

Il Project Management a supporto della Pubblica Amministrazione: *Stato dell'arte a livello internazionale*

Project Management in Support of Public Administration: *Reflecting the State of the Art in International Project Management*

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Abstract

This paper is intended to provide governmental ministers and their senior executives with the understanding of what they must demand of their staff members, today and in coming years, to achieve the full benefits of modern project management 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 executives and convey to them the direction that the development of the project management discipline should be going. The important linkage is illustrated between the organization's mission, its current and future 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 ministers and other senior executives, and the performance levels that can be demanded for each of these principles and practices are presented as bench marks for progress measurement of continued improvement.

PM Demands: Inserts like this are placed in the text where reasonable demands must be made regarding the topic being discussed:

PM Policy: 3 demands

Strategic PM: 9 demands

Operational PM: 5 demands

Operational Planning and Control: 8

Project Teams: 5 demands

PM Improvement: 3 demands

Total demands: 33

Three Project Management Policies Are Required

To gain the full power of project management within an agency the Minister and his or her senior executives must demand that:

- Project portfolio management/PPM fully supports the agency's mission and current and future strategies.
- A coherent portfolio project management/PPM process exists within the agency and is fully understood by all.
- This PPM process and the supporting systems and tools are fully integrated with the agency's policies, procedures and systems.

Three PM Policy Demands:

1. PPM must fully support the agency's mission and strategies.
2. A coherent PPM process must exist and be fully understood.
3. PPM process and tools must be fully integrated.

The more detailed demands that must be made in support of these three PM policy demands are identified in the remainder of this paper. When these demands are fulfilled the results will provide significant advantages to the organization in today's world of Internet speed. They will also enable the organization to collaborate effectively with counterpart agencies, both national and foreign, suppliers, contractors, non-government and other controlling agencies, as required in this Internet Age, benefiting the country and its citizens.

Implementing Strategies Through Projects

Strategically managing the growth of any governmental agency, institution, company, 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 to the mission and its future direction;
- **Documentation and dissemination** of the key objectives and strategies to fulfill the mission;
- **Selection, planning and execution of specific programs and 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 achieve them. 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.

Project-Driven versus Project-Dependent Organizations

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.

Within governmental organizations project-driven organizations also exist, of course. In the USA, for example, within the U.S. Department of Energy the Global Threat Reduction Program exists only to plan and execute a large number of projects throughout the entire world to reduce the threat of terrorists acquiring radioactive material that could be used to make “dirty bombs.”

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 most governmental agencies, manufacturing (consumer products, pharmaceuticals, engineered products, etc.), banking, transportation, communications, computer hardware and software developers and suppliers, universities and other institutions, among others. These organizations depend on projects to support their primary missions or 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: political, technical, cost and schedule.
- To plan, execute, and control each project simultaneously with all other projects effectively and efficiently so that each will achieve its approved objectives: meeting the related strategic objective by producing the specified results on schedule and within budget.

Strategic PM Demands:

1. Every authorized project must clearly support an approved strategic objective of the organization.
2. Each project’s risks must be evaluated and managed using currently available methods and systems.
3. All projects must be evaluated, prioritized and approved using the same criteria.

The first of these objectives is essential 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.

