KEY COMPETENCIES FOR SUCCESS IN NAVIGATING COMPLEXITY

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Abstract

Any project can be complex, regardless of its size, and elements of complexity have been present in projects since ancient times. The difference today is that complexity is a much more common occurrence and has become a key area to navigate in order to ensure projects add business value. More stakeholders, greater diversity, distributed teams, social media, new technology, and the need to do more with less, are some of the reasons why complexity has greater importance than ever before. Some project professionals are more adept at dealing with it than others—but most realize that complexity will only continue to increase in project work.

One can use professional and personal competencies to leverage complexity, whether as a team member, project manager, program manager, or portfolio manager. Establishing, maintaining, and using competency profiles—especially at the portfolio level—enable executives to better match competencies to program and project needs or demands. Once a new program or project is approved, the portfolio manager—in conjunction with the sponsor—assesses its characteristics and uses the competency profiles to assign resources that are best suited to manage the work. It is important to review existing initiatives that may be struggling in an effort to determine if complexity is the key issue and, if so, to see whether the resources involved possess the competencies to best manage the program or project; or, if not, to determine the appropriate actions to take.

An Economist Intelligence Unit [EIU] (2013) study noted that 49% of respondents indicated that ineffective resource allocation was an issue in managing their portfolio of strategic initiatives. The study also noted “nearly twice as many respondents from best-executing companies report that sufficiently skilled personnel are provided for strategic initiatives than do from all other companies” (p. 14). Building a database of competencies, therefore, becomes an enabling tool for organization leadership to ensure the right resources are assigned to specific projects and programs, especially those with elements of complexity that inherently contain higher risk. But the database of competencies is also useful for ongoing talent development as gaps are identified between the competencies needed in the future and existing competencies.

For best results, the competency profiles should be in an up-to-date, easily accessible database of a knowledge transfer system to best locate the talent appropriate for the initiative. The objective is to develop and leverage talent so that the organization is able to embrace and exploit complexity, because it will only continue to proliferate. Complexity then becomes an opportunity to increase business value through increasing talent competencies to handle it effectively.
Complexity Concepts

Success in today’s business environment is contingent on making predictions and meeting commitments relative to products, services or results and providing sustainable benefits for customers in the process. Complexity challenges one’s ability to manage time, cost, scope, and quality and makes it harder to deliver exemplary work.

The data collected in PMI’s (2014a) Pulse of the Profession® report emphasize the need for organizational leaders to take action to become high performers. The report points out that only 9% of organizations are considered as ones that successfully execute projects, and that the poor performance of others results in a loss of “US$109 million for every US$1 billion invested in projects and programs” (p. 2).

However, success is difficult to achieve, and one of the major reasons is increased complexity. Complexity, as defined in Navigating Complexity: A Practice Guide (PMI, 2014b) is “a characteristic of a program or project or its environment, which is difficult to manage due to human behavior, system behavior, and ambiguity” (p. 93). Complexity has numerous directions at different levels, but the ability to navigate it effectively can lead to successful programs and projects aligned with organizational strategic goals and objectives.

The Pulse of the Profession® (PMI, 2014a) report found that the lack of focus on talent development also contributes to the poor performance of programs and projects. Competencies that were previously successful may not be the right ones today because of increasing complexity; project professionals at all levels need to ensure their work is aligned with organizational strategies and goals. As the report states, “high-performing organizations are more than twice as likely as their low-performing counterparts to align talent management to organization strategy—a significant competitive advantage” (p. 10).

It is easy to blame the poor economy and its lack of growth, downsizings, lack of customer collaboration, numerous stakeholders, cultural diversity, poor or non-existent processes and procedures, mergers and acquisitions, or the excessive turnover among C-suite executives for the complexity project professionals face in daily work. However, it is incumbent on professionals at all levels to be the catalysts to navigating complexity, recognizing it is unavoidable, and realizing that “business as usual” is no longer acceptable.
Complexity Competencies

The *Project Manager Competency Development Framework* (PMI, 2007) defines competency as "a cluster of related knowledge, attitudes, skills, and other personal characteristics that affects a major part of one’s job... correlates with performance on the job, can be measured against well-accepted standards, and can be improved by means of training and development" (p. 73). By extension, a competent portfolio, program, or project manager is qualified with high standards of professional responsibility and integrity. A competent person is considered a capable person.

Competencies have different dimensions; and, competencies that may assist one in becoming more adept at managing time or change, for example, may not be the same as those that apply to leveraging complexity. Competencies at any level can be divided into ones that involve performance—or work on the job—and others that are personal, or how one interacts most effectively with others.

Competencies apply regardless of whether the individual is a portfolio manager, program manager, project manager, or team member. However, it should be noted that each environment, as well as each initiative to be pursued, is unique. Therefore, as *Navigating Complexity* (PMI, 2014b) points out, "The right combination of abilities and competencies for program and project success needs to be determined for each environment and each initiative" (p. 9). There is no one-size-fits-all approach.

*Navigating Complexity* (PMI, 2014b, p. 9) describes three key elements to consider (as shown in Figure 1). A combination of technical project management, leadership, and strategic and business management are capability groupings for any project management practitioners dealing with programs and projects that contain elements of complexity.

