МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ

КАЗАНСКИЙ ГОСУДАРСТВЕННЫЙ АРХИТЕКТУРНО-СТРОИТЕЛЬНЫЙ УНИВЕРСИТЕТ

Кафедра иностранных языков

Казань
2011

Составитель: Э.С. Максудова
УДК 372.8+802.0
ББК 81.2 – 923 Англ.

Печатается по решению заседания кафедры иностранных языков Казанского государственного архитектурно-строительного университета протокол № 3 от 13 ноября 2010 года.

Методические указания для студентов дневного отделения по развитию умения читать оригинальную литературу по широкому профилю специальностей.

Учебное пособие. – Казань, КГАСУ, 2011. – 37с.

Методические указания на английском языке «Управление проектом» составлены в соответствии с требованиями программы.

Целью данной работы является совершенствование навыков перевода научно-технической литературы по широкому профилю специальности.

Отв. редактор: канд. фил. наук, зав. кафедрой иностранных языков КГАСУ Максудова Э.С.

The goals of this manual are:

- To describe the basic characteristics of project management;
- To describe key general management skills;
- To demonstrate how project management processes can be organized;
- To develop an understanding of quality requirements that influence the success of the project;
- To help students understand the importance of human resource management;
- To forester appropriate skills of communications management;
- To enable students to understand which risks are likely to affect the projects;
- To demonstrate how procurement and solicitation help project needs be best met;
- To develop an understanding of contract administration.

The main goal of this manual is to perfect skills in translation of original texts from English into Russian.

INTRODUCTION

As you read Introduction, look for answers to the following questions, put them down, translate them in a written way and then translate the whole text:

- What characteristics do operations and project share?
- What do operations and projects differ in?
- How can the form project management be used?

What is a Project?

Organizations perform work. Work generally involves either operations or projects, although the two may overlap. Operations and projects share many characteristics; for example, they are:

- Performed by people.
- Constrained by limited resources.
- Planned, executed, and controlled.

Operations and projects differ primarily in that operations are ongoing and repetitive while projects are temporary and unique. A project can thus be defined in terms of its distinctive characteristics—a project is a temporary endeavor undertaken to create a unique product or service. Temporary means that every project has a definite beginning and a definite end. Unique means that the product or service is different in some distinguishing way from all similar products or services.

Projects are undertaken at all levels of the organization. They may involve a single person or many thousands. They may require less than 100 hours to complete or over 10,000,000. Projects may involve a single unit of one organization or may cross organizational boundaries as in joint ventures and partnering. Projects are often critical components of the performing organization's business strategy. Examples of projects include:

- Developing a new product or service.
- Effecting a change in structure, staffing, or style of an organization.
- Designing a new transportation vehicle.
- Developing or acquiring a new or modified information system.
- Constructing a building or facility.
- Running a campaign for political office.
- Implementing a new business procedure or process.

What is Project Management?

Project management is the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectations from a project; fleeting or exceeding stakeholder needs and expectations invariably involves balancing competing demands among:

• Scope, time, cost, and quality.
• Stakeholders with differing needs and expectations.
• Identified requirements (needs) and unidentified requirements (expectations).

The term project management is sometimes used to describe an organizational approach to the management of ongoing operations.

CHAPTER I

As you read Chapter I, look for answers to the following questions, put them down, translate them in a written way and then translate the whole text:

- Why is each project divided into several project phases?
- What does each project phase normally include?
- What do project life cycles generally define?
- What are stakeholders?
- Whom do stakeholders on every project include?
- Why may managing stakeholder expectations be difficult?

The project management context

Projects and project management operate in an environment broader than that of the project itself. The project management team must understand this broader context—managing the day-to-day activities of the project is necessary for success but not sufficient.

Project phases and the project life cycle

Because projects are unique undertakings, they involve a degree of uncertainty. Organizations performing projects will usually divide each project into several project phases to provide better management control and appropriate links to the ongoing operations of the performing organization. Collectively, the project phases are known as the project life cycle.

Characteristics of Project Phases

Each project phase is marked by completion of one or more deliverables. A deliverable is a tangible, verifiable work product such as a feasibility study, a detail design, or a working prototype. The deliverables, and hence the phases, are part of a generally sequential logic designed to ensure proper definition of the product of the project.

