

What CEOs Must Demand To Compete and Collaborate in 2005

Unleashing the Full Power of Project Management in the Internet Age

Russell D. Archibald^a, PMP, PMI Fellow

PMI Orange County Chapter
Wyndham Hotel, Costa Mesa, California
November 13, 2001

Abstract

This paper is intended to provide chief executive officers (CEOs) and other senior executives with the understanding of what they must demand regarding project management within their organizations, today and in coming years, to compete and collaborate effectively within the realities of the Internet Age. It is also intended for use by project management professionals at all levels to communicate with their senior managers and convey to them the direction that the development of the project management discipline should be headed. The need is explored to simultaneously compete and collaborate in response to the challenges posed by the phenomena of the Internet and World Wide Web, together with ways that are open to the CEO to unleash the full power of project management to satisfy that need. The important linkage is illustrated between the organization's mission, its business strategies, and the execution of those strategies through effective management of both the project portfolios and individual programs and projects. The underlying principles and practices of modern, integrated project management are presented in a manner that hopefully makes sense to CEOs and other senior executives, and the performance level that can be demanded for each of these principles and practices is presented as benchmarks for the CEO to measure against.

CEO Demands: 31 inserts like this are placed in the text where reasonable demands must be made regarding the topic being discussed or described to achieve the full power of project management.

Challenges of the Internet

The advent of the Internet in recent years is posing serious challenges to industry, business and government. CEOs are recognizing the threats and opportunities of the Internet, as shown in Table 1.

1. Changes in type and level of competition	41%
2. Impact of the Internet	38%
3. Industry consolidation	37%
4. Downward pressure on prices	33%
5. Skill shortages	32%

Table 1. CEOs of 506 Companies With Sales Over \$5 Billion
List Their Greatest Challenges for 2001¹

Most executives in business and government today have had some direct experience with the Internet and the World Wide Web—but most of us still do not fully comprehend what these revolutionary developments really are and what their full impact on our world will be. Although we are learning something new every day about these unprecedented phenomena, a 1999 (prior to the dot com meltdown in 2000) survey² of 600 top-ranking executives found that

- 92% said the Internet will reshape the world marketplace by 2001
- 37% expected serious competition from start-ups
- 16% expected competition from their own customers
- 86% said the Internet would force significant changes in organizational structure.

^a archie@unisono.net.mx U. S. mailing address: PMB 90A, 521 Logan Ave., Laredo, TX 78040-6633.

The evolution envisioned by some from our traditional vertically integrated companies to the “internetworked enterprise” is shown in Figure 1-1³. The intermediate transitional organization form has been termed the “virtual corporation”, operating through an integrated network that connects the company employees, suppliers, distributors, retailers and customers. Prior to the advent of the Internet a number of companies (including, for example, Chrysler Corporation and Hewlett-Packard) developed their own “intranets” using electronic data interchange and client/server computing technologies.⁴ The Internet has now made at least some intranets obsolete and made possible the internetworked enterprise. Tapscott et al⁵ define three layers in this new digital enterprise economic model, based on a multiclient research project with participation by a number of leading corporations:

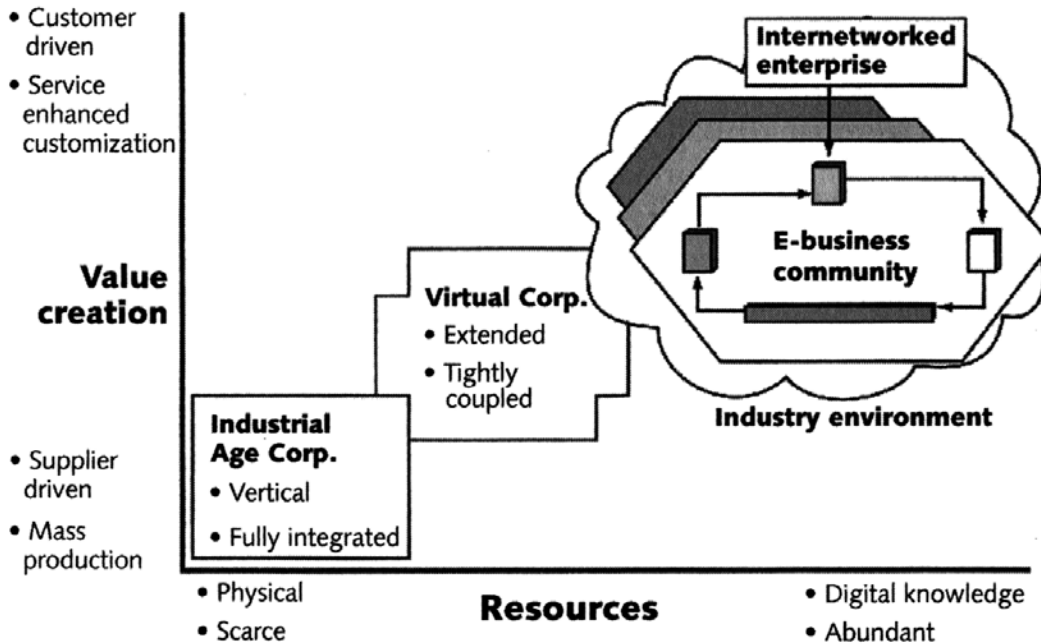


FIGURE 1-1. Vertically integrated enterprises have given way to the virtual corporation and are now moving to the e-business community.

1. The *internetworked enterprise* is the basic functional unit of an industry environment. It relies on internetworked, knowledge-based systems to enhance its capacity to learn, be agile, and respond quickly to customer requirements. It **collaborates and competes** [emphasis added] in industry environments and e-business communities—often in several EBCs at once. It embraces digital strategies for developing products and services and for renewing relationships with customers and suppliers.

“2. An *e-business community* is a specific set of players with shared interests, who, together, seek market dominance within the industry environment. In the software industry, the leading EBCs are Wintel (led by Microsoft and Intel) and Java (led by Sun, IBM, Oracle, and Netscape). Often, a single company is a member of two or more competing EBCs; Microsoft and Intel, for better or for worse, are involved in the Java community. Meanwhile, IBM, Oracle, and Netscape are active players in the Wintel EBC. The term “coopetition” best describes these dynamics.

“3. The *industry environment* is the overall context in which businesses operate (for example, the software industry). An industry environment consists of multiple e-business communities, each of which is competing to dominate and control the overall environment.

“As noted earlier, it is the coordination of business practices and the deployment of knowledge as enabled by the Internet that distinguishes the new environment. In the EBC, the concept of partnership is not merely a vendor’s euphemism for a conventional sales relationship; it takes on real meaning.”

The underlying concept that enables the internet networked enterprise to operate effectively is the real-time, geographically unlimited *collaboration* that is only available economically using the Internet and the World Wide Web. Coupling the Internet with the natural collaborative capabilities of integrated project management produces a powerful approach to the Internet challenges.

Challenges Posed by the Internet

The challenges to business and government executives that are posed by these extraordinary developments should be rather obvious to the thoughtful executive. The most basic challenge is to determine in which of two situations your company, agency or organization finds itself:

Transform or Perish: For many organizations the changes brought on by the Internet and its related technologies are truly a life or death matter. Either the company or agency transforms itself to compete in this new environment, or accepts the fact that its days are numbered.