**Strategic and business management**

*Navigating Complexity* (PMI, 2014b) defines strategic and business management as “the ability to see the high-level overview of the organization and effectively negotiate and implement decisions and/or actions that support strategy, alignment, and innovation. This ability may include working knowledge of other functions such as finance, marketing, and operations” (p. 9). Strategic and business management capabilities are essential competencies for success in a complex situation as they require taking a broader view than just that associated with one’s own responsibilities.

Strategic and business management capabilities therefore help in changing an organization, for example, from one that works in silos or is considered as a “tribal culture” to a matrixed unit focused on overall strategic objectives and the defined vision—or end state—and mission, or what is significantly important to organizational leaders. One is able to assess overall business strategies and practices to see if they are contributing to the complexity of the work that is pursued.
The Guide to Lean Enablers for Managing Engineering Programs (Oehmen, 2012) provides this example:

A project in a large semiconductor device manufacturer in the communications sector was continuously stressed regarding resources and, as a result, was one of the lower-performing projects in a wireless network processor development program. To define the project’s role in obtaining the program benefit targets, the program manager clearly communicated the linkage between the project’s schedule performance with its effect on program performance. The behavior of the project team towards innovative recovery of the project was renewed. The result was a significant improvement in schedule, reduction of risk, and a doubling of program revenue contribution related to that project (p. 45).

The program manager helped the team connect its work back to the organization’s overall strategic objective.

**Opportunity management**

Another aspect of strategic and business management is opportunity management. It is easy to focus on risk management and consider risks as negative events, which may, at some point, adversely affect a program or project. Sophisticated tools and techniques can identify, analyze, determine possible responses, and monitor and control them. However, in a complex environment, it is impossible to spend extensive time and resources to identify every possible risk, because one can never foresee all the possible risks that can potentially occur. Something unexpected will happen, which is why an important competency for navigating complexity is opportunity management.

Opportunity management focuses on removing barriers, which complexity often causes. It emphasizes capturing opportunities to maximize business benefits and focuses on uncertain events in a positive manner. This approach frees the team to think more systemically to identify potential solutions. Once the applied approach is successful, that approach then can be replicated within other programs and projects the organization pursues.

For example, as The Guide to Lean Enablers for Managing Engineering Programs (Oehmen, 2012) relates:

The Coast Guard in the Deepwater program chose a system-of-systems acquisition strategy. Instead of replacing older equipment with new in a series of individual acquisitions, the older assets were replaced in a single program by an integrated set of modern equipment. For that purpose, the Coast Guard awarded a contract for providing capabilities—not concrete assets—to a systems integrator. The systems integrator had the freedom to translate the required capabilities to the asset level while striving for three overarching goals: (1) maximize operational effectiveness, (2) minimize total cost of ownership, and (3) ensure customer satisfaction (p. 54).

The 2005 PMI Project of the Year award recipient (Ellis, 2006) provides another example. The management of the Quartier International de Montreal devised a unique project execution approach. The program manager divided the workload into smaller packages and used some of the smaller projects as pilots for testing management techniques and contract awards. If proven successful, these would be rolled out on a wider scale; if not, management would adjust and test a different technique in the next pilot.
Technical program and project management

It is equally important that the program or project manager be able to apply knowledge, skills, tools, and techniques effectively and use them to reduce complexity. For example, a program was using a large number of contractors to meet resource requirements and fill internal staff gaps. These contractors used subcontractors; therefore, the program manager needed to have experience in large-scale procurement management, intellectual property and legal issues, and have the ability to integrate the work done by both internal and external staff so that the complex program was delivered as expected and also that its benefits were transitioned and sustained. The program manager needed to be able to achieve the program’s goals and optimize the integrated cost, schedule, and effort.

Expertise

Technical project and program management naturally includes expertise in project and program management, but goes further. Navigating Complexity (PMI, 2014b) defines expertise as “the expert skill and knowledge in an application area, subject matter, discipline, industry, etc., as appropriate for the activity being performed” (p. 8).

Throughout their careers, project managers gain expertise by working on projects of increasing complexity; different types of projects; and projects that require them to select from a broad range of practices, tools, and capabilities that will help the project succeed. As Implementing Organizational Project Management: A Practice Guide (PMI, 2014c) and the Organizational Project Management Maturity Model (OPM3®) (PMI, 2013b) note, project and program practices must fit the organization’s business practices and must be adaptable for the unique requirements and conditions of each project. For example, programs with multiple customers who have different expectations of the program may require a stronger focus on stakeholder engagement, change management, and governance than programs with one customer. Public/private partnerships represent a good example of a program with multiple customers, who define scope; who participate in governance; and who often have different expectations. Highly skilled program and project managers can effectively adapt their approaches to the unique circumstances associated with each program or project to which they are assigned.