The conclusion of a project phase is generally marked by a review of both key deliverables and project performance in order to (a) determine if the project should continue into its next phase and (b) detect and correct errors cost effectively. These phase-end reviews are often called phase exits, stage gates, or kill points.

Each project phase normally includes a set of defined work products designed to establish the desired level of management control. The majority of these items are related to the primary phase deliverable, and the phases typically take their names from these items: requirements, design, build text, start-up, turnover, and others as appropriate. Several representative project life cycles are described.

Characteristics of the Project Life Cycle

The project life cycle serves to define the beginning and the end of a project. For example, when an organization identifies an opportunity that it would like to respond to, it will often authorize a feasibility study to decide if it should undertake a project. The project life cycle definition will determine whether the feasibility study is treated as the first project phase or as a separate, stand-alone project.

The project life cycle definition will also determine which transitional actions at the end of the project are included and which are not. In this manner, the project life cycle definition can be used to link the project to the ongoing operations of the performing organization.

The phase sequence defined by most project life cycles generally involves some form of technology transfer or hand-off such as requirements to design, construction to operations, or design to manufacturing. Deliverables from the preceding phase are usually approved before work starts on the next phase. However, a subsequent phase is sometimes begun prior to approval of the previous phase deliverables when the risks involved are deemed acceptable. This practice of overlapping phases is often called fast tracking.

Project life cycles generally define:

- What technical work should be done in each phase (e.g., is the work of the architect part of the definition phase or part of the execution phase?).
- Who should be involved in each phase (e.g., concurrent engineering requires that the implementors be involved with requirements and design).

Project life cycle descriptions may be very general or very detailed. Highly detailed descriptions may have numerous forms, charts, and checklists to provide structure and consistency. Such detailed approaches are often called project management methodologies.

Representative Project Life Cycles

The following project life cycle has been chosen to illustrate the diversity of approaches in use. The examples shown are typical; they are neither recommended nor preferred. In each case, the phase names and major deliverables are those described by the author.

Construction. A construction project life cycle includes:

• Feasibility—project formulation, feasibility studies, and strategy design and approval. A go/no-go decision is made at the end of this phase.

• Planning and Design—base design, cost and schedule, contract terms and conditions, and detailed planning. Major contracts are let at the end of this phase.

• Production—manufacturing, delivery, civil works, installation, and testing. The facility is substantially complete at the end of this phase.

• Turnover and Start-up—final testing and maintenance. The facility is in operation at the end of this phase.

Software development. A spiral model for software development with four cycles and four quadrants is described:

• Proof-of-concept cycle—capture business requirements, define goals for proof-of-concept, produce conceptual system design, design and construct the proof-of-concept, produce acceptance test plans, conduct risk analysis and make recommendations.

• First build cycle—derive system requirements, define goals for first build, produce logical system design, design and construct the first build, produce system test plans, evaluate the first build and make recommendations.

• Second build cycle—derive subsystem requirements, define goals for second build, produce physical design, construct the second build, produce system test plans, evaluate the second build and make recommendations.

• Final cycle—complete unit requirements, final design, construct final build, ' perform unit, subsystem, system, and acceptance tests.

Project stakeholders

Project stakeholders are individuals and organizations who are actively involved in the project, or whose interests may be positively or negatively affected as a result of project execution or successful project completion.

Key stakeholders on every project include:

• Project manager—the individual responsible for managing the project.

• Customer—the individual or organization who will use the project product. There may be multiple layers of customers. For example, the

customers for a new pharmaceutical product may include the doctors who prescribe it, the patients who take it and the insurers who pay for it.

• Performing organization—the enterprise whose employees are most directly involved in doing the work of the project.

• Sponsor—the individual or group within the performing organization who provides the financial resources, in cash or in kind, for the project.

In addition to these there are many different names and categories of project stakeholders—internal and external, owners and funders, suppliers and contractors, team members and their families, government agencies and media outlets, individual citizens, temporary or permanent lobbying organizations, and society at large. The naming or grouping of stakeholders is primarily an aid to identifying which individuals and organizations view themselves as stakeholders. Stakeholder roles and responsibilities may overlap, as when an engineering firm provides financing for a plant it is designing.

