events.

## RESULTS

### Critical Competencies and Learning Methods

Table 3 shows the number of critical learnings linked to each competency, and the number of project managers describing at least one learning related to each competency. Five of the competencies in Table 3 were evident in skills described by more than one third of the project managers in the present study, namely team leadership; concern for order, quality and accuracy; relationship building; impact and influence; and organizational awareness. The remaining competencies could be identified in less than one third of the respondents, suggesting that these areas are of lesser importance for most IT project managers.

The two competencies containing the most critical learnings were team leadership, with 29 related learnings and mentioned by 19 of the 23 respondents, and concern for order, quality and accuracy, with 28 related learnings and mentioned by 17 of the 23 respondents. These two competencies together can be seen as representing the key dimensions of project management skills, as described by E2: *“Hard skills get you into the business. Soft skills keep you in the business.”* Similarly, G2 commented: *“It’s easy to learn hard skills,[but] it’s really hard to put those to use in a practical environment without the soft skills and a real understanding of why are you doing these things.”*

**Table 3: Critical learnings and number of respondents describing at least one learning related to competencies**

Competency (as defined in Table 1)	Number of critical learnings linked to the competency (out of a total of 89 learnings)	Number of PMs describing at least one learning linked to the competency (out of a total of 23 PMs)
Team leadership	29	19
Concern for order, quality and accuracy	28	17
Relationship building	16	13
Impact & influence	14	11
Organizational awareness	13	9
Achievement orientation	9	7
Flexibility	8	7
Focus on client needs	7	7
Interpersonal understanding	7	7
Initiative	7	6
Teamwork & cooperation	9	5
Information seeking	8	5
Directiveness/assertiveness	6	5
Analytical thinking	7	4
Self confidence	4	4
Developing others	4	3

Self control	2	2
Organizational commitment	2	2
Conceptual thinking	1	1
IT technical knowledge	1	1

The team leadership competency was an area that respondents regarded as critically important and on which they focused much on-going energy in honing their skills. As shown in Table 4 below, the primary learning method here, and the only learning method for eight of the respondents, was reflection on experience. Six respondents also commented that observation of peers and senior project managers had guided them in their own practice, with three of these noting that such observations helped them learn what not to do. Five respondents described getting feedback from a superior or coaching from a mentor as the trigger for their reflection on experience and subsequent learning. One respondent described applying a formal training on team leadership in her practice.

Not surprisingly, the concern for order, quality and accuracy competency relies heavily on declarative and procedural knowledge about project management methodologies. Ten of the 17 managers reporting a skill related to this competency actually described two critical skills in their toolkit both drawing on this competency, suggesting that concern for order was a foundational project management skill for these respondents. More surprising was how these respondents reported learning about these foundational skills (see Table 4). Only seven of the 17 managers described formal training as the primary learning method, and all except one of these managers described supplementing their formal learning with at least one other approach, including extensive reflection on their experience, observation of other project managers, interaction in communities of practice, independent learning, and being coached. The remaining ten managers described learning skills related to the concern for order competency by reflection on experience, supplemented by performance feedback and mentoring (four managers), observation of other project managers (three managers), and interaction in communities of practice (one manager).

**Table 4: Methods reported for acquiring each competency**  
[Note: Some respondents reported multiple methods for learning critical skills]

Competency (as defined in Table 1)	Reflection on experience	Observation of other PMs	Formal training	Coach or mentor	Performance feedback	Communities of practice	Other
Team leadership	14	6	1	3	1	-	-
Concern for order, quality and accuracy	13	6	7	2	2	2	1
Relationship building	12	2	-	2	1	-	-
Impact & influence	9	1	-	2	1	-	-
Organizational awareness	8	1	-	2	-	1	-
Achievement orientation	6	2	-	4	-	-	-
Flexibility	6	-	-	-	2	-	1
Focus on client needs	6	1	-	1	-	-	-
Interpersonal understanding	5	2	-	1	-	-	-
Initiative	5	2	-	1	-	-	1
Teamwork & cooperation	6	-	-	1	1	-	-