Such technical expertise is essential on programs and projects with elements of complexity. For example, a project manager is working on development of a new food additive; however, this manager has not worked in the food industry and is not a food scientist. When issues arise and technical aspects of the project are discussed, this project manager cannot contribute and must rely on the technical expertise of his or her team. Such an approach may be acceptable when dealing with internal staff, but is difficult at best if the manager is responding to questions from external stakeholders, such as members of consumer and special interest groups or regulatory officials, when subject matter experts are not available. It is an opportunity for partnering with a project team member with expertise in food science and knowledge of new technologies. The project manager can benefit from mentoring by the team member on technical concerns, giving the project manager broader experience in the unique aspects of leading food science and technology projects.

Procurement management

Another technical competency and source of complexity is the increasing reliance on vendors to perform much of the work under way, regardless of whether it involves a program, a project, or an operational activity. Procurement management is a key technical performance competency in navigating complexity to ensure the vendor selected is one with whom an outstanding working relationship can be established. The type of contract selected also must be one that is mutually beneficial to both parties. Additionally, it is preferable that the organization and the vendor reach agreement on a common vision and ways to easily handle any differences
that may occur without the need for extensive change orders that can lead to late completion and budget overruns.

For example:

For nearly 37 years, the Rocky Flats Plant in Golden, Colorado, USA, served as a top-secret, high-security nuclear weapons facility. In 1989, it abruptly stopped making weapons, leaving behind contaminated facilities, soil, and groundwater. Five years later, the U.S. Department of Energy (DOE) labeled the site one of the country’s most significant nuclear vulnerabilities. That same year, Kaiser-Hill Co. LLC, in Broomfield, Colorado, USA, picked up the contract to begin cleanup and stabilization of the plant. In 2000, the company won a second contract to finish the closure and cleanup of the entire 6,245-acre site, including the 385-acre industrial area. The company was given only six years and a US$3.96 billion budget—a task that most thought impossible. In fact, the DOE estimated that the project would take 70 years and cost US$36 billion... With the help of innovative initiatives such as pay-for-performance incentives, the company closed the plant 14 months ahead of schedule and was more than US$553 million under budget (Hunsberger, 2007, p. 30).

Another approach for mitigating the effects of complexity is to utilize a consortium model. The consortium differs from a partnership in that several firms work together to pool their expertise. However, the client is not aware of which person works for which company. The consortium is able to complete more complex work, because a single firm on its own may lack the needed competencies to successfully complete the program or project. The consortium may add complexity to the program because of the increased number of players and their individual performance; additional risk management issues; and complications regarding ownership of intellectual property. However, its benefits may outweigh the challenges while also adding new value in terms of specialized and available talent.

This performance competency recognizes the need to foster relationships and share a common set of values for which decisions are made. It also emphasizes knowledge sharing among the parties involved to promote and extend the intellectual property each organization member brings, reducing the overall talent gap.

Levin and Ward (2011) provide examples of indications of whether one has demonstrated this procurement management competency, such as:

- Focusing on meeting the contractual objectives;
- Providing information to stakeholders when the contract is closed, and deliverables have been accepted;
- Conducting regular reviews to note strengths and opportunities for improvement, and needed corrective actions looking toward future relationships; and
- Preparing budget reconciliations to compare actual costs with those in the budget and to ensure any remaining budget allocations are returned.
Further, evaluation of results should include analysis to the extent to which each party contributed to the solution; the degree to which integrated project management was demonstrated; and, how well risk, stakeholder engagement, and supplier relationships were managed.

**Leadership**

Leadership is embedded into one’s job at any level of an organization or project team. It is an essential competency, particularly for programs and projects with complex elements associated with human behavior, and covers areas such as negotiating, communicating, problem solving, and critical thinking (PMI, 2014b). Further, portfolio, program, or project managers must motivate and guide teams, and need to adapt their leadership style depending on the circumstances and stakeholders. If one is managing a routine project, one can follow existing guidelines and procedures used in the organization or practices and procedures that have been successful in the past. Alternative approaches may be required for programs and projects with complex elements, including ensuring there is a common understanding of the vision by the internal and external stakeholders from the outset. If there are concerns, the program or project manager as the leader can remind the stakeholders of the desired end state and maintain agreement to support it.

For example:

During the planning for a complex program that would bring together three separately developed components of what would ultimately become an integrated Management Information Systems (MIS) platform for a government agency, the program manager carefully planned stakeholder communications. As part of the stakeholder engagement plan, the program manager established information/action meetings specifically designed to meet the needs of different stakeholder groups. During program planning stages, there were weekly steering committee meetings for the program’s sponsors; for executive management, monthly progress updates and demonstrations; and for executive staff, finance, and operations, bi-weekly governance meetings that ensured proper policies and practice were in place and being followed for the program. While these stakeholders were engaged and actively participating in the work, the program was seen as successful, moving forward, and was hailed as an example of a properly managed program effort…When (some) stakeholders were unable to participate regularly, although the program team’s activity remained constant, program progress slowed and the perception of the quality and completeness of the work was questioned. When the absent stakeholders were re-engaged, the program was again seen in a positive light—proving to the program manager and team the importance and need for active stakeholder engagement for the initiative (Oehmen, 2012, pp. 46–47).