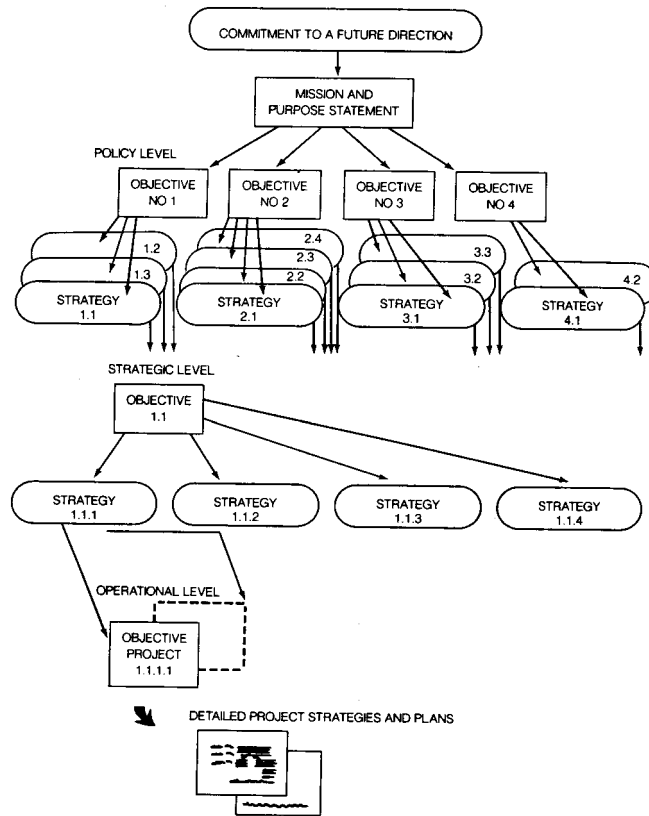


Figure 2. The hierarchy of objectives, strategies and projects.¹

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

Program: A group of related projects managed in a coordinated way to obtain benefits not available when managing them individually.

Source: *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*, 3rd Ed 2004 © Project Management Institute, p 368

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*, 3rd ed. 2003, John Wiley & Sons, p 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.²

As indicated in Figure 3, a 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 basic project categories or product line, geographic or technological divisions of the organization, industry or market.

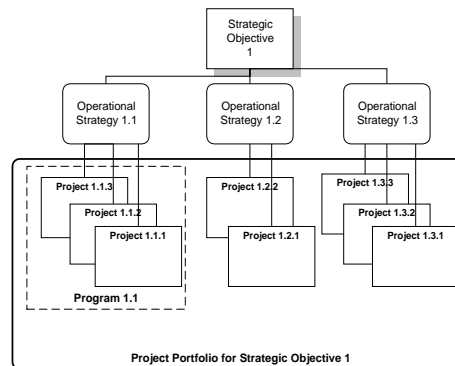


Figure 3. Schematic of Strategies, Projects, a Program and a Project Portfolio.³

A **Project Portfolio Steering Group** consisting of senior executives as appropriate is usually 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 includes the following twelve generic 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 as appropriate for each project category.
12. Periodically re-prioritize, re-allocate resources and re-schedule all programs and projects as required.

Documenting the Organization's Project Portfolio Management Process

In order to achieve the full benefits of modern project management each agency must have a documented picture of its overall project management process. This documented 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,
- Defines, for each project category, the corporate guidelines for project risk analysis and project 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 agency policies, procedures and forms. When this is done properly the result is *integrated* project portfolio management.

Strategic PM Demands:

4. The project management process of the organization must be documented in a coherent, easily understood manner.
5. All projects must be planned & managed appropriately for their specific categories within their appropriate, defined portfolios.

Project Categories

Projects can be categorized in many ways for different purposes. The best process management process for each major project category must be applied to achieve the full power of project management. Table 3 presents a recommended list of project categories for the purpose of selecting and adapting the most effective project management process for those categories for which the agency has responsibility.

Project Categories: Each having similar life cycle phases and a unique project management process	Examples
1. Aerospace/Defense Projects 1.1 Defense systems 1.2 Space 1.3 Military operations	New weapon system; major system upgrade. Satellite development/launch; space station mod. Task force invasion
2. Business & Organization Change Projects 2.1 Acquisition/Merger 2.2 Management process improvement 2.3 New business venture 2.4 Organization re-structuring 2.5 Legal proceeding	Acquire and integrate competing company. Major improvement in project management. Form and launch new company. Consolidate divisions and downsize company. Major litigation case.
3. Communication Systems Projects 3.1 Network communications systems 3.2 Switching communications systems	Microwave communications network. 3 rd generation wireless communication system.
4. Event Projects 4.1 International events 4.2 National events	2004 Summer Olympics; 2006 World Cup Match. 2005 U. S. Super Bowl; 2004 Political Conventions.
5. Facilities Projects 5.1 Facility decommissioning 5.2 Facility demolition 5.3 Facility maintenance and modification 5.4 Facility design/procurement/construction Civil Energy Environmental High rise Industrial Commercial Residential Ships	Closure of nuclear power station. Demolition of high rise building. Process plant maintenance turnaround. Conversion of plant for new products/markets. Flood control dam; highway interchange. New gas-fired power generation plant; pipeline. Chemical waste cleanup. 40 story office building. New manufacturing plant. New shopping center; office building. New housing sub-division. New tanker, container, or passenger ship
6. Information Systems (Software) Projects All types of software projects	New project management information system. (Information system hardware is considered to be in the product development