Information seeking	6	2	-	1	-	-	-
Directiveness/assertiveness	4	1	-	2	-	-	-
Analytical thinking	3	2	1	-	1	-	1
Self confidence	4	1	-	1	-	-	-
Developing others	3	1	1	-	-	-	-
Self control	2	1	-	-	-	-	-
Organizational commitment	2	-	-	-	-	-	-
Conceptual thinking	-	-	-	-	1	-	-
IT technical knowledge	1	-	-	-	-	-	-

A further three competencies – relationship building, organizational awareness, and impact and influence – were mentioned by at least nine of the 23 respondents. The primary learning method for these three competencies was reflection on experience, with triggers for learning sometimes provided by mentors, performance feedback or observation of other project managers. The relationship building and impact and influence competencies were linked, in that nine of the 16 relationship building learnings were also coded to impact and influence, with the managers describing the need to build relationships on a continuous basis in order to have impact and influence to promote the needs of their projects. A ‘currency’ theme was apparent in some of the respondents’ approaches to their relationship building and their actions to develop impact and influence. For example, B1 commented: “*Finding a ‘currency’... I work completely through influence ... I have to trade experience, knowledge and skill to get work accomplished*” and B5 noted: “*Identify all the stakeholders and involve them early, be proactive ... a lot of it’s relationships ... you make deposits when you help and withdrawals when you need help.*”

The organizational awareness competency was identified in 13 critical learnings described by nine respondents. These respondents displayed a keen sense of looking beyond the immediate concerns of the project to address the wider business goals. Considering the overall business goals was of paramount importance for I1: “*The first question has to be, ‘are we creating business value?’ And then the second question should be, ‘what role can project management play in that?’ Sometimes that first question doesn’t get adequately addressed, and if it did, sometimes project management wouldn’t actually be the answer.*” Similarly, B6 commented: “*If a solution is designed and developed, it should be able to encompass the broadest possible benefit as opposed to just looking at what’s being done on a day-to-day basis.*”

### Organizational Development Interventions

In the final portion of the interviews we examined what formal learning opportunities the respondents had experienced, and how useful they found these learning occasions. We have seen that, except for the concern for order, quality and accuracy competency, respondents overwhelmingly identified reflection on experience as the primary learning mechanism for their critical skills, and even though formal training was important for the concern for order competency, reflection on experience also played a big part in the respondents’ descriptions of their skill development here. We were interested to compare respondents’ perceptions of the learning mechanisms that had been effective for their critical skills development with their views on the usefulness of their organizations’ development interventions.

As can be seen from Table 5, the respondents had experienced a wide range of training interventions. All except two respondents had participated in formal project management training, most of which was either provided in-house or paid for by their employers. While this training was generally regarded as useful, three who had studied at least some of the Project Management Institute training materials commented that they had not found the material particularly helpful. I1 explained: “*They’ve gotten so focused on instituting project management practices that they’ve sometimes lost sight of the fact that ultimately what we’re all trying to do here is to create value for our organizations and project management can be a pathway to doing that, it can be one part of that, but it is a means to an end, not the end itself.*”

**Table 5: Development interventions experienced by respondents and average ratings of usefulness**

<b>Development intervention</b>	<b>Number of respondents (out of 23) reporting experience with the intervention</b>
Formal project management training	21
Other management training	22
Performance appraisals	22
Participating in communities of practice	22
Coaching or mentoring	22
360-degree feedback	18

It is also interesting to note that even though 16 of the 17 respondents who identified skills related to the concern for order competency had received formal project management training, only seven of these 16 attributed learning their skill to their formal training, even though they may have found the formal training useful. For example, H1 commented about the project management training she received early in her career: *“Having the foundation of the training just gives you tools, it gives you processes, it gives you fundamentals to work with so that you aren’t floundering in the dark so much.”* Yet, when describing how she learned her skills related to the concern for order, quality and accuracy competency, she referred only to learning by reflecting on her experiences on the job. Notably, she added, when commenting about the project management training: *“But don’t think that training necessarily makes you a good project manager. I think that you need to get out and get the experience.”*