Exploit the Internet to Grow and Compete: All those for whom the Internet is not a life or death matter have the choice either to capitalize on the opportunities presented by the Internet or not. However, even those who are not today faced with the transform or perish option may well find themselves confronted with that option tomorrow. The developments in the global arena are moving so fast that it is impossible to predict which industries, companies and agencies are invulnerable to the challenges of the Internet phenomena. If an organization adopts a strategy to transform itself then of course this will perforce incorporate the second strategy to exploit the Internet to grow and prosper.

Within this context the specific challenges posed by the Internet include:

- What must I do to transform my organization to assure that it will survive and prosper?
- What changes can/must I introduce into my organization to participate appropriately in the new e-business communities and the “Customer Led Revolution”—within this new “truth economy”?
- How can my company compete effectively when much of our previously proprietary intellectual property has been made available on the Internet?
- How can we adequately protect our proprietary interests and intellectual capital and at the same time enter into strategic partnerships with companies that can easily become direct competitors?
- How can I promote, foster and support the means to enable the broad collaboration that is necessary both within my organization and with our strategic partners?
- What can I do to be sure that we can develop and launch our new products and services rapidly enough to compete in this high-speed environment?
- How can/do I prioritize and manage strategies, projects within strategic programs and within my project portfolios, and activities within projects in this new environment?

For the shareholder and prospective investor, how can I differentiate my organization from all the other “dot com” companies so that our financial fortunes in the stock market do not rise and fall with the herd?

The principles of program and project management, effectively applied, provide powerful answers to these challenges, as discussed in the remainder of this paper.

Unleashing the Full Power of Project Management to Compete and Collaborate

To gain the full power of project management the CEO must demand that:

- Project portfolio management fully supports the organization’s growth strategies.
- A coherent project management process exists and is fully understood.
- This process and the supporting systems and tools are fully integrated with corporate policies, procedures and systems.
- The Internet and World Wide Web are used properly in the daily project management operations.

The more detailed demands that must be made are identified in the remainder of this paper. When these demands are fulfilled the results will provide a significant competitive advantage to the organization in today’s world of Internet speed. They will also enable the organization to collaborate effectively with customers, suppliers, government and other controlling agencies, and even direct competitors, as required in this Internet Age.

Implementing Business Strategies Through Projects

Strategically managing the growth of a company, agency, institution, or other human enterprise requires:

- **A vision of the future** of the organization at the top level;
- **Consensus and commitment** within the power structure of the organization on the mission and future direction of the organization;
- **Documentation** of the key objectives and strategies to fulfill the mission;
- **Planning and execution of specific projects** to carry out the stated strategies and reach the desired objectives.

Objectives are descriptions of where we want to go. *Strategies* are statements of how we are going to get there. Strategies are carried out and objectives are reached, when major growth steps are involved, through execution of projects and multi-project programs. Projects translate strategies into actions and objectives into realities.

It is important to recognize that objectives and strategies exist in a hierarchy—and not just at one level—in most organizations. A useful way to describe this hierarchy is to define three levels:

Level 1: Policy

Level 2: Strategic

Level 3: Operational

Figure 2 shows how the strategies become objectives at the next lower level in the hierarchy, until at the operational level projects are identified to achieve the operational objectives. Unless the higher-level objectives and strategies are translated into actions through projects, the plans will simply sit unachieved on the shelf. The linkage between strategic and project management is also shown in Figure 2. Strategic managers set the future course of the organization. Project management executes the specific efforts that achieve the growth strategies. The managers of these projects are acting for and representing the project owners, and receive their direction through the project sponsors.

Two broad classes of organizations can be identified: First, those *project-driven* organizations whose primary business is in fact made up of projects. Examples of this class include architect/engineer/constructor, general contractor, and specialty contractor firms; software development firms who sell their products or services on a contract basis; telecommunications systems suppliers; consultants and other professional services firms; and other organizations that bid for work on a project-by-project basis. Growth strategies in such organizations are reflected in the type, size, location and nature of the projects selected for bidding, as well as the choices made in how the required resources will be provided (in-house or out-sourced) to carry out the projects, if and when a contract is awarded or the project is otherwise approved for execution

The second category of organizations—those that are *project-dependent* for growth— includes all others that provide goods and services as their mainstream business. Projects within these organizations are primarily internally sponsored and funded. Examples include manufacturing (consumer products, pharmaceuticals, engineered products, etc.), banking, transportation, communications, governmental agencies, computer hardware and software developers and suppliers, universities and other institutions, among others. These organizations depend on projects to support their primary lines of business, but projects are not their principle offering to the marketplace. Many of these sponsors of internally funded projects are important buyers of projects from project-driven organizations.

In both of these types of organizations, projects are the primary vehicles for executing their growth strategies. For this reason the project management capabilities of organizations are crucial to their current and future success.

Objectives of Modern Project Management

The objectives of project management are two-fold:

- To assure that each project when initially conceived and authorized supports the organization's approved higher level strategic objectives and contains acceptable risks regarding the project's objectives: competitive, technical, cost and schedule.
- To plan, control and lead each project simultaneously with all other projects effectively and efficiently so that each will achieve its approved objectives: meeting the related

CEO Strategic Demands:

1. That every authorized project clearly supports an approved strategic objective of the organization.
2. That each project's risks are evaluated and managed using currently available methods and systems.
3. That all projects are evaluated, prioritized and approved on the basis of the same corporate criteria.

strategic objective by producing the specified results on schedule and within budget. The first of these objectives is closely linked to the strategic management of the organization. Application of project management practices during the early strategic planning and project concept phases has been introduced in more organizations within the past few years, with beneficial results. Too frequently, project failures can be traced directly to unrealistic original technical, cost or schedule targets, and inadequate risk analysis and risk management.

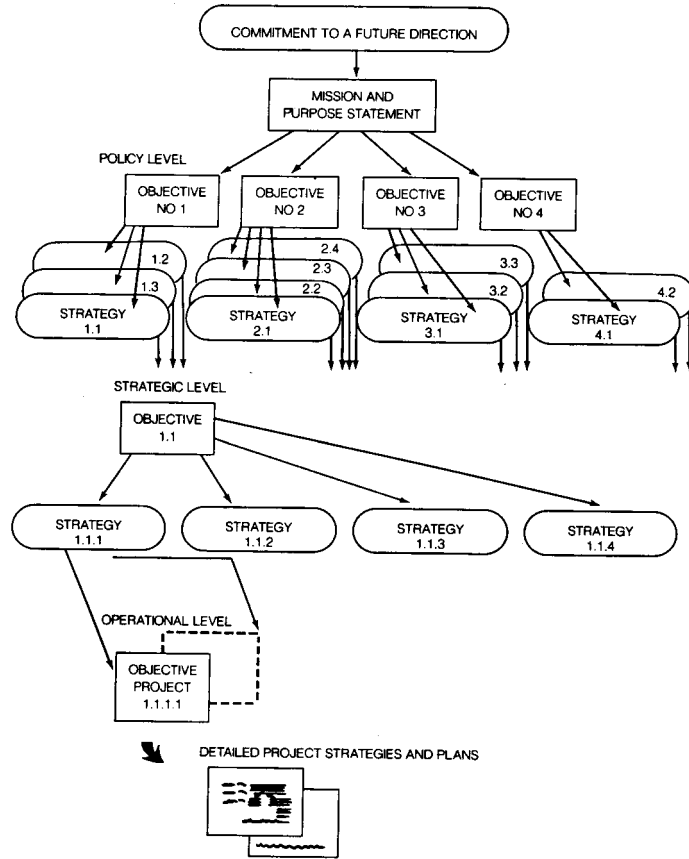


Figure 2. The hierarchy of objectives, strategies and projects.⁶

Project: A temporary endeavor undertaken to create a unique product, service or result.

