DEMONSTRATING AND EVALUATING AN ACTION LEARNING APPROACH TO BUILDING PROJECT MANAGEMENT COMPETENCE

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Abstract

This paper contributes a description of an action-learning approach to building project management competence. This approach was designed, implemented, and evaluated for use with the Dynacs Engineering Development Contract at the Kennedy Space Center. The aim of the approach was to improve three levels of competence within the organization: individual project management skills, project team performance, and organizational capabilities such as the project management process and tools. The overall steps to the approach, evaluation results, and lessons learned are presented. Managers can use this paper to design a specific action-learning approach for their organization.

Introduction

Given the competitive environment, the need for project management competence is increasing. In executing projects, the organization follows a systematic marketing to contracting to execution process because it generates business on a project-by-project basis. Customers require the organization to provide custom design solutions which leads to the organization having to deal with risk in executing the plan. The organization may also experience gaps in projects due to marketing and securing projects (Kerzner, 1998). The project-based organization relies on its knowledge and processes to be successful. Project organizations are faced with two important competitive forces: the shift to a knowledge based society (Toffler, 1990) and the need to improve their knowledge faster than the competition (Stata, 1989). Within this environment, improving the work systems of the knowledge worker is crucial (Drucker, 1999; Davenport, Jarvenpaa, & Beers, 1996). This paper answers the question: How can an organization implement a performance improvement program to enhance performance at the individual, team, and organizational levels?

## Improving Competence in a Project-Based Organization

To develop a performance improvement approach, we need to define a set of requirements. Three concepts provide the foundation to define five requirements.

Core competencies of a project organization. As shown in Exhibit 1, a knowledge, technical, project-based organization's core competencies include:

- **Systems engineering:** the process by which customer needs are converted into detailed requirements and specifications.
- **Project management:** the process by which projects are planned, organized, directed, and controlled.
- **Technical:** the process by which the organization produces the products (e.g., software development).
- **Learning/knowledge management:** the process by which the organization improves its capabilities.
- **Strategic management:** the process by which the organization provides an integrated management system and enables the organization to achieve its vision, mission, goals, and objectives.

These processes are necessary because a knowledge, technical, project-based organization survives on technical capability and knowledge.

Exhibit 1. Conceptual View of Knowledge-Based, High-Tech Organization's Core Processes
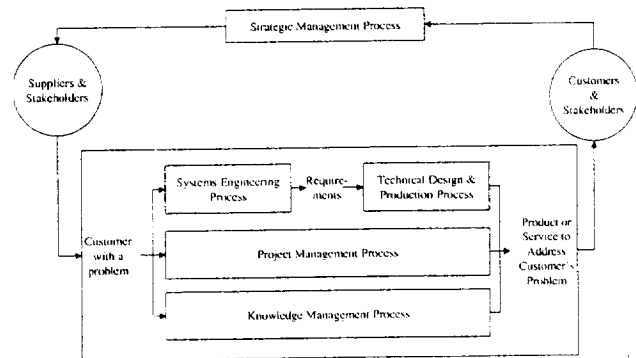
Multiple levels of competence. These five core competencies need to be improved at three levels: individual, team, and organization (Frame, 1999). Individual level competence includes the knowledge, skills, and commitment to a competence. Team level represents the collective actions of a project team that are consistent with the desired competence. Organization level represents the processes, tools, and culture that are consistent with the desired competence. To enable improvement of the organization's performance, the organization must improve: an individual's knowledge of and commitment to; a project team's implementation or

use of; and the organization's processes and tools for the desired competencies

Outcomes in a project based organization. Improving these core competencies is important to the project-based organization. Through improvement the organization is better able to meet the customer's needs. Most importantly the organization is able to meets its project expectations. *Project performance* is measured by the common approaches of cost, schedule, technical performance, and stakeholder satisfaction. Project performance is enabled by the organization having the *abilities* to define a customer's need, translate the need to a meaningful project plan, produce the product or service, and learn. The change in project management ability is driven by the *change in knowledge*. Organizational knowledge is changed based on the project manager's ability to act as a knowledge broker. The use of the *project manager's time* demonstrates the balance in time and resources on project management and learning. The project manager will be able to focus on project leadership (i.e., growing capabilities while meeting cost, schedule, performance, and stakeholder needs) instead of project administration (i.e., status and reporting). The project manager's time allocation is driven by *the project management process performance*. For example, if the project management process is inefficient or ineffective, then the project manager will spend more time on "fighting administrative fires" and not on meeting stakeholder needs. The performance improvement effort must focus on improving the five outcomes.

Requirements. From the above discussion, an approach for improving a project-based organization's performance must include the opportunity to:

- Focus on the core processes (e.g., project management, strategic management, knowledge management, and the technical/systems engineering).
- Improve the individual's knowledge and commitment.
- Improve a project team's use of new practices.
- Improve the organization's processes and tools.
- Improve the actual performance across a set of outcomes.