Twenty-two of the 23 respondents had also received a variety of other management trainings, including general management, leadership, team building, conflict and negotiation, interpersonal, intercultural and presentation skills, and these trainings were generally described as very helpful. Looking at the 19 project managers who identified team leadership as a critical skill, all except one had experienced formal management training related to leadership, team building, conflict and negotiation, or intercultural skills – all types of training which might be expected to contribute to a manager’s overall team leadership skill development. However, even though these managers generally commented that their various management trainings had been useful – for example J1 commented: *“those are the kind of the building blocks that you need to be a good project manager”* - only one cited formal training as a major learning method for her team leadership skills. Other than reflection on experience, having a coach or mentor was highly valued by those who had the opportunity to work with someone in this role, as was the opportunity to observe other project managers in action, although in four cases, such observation led to a learning about what *not* to do.

## DISCUSSION

It is interesting to compare the top five competencies identified in this study of IT project managers (in Table 3) with the top five competencies identified by Dainty et al. (2004; 2005) for construction project managers (in Table 1). While team leadership features highly in both studies, the remaining four competencies in each study are quite different. Dainty et al. found self control and composure was the highest rated competency for construction managers, with directiveness/assertiveness, achievement orientation and analytical thinking also appearing in the top five. In the present study, concern for order, quality and accuracy, relationship building, impact and influence, and organizational awareness round out the top five competencies, suggesting that IT project managers are drawing on quite a different skill-set from construction managers. The current study is exploratory and further work is required to substantiate these findings, but organizations would be wise to proceed cautiously before assuming that project management skills in one practice arena can be automatically translated into relevant skills in another area.

The two most highly mentioned competencies found in the present study – team leadership and concern for order, accuracy and quality - correspond to two types of training - management and project management - that were experienced by almost all of our respondents. Yet the formal trainings the project managers received did not feature prominently in their descriptions of learning methods for these competencies. Those managers who did mention formal project management training as a learning method for the concern for order competency, typically described two or three additional experiential methods for their development in this skill, while reflection on experience was the primary learning method for team leadership skills.

We were surprised at the disconnect between the positive evaluations of organization-initiated training experiences and the lack of mention of these training experiences in the methods of learning identified by respondents for their critical skills. As noted in the Method section, we thought initially that our interview protocol may have contributed to this disconnect, so for the final ten respondents, we anchored the learnings described during the interview against the career timeline, thus providing an opportunity for the respondents to recall events such as training that occurred at the same time as the learning incident. The timelines revealed that the provision of specific project management training sometimes did not occur until later in the respondent’s career, most likely after the manager had already acquired the skills experientially, thus providing a possible explanation for the disconnect related to project management training. General management training was usually provided in a timely fashion early in the managers’ careers and thus might have been expected to feature more highly in the methods of learning. However, the critical learnings described by the respondents typically came from quite recent projects, even though their project management careers spanned decades, suggesting that a key underlying competence of these project managers may be related to the ability to build on early formal training and engage in on-going learning throughout their careers. Clearly, the inter-relationship between training events and subsequent learning is a complex one requiring further in-depth research.

We were also struck by the descriptions from some respondents of the extent of their self motivation for learning and their active reflection on their experiences. Two managers described their practice of maintaining a journal, while a third described his own reflective practices: “I make a mindmap and notes for myself.” Respondent B6 commented that he actively sought out developmental assignments in a spirit of continuous learning: “Even if you crash and burn, which I have as well, you learn why.” And B5 commented: “I believe I’m still learning, and probably always will be. If I ever think I’ve learned it all I think I’ll be in trouble.” Thus encouraging self reflective practices such as journaling and life-long learning could be a productive development route for junior project managers.

Finally, we speculate that while formal training alone is not enough to foster the development of a particular skill, it may provide the necessary foundation for subsequent experiential learning to occur. As noted earlier, procedural knowledge and behavioral competence are more likely to develop in a situated learning environment, where trainees have the opportunity to practice the skills that have been addressed in the formal situation and to get feedback and reflect on their practice (Eraut, 2000). Thus, organizations wishing to foster the development of project management skills in their personnel may be well advised to plan trainings that are supported with mentoring relationships between senior and junior project managers and follow-up practice opportunities and constructive feedback on performance.

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