Program: A group of related projects managed in a coordinated way.

Source: *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*, 2000 Edition © Project Management Institute, 191

Project: A complex effort, usually less than three years in duration, made up of interrelated tasks performed by various organizations, with a well-defined objective, schedule and budget.

Program: A long-term undertaking that is usually made up of more than one project.

Source: Archibald, Russell D., *Managing High-Technology Programs and Projects*, Second Edition. 1992, John Wiley & Sons, 24

A Few Key Definitions

Integrated Project Portfolio Management

Rather than attempt to manage individual projects as if they were stand-alone endeavors, executives have learned over the years that every project is always interrelated, primarily through the use of common resources, with some—if not all—other projects in the organization. Relating selected projects within a *program* is often a step in the right direction. Organizations have progressed from single project and program management to multiple project management, and they are now moving rapidly to project portfolio management. Dye and Pennypacker show the key differences between portfolio and multiple project management in Table 2.

	Project Portfolio Management	Multiple Project Management
Purpose	Project Selection and Prioritization	Resource Allocation
Focus	Strategic	Tactical
Planning Emphasis	Long & Medium-Term (annual/quarterly)	Short-Term (day-to-day)
Responsibility	Executive/Senior Management	Project/Resource Managers

Table 2. High-Level Comparison of Project Portfolio Management and Multiple Project Management.⁷

As indicated in Figure 3, the project portfolio consists of the programs and projects supporting a given higher-level strategy. There could be only one overall corporate project portfolio, but it generally makes more sense to define more than one portfolio on a strategic basis in large organizations to reflect product line, geographic or technological divisions of the organization, industry or market.

A *Project Portfolio Steering Group* consisting of senior executives as appropriate is responsible for establishing the project portfolio management process and for the decisions that must be made concerning the programs and projects within the project portfolio(s) during the operation of that process.

The project portfolio management process consists of the following twelve basic steps:

1. Define the project portfolios required within the organization.
2. Define the project categories within each portfolio based on uniform criteria for the entire organization.
3. Identify and group all projects within categories and programs.
4. Validate projects with the organization's strategic objectives.
5. Prioritize projects within programs and portfolios.
6. Develop the Project Portfolio Master Schedule.
7. Establish and maintain the key resources data bank.
8. Allocate available key resources to programs and projects.
9. Compare financial needs with availability.
10. Decide how to respond to shortfalls in money or other key resources and approve the list of funded projects.
11. Plan, authorize and manage each program and project using the Project Management Process and supporting systems and tools.
12. Periodically re-prioritize, re-allocate resources and re-schedule all programs and projects as required.

The Organization's Project Management Process

In order to achieve the full benefits of modern project management each company or agency must have a documented picture of its overall project management process. This process

- Describes how the organization's project portfolios are related to the organization's growth strategies,
- Identifies the basic types or categories of projects that exist or are planned,
- Defines the project life cycle for each project category,

CEO Demands:

4. That the project management process of the organization be documented in a coherent, easily understood manner.
5. That all projects be managed within their appropriate, defined portfolios.

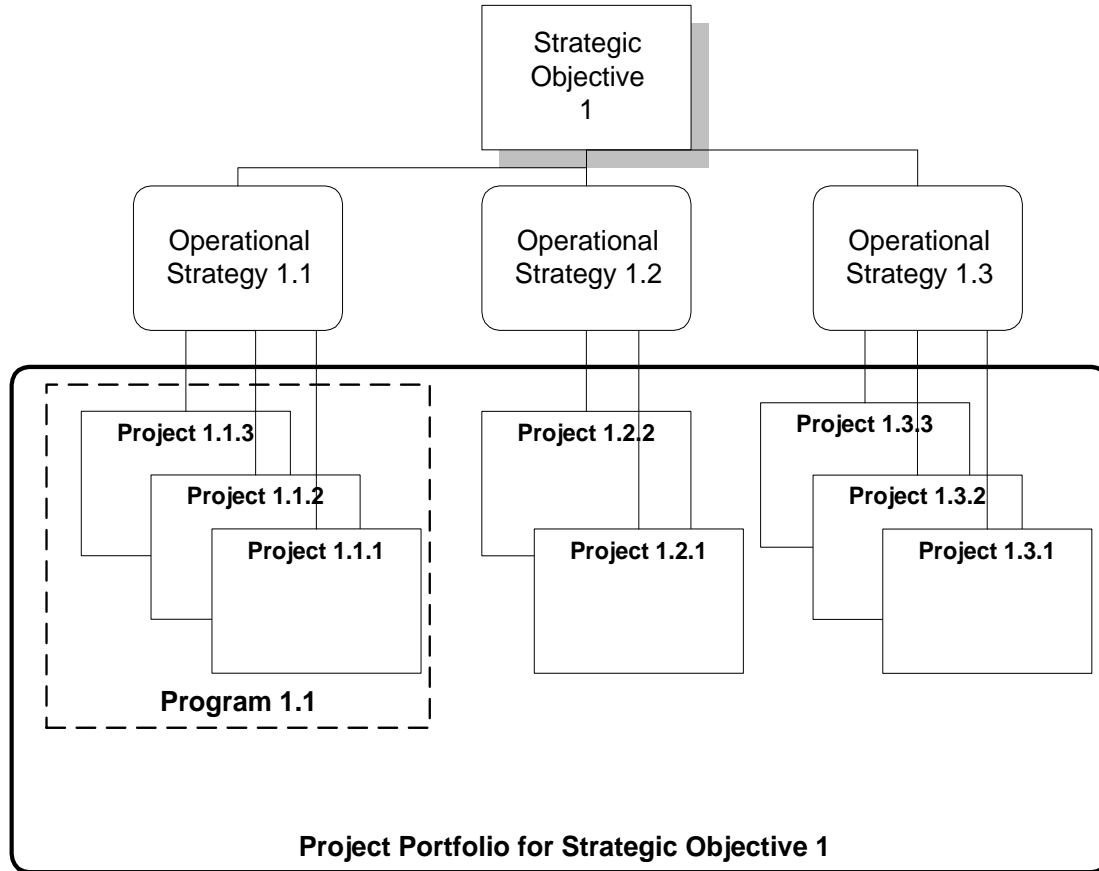


Figure 3. Schematic of Strategies, Projects, a Program and a Project Portfolio.

- Defines, for each project category, the corporate guidelines for project risk analysis and planning and control, with provision for appropriate adaptation for specific situations,
- Specifies the documents and related levels of approval authority for initiating and authorizing new projects and major changes to authorized projects,
- Identifies the key roles and defines their responsibilities and authority as related to project and functional management, and
- Specifies the procedures for escalating the inevitable conflicts (for scarce resources, priorities between projects and others) to the appropriate level for their prompt resolution.

