

We appreciate the good response to our inaugural newsletter, dealing with the "fuzzy front end" of the innovation process. This issue is devoted to project management, which was the subject of our June Conference and July Roundtable and is becoming recognized as an important source of competitive advantage.

Larry Gastwirt  
Director

## **Toward World-Class Project Management: Making Projects Your Next Competitive Weapon** by Aaron Shenhar

As an organized activity of mankind, projects existed in almost all civilizations; however, as a formal discipline, project management is traced back to the 1950s and 1960s when major defense programs have started to use network diagramming techniques, known today as PERT, or Critical Path Methods. This article summarizes the presentation given at the Alliance's June 1997 Conference on World-Class Project Management.

Project Management, today, is a well-recognized discipline, and it has accumu-

lated extensive knowledge and wide industry-based experience.

Yet what about performance? With this accumulation of knowledge, here is one of the major paradoxes of organizational life today: Projects are achieving only moderate levels of success and very often do not fulfill managerial and/or customer expectations. The data is striking: most projects still suffer extensive overruns, and when completed, many do not meet their business goals.

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## Next Competitive Weapon (continued from page 1.)

In our research, we found overruns in 85% of all projects, accumulating on average a 70% overrun in schedule and 60% in budget. Similar conclusions were reached in a 1987 study, which summarized more than twenty earlier studies.

Why, then, do we spend so much effort on projects to achieve only moderate levels of success? Given the current environment of increased competition, one should ask, what is wrong in project management? What is missing? How can we do better? Shouldn't projects become our next competitive weapon?

I believe the problem is in our understanding of projects. Project management is a complex concept and a risky endeavor, and it is different than any functional work or operation. No two projects are alike, yet most organizations treat all their projects in the same way. Furthermore, the amount of learning carried over from one project to the next is very limited, and the typical training pattern is focused on the tools and applications, rather than on higher levels of integration and conceptualization.

Based on our studies in recent years, the following conceptual framework is focused on these issues. While it is still utopic in many ways, I dare to call it, "World-Class Project Management." When fully developed and applied, it could transform project management into one of the major competitive weapons of the organization.

The framework includes three concepts: style, adaptation, and learning, each of which needs to be addressed at the corporate, project, and individual levels.

### Project Management Style

The concept of style helps see projects in a holistic way. It assumes that project management is more than just tools or processes, and it directs people's attention to higher levels of awareness which have substantial impact on project performance. The holistic style approach includes the following five components: strategy, attitude, organization, processes, and tools.

### Strategy

Every project is initiated with a certain purpose in mind, yet many projects still fail because of fuzzy mission statements and ill-defined project purpose. But a good project strategy involves more than just purpose; it should address the business aspects of the project, namely, the expected advantage once the effort is over. A fully developed project strategy must include the following parts:

**Goal and Mission.** Project mission must be stated clearly and well articulated. What is the goal, what is our purpose, and why are we making this effort? This statement

must be made clear to all project participants, well-articulated, and shared and supported by everyone.

**Competitive Advantage.** The expected competitive advantage of the project's product must be clearly worded and understood. Are we trying to gain market share through cost reduction, gain an advantage through better performance, or achieve new capabilities with the most advanced technology? And why is our outcome going to be better than the competition? In this way competitive advantage will be embedded in the project's work and everyone will be focused on achieving this advantage - designers, planners, builders, testers, etc.

**Success Measures.** Project expectations must be set in advance and in the most clear way. An organization must identify up front the measures with which project success will be assessed. Meeting time and budget goals is not enough. They only indicate the goodness of planning and the efficiency with which the project was run. In our studies we have identified four groups of success measures. Various projects will have diverse success measures in mind and will place different levels of importance to these measures.

### Attitude

Project management, like any managerial activity, is not an exact science. It requires a proper attitude and mindset, and transforming these mindsets into action. A right attitude will energize people and direct their activities and will save managerial time. What are the elements of project attitude?

**Managerial Approach.** Project managers are often technical people turned into managers. They must remove their technical hats and adopt managerial hats in several ways: They should learn to integrate project components and disciplines, develop the right attitude toward conflicting demands, and adapt the right balance between firmness and flexibility.

## Next Roundtable

<b>Topic</b>	Software Project Management
<b>Speakers</b>	ARDEC & GTECH
<b>Date</b>	Wed. September 24, 1997
<b>Time</b>	2:00 - 5:00pm
<b>Location</b>	ARDEC
<b>Information</b>	Lem Tarshis (610) 277-4805

## Next Competitive Weapon (continued)

**Vision, Passion, and Excitement.** Real leadership energizes and puts passion in people's minds. Project management must address vision and create excitement. Together with a carefully structured strategy, it is the driving force which unleashes talent and generates the project execution energy.

**Policy.** Policy is the set of project rules according to which team members would behave when making decisions. Appropriate policy statements should apply to almost all areas of the project activity, among them, design, quality, vendor selection, testing, etc. Proper policies will save time and will direct people's actions without too many questions asked or managerial intervention.

**Risk Taking.** No project is risk free. However, risks may vary and managers must choose the right attitude to live with uncertainty and risk. Some projects must ensure that nothing can go wrong; others may be managed with a success oriented higher risk attitude; accepting the fact that some risks are unavoidable and if trouble strikes, it will be dealt with. The risk attitude should direct numerous project activities such as planning, budgeting, testing, etc.