The leader of a program or project with complex elements must find and negotiate for the critical subject matter experts to work on the program and then persuade these key people to be part of the initiative, show why their expertise is critical to its success, and explain its importance to the organization. Additionally, as the leader, one must convince the functional manager that a key person from his or her business unit is needed for program or project success and should be released from current responsibilities to support it. Early involvement by these functional managers is desirable to ensure their support from the beginning, and inviting some representatives to be on a governance board or oversight group shows the leader is interested in their points of view and respects them as contributors to program or project success.
Leadership at any level also involves the willingness to try new ideas or approaches on complex initiatives. If one is a team member, he or she should describe why an alternative approach is beneficial and can reduce the complexity. As the program or project manager, he or she moves forward even despite the intransigence of others, but works with people who are not supportive to assist in its implementation and success (Levin & Ward, 2011).

The leader, therefore, owns the program or project and thus must have a strong sense of accountability for the work of his or her team. The leader quickly responds to any issues raised by stakeholders and takes corrective or preventive action, as required. Often there is insufficient time to gather the information needed to make challenging decisions, but the leader recognizes the key information required that may be obtained rapidly to resolve a complex situation.

**Adaptability**

Adaptability, as a leadership competency, is the ability to recognize change and complexity and adjust to it, even if on the surface it appears to lack benefits. *Navigating Complexity* (2014b) defines it as “the ability to adjust to a changing environment or situation and to adopt a flexible approach that shifts according to the situation” (p. 8). It is a competency that can enable a person to be flexible when a complex situation arises that was not planned or expected.

A good example of the need for adaptability can be found with mergers and acquisitions. Each organization has competencies and capabilities entering into the relationship. Many mergers and acquisitions fail because of deep cultural divides; misunderstanding of key customer or stakeholder segments; and business practices that do not effectively align. So for a program team, adaptation may begin with evaluating each organization’s business practices to determine which practices may yield the most value for the integrated organization. The program team can then use an integrated team to support change management activities to incorporate those practices into the new organization.

**Creativity**

Complexity dictates creativity as a leadership competency. Consider, for example, an organization that is pursuing a high-risk/high-reward project in its portfolio. It is entering into a new market, and it does so to diversify its product line and to show it can adjust to new ways of working. The high-risk/high-reward project has been endorsed by the portfolio oversight group, resources are allocated to it, and it is ranked in the top five of the most important undertakings in the portfolio. The people assigned to work on it are pleased to be selected; however, it seems that the project is so different from previous strategic initiatives that it is difficult to obtain agreement to proceed at gate reviews. Ambiguity and emergent issues dominate increasingly over what was complex from the start. Creativity, as a complexity competency, is required to handle such a complex situation.

In this situation, the company recognized that to succeed, it needed to add staff members with expertise in the new software that was part of its solution. It relied on use of an outside consultant to evaluate the situation and determine how the company might proceed to meet contractual deliverables. The consultant found that internal staff lacked the necessary talent to complete the project successfully and evaluated a number of alternatives before recommending the hiring of new people, since expertise in this software was also needed for one of the company’s other clients.
Collaboration

Navigating Complexity (PMI, 2014b) points out different causes of complexity, one of which is human behavior (see Figure 2), which requires a leadership competency in collaboration. Program and project managers motivate teams of people to collaborate on achieving organizational strategies and goals. However, complexity is enhanced by the large number of interested stakeholders, many of whom may influence elements of the program or project, such as which resources are dedicated to it or they may be interested in ensuring the program or project does not cross into “their turf.” Unless a cohesive, collaborative approach can be fostered, the result and the high cost of failed programs and projects will continue to be the norm. After all, “human beings are neither always rational nor deliberate” (PMI, 2014b, p. 13). The objective is to see whether solutions are available for winning relationships with people who are involved, recognizing that even if a consensus cannot be obtained, a decision will need to be made.

One tool that can be useful in managing collaboration is a well-defined stakeholder register that leads to a stakeholder map. Managing Change in Organizations: A Practice Guide (PMI, 2013c) describes a mapping process where one axis indicates the level of interest and the other axis is power (i.e., influence). A number of other stakeholder aspects should also be included in the stakeholder register. Additional attributes are suggested in The Standard for Program Management (PMI, 2013a). However, the important point here is that the stakeholder register should include stakeholder attributes that may be relevant to issues anticipated within the program or project. There is no universally correct set of attributes and other related information. The list of attributes may be developed based on a list of typical attributes, but should be evaluated against the anticipated needs of the particular program or project being undertaken.

![Diagram of causes of complexity pertaining to human behavior.](image)

Cultural diversity is another aspect of human behavior that can lead to complexity in projects and programs. Competence in collaboration is also demonstrated by recognizing the benefits of diversity of opinion, especially in terms of encouraging team members and other stakeholders to offer ideas even if they seem different than those usually practiced on programs or projects. A competency in collaboration leads to an open atmosphere in which people are not afraid to speak out on various issues, and then their ideas may help to leverage a complex situation into one that is beneficial to other programs and projects.
Bringing the Competencies Together:  
The Prairie Waters Project

A massive drought from 2002 to 2003 depleted the water supply in the city of Aurora, Colorado, USA to an all-time low, falling to just 26 percent of its total capacity. The city was left with a nine-month supply of water for its citizens—far less than the three-to-five year supply it prefers to keep. Officials decided to implement a project that would prevent future drought-related shortages…In August 2005, the Aurora City Council launched the Prairie Waters project, which called for the construction of nearly 34 miles (55 kilometers) of 60-inch (1.5-meter) pipeline, four pump stations, a natural purification area and one of the world’s most technically advanced water-treatment facilities, handling 50 million gallons (189 million liters) per day (Allen, 2011, p. 28).