This process is often documented as an overall flow chart with supporting narrative descriptions, together with appropriate references to pertinent corporate policies, procedures and forms. When this is done properly the result is *integrated* project management.

Basic Project Management Principles

One way to look at the project management discipline is to view it as consisting of these three basic principles:

1. **Assignment of integrative project responsibilities**—the key integrative roles.
2. **Application of integrative and predictive project planning and control systems**—the project documents, procedures, information processing and communication systems, and their application.
3. **Integrated project team-working**—identifying, integrating, and managing the project team to integrate the efforts of all contributors to the project.

Each of these is discussed in the following sections.

1. The Key Integrative Roles⁸

The role of the project manager is obviously a central one, and in fact this role has received considerable attention in the project management literature over the past several decades. However, there are other important integrative roles in project management, and these frequently have been ignored. The key integrative roles are:

CEO Demand:

6. That *all* of these integrative roles are clearly defined, understood and assigned to qualified people.

Executive Level

General Manager: integrates all projects with the corporate strategic plans. This role in project management is focused on:

- Determining how the organization's portfolio of projects supports the overall business strategies of the organization,
- Overseeing the organization's overall project management process, and
- Monitoring how this process is integrated with all other aspects of the organization, and ensuring that sufficient money, human, and other resources are available on a timely basis to support the on-schedule completion all of the approved projects; if sufficient resources are not available then the General Manager must delay, cancel, or change the scope of one or more projects.

CEO Demand:

7. That the general manager (or COO) understands and fulfills these project management responsibilities.

Project Sponsor: integrates, on the assigned project(s), the ongoing strategic direction of the project with the ongoing operations of the organization. This strategic direction is given to the project manager and through him or her to the project team. The project sponsor role is usually held by a senior manager or a "plural executive" in the form of a steering group or committee, acting for the top management of the sponsoring or project executing organization. This role may be held by the general manager of the organization responsible for the project, by a high-level executive, or it may be delegated to someone who reports to the general manager. In some cases, the project sponsor role is held by a steering group comprised of key people from various parts of the organization. Only within the past decade or so has the importance of the project sponsor role been recognized, together with the importance of formally identifying whom is assigned to this role for a specific project.

CEO Demand:

8. That a project sponsor be appointed for every project and given appropriate indoctrination to carry out this role effectively.

Multi-Project/Portfolio Level

Manager (or vice president, director, and so on) of project management: integrates the operational aspects of the work being done on all projects within the organization, and integrates the development and use of the organization's project management methods and tools on all projects. This role has emerged in many organizations as they mature in their project management capabilities, and it recognizes that the project management function as an important capability within the organization, along with the more traditional functions of marketing, engineering, procurement, manufacturing, construction/field operations, finance and accounting, legal, and so on. The manager of project management may also be the project sponsor for specific projects, in some situations.

CEO Demand:

9. That an experienced manager of project management be appointed reporting to a senior executive of the organization.

Some practitioners and consultants⁹ have predicted that there will soon be a *chief projects officer* in many organizations, on a par with the fairly recent position of chief information officer. This position might combine aspects of the project sponsor and manager of project management roles. It remains to be seen whether or not this becomes a reality.

The *project office* is a term that is written about often in current project management literature. Dinsmore says "Any

CEO Demand:

10. That an appropriate home be established within the organization for the project management discipline.

organization with a project backlog needs to support its projects from some coherent base. A project management home is just such a vantage point from which to support, influence, and direct project management endeavors.”¹⁰ He goes on to say “There are some classic ‘homes’ for project management; they are sometimes referred to by the catchall term ‘project office’, even though they vary considerably in concept.” He then describes four possibilities:

- The autonomous project team.
- The project support office.
- Project management center of excellence.
- The program management office.¹¹

Multi-project Manager or Program Manager: integrates the efforts of all project contributors on his or her assigned projects. The multi-project manager or program manager performs the duties of the project manager on several projects at the same time. These may be several small projects, or a project manager near the end of one project may also be assigned to another project that is in its initial conception phase, for example. Strategically this role differs somewhat from the project manager since this person must often resolve conflicts between the two or more projects that she or he is managing. Depending on the number, size and nature of the projects, this role may take on some of the responsibilities of the manager of project management or the general manager. On some large aerospace programs, for example, a subordinate project manager is usually assigned to each project within the overall program.

CEO Project Manager Demand:

11. That all multi-project and program managers are given the training needed to ensure their effective performance.

Project Level

Project manager: The project manager integrates the efforts of all persons and organizations contributing to the project, primarily working through the various functional project leaders. This role is more operational in nature compared to the more strategic role of the project sponsor. The project manager plans and directs the execution of the project to meet the time, cost, and performance objectives as established by the project sponsor.

CEO Project Manager Demand:

12. That each project manager respects the functional lines of authority when giving project direction to team members.

Functional Department and Project Contributor Level

Functional department managers: integrate the efforts of project contributors on all projects within their individual departments or disciplines, primarily through the allocation of resources available within the department to the approved, active portfolio of projects. When conflicts occur between projects (insufficient skilled resources, for example) the involved department and project managers will escalate the conflict to the appropriate level for resolution, in accordance with the escalation procedures given in the corporate project management process.

CEO Demand:

13. That functional managers and project leaders respect the project lines of authority as exercised by the project managers.

Functional Project Leaders: integrate the work of all contributors to their specific assigned projects within each of their respective functions.

Work Package Leaders: integrate the work of individual contributors to each of their assigned work control packages within each project.

Figure 4 illustrates the relationships between these integrative roles.

Other Important Roles

Other important roles relating to projects also exist, including:

Project customer: the person or organization that will receive the benefits from the results of the project. For projects under contract, the customer usually pays for and authorizes the project when the contract is signed. For in-house projects there may be several customers.

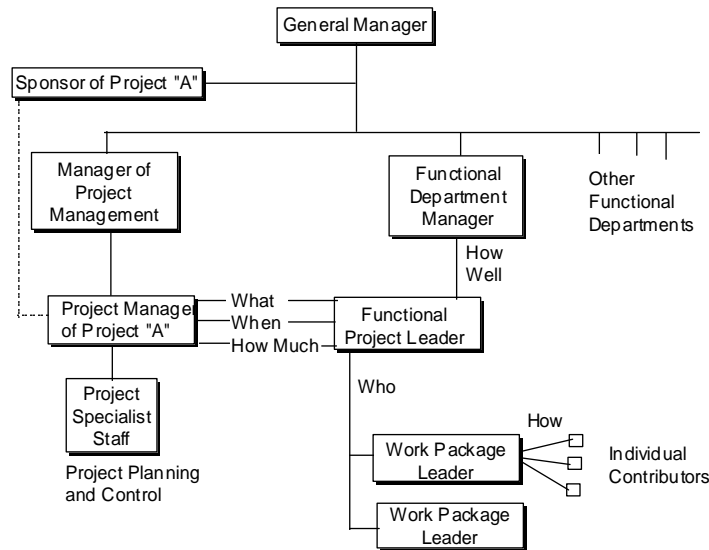


Figure 4. Relationships between the key integrative roles.¹² The project specialist staff shown reporting to the project manager of project “A” may be directly assigned to the project office of project “A” (as shown) or may be located in a functional department responsible for all project planning and control support within the organization.

Project champion: the person who promotes and keeps the project alive, who may or may not be the general manager.