	category.)
7. International Development Projects 7.1 Agriculture/rural development 7.2 Education 7.3 Health 7.4 Nutrition 7.5 Population 7.6 Small-scale enterprise 7.7 Infrastructure: energy (oil, gas, coal, power generation and distribution), industrial, telecommunications, transportation, urbanization, water supply and sewage, irrigation)	People and process intensive projects in developing countries funded by The World Bank, regional development banks, US AID, UNIDO, other UN, and government agencies; and Capital/civil works intensive projects —often somewhat different from 5. <i>Facility Projects</i> as they may include, as part of the project, creating an organizational entity to operate and maintain the facility, and lending agencies impose their project life cycle and reporting requirements.
8. Media & Entertainment Projects 8.1 Motion picture 8.2 TV segment 8.2 Live play or music event	New motion picture (film or digital). New TV episode. New opera premiere.
9. Product and Service Development Projects 9.1 Information technology hardware 9.2 Industrial product/process 9.3 Consumer product/process 9.4 Pharmaceutical product/process 9.5 Service (financial, other)	New desk-top computer. New earth-moving machine. New automobile, new food product. New cholesterol-lowering drug. New life insurance/annuity offering.
10. Research and Development Projects 10.1 Environmental 10.2 Industrial 10.3 Economic development 10.4 Medical 10.5 Scientific	Measure changes in the ozone layer. How to reduce pollutant emission. Determine best crop for sub-Sahara Africa. Test new treatment for breast cancer. Determine the possibility of life on Mars.
11. Other Categories?	

Table 3. Recommended project categories/sub-categories, with each category (or subcategory) having similar project life cycle phases and one unique process management process [Archibald 2003, Fig. 2.3, p.35].

Three 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 Roles⁴

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:

Strategic PM Demand:
 6. *All* of these integrative roles must be clearly defined, understood and assigned to qualified people.

Executive Level

Minister as General Manager: integrates all projects with the agency's 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

Strategic PM Demand:
 7. The Minister (or an identified deputy) must understand and fulfill these executive project management responsibilities.

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.

Project Portfolio Steering Group: manages each assigned project portfolio by conducting periodic portfolio reviews of all active and planned projects in the portfolio and making strategic decisions regarding selection and approval of new projects, cancellation and changes in project priorities, and allocation of resources to all projects in the portfolio.

Project Sponsor: integrates, on assigned major projects, 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. 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. Within the past decade the importance of the project sponsor role been recognized, together with the importance of formally identifying who is assigned to this role for a specific project.

Strategic PM Demands:

8. A Project Portfolio Steering Group must be appointed for each project portfolio.
9. A Project Sponsor must be appointed for every major project and given appropriate indoctrination to carry out this role effectively.

Multi-Project/Portfolio Level

Manager/Director 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 the agency. The manager of project management may also be the project sponsor for specific projects, in some situations.

Operational PM Demand:

1. An experienced manager of project management must be appointed reporting to a senior executive of the organization.

Some organizations have appointed a **Chief Projects Officer**, on a par with the position of Chief Information Officer. This position might combine aspects of the project sponsor and manager of project management roles.

The **project management office** has emerged in many organizations as the 'home' for the project management function. Dinsmore says "Any 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."⁵ He goes on describe four possibilities:

Operational PM Demand:

2. An appropriate home must be established within the organization for the project management discipline.

- The autonomous project team.
- The project support office.
- Project management center of excellence.
- The program management office.⁶

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

Operational PM Demand:

3. All multi-project and program managers must be given the training needed to ensure their effective performance.

Operational PM Demand:

4. Each project manager must respect the functional lines of authority when giving project direction to team members.

manager is usually assigned to each project within the overall program.

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 managers and 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.

Functional and Project Contributor Level

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

Operational PM Demand:
5. Functional managers and project leaders must 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.