These five requirements provide a direction for an action-learning approach (Dotlich & Noel, 1998).

Case Study: Dynacs Engineering, Co., Inc.
Dynacs, Inc. is a knowledge-based organization that provides highly technical engineering and scientific services to NASA at the Kennedy Space Center and other customers. The KSC Engineering Contract develops new systems and tools to assist in the processing, launch, and landing of the Space Shuttle and its payloads. Work also involves advanced initiatives such as Mars exploration and the development of ground systems for future reusable launch vehicles. The contract is noted for the high level of inventiveness and produces the majority of new technologies at the Kennedy Space Center, which has become a leader in the agency in the area of successful technology commercialization.

NASA recently restructured the contract from what is called Level of Effort to Performance Based Contracting (PBC). In the past, Dynacs provided a talented workforce while NASA personnel performed most of the project management activities. The change to PBC entailed a higher level of responsibility to plan and execute projects which, in the past, had been managed by NASA personnel. This change required the introduction of a new culture based on Project Management including tools, processes, and shared understanding.

Dynacs developed a new system of project management consistent with the PBC business processes and did so in a Continuous Improvement environment. While technical performance remained excellent, a number of project set-backs including customer satisfaction issues, schedule variances, or cost variances occurred which were attributed to the understanding of the processes and tools or due to the tools themselves.
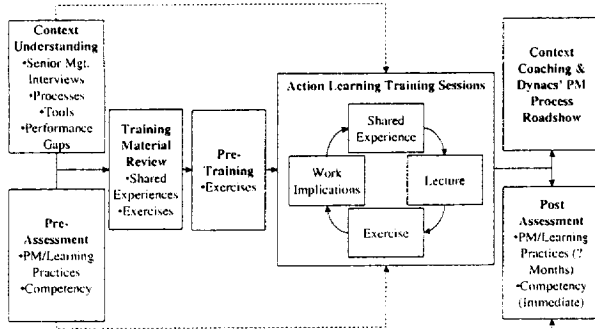
A detailed assessment of project management competencies was implemented in the organization. Analysis of the responses of various stakeholder groups showed clearly that gaps existed in individual and organizational competencies in project management. While project management was recognized as a valuable avenue to meeting Dynacs' goals, there was clear dissatisfaction in the implementation of project management in the organization and a demonstration that a number of individuals charged with managing projects lacked certain accepted project management skill sets. In short, simply building tools and drilling the staff in their use had not achieved a high performing project based organization and further development was required. Our goal was to enhance the individual and organizational competencies and to establish processes where lessons learned were continuously incorporated into process improvements.

Overview of action learning training approach. To improve project management competence, Dynacs undertook an action-learning approach. As shown in Exhibit 2, this action-learning approach was developed by first understanding the current project performance through "context understanding" and "pre-assessment." This assessment led to the identification of key issues and a "planning session". The planning session developed an overall plan to improve competence. The action-learning approach was chosen as the cornerstone of the improvement effort.

Exhibit 2. Overview of action learning as part of improvement effort.

An "Action Learning" Approach Helps Make the Training Job Related and Achieve Long-Term Outcomes.

Exhibit 3. Abilities for Project Management

1.	**Use project planning tools**: Implement the standard project management tools to develop a useful plan.
2.	**Develop useful plan**: Develop plans that ensure project success and learning.
3.	**Empower action**: Provide the project team the resources they need to have to be successful.
4.	**Collect useful learning data**: Collect data that supports project management and learning.
5.	**Use project management study tools**: Implement the standard project management tools to understand project status and learn from experience.
6.	**Identify and work gaps**: Use the study results to take actions to improve performance.
7.	**Produce useful lessons learned**: Produce knowledge gained from experience on the project team.
8.	**Share knowledge**: Share the produced lessons learned or knowledge throughout the organization.
9.	**Use knowledge**: Use past knowledge in other projects.

Exhibit 4. Enablers for Project Management

1.	**Strategic view of projects**: A shared understanding of how the projects relate to an overall strategic plan (i.e., mission, vision, and goal/objective accomplishment).
2.	**Time and resources for learning**: Project teams have the resources needed to complete the project.
3.	**Teamwork**: Organizational members support each other.
4.	**Open environment**: Information and knowledge is shared in open and honest conversations.
5.	**Problem-solving focus**: Performance gaps are understood and closed.
6.	**Learning philosophy**: A shared understanding of the competitive advantage that the organization's knowledge provides.
7.	**Sharing mechanisms**: Processes and tools to share learning throughout the organization.
8.	**Desire for survival and growth**: The shared desire to provide a long-term future for individuals and the organization.

Next, "action-learning approach development" led to the definition of the goals, products, content, and delivery mode. Consistent with the requirements, the goals of the action-learning approach were to improve: an individual's competence, knowledge, and experience; a team's practice of a new approach to project management; and the organizational processes and tools for project management. The action-learning approach was to produce the following products:

- Hands-on facilitated, action-learning based training.
- Project management handbook containing a description of the project management process and tools.
- A definition of the roles and responsibilities for the project management process.
- A set of project templates for four typical projects completed by Dynacs.