The program won the 2011 PMI Project of the Year award. It demonstrates many of the competencies highlighted in this paper and their impact on effective delivery of a project with multiple sources of complexity.

Adaptability Competency: The program had multiple stakeholders involved in making key decisions related to the program, and there were various regulatory requirements with which the program had to comply. Combined, those two factors represented significant risks to the program schedule. On the other hand, failure to obtain the required approvals and comply with legal requirements could have resulted in fines and legal action. So the two complex elements forced the team to explore alternative approaches.

The program team took a number of actions to ensure efficient decision making:

- In a series of chartering workshops at the beginning of the program, the team set the foundation for efficient decision making throughout the program.
- The team adapted the organizational structure not only to foster collaboration, but also to speed up decision making.
- The team ensured that the right information required to make decisions was available and up to date.

Leadership Competency: Despite the fact that the program had contractors from multiple companies, as well as government and community stakeholders, the program leadership established a culture of “what’s right” and not “who’s right,” emphasizing the fact that everyone’s ideas were heard and treated equally, regardless of his or her position in the organization. This approach fostered professional excellence regarding behavior. Not only did the leadership clearly communicate what behavior was expected, but managers served as role models for these behavioral characteristics.

Technical Competencies: The program had a master schedule early in the program. The master schedule contained start and completion dates for the ten major construction contracts. As the program evolved, the master schedule was completed using more detailed schedules of the milestones within the contracts. A program manual served as a guidebook for individuals to outline standard procedures as well as roles and responsibilities for key tasks. The program also established program oversight committees. It fell within the committee’s responsibility to oversee the program planning and management as well as the systems integration process.

Strategic Management and Procurement Competencies: The program stakeholders agreed on a set of critical success factors, such as budget, schedule, environmental protection, and proactive communication, all of which were continuously tracked and displayed in a dashboard, making the current status highly visible. These top-level metrics were broken down for every bidding package to track contractors’ performance. In addition, every contractor was incentivized to propose ideas to reduce costs. In cases in which the ideas proved valid and were selected for realization, the savings were split evenly.

Collaboration Competency: The program team implemented an effective communication strategy across multiple organizations in the enterprise. It designated individuals as direct points of contact between organizational and functional counterparts, which proved to be a major facilitator of direct and efficient communication and decision making.
Using Complexity Competencies for OPM Talent Management

Complexity competencies can help those responsible for strategic initiative management identify team members who may be best suited for each type of program or project. To be effective, ongoing assessment and documentation of individual capabilities need to be built into the organization’s talent management program.

**An inventory of existing work**

Ideally, a list of the work underway is available in a central repository (i.e., the portfolio of programs and projects under the purview of a portfolio manager). Since, in many organizations, resources are constrained, this inventory is useful to see if the resources with the needed competencies are assigned to those programs and projects for which they are best suited to contribute. Often, the people who excel on more challenging projects and programs are in short supply and are considered “bottleneck” resources. Others may have the potential, but require additional development or experience in some areas.

Developing this inventory is a difficult undertaking, especially if the organization lacks a time reporting system or is not using earned value calculations. Many people may not wish to openly share what they are doing because they feel they are working on breakthrough projects or one of special interest to organizational executives. Others may feel that if they disclose their existing work, they may be reassigned to some other project or have additional assignments added to their present workload.

As the inventory is developed, it is an ideal time to ask people to assess their competencies in recognizing and dealing with sources of complexity. Each person can rate his or her competencies using a format such as that shown in Table 1, which then supplements other documentation, including credentials earned in project, program, and portfolio management. The inventory answers are not yes or no questions. Rather, each area requires that they rate the level of competency achieved on a multipoint scale along with a description of the learning event. For example, in the area of project management, a project manager may detail how he or she refined the standard project management methodology for the unique circumstances of the project. For example, if the project required high levels of technical interfaces, the project manager might have:

1. Added more engineering elements to the project documentation to ensure all details were properly captured;
2. Added more rigorous testing; and
3. Enhanced the risk register with business and technical risks.

Taking this approach to the assessment grounds the competency rating in tangible experience and provides context for use by others at a later date.