Owner of the results of the project: this person or organization may or may not be the project customer.

User or operator of the project results: this person or organization may or may not be the project owner.

While all of these additional roles are important, they do not carry the same level of *integrative* responsibility as the key roles listed above. However, if the project customer organization is a major contributor to the project, performing important tasks on which project completion is dependent, then there is a need to identify the integrative roles listed above within the customer’s organization as well. The same can be said for all outside organizations that contribute significantly to the project in question.

2. Application of Integrative and Predictive Project Planning and Control Systems.

This second key concept of the project management discipline requires that

- Each project be planned and controlled on an integrated basis;
- Including all contributing functional areas or organizations;
- Through all of the project life cycle phases: conception, definition, design, development/manufacture/construct, installation/initial use/operation, post-completion;
- Including all the elements of information (schedule, cost and technical) pertinent to the situation, together with proven *earned value*¹³ techniques with cost and schedule variance reports; and
- Using currently available Web-based project management software systems.

Integrative means that all phases of the project and all the elements of information mentioned above are logically linked together. *Predictive* means that the system forecasts what will happen in the future based on the current plans, and estimates, with the actual physical progress and reported expenditures constantly updating the schedule and cost baseline for the future forecasts.

Most organizations are faced with the need to plan and execute many projects simultaneously using common resource pools, creating the need to use one common project planning and control information system for all projects. Effective application of the powerful computer-supported project planning and control systems available today requires **using one integrated system** (usually consisting of project-oriented subsystems that are properly linked together) for each and every project within the organization to:

1. Define and control systematically the project's objectives and scope.
2. Evaluate and proactively manage individual project risks together with the aggregate project portfolio risks.
3. Define and control the specification, quality, configuration and quantity of intermediate and final products (or deliverables) of the project.
4. Systematically define and control the work to be carried out using the project/work breakdown structure (P/WBS) approach.
5. Estimate the labor, material and others costs associated with the project's deliverable products and related work elements, and each summary element in the P/WBS.
6. Plan and control the sequence and timing of the project deliverables and related work elements using a top level project master schedule plus an appropriate hierarchy of schedules.
7. Authorize and control the expenditure of funds and work hours required to execute the project.
8. Provide the information—regarding both a) actual progress and expenditures and b) forecasts in the future—required by project managers, department managers, functional task leaders and work package leaders on a timely and reasonably accurate basis.
9. Continually evaluate progress and predict and mitigate problems with quality, cost, schedule and risk using earned value project management methods.
10. Report to management and customers on the current status and future outlook for project quality, cost and schedule completion, including post-completion reports.

With regard to the earlier statement that only one corporate system be used, there are times when customer demands or other factors may require that a specific project planning and control system that is different from the corporate system be used for a particular project. In such cases the different system must be capable of linking with and providing summary information to the corporate system so that all project information, and particularly the time-related resource data, can be viewed on an integrated basis for the total company.

An Overview of Project Management Systems: There are many ways to define and depict a project management system. Cleland¹⁴ has defined an overall project management system consisting of five subsystems (planning, information, control, human, and facilitative organizational subsystems) and two additional elements (techniques and methodologies, and cultural ambiance). Tuman¹⁵ presents detailed descriptions and analyses of project management information and control systems from several perspectives, reflecting his long experience in developing and implementing computer-based systems for project planning and control. He defines a "project management and control system" of broad scope, as shown in Table 3, including both technical and risk information and control systems, in addition to a project information and control system.

CEO Project Planning and Control Demands:

14. That every project is planned and controlled within the guidelines specified in the corporate project management process documentation.

15. That all P & C systems and procedures are integrated so that all project information is current and consistent throughout the organization.

16. That only one summarizing project planning and control system is used throughout the organization.

17. That *earned value* progress evaluation and forecasting methods be applied on all projects.

CEO Demand:

18. That the corporate project management process includes a detailed description of the corporate project management information and control system.

CEO Demand:

19. That all modules shown in Table 3 are included in the corporate project management process and the overall corporate information and control system.

- However one defines such systems they all consist of
- Documents (containers of information) and
- Procedures and software systems for preparation, maintenance, preservation, transmittal and utilization of the documents that are used for creating, planning, evaluating and executing projects within a given organization.

Technical Information and Control System	Project Information and Control System	Risk Information and Control System
Engineering Management Module Procurement Management Module Construction/Production Management Module Test Management Module Configuration Management Module	Project/Work Breakdown Structure Module Planning and Scheduling Module Cost Management Module -- Cost Estimating -- Cost Estimating Support -- Craft and Crew -- Unit Material -- Unit Labor hours -- Source Document -- Cost Control -- Cost Projection Accounting Module Data Entry Module On-Line Query Module	Planning Assurance (Risk Assessment) Module Quality Assurance Module Reliability Module Maintainability Module Safety Assurance Module

Table 3. Definition of a Project Management Information and Control System.¹⁶

Table 4 presents a summary of the documents typically used for project planning, authorizing, controlling and reporting. Procedures must exist for the preparation and use of each of these documents. Computer software systems incorporating essentially all of these documents and procedures have proliferated within the past ten years and have made it possible to use one integrated information system for managing all projects within the organization.

Level of Detail in Project Planning, Authorizing, Controlling and Reporting Documents: Determining how much detail is needed and practical has always been a fundamental problem in achieving effective project management. Available automated systems apparently can handle an unlimited amount of detail, but the people involved in estimating, reporting and evaluating the information have definite limits in the time they have available for planning and control purposes and in their ability to integrate and digest large amounts of data. A related problem of equal significance has always been how to effectively integrate project management systems and information with all the other business information and systems in the organization.

Two basic concepts provide invaluable assistance in resolving these two related problems:

- *Systematic, hierarchical breakdown* of the project using the project/work breakdown structure concept to define the work packages (or tasks) that form the basic elements of project planning and control, and to provide a logical structure for summarizing information for evaluation, control, and reporting purposes.
- The systematic use of the *project interface management* concept to identify the points of interaction between project plans and schedules and other established planning and control systems in the organization.

CEO Demand:
20. That all (with specifically approved exceptions) project planning, authorizing, controlling and reporting documents be produced by the supporting computer software systems.

CEO Demand:
21. That the concepts of the P/WBS and project interface management be applied to achieve an effective, sustainable level of detail in project documentation.

These concepts, coupled with the power of today’s automated systems, enable organizations to work at the appropriate, economically and practically feasible level of detail. Figure 5 (later in this paper) illustrates how project management systems can be linked with other business systems through project interfaces.