Managing stakeholder expectations may be difficult because stakeholders often have very different objectives that may come into conflict. For example:

• The manager of a department that has requested a new management information system may desire low cost, the system architect may emphasize technical excellence, and the programming contractor may be most interested in maximizing its profit.

• The vice president of research at an electronics firm may define new product success as state-of-the-art technology, the vice president of manufacturing may define it as world-class practices, and the vice president of marketing may be primarily concerned with the number of new features.

• The owner of a real estate development project may be focused on timely performance, the local governing body may desire to maximize tax revenue, an environmental group may wish to minimize adverse environmental impacts, and nearby residents may hope to relocate the project.

In general, differences between or among stakeholders should be resolved in favor of the customer. This does not, however, mean that the needs and expectations of other stakeholders can or should be disregarded. Finding appropriate resolutions to such be one of the major challenges of project management.

CHAPTER II

As you read Chapter II, look for answers to the following questions, put them down, translate them in a written way and then translate the whole text:

- What is managing primary concerned with?
- What does leading involve?
- What dimensions does communicating have?
- What is Project Communication Management?
- What issues do negotiations occur around?
- What does problem solving involve?
- What does cultural norms influence include?

Key general management skills

General management is a broad subject dealing with every aspect of managing ongoing enterprise. Among other topics, it includes:

• Finance and accounting, sales and marketing, research and development, manufacturing and distribution.

• Strategic planning, tactical planning, and operational planning.

• Organizational structures, organizational behavior, personnel administration compensation, benefits, and career paths.

• Managing work relationships through motivation, delegation, supervision team building, conflict management, and other techniques.

• Managing oneself through personal time management, .stress manage and other techniques.

Leading

Many authors distinguishe between leading and managing while emphasizing the need for both: one without the other is likely to produce poor results. Managing is primarily concerned with "consistently producing key results expected by stakeholders," while leading involves:

• Establishing direction—developing both a vision of the future and strategies for producing the changes needed to achieve that vision.

• Aligning people—communicating the vision by words and deeds to all those whose cooperation may be needed to achieve the vision.

• Motivating and inspiring—helping people energize themselves to overcome political, bureaucratic, and resource barriers to change.

On a project, particularly a larger project, the project manager is generally expected to be the project's leader as well. Leadership is not, however, limited to the project manager: it may be demonstrated by many different

individuals at many different times during the project. Leadership must be demonstrated at all levels of the project (project leadership, technical leadership, team leadership).

Communicating

Communicating involves the exchange of information. The sender is responsible for making the information clear, unambiguous, and complete so that the receiver can receive it correctly. The receiver is responsible for making sure that the information is received in its entirety and understood correctly. Communicating has many dimensions:

- Written and oral, listening and speaking.
- Internal (within the project) and external (to the customer, the media, the public, etc.).
- Formal (reports, briefings, etc.) and informal (memos, ad hoc conversations, etc.).
- Vertical (up and down the organization) and horizontal (with peers).

Communicating is a broad subject and involves a substantial body of knowledge that is not unique to the project context, for example:

- Sender-receiver models-feedback loops, barriers to communications, etc.
- Choice of media-when to communicate in writing, when to communicate orally, when to write an informal memo, when to write a formal report, etc.
- Writing style-active vs. passive voice, sentence structure, word choice, etc.
- Presentation techniques-body language, design of visual aids, etc.
- Meeting management techniques-preparing an agenda, dealing with conflict, etc.

Negotiating

Negotiating involves conferring with others in order to come to terms or reach an agreement. Agreements may be negotiated directly or with assistance; mediation and arbitration are two types of assisted negotiation.

Negotiations occur around many issues, at many times, and at many levels of the project. During the course of a typical project, project staff are likely to negotiate for any or all of the following:

- Scope, cost, and schedule objectives.
- Changes to scope, cost, or schedule.
- Contract terms and conditions.
- Assignments.
- Resources.

Problem Solving

Problem solving involves a combination of problem definition and decision making. It is concerned with problems that have already occurred (as opposed to risk management that addresses potential problems).