For success, organizational leaders must communicate why the inventory is being set up and why competency information is being collected to obtain buy-in and reassure people that their positions are not in jeopardy. The communication message should be sincere, and people should be thanked for their assistance. It also should note that the inventory will be maintained as part of the ongoing talent management and development plan and encourage people to contribute to it. A good practice is to conduct surveys on a quarterly basis until the process is considered routine.
### STRATEGIC AND BUSINESS MANAGEMENT

- **Strategic Management** – Ensuring work supports the organization’s strategic goals and examples
  
  Describe and document

- **Business Management** – Ensuring work provides business value
  
  Describe and document

- **Opportunity Management** – Removing barriers to avoid increased complexity
  
  Describe and document

### TECHNICAL PROJECT MANAGEMENT

- **Project Management** – Applying knowledge, skills, tools, and techniques to project activities to meet project requirements
  
  Describe and document

- **Program Management** – Providing more benefits than if the projects and other work within the program were managed as standalone activities
  
  Describe and document

- **Expertise** – Applying expert skill and knowledge in an application area, subject matter, discipline, or industry, depending on the activity being performed
  
  Describe and document

- **Procurement Management** – Purchasing or acquiring products, services, or results from outside the team
  
  Describe and document

### LEADERSHIP

- **General Leadership** – Communicating the vision and inspiring the team to achieve it to get work accomplished through others
  
  Describe and document

- **Adaptability** – Recognizing change and complexity and adjusting to it
  
  Describe and document

- **Creativity** – Seeking a more effective way to generate ideas, alternatives, and possibilities
  
  Describe and document

- **Collaboration** – Fostering solutions to build winning relationships and working toward a common goal
  
  Describe and document

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**Table 1**: Competencies self-assessment.
Using the inventory and the competency profiles

Once the inventory is set up and the competency profile information is available, these data require analysis to best manage supply and demand. If a person is the project manager for a project that is comparable with others done regularly in the past, such as updating the packaging for a product or revising a course, but the individual shows he or she has the potential to manage or be on a team for a project with greater elements of complexity, it is ideal to then consider reassignment. The individuals’ competencies can be analyzed to determine if they demonstrate the competencies to effectively navigate the unique elements of complexity in the identified project, require training in some areas, or should be reassigned. The profile may also identify developmental opportunities for individual program or project managers by ensuring their program or project assignments help to build new experiences to expand their skills and capabilities. The competency profiles can be analyzed in order that the portfolio manager, or someone in the project management office (PMO),¹ can then use those profiles when a new program or project is considered to determine if current staff can capably manage the complex elements or whether external resources need to be acquired to supplement internal staff members.

For example, during an OPM3 assessment, the assessor conducted 168 interviews across a number of business units in a global healthcare company. The assessor reported that many people were working on programs or projects that had been under way for years, but lacked the opportunity to advance to work in new areas. Some of the interviewees in this assessment had their Project Management Professional (PMP)®, Program Management Professional (PgMP)® credential or had obtained a master’s degree in project management. Fortunately, this organization had a competency profile in place and it was up to date; however, in making assignments, the portfolio manager or sponsor rarely consulted it. When the consultant noted this competency profile in the improvement report, the company decided to make changes. These involved first reviewing the inventory before making assignments to see if talent was available within the company to support the new initiative. When the consultant returned for a follow up assessment the following year, many people were in new roles and overall employee productivity and satisfaction had increased.

Updating the competency profiles

Each time a person develops or advances in one of the competency areas, he or she should be encouraged to update his or her competency profile. For example, the person may have made a significant contribution as a team member on a project or as the manager of a program or project. While attending a training class does not per se indicate an acquired competency, the team member should note its successful completion in the profile. In addition to the individual self-assessment, the competency database should provide for input from a 360-degree perspective. Whether the assessment data are collected and input after the close of a project or program, or are updated as part of a periodic review process, such as a quarterly performance review, the composite assessment should include responses from sponsors, supervisors, other team members, and potentially outside vendors and suppliers. This approach ensures a balanced view that most accurately reflects the competencies developed over time.

For best results, the competency profile data should be maintained in partnership with the human resources (HR) department. People in the HR group also can review the competencies to determine whether, for example, taking a class in strategic and business management or leading a project with elements of complexity would be beneficial for individuals in the organization. Given that complexity is the norm and not the exception, this group

¹ The PMO may be a project management office, a program management office, or a portfolio management office. It could be at the enterprise level and/or at a business unit or department level.
may elect to develop curricula around navigating complexity to better equip people at a variety of levels with the knowledge, skills, and competencies needed for success. Individuals desiring to move into work with more complex elements can contact HR to determine a possible development path to follow to increase their abilities.

The PMO can access the competency profiles when new work is anticipated to determine if existing staff members possess the competencies required before the new work is submitted in a business case for approval. If staff members are not available internally, then the PMO can note in the business case that external resources will be required before a decision is made to fund the program or project.

**Using mentors**

The PMO and HR groups also can set up a mentoring program. Mentoring is the process by which one person (the mentor) assists another person (the mentee) either formally or informally in various tasks related to professional development and growth. *The Project Manager Competency Development Framework* (PMI, 2007) notes that establishing mentoring relationships is a leadership performance criterion and describes it as providing a valuable contribution to team member performance and development. It further explains it as one of the five elements under leadership, with the performance criteria focused on establishing these mentoring relationships to support team member development.