Planning	Authorizing	Controlling	Reporting
<ul style="list-style-type: none"> ▶Project Summary Plan. ▶Project/Work Breakdown Structure (P/WBS) ▶Task Responsibility Matrix ▶Project Master Schedule ▶Integrated Project Network Plan ▶Project Interface and Milestone Event List ▶Project Budget ▶Project Funding Plan ▶Project Chart of Accounts ▶Task Statements of Work ▶Task Schedules ▶Task Budgets ▶Detailed Network Plans ▶Technical Perf. Planned Value Profiles and Milestones 	<ul style="list-style-type: none"> ▶Master Contract Release ▶Project Release ▶Subcontracts and Purchase Orders ▶Task Work Orders <p style="text-align: center;"><i>[“Task: A short-term effort ... performed by one organization...”¹⁷ May be synonymous with “work package”; usually comprised of more detailed activities.]</i></p>	<ul style="list-style-type: none"> ▶Management Reserve Transaction Register ▶Cost Expenditure Reports ▶Updated planning and authorizing documents, comparing actuals with budgets and schedules <ul style="list-style-type: none"> - Project Master Schedule - Milestone Charts - Other ▶Cost Performance Reports ▶Schedule Variance Reports ▶Earned Value and Cost Variance Reports ▶Technical Perf. Measurement Reports ▶Risk & Issue Tracking Reports ▶Milestone Slip Charts ▶Trend Analysis Charts ▶Task Estimates to Complete (ETC) and Estimates at Completion (EAC) ▶Action Item Lists from Project Review Meetings 	<ul style="list-style-type: none"> ▶Monthly Progress Reports <ul style="list-style-type: none"> - Narrative - Project Master Schedule - Cost Performance Reports - Risk Tracking Reports ▶Management Reviews of Critical Projects: <ul style="list-style-type: none"> - Major Project Identification Data - Summary Status Reports - Above Reports as required

Table 4. Summary of documents for project planning, authorizing, controlling and reporting.¹⁸

3. Integrated Project Team-Working

The third basic concept of project management is that of designating and managing the *project team*, to integrate the efforts of all contributors to the project. Projects consist of many diverse tasks that require the expertise and resources of a number of different specialties. These tasks are assigned to various people and organizations, usually from both within and outside the organization holding primary responsibility for the project. Other persons hold decision making, regulatory, and approval authority over certain aspects of a project. All of these persons contributing to a given project are considered members of that project team. The most effective project management is achieved when all such contributors collaborate and work together as a well-trained team, under the integrative leadership of the project manager.

The advantages of effective *team-working*, especially in conjunction with the other two primary concepts of project management discussed above—focused, integrative responsibilities and integrative, predictive planning and control—include:

- The ability to bring needed multiple disciplines together from diverse organizations to collaborate creatively to achieve project objectives.
- Understanding of and strong commitment to the project and its objectives.
- Development of jointly agreed plans, schedules and budgets for executing the project, with resulting commitment to achieving the results within the target schedule and cost.
- Frequent monitoring of progress and expenditures and re-forecasting their future impact on intermediate milestones and project completion.

- Achieving outstanding performance on the project—at Internet speed.

Requirements for an Effective Team and for Excellent Teamwork

Because a project is comprised of a number of diverse tasks different people—each having the required expertise and experience—are needed to perform each task. In the broadest sense, all persons contributing to a project are members of the project team. However, on larger projects it is not possible to have several hundred or several thousand people working as one giant, monolithic team. Therefore we must identify the *key* project team members in order to have a reasonable number of people to work with as a team. These key team members will include at least the project manager (the team leader) and the key functional project leaders (discussed earlier). Each of these persons becomes a team leader of their sub-team within the overall project team.

The term "functional project leader" is used here generically, and includes people within the project's parent organization as well as people in outside organizations, such as consultants, contractors, vendors and suppliers. In many projects the client or customer is an active contributor, and therefore is included as a member of the team. When possible, inclusion on the project team of representatives of other outside organizations that contribute in some way to the project can be very beneficial. Such organizations include financial institutions, regulatory or oversight agencies, and labor unions, as examples.

To have an effective project team, as distinct from simply a group of people working on loosely related tasks, five conditions are necessary:

1. Identification of the project team members and definition of the role and responsibilities of each.
2. Clearly stated and understood project objectives.
3. An achievable project plan and schedule.
4. Reasonable rules of the game (procedures regarding information flow, communication, team meetings, and the like).
5. Leadership by the project manager.

If any of these conditions is not present it will be difficult to achieve effective teamwork.

1. Identification of the Project Team Members and Definition of the Role and Responsibilities of Each

It seems obvious that in order to have an effective team, the team players must be identified. However, experience shows that project managers often fail to do this, or only identify their team members on an "as needed" basis when a new task comes up that cannot be performed by someone already on the team. In some cases the project manager may know the team members, but will fail to inform the other members, so that only the project manager knows who is on the team.

CEO Demands:

22. That a complete team list as described here is produced and distributed to all key team members.

Using the defined project scope and objectives and the initial list of project deliverables, a listing of all project team members is compiled and distributed to the entire team. This list should include each team member's full name, address (regular and e-mail), voice and facsimile telephone numbers, and any other pertinent communication information. Frequently, this list will include home telephone numbers. For those project teams that have established escalation procedures (for resolving issues, conflicts or other problems), the team member's immediate supervisor with office and home telephone numbers are also listed.

The general duties and responsibilities of each team member will normally be documented by the organization's human resource practices and its project management process description. However, for effective project teamwork it is imperative to define the responsibilities of each team member for each task to be carried out on their specific project. The best tool available for this purpose is the task/responsibility matrix¹⁹ based on the project/work breakdown structure.

2. Clearly Stated and Understood Project Objectives

The basic project objectives will usually be known prior to identifying the project team members. However, for effective teamwork, experience has demonstrated that a team effort is required to clarify, expand on, and quantify these initial project objectives, with input as appropriate with the project customer, to produce a statement of

CEO Demands:

23. That the project team develops a statement of project objectives that all team members understand and support — consistent with the 'official' project objectives—within two weeks of the team formation.

objectives that all members of the team understand, accept and are committed to. Hastings et. al.²⁰ point out that teams must be aware that there are multiple and often conflicting sets of expectations about their performance on the project, including expectations from outside the project, the team, and each individual team member. These authors suggest thinking about good performance and successful achievement along two dimensions, the hard/soft dimension and the acceptable/excellent dimension. The hard/soft dimension refers to two different kinds of *criteria* of performance, and the acceptable/excellent dimension refers to two different *standards* of performance.

"The Hard/Soft Dimension: The hard/soft dimension concerns the tangible and intangible aspects of performance. Hard criteria tend to be measurable, the most frequent being to do with time, cost, resources and technical standards. Soft criteria on the other hand are more subjective and difficult to measure. Yet they are clearly used frequently in evaluating performance. They are more about "how" the task was accomplished, the attitudes, skills and behavior demonstrated by the team and its members....

"In setting success criteria ordinary teams tend to concentrate on *hard* criteria only and ask questions such as, "How many, how much and when?" Superteams do all this too (and mostly more punctiliously) but add another dimension. They also draw out clients' and sponsors' more subtle expectations, those to do with ways of working and the relationships with the client, to attitudes adopted on such things as quality, reliability and attention to detail. These are all factors that are crucial to a client's ultimate satisfaction. Equally these soft criteria are explored, clarified and agreed with the sponsor, and service departments.

CEO Demands:

24. That project teams set both hard and soft criteria for project success.

"The Acceptable/Excellent Dimension. The acceptable/excellent dimension on the other hand concerns standards of performance. And it is around this dimension that the whole Superteam idea was originally crystallized. In a world where the best is no longer good enough, the frontiers of performance are always being stretched. "The best can always be bettered" could almost be the Superteam motto. We find many teams who think that their performance is good, but who in fact are under-performing.

CEO Demands:

25. That each project team establishes success criteria to achieve excellent results, beyond the normal acceptable standards.