Content. The content delivered and discussed during the sessions focused on the organizational capabilities for a set of project management abilities and enablers. Organizational capabilities are the processes, tools, communications, and educational approaches for performing project management. As shown in Exhibit 3, the abilities represent the basis set of tasks to manage and learn from a project. The project manager can perform these abilities provided the organization and the project manager has the capabilities. Capabilities are the processes (i.e., project management and knowledge management), tools (i.e., project planning and study), and people (i.e., knowledge, skills, experience, attitude).

Further support or **enablers** are needed to ensure the project manager and team can perform the abilities, see Exhibit 4. The enablers focus on the organization providing an environment in which a learning approach to project management can thrive. The lack of these enablers become barriers to the organization accomplishing their outcomes.

Action-learning activities. The delivery of the content included six types of action-learning activities:

1. **Training**: The aim was to improve an individual's understanding of the basic project management practices.
2. **Personal Application Tasks**: The aim was for an individual to apply a new technique learned during a session to their workplace.
3. **Reflection of Dynacs' Performance**: The aim was to understand the strengths and weaknesses of the organization's current practices and performance. This reflection was completed by reviewing the results of the pre-assessment.
4. **Team Building Exercises**: The aim was to build teamwork across the organization.
5. **Technical Team Template Development**: The aim was for the organization to develop a template (e.g., objectives, deliverables, WBS, skills needs, risk management plan) for a typical project. Dynacs developed template project plans for four technical areas.
6. **CI Team Capability Development**: The aim was for the organization to improve the organization's processes, tools, communication, and education capabilities for project management.

As shown in Exhibit 5, these six action-learning activities aimed to improve competence at a given level.

Exhibit 5. Activities to improve competence.

Level	Activities
Individual	• Training • Personal application tasks
Team	• Technical teams template development • Team building exercises
Organization	• Reflection of Dynacs' performance • CI team capability development

Assessment of action-learning approach. To understand the immediate impacts of the action-learning approach, we conducted a post-workshop assessment with the participants. The participants answered a set of questions to define how well their knowledge of and commitment to project management changed as a result of being involved in the action-learning training approach.

As shown in Exhibit 6, the participants viewed the action-learning approach as improving their knowledge. Specifically, based on their participation in the workshop, they were able to remember, understand, apply, analyze, adapt, and judge the project management practices discussed. As shown in Exhibit 7, the participants viewed the action-learning approach as improving their commitment. Specifically, based on their participation in the workshop, they were aware of, exhibiting new behaviors, showing a personal commitment to, made a personal commitment to practicing, and living according to the concepts discussed in the workshops.

Exhibit 6. Knowledge results from assessment.

Response Based on my participation in this workshop,	SD	D	NS	A	SA
1. I remember the basic abilities for project management	0	0	0	70%	30%
2. I understand the basic abilities for project management	0	0	0	55%	45%
3. I can apply the basic abilities for project management	0	0	10%	55%	35%
4. I can analyze the basic abilities for project management	0	0	0	70%	30%
5. I can adapt the basic abilities for project management to a variety of projects	0	0	5%	55%	40%
6. I can judge the performance of the basic abilities for project management	0	0	10%	60%	30%

Note: SD = Strongly Disagree, D = Disagree, NS =Not Sure, A = Agree. SA= Strongly Agree.

Exhibit 7. Commitment results from assessment.

Response Based on my participation in this workshop,	SD	D	NS	A	SA
7. I am aware of the basic abilities for project management	0	0	0	60%	40%
8. I am exhibiting new behavior associated with the basic abilities for project management	0	10%	20%	45%	25%
9. I am showing a personal commitment to the basic abilities for project management	0	0	10%	45%	45%
10. I have made a personal commitment to practicing the basic abilities for project management	0	0	5%	50%	45%
11. I am living according to the basic abilities for project management	0	0	15%	75%	10%

Note: SD = Strongly Disagree, D = Disagree. NS =Not Sure. A = Agree, SA= Strongly Agree.

Conclusions--Lessons Learned

The action-learning approach to enhancing project management competencies was well received by the participants from the Dynacs staff. Combining general project management knowledge training with exercises relevant in the context of immediate work and developing new processes and tools simultaneously, was engaging and relevant to participants. This customized approach is also cost effective when compared to sending a cadre of stakeholders to conventional project management training especially when consideration is given to the specificity of the activities to the business environment experienced by participants. The action-learning approach also results in materials suitable for an effective project-management handbook and as training material for follow-on training of other company personnel. Perhaps the most important, albeit intangible result, was the sharing of experiences and philosophies among the participants working in different areas of the organization. This development of shared understanding and its documentation in the various products of the sessions has led to a greatly enhanced culture melding across the organization and identified areas for future improvements.

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