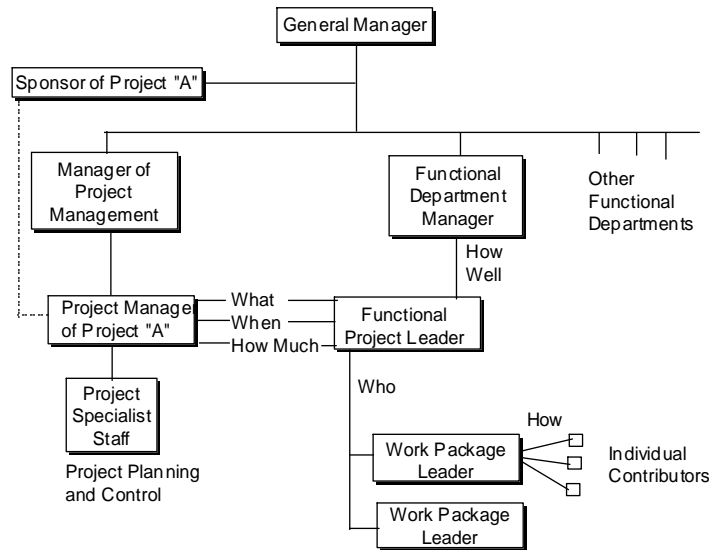


Figure 4. Relationships between the key integrative roles.⁷ The project specialist staff shown reporting to the project manager of project “A” may be directly assigned to the project office of project “A” (as shown) or may be located in a Project Management Office responsible for all project planning and control support within the organization.

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.

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.

Project Stakeholders

Project stakeholders include all persons or agencies that have any level of interest in the project or its outcome. This includes all of the persons carrying out the roles described above, plus all team members who contribute in some way to the project. In addition there are often a number of people outside the

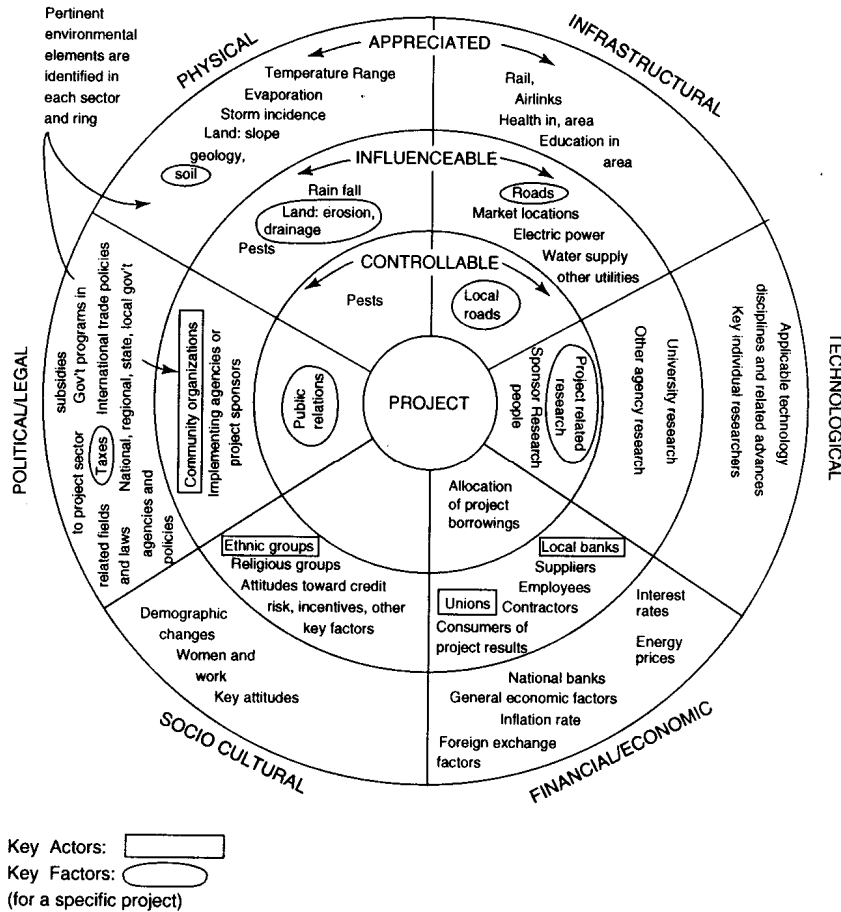


Figure 5. A method for documenting an environmental scan. Source: Archibald. 2003, Fig. 2.5, p 51

project itself who must be considered project stakeholders, especially in the case of governmentally sponsored projects. Figure 5 illustrates a useful way to identify actors (stakeholders) and factors that must be considered when planning for total success of any major project. Identifying and connecting the project with all key actors and factors affecting it is especially important with projects that directly affect the local and global environment.