Using a mentor, or serving as a mentor to others, can assist in the quest for success. Further, it is important to do things right—this does not mean only following a process, but it means using those processes and procedures to help succeed and improving them as best as possible. The mentor can work with interested people to demonstrate best practices to follow in navigating complexity and, over time, transition into a consulting role if the mentee has specific questions concerning how to handle a complexity issue involving people, systems, or ambiguity.

Once the mentoring program is established for programs and projects, its existence needs to be communicated throughout the organization. An orientation session should be held to show why the organization has developed the program and to explain how people can participate in it—either as mentors or mentees. The person who is responsible for coordinating the program then needs to be identified so he or she can answer questions.

However, it is also necessary to recognize that some people may not wish to be in a mentoring relationship. For mentoring to be successful, it should not be imposed on others, but instead be requested by the mentee. Mentoring can be done in a formal or an informal way. Both approaches require mutual respect and trust between the people involved and, initially, the beginning of the process is the mentee’s responsibility. If a formal relationship is to be used, time for the mentor and the mentee to work together is required. Setting aside times for the mentoring relationship by the organization’s executives shows their commitment to the program. It is not something the mentor and mentee should do in their spare time on nights and weekends, and mentoring should be built into each person’s schedule on the job (Levin, 2011).

**Knowledge transfer**

Working in virtual teams on complex programs and projects means a knowledge transfer process is essential, which among other items includes the competency profiles, along with artifacts and other knowledge assets as described below. Someone on the team may encounter a complex issue, for example, in dealing with an influential stakeholder, and as *Navigating Complexity* (2014b) explains, “It is rare that one person’s efforts are
isolated from those of team members and other stakeholders” (p. 11). It further notes that individual behavior may add to the overall complexity involved by inadvertently introducing elements of irrationality. For example, people may be overly optimistic and underestimate the costs associated with use of new and unproven technology; initial assumptions may not be correct, leading to later misunderstandings; constraints may be added that were not known when the project began; stakeholders change; or the corporate culture changes, just to name a few.

A knowledge transfer system can alleviate some of these concerns. Unlike portfolio, program, or project management, there is not a universally accepted definition of knowledge management, although many exist in the literature. Quintas, Lefrere, and Jones (1997) define knowledge management as managing the processes to create and apply knowledge. They also note knowledge management must consider organization, human, and technological aspects to ensure there is successful enterprise support. Maier and Lehner (2000) describe it as the creation and maintenance of a knowledge base for the organization. Paulzen and Perc (2002) state that knowledge management is the management of knowledge processes to support business processes and involves mapping knowledge processes to support the organization’s knowledge base. The Dictionary of Accounting Terms (2005) describes knowledge management as “The process of connecting people to people and people to information to create a competitive advantage.” This definition, because of its emphasis on people, will be used in this paper.

There also is no universal definition in place for knowledge assets, but they are considered to be codified human expertise, stored in a digital format, and used to create organizational value. The emphasis is on using knowledge assets to promote understanding, provide guidance for decision making, and record facts about critical decisions. The Baldridge Excellence Glossary states the term “knowledge assets” refers to the accumulated intellectual resources of the organization. It is the knowledge possessed by the organization and its workforce in the forms of information, ideas, learning, understanding, memory, insight, cognitive and technical skills, and capabilities. This means that the organization’s workforce, databases, documents, guides, policies and procedures, software, and patents are repositories for the organization’s knowledge assets. They are held not only by an organization, but reside with customers, suppliers, and partners as well; therefore, knowledge assets are the know-how that each organization has available to use, invest, and grow (Levin, 2010).

In terms of complexity, knowledge management and an atmosphere of “knowledge sharing is power” must exist to leverage the expertise among team members, recognizing no one person has all the needed competencies and answers. If the knowledge repository is set up correctly and maintained, it then leads to the opportunity for those working on programs and projects to reach out to others for advice and assistance; as people do so, they then add information to the knowledge repository with respect to how they handled complexity in their programs and projects. The objective also is to have the knowledge repository or knowledge transfer system set up so people can contact others with requisite expertise and also can locate information quickly, which may help solve complex issues or provide alternatives for consideration.

**Establishing and setting up a knowledge transfer system**

Determining metadata—or data about data—is a first step in establishing a knowledge transfer system. It describes the contents of the knowledge assets for ease of use in retrieving them by project professionals. However, its creation takes time to ensure everyone has a common understanding of the meaning of the various metadata to be used so it is informative on the program or project (Levin, 2010). One recommendation is to use the three categories of complexity and their associated causes described in Navigating Complexity (PMI, 2014b) and shown in Figure 3.
Knowledge transfer also must be built into the program and project management lifecycles. For example, each time the governance board or other oversight group meets to review a program or project, knowledge transfer—such as lessons learned to date—can be on the agenda (PMI, 2013a). Since programs and projects with high levels of complexity tend to last longer than routine ones, each time a team member leaves the program or project, the program or project manager or a member of the PMO can conduct a structured debriefing. He or she can use it to capture intellectual property from this team member and also to see whether he or she has suggestions as to how to approach similar work in the future, such as specific processes that were effective, ones that could be approved, and others that were not useful. The objective is to proactively promote knowledge transfer. Another approach is to have a staff member from the PMO facilitate post-project or program reviews with the team and other key internal stakeholders to obtain their views as to desired improvements. As well, this staff member—since he or she was not on the program or project team—can survey customers in an objective way to obtain insight to desired improvements. Knowledge transfer needs to be part of one’s daily work and not limited to collecting lessons learned at the end of a program or project (Levin, 2010).