### Organization

Organization involves the project structure, the team building, and the people. The formal structure may be functional, pure project, matrix, or some combination. However, no structure is ideal and each has its benefits and drawbacks. The matrix organization, for example, enables good disciplinary work together with project integration and focus, but it involves conflict and fuzzy authority definitions. Understanding these limitations will help tremendously in later stages when inevitably faced with project problems.

The team structure depends on the disciplinary areas required based on the technology used. And of course, the right selection of people is critical to success. Obviously it involves functional expertise, but also personality and character.

### Processes

Project processes are well documented by now and well treated. The Project Management Institute has identified thirty nine processes, based on nine knowledge areas, among them, cost, time, quality, and procurement. Processes may also include communication and information sharing, project monitoring, planning and control, decision making and review processes.

### Tools

Obviously, to execute projects one must apply tools. Tools involve planning, scheduling, budgeting, organizing, allocating resources, quality measurement, and configuration management. These tools are also well addressed in the current literature and application references.

### Adapting Your Project Management Style

The second concept is based on the fact that no two projects are the same and different projects must be managed in different ways. How can you classify your project and select the proper style which will fit your specific project type?

The UCP model classifies projects along three dimensions: uncertainty, complexity, and pace. Specifically, we may classify technological uncertainty into four levels, system scope (complexity) into three levels, and pace into two levels:

### The Technological Uncertainty Dimension

**Type A - Low-Tech Projects.** Projects such as construction or road building are based on existing and well established technologies. No development work is needed and no testing is required. They are designed and built as planned and no changes are expected or anticipated.

**Type B - Medium-Tech Projects.** Incremental innovations or improvements in existing products are based mainly on existing technologies, but they incorporate a single new technology or a new feature or design. They may include building a new car model or a slightly better consumer electronics product. Such projects require some development, and some testing, but their design must be frozen relatively early to make sure timely product completion.

**Type C - High-Tech Projects.** Projects in the high-tech and defense industry often employ a whole collection of new technologies. These technologies, however, have been developed prior to project initiation. Integrating new technologies for the first time involves a high level of uncertainty and risk and requires extensive development and testing and much later design freeze.

Look for our next issue  
coming in the Fall '97.

The theme will be on  
the management of  
software product development.

## Next Competitive Weapon (continued from page 3.)

*Type D - Super-High-Tech Projects.* In rare cases projects are based on "non-yet" existing technologies. Although the mission is clear (e.g., "get to the Moon in less than ten years"), no technology is known for getting there. Risk is obviously a major factor, and much of the project effort is devoted to technology development rather than building the final product. Obviously, the freezing and design effort conclusion is pushed back to a much later stage in the project execution period.

### The System Scope Dimension (Complexity)

This dimension is based on the product's level on a hierarchy of systems and subsystems:

*Scope 1 - Assembly.* A collection of components and modules combined into a single unit and performing a well defined, limited function. This can be a subsystem of modules combined into a single unit and performing a well defined limited function. This can be a subsystem of a larger system, such as the power supply of a computer, or a stand-alone product, such as an overhead projector. The creation of assemblies is usually performed within one organization, and often under the responsibility of a single functional group.

*Scope 2 - System.* A complex collection of interactive units and subsystems, jointly performing a wide range of functions and addressing a complex operational need. A radar, a computer, an automobile, or a ship are typical examples. Building systems would usually entail a main contractor and many internal and external subcontractors, and they must be managed in a rather formal and bureaucratic way.

*Scope 3 - Array.* A large collection or widely dispersed conglomeration of systems, functioning together to achieve a common purpose. The National Air Defense System, or the public transportation network of a large city are typical examples. The effort of building or expanding an array is usually conducted under an umbrella organization which coordinates the efforts of varied system project organizations. The effort is very rigid, bureaucratic and tightly linked to legal and environmental issues.

### The Pace Dimension

*Regular Projects.* Such projects, although confined to a limited time-frame, could still succeed even in cases when schedule goals are not met.

*Fast Projects.* In contrast, in these projects time is critical to success. Wartime, or industrial crisis projects are examples. Normal procedures for managing projects do not apply. They require pure and autonomous project task forces, and enormous top management support.

### Continuous Learning

Since projects are non-repetitive activities and each project is a new entity, it is extremely important to install the third component of the framework - learning. Learning, like other elements, should be addressed at three levels:

#### The Corporate Level

The entire organization should learn to learn from its previous project experiences. Sharing information across projects during execution is extremely important and summarizing project lessons upon project completion should become a common norm. The most we learn is from project failure, and failures should become events for celebrating the learning opportunity. Databases of project lessons must be shared with everyone and become part of a culture of continuous organizational learning.

#### The Project Level

Every project should establish a procedure of internal learning. Events, consequences of previous decisions, and in-between lessons must be documented and shared with all team members and with the rest of the organization. Special sessions must be conducted to accommodate these lessons, primarily at the completion of major milestones (gates) and while deciding to move to the next step or stage.

#### The Individual Level

Project managers should continuously strive to improve their skills and knowledge base in project management. This will involve reading, course work, mentoring and seeking advice, and reflection.

### Conclusion

The key to success in world-class project management is integration. The framework presented above proposes a starting point for achieving such integration. Using the classical knowledge areas, such as cost, time, etc., together with other relevant areas, such as product design or testing on one dimension, and the five elements of style (strategy, attitude, organization, processes, and tools) on the other dimension, generates a matrix for integration. You may start by identifying the project type and then fill out the cells of the matrix for your specific project. Seeing projects in this way will expand comprehension of the project phenomena and will create real focus on project competitive potential.

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