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*⁸ techniques with cost and schedule variance reports; and
- Using currently available Web- or Intranet-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 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 more detailed 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. Cleland⁹ has defined an overall project management system consisting of five subsystems (planning, information, control, human, and facilitative organizational subsystems) and two additional

Operational Project Planning and Control Demands:

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

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

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

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

Operational Project Planning and Control Demands:

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

Operational Project Planning and Control Demands:

6. That all modules shown in Table 4 are included in the corporate project management process and the overall corporate information and control system.

elements (techniques and methodologies, and cultural ambiance). Tuman¹⁰ 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 4, (below) including both technical and risk information and control systems, in addition to a project 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	Project/Work Breakdown Structure Module	Planning Assurance (Risk Assessment) Module
Procurement Management Module	Planning and Scheduling Module	Quality Assurance Module
Construction/Production Management Module	Cost Management Module	Reliability Module
Test Management Module	-- Cost Estimating	Maintainability Module
Configuration Management Module	-- Cost Estimating Support	Safety Assurance Module
	-- Craft and Crew	
	-- Unit Material	
	-- Unit Labor hours	
	-- Source Document	
	-- Cost Control	
	-- Cost Projection	
	Accounting Module	
	Data Entry Module	
	On-Line Query Module	

Table 4. Definition of a Project Management Information and Control System.¹¹

Table 5 (next page) 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 15 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:

Operational Project Planning and Control Demands:

7. All (with specifically approved exceptions) project planning, authorizing, controlling and reporting documents be produced by the supporting computer software systems.

Operational Project Planning and Control Demands:

8. The concepts of the P/WBS and project interface management be applied to achieve an effective, sustainable level of detail in project documentation.

- *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.

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><i>[“Task: A short-term effort ... performed by one organization....”¹² 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 - 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 - Narrative - Project Master Schedule - Cost Performance Reports - Risk Tracking Reports ▶ Management Reviews of Critical Projects: - Major Project Identification Data - Summary Status Reports - Above Reports as required

Table 5. Summary of documents for project planning, authorizing, controlling and reporting.¹³

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.

Project Team Demands:

1. A complete team list as described here must be 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 fax 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 matrix¹⁴ 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 from the project customer, to produce a statement of objectives that all members of the team understand, accept and are committed to. Hastings et. al.¹⁵ 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, within the team, and from each individual team member.

Project Team Demands:

2. The project team must develop 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.

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"¹⁶, describes methods for setting the stage for effective project team-working.

Project Team Demands:

3. That each team must establish or otherwise commit to 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 and communicated to the project team. 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.

Project Team Demands:

4. The agency's project management process documentation must include 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 any 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:

- 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.

Project Team Demands:

5. Project managers must be given appropriate leadership training prior to their being put in charge of any major project.

- 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.¹⁷

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.

PM Improvement Demand:

1. A post-completion appraisal must 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.

PM Improvement Demand:

2. The project management discipline and supporting systems must 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 a “Project/Operations Planning and Control” function, for want of a better name. Figure 6 (next page) 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.

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.