They may be averagely good when compared with those other teams they see. Their performance is acceptable but in no way outstanding.... Superteams strive to be different, and achieve just a little bit more than the competition. They are constantly looking for ways to do things better, constantly testing their assumptions about what is achievable and searching for ways to overcome any problems that lie in the path."²¹

In achieving results beyond the normal acceptable standards the project manager and team must always be alert to the fact that such results must be achieved within the bounds of the established schedule, resources available and cost.

3. An Achievable Project Plan and Schedule

Effective teamwork depends heavily on having a project plan and schedule that reflects the way the team members will actually do the work. The team must understand and be committed to the plan and schedule, which must be reasonably achievable. The project management literature contains abundant descriptions of how to plan projects. For example, "Project Team Planning and Project Start-Up"²², describes methods for setting the stage for effective project teamworking.

CEO Demands:

26. That each team establishes an achievable project plan to which all team members are committed.

4. Reasonable Rules of the Game

Reasonable rules, procedures, guidelines and practices for how the project will be planned, the work authorized, progress reported and evaluated, conflicts escalated and resolved, and so on, must be established. Trying to achieve good teamwork on a complex project without having such established procedures is like collecting the best athletes from six different sports and turning them loose on an open, unmarked field with instructions to "play the game as hard as you can".

Each organization must develop its own set of project procedures covering the topics of importance within its environment. On large projects, such procedures are usually tailored to the specific needs of that project and issued to all team members in the form of a Project Procedures Handbook, Project Manual, Project Guidelines, or some similar document. The project procedures usually rely on established corporate practices and procedures wherever possible, and avoid duplication or conflict with such practices.

CEO Demands:

27. That the corporate project management process documentation includes the procedures needed to insure effective teamwork.

5. Leadership By the Project Manager

Extensive literature exists on the subject of leadership, and it is not the intent here to treat this complex and important subject in great detail. The key point to be made is that the project manager is expected to be the *leader* of the project. Successful project managers have used many different styles and methods of leadership, depending on their own personalities, experience, interpersonal skills and technical competence on the one hand, and the characteristics of the project and its environment on the other. Owens concluded the following regarding project leadership and related behavioral topics:

CEO Demands:

28. That project managers be given appropriate leadership training prior to their being put in charge of any major project.

- Leadership behavior. Project managers cannot rely on one particular leadership style to influence other people's behavior. Different situations call for different approaches, and leaders must be sensitive to the unique features of circumstances and personalities.
- Motivational techniques. An awareness of unfulfilled needs residing in the team is required to successfully appraise motivational requirements and adjust a job's design to meet those needs.
- Interpersonal and organizational communications. Conflict situations occur regularly. A problem-solving or confrontation approach (confronting the problem and not the persons), using informal group sessions, can be a useful resolution strategy.
- Decision-making and team-building skills. Participative decision making meets the needs of individual team members and contributes toward effective decisions and team unity.²³

Continual Improvement in Project Management

Every project must be reviewed carefully after it has been completed to determine where the corporate project management process was successful and where improvements are required. New developments occur in this discipline continually, and the corporate process and systems must continually be improved to reflect the lessons learned and newly available systems and procedures.

CEO Demand:

29. That a post-completion appraisal be performed on every project to document the lessons learned and improve the corporate project management process, practices and procedures.

Integrating Project Management Into the Organization

It is no longer sufficient to treat the project management discipline as an add-on, separate approach to how we handle our projects. It must be fully integrated with all affected business systems. This means effectively linking all project management systems and procedures with those that deal with:

- Financial and accounting.
- Resources: people, facilities, equipment.
- Development of product and services: research, engineering, prototype manufacturing.
- Operations: manufacturing, production, field service and support.
- Procurement: purchasing and contracting.
- Marketing: advertising, sales, distribution.

CEO Demand:

30. That the project management discipline and supporting systems be fully integrated with affected parts of the organization.

One of the primary causes of difficulty in planning and scheduling projects has always been how to avoid too much detail in project plans, and how to avoid conflict between project plans and the planning and scheduling systems and methods used in the contributing functional departments. One answer in this area is the establishment of what has been termed an "Project/Operations Planning and Control" function, for want of a better name. Figure 5 illustrates this concept schematically, and shows how projects, whether

in portfolios, programs, or stand-alone, and project management systems can be linked and integrated with the overall operations of the organization.

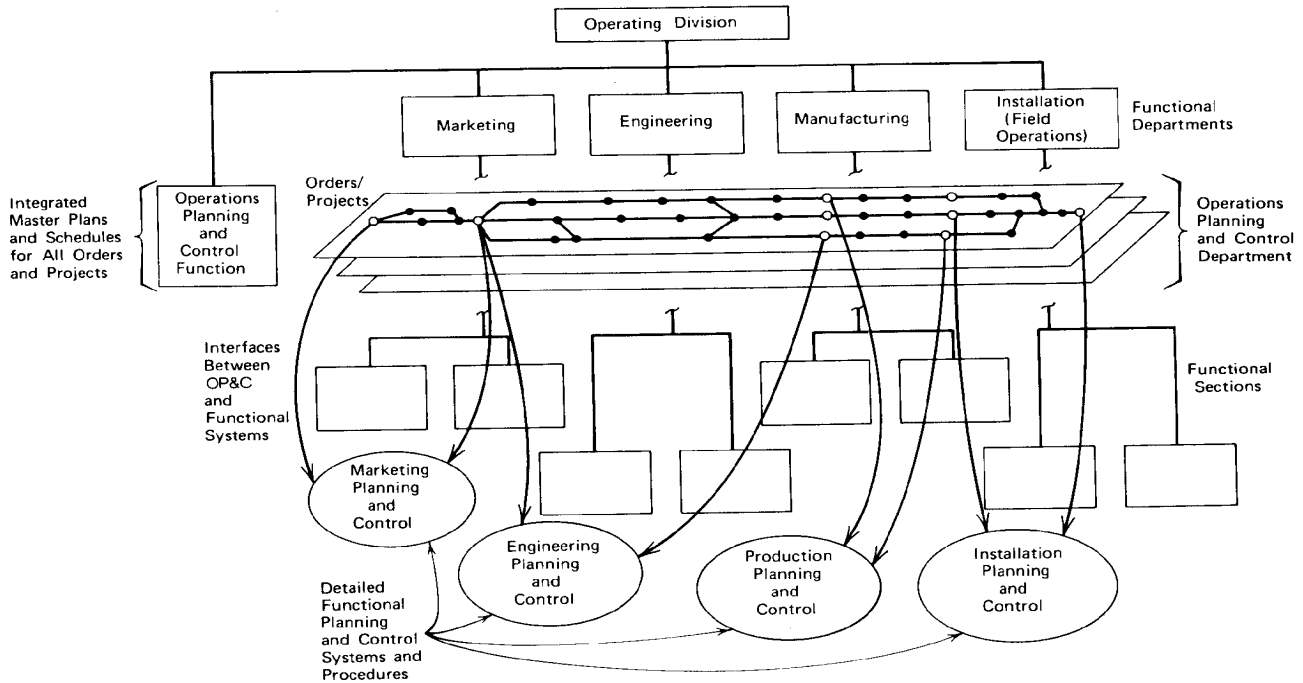


Fig. 5. General Illustration of an Integrated Project/Operations Planning and Control System.²⁴

Using the Internet In Response to Its Challenges

“Internet Speed” refers to the recent drastic reductions in both a) the time required to launch a new product or service, and b) the time available to competitively respond to market opportunities. The Internet both causes this situation and enables the competitive response. But using the Internet to help deliver completed projects in shorter times requires a concerted effort, starting with the CEO.