For example, assume the number of connections increases, which is due to an increase in the number of affected stakeholders, and unrelated stakeholders somehow become related. Now, the number of stakeholders has increased, and those managing a program or project, or working as a team member, may lack past experience in working with some of them, including regulatory authorities, quality control consultants, investors, or specialty subcontractors. People may lack the needed technical expertise to work with these components. Through an easily accessible knowledge transfer system that includes competency profiles, one may be able to locate others in the organization with experience working with these stakeholder groups to obtain insight into how best to meet their expectations. They may find people or information to help better understand the technical issues involved. This approach can assist with simplifying and aligning these new connections, planning how best to do so, and communicating the approaches to use (PMI, 2014b).
Knowledge transfer is not a one-time endeavor. There are costs involved in setting up a reliable process and system and, more importantly, obtaining buy-in to it from the people working on programs and projects. Extensive communications, although a characteristic of all programs and projects, takes on even greater importance in implementing knowledge transfer in an environment in which knowledge hoarding is the norm; or, as Navigating Complexity (PMI, 2014b) notes in its definition of misrepresentation, “knowingly conveying false information to achieve desired ends. This typically occurs in circumstances with significant political pressures and/or economic incentives.” (p. 14).

The key issues and concerns of executives; portfolio, program and project managers; operations managers; and team members must be part of the system so that the focus is not solely on being able to locate an artifact, but also on understanding the underlying reason why it was included in the first place. It also is desirable to talk about it with others through discussion forums and other media. The emphasis is to ensure knowledge transfer is not a “passing fad” and is taken seriously at all levels. As Weick (1995) states: “the same event means different things to different people, and more information will not help them. What will help them is a setting in which they can argue, using rich data pulled from a variety of media, to construct fresh frameworks of action-outcome linkages that include their multiple interpretations” (p. 186).

This commitment to knowledge transfer takes time to develop. It is a project and should be managed accordingly with a charter, scope statement, work breakdown structure, schedule, project plan, communications management plan, risk management plan, and stakeholder engagement plan. It is not something that can be done in one’s spare time, and a dedicated team with a project manager is required. For example, the communications management plan describes the strategy to be used to communicate with stakeholders at all levels about knowledge transfer, and the information they will receive about the process and progress in establishing the system for programs and projects. The stakeholder engagement plan is used to gain acceptance by people in the organization to the concept of sharing—not hoarding—and to the belief that by sharing they will not be replaced in the organization, but instead will have new opportunities to pursue. It also discusses how knowledge sharing and the inclusion of new knowledge assets in the repository will be parts of each employee’s performance plan, along with the metrics used to measure success in achieving knowledge transfer objectives.

As part of the stakeholder engagement plan, an orientation session as to why the organization has set up this process should be included to explain why the organization considers knowledge transfer to be important. People at all levels need to know their own roles and responsibilities in the process. When the repository is set up, it is important to ensure that people understand why a single repository for the organization is being used, even if they already have something in place for use on their own specific program or project. A best practice is to incorporate use of a single repository as part of the orientation and training sessions that are held so people realize the benefits of a single format.

Further, it is useful to periodically review the knowledge assets in the repository. If the knowledge assets are not current, are ambiguous, or are incorrect, they then affect the ability to make useful and valuable decisions. Of course, perfect quality is never attainable; however, a focus on integrity and the usefulness of the knowledge assets can be determined. Additionally, metrics can be developed to determine the extent of quality issues. One approach is to show the consequences of not implementing a robust knowledge transfer system, such as inconsistent processes, duplication of effort, or views that only represent one part of the organization. Therefore, it is useful to quantify the effect of a poor decision made from incomplete or unreliable information in the knowledge repository on a program or project. The emphasis also is not one of just submitting knowledge assets to a repository and using them from time to time, but rather it is to use them and expand upon what exists to create new knowledge assets to navigate complexity and contribute to the organization’s strategic goals and objectives (Levin, 2010).
Summary

Increasingly, organizations are managing by programs and projects and using portfolio management in a structured manner to ensure the work that is pursued is consistent with organizational strategy and can be undertaken given the required level of investment and the competencies possessed by the workforce. However, work is even more complex in different ways and dimensions, and many individuals assigned to these programs and projects lack the needed complexity competencies to successfully complete them. Focusing on the competencies discussed in this paper is beneficial in navigating complex work. The competencies for every team member should be incorporated into a competency profile database and frequently updated and reviewed. The competency profile database then becomes a strategic resource for matching team members to the profiled characteristics of the project or program under consideration. The competency profile database also becomes a forward-looking tool for proactively developing competencies before they are needed. Furthermore, it is part of a knowledge transfer system that, with various knowledge assets, contributes as well to the organization's successful results as it undertakes more and more complex strategic initiatives.
References