PM Improvement Demand:

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

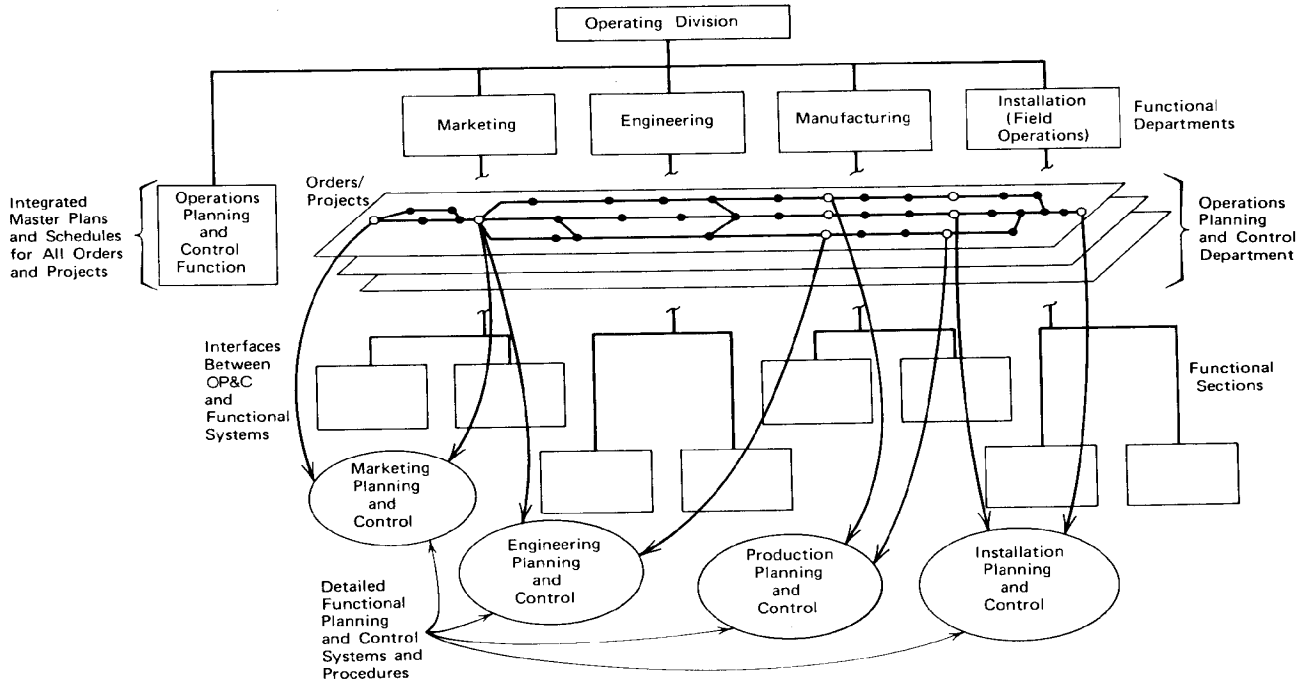


Fig. 6. General Illustration of an Integrated Project/Operations Planning and Control System.¹⁸

- Empower staff and project team 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.

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.

Conclusion

An organization that fulfills the listed demands will join the ranks of those who are on the leading edge of excellence in managing governmental agencies and in fact essentially every type of organization that depends on projects and programs for achieving their objectives. By exploiting the capabilities and power of integrated project management as described above, coupled with the facilities of the Internet—and with good definition of the right strategies, of course!—the governmental agencies will survive and prosper while delivering the desired benefits to their citizens and countries in the most effective manner possible.

References:

- 1 From Archibald, Russell D., **Managing High-Technology Programs and Projects**, 3rd ed, 2003, John Wiley & Sons, New York, 9.
- 2 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.
- 3 Archibald, 2003, op cit, 13.
- 4 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.
- 5 Ibid, 64.
- 6 Ibid, 64-72.
- 7 Archibald, 2003, op cit, 85.
- 8 See Fleming, Quentin W., and Joel M. Koppelman, **Earned Value Project Management**, 2nd Ed, Newtown Square, PA, Project Management Institute, 2000.
9. Cleland, David I., "Defining a Project Management System", **Project Management Quarterly**, Project Management Institute, Drexel Hill, PA, December 1977.
10. 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.
- 11 Ibid, 673.
- 12 Archibald, 2003, op cit, 25.
- 13 Ibid, 301.
- 14 Ibid, 208.
15. Hastings, Colin, Peter Bixby and Rani Chaudhry-Lawton, **The Superteam Solution**, University Associates, San Diego, 1987, 32-42.
- 16 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.
17. Owens, Stephen D., "Project Management and Behavioral Research Revisited," **Project Management Institute Proceedings (Toronto 1982)**, p II-F.1.
- 18 Archibald, 2003, op cit, 197.