There are a number of powerful, commercially available, Web-enabled project management software systems using client servers and desktop/notebook/handheld computers that bring Internet speed to the project planning and control arena. These systems:

- Enable improved collaboration and communication for project teams no matter where the members are located geographically, with everyone working from the same currently updated information.
- Provide risk and issue tracking and escalation processes.
- Empower staff members through access to central information repositories, with suitable controls on who can change the information.
- Automate much if not most of the project management process and related documentation and record keeping.
- Enable key resource assignment within and between projects, programs, and project portfolios, and facilitate corporate resource planning and acquisition.
- Enable tracking and evaluation of changes in project scope, schedule, cost and risk.
- Allow integration of project management processes with all other business systems.
- Capture the “lessons learned” on every project for incorporation into the project management process and related data repositories.

CEO Demands:

31. That a Web-enabled project management system be selected and implemented—as a project—at the most effective (project portfolio or total enterprise) level.

The selection and implementation of such systems is in itself a complex management project that requires application of the principles and practices discussed in this paper.

Using Internet Resources To Improve Your Project Management

The Internet and World Wide Web provide low cost, rapid access to many resources that can be used to improve an organization's project management capabilities, and to keep them abreast of the competition. Table 5 is a partial listing of Web sites related to this subject, courtesy of Max Wideman, with additions to his list. Many of these provide further links to other useful project management sites.

<http://www.aipm.com/research.htm>
<http://www.airtime.co.uk/users/wysywig/gloss.htm#WBS>
http://www.altisinc.com/Links/100_Rules.html
<http://www.artemisp.com>
<http://www.asapm.org>
<http://www.BUtrain.com>
<http://www.cbponline.com/index.htm>
<http://www.cs-solutions.com>
http://www.dot.ca.gov/hq/oppd/pdpm/chap_hm/chapt08/chapt08.htm
<http://www.gantthead.com/Gantthead/default/>
<http://www.governance.uottawa.ca/english/education/dbm/splash.html>
<http://www.iil.com>
<http://www.infofer.com/infocons/pmi/insight.html>
<http://www.inovie.com/>
<http://www.iproj.com>
<http://www.maxwideman.com>
<http://www.michaelgreer.com/>
<http://www.aol.com/allenweb/>
<http://www.mpug.org/>
<http://www.newgrange.org/>
<http://www.onelist.com/archive/PM-Talk>
<http://www.planview.com>
<http://www.pmi.org/>
<http://www.PMForum.org/>
<http://www.pmpartners.com/resources/index.html>
<http://www.pmsolutions.com>
<http://www.powerpointers.com/>
<http://www.primavera.com>
http://www.ProjectConnections.com/knowhow/template_list/subjects/pmskills.html#planning
<http://www.projectlearning.com/project-software/index.htm>
<http://www.projectmagazine.com>
<http://www.projectnet.co.uk/pm/pmgloss.htm>
<http://www.projectsresults.com/>
<http://www.robbinsgioia.com/>
http://www.scitor.com/resources/project_management_links.htm
http://www.scitor.com/resources/white_papers/harvey_levine.htm
<http://www.startwright.com/>
http://www.tbs-sct.gc.ca/cio-dpi/ciohome/infoproducts/information_e.html
<http://www.txconn.org> (home page for the PMI Texas Connection Sept. 13-15 2001 PM Conference)
http://www.visualproject.net/index_Flash.html

Table 5. Partial List of Web Sites Related to Project Management²⁵. If some pages are no longer available, try deleting the ends of the URL until you get back to its home page. This list includes e-zines, associations, newsletters, consultants, trainers, software vendors and others, and is by no means complete.

Conclusion

An organization that fulfills the listed demands will join the ranks of those who are on the leading edge of excellence in the global, Internet-Age market. By exploiting the capabilities and power of integrated project management as described above, coupled with the facilities of the Internet—and the right strategies, of course!—organizations will survive and prosper.

References:

- 1 Sources: Accenture (formerly Anderson Consulting) and The Conference Board; multiple answers accepted; as reported in **PC Magazine Internet Business**, June 12, 2001, p 5
- 2 Siegel, David, **Futurize Your Enterprise**, Wiley, NY, 1999, 4, quoting a survey by the Booz Allen & Hamilton/Economic Intelligence Unit.
- 3 Tapscott, Don, Alex Lowy and David Ticoll, **Blueprint to the Digital Economy**, McGraw-Hill, 1998, 22.
- 4 Ibid., 23.
- 5 Ibid., 23-24. An excellent in-depth discussion of the various types of EBC is given in this reference.
- 6 From Archibald, Russell D., **Managing High-Technology Programs and Projects**, 2nd Ed, 1992, John Wiley & Sons, New York, 9.
- 7 Dye, Lowell D., and Pennypacker, James S. 2000. "Project Portfolio Managing and Managing Multiple Projects: Two Sides of the Same Coin?" **Proceedings of the 2000 PMI Seminars & Symposium**. Newtown Square, PA: Project Management Institute. 321.
- 8 From Archibald, Russell D., Chapter 23, "Role Management: The Integrative Roles in Project Management", **Project Management for the Business Professional: A Comprehensive Guide**, Joan Knutson, Editor, Wiley, NY, 2001, 440-457.
- 9 See Dinsmore, Paul C., **Winning in Business With Enterprise Project Management**, AMACOM American Management Association, New York, 1999, 72-76.
- 10 Ibid, 64.
- 11 Ibid, 64-72.
- 12 Archibald, 1992, op cit, 79.
- 13 See Fleming, Quentin W., and Joel M. Koppelman, **Earned Value Project Management**, 2nd Ed, Newtown Square, PA, Project Management Institute, 2000.
14. Cleland, David I., "Defining a Project Management System", **Project Management Quarterly**, Project Management Institute, Drexel Hill, PA, December 1977.
15. Tuman, John, Jr., Chapter 27, "Development and Implementation of Project Management Systems", **Project Management Handbook**, David I. Cleland and William R. King, Editors, Van Nostrand Reinhold, New York, 2nd Ed., 1988, 652-691.
- 16 Ibid, 673.
- 17 Archibald, 1992, op cit, 24.
- 18 Ibid, 301.
- 19 Ibid, 208.
20. Hastings, Colin, Peter Bixby and Rani Chaudhry-Lawton, **The Superteam Solution**, University Associates, San Diego, 1987, 32-42.
21. Ibid, 35-37.
- 22 Ono, Daniel P., and Russell D. Archibald, **Chapter 28**, "Team Infrastructure Management: Project Team Planning and Project Start-Up," **Project Management for the Business Professional: A Comprehensive Guide**, Joan Knutson, Editor, Wiley, NY, 2001, 528-549.
23. Owens, Stephen D., "Project Management and Behavioral Research Revisited," **Project Management Institute Proceedings (Toronto 1982)**, p II-F.1.
- 24 Archibald, 1992, op cit, 148.
- 25 Source: Wideman, R. Max, <http://www.maxwideman.com>