Problem definition requires distinguishing between causes and symptoms. Problems may be internal (a key employee is reassigned to another project) or external (a permit required to begin work is delayed). Problems may be technical (differences of opinion about the best way to design a product), managerial (a functional group is not producing according to plan), or interpersonal (personality or style clashes).

Decision making includes analyzing the problem to identify viable solutions, and then making a choice from among them. Decisions can be made or obtained (from customer, from the team, or from a functional manager). Once made, decisions must be implemented. Decisions also have a time element to them—the "right" decision may not be the "best" decision if it is made too early or too late.

Internationalization

As more and more organizations engage in work which spans national boundaries, more and more projects span national boundaries as well. In addition to the traditional concerns of scope, cost, time, and quality, the project management team must also consider the effect of time zone differences, national and regional holidays, travel requirements for face-to-face meetings, the logistics of teleconferencing, and often volatile political differences.

Cultural Influences

Culture is the "totality of socially transmitted behavior patterns, arts, beliefs, institutions, and all other products of human work and thought". Every project must operate within a context of one or more cultural norms. This area of influence includes political, economic, demographic, educational, ethical, ethnic, religious, and other areas of practice, belief, and attitudes that affect the way people and organizations interact.

CHAPTER III

Project management processes

As you read Chapter III, look for answers to the following questions, put them down, translate them in a written way and then translate the whole text:

- What is project cost management primarily concerned with?
- What is project cost management primarily concerned with?
- What is necessary for resource planning?

Process groups

Project management processes can be organized into five groups of one or more processes each:

• Initiating processes—recognizing that a project or phase should begin and committing to do so.

• Planning processes—devising and maintaining a workable scheme to accomplish the business need that the project was undertaken to address.

• Executing processes—coordinating people and other resources to carry out the plan.

• Controlling processes—ensuring that project objectives are met by monitoring and measuring progress and taking corrective action when necessary.

• Closing processes—formalizing acceptance of the project or phase and bringing it to an orderly end.

The process groups are linked by the results they produce the result or outcome of one becomes an input to another. Among the central process groups, the links are iterated—planning provides executing with a documented project plan early on, and then provides documented updates to the plan as the project progresses. In addition, the project management process groups are not discrete, one-time events; they are overlapping activities which occult varying levels of intensity throughout each phase of the project.

Finally, the process group interactions also cross phases such that closing one phase provides an input to initiating the next. For example, closing a design phase requires customer acceptance of the design document. Simultaneously, the design document defines the product description for the ensuing implementation phase.

Repeating the initiation processes at the start of each phase helps to keep the project focused on the business need it was undertaken to address.

Planning Processes

Planning is of major importance to a project because the project involves doing something which has not been done before. As a result, there are relatively more processes in this section. However, the number of processes does not mean that project management is primarily planning—the amount of planning performed should be commensurate with the scope of the project and the usefulness of the in formation developed.

These processes are subject to frequent iterations prior to completing the plan. For example, if the initial completion date is unacceptable, project resources, cost, or even scope may need to be redefined. In addition, planning is not an exact science – two different teams could generate very different plans for the same project.

Core processes. Some planning processes have clear dependencies that require them to be performed in essentially the same order on most projects. For example, activities must be defined before they can be scheduled or costed. These core planning processes may be iterated several times during any one phase of a project. They include:

- Scope Planning — developing a written scope statement as the basis for future project decision.
- Scope Definition — subdividing the major project deliverables into smaller, more manageable components.
- Activity Definition — identifying the specific activities that must be performed to produce the various project deliverables.
- Activity Sequencing — identifying and documenting interactivity dependencies.
- Activity Duration Estimating — estimating the number of work periods which will be needed to complete individual activities.
- Schedule Development — analyzing activity sequences, activity durations, and resource requirements to create the project schedule.
- Resource Planning — determining what resources (people, equipment, materials) and what quantities of each should be used to perform project activities.
- Cost Estimating — developing an approximation (estimate) of the costs of the resources needed to complete project activities.
- Cost Budgeting — allocating the overall cost estimate to individual work items.
- Project Plan Development — taking the results of other planning processes and putting them into a consistent, coherent document.

Project Cost Management

Project Cost Management includes the processes required to ensure that the project is completed within the approved budget:

Resource Planning—determining what resources (people, equipment, materials) and what quantities of each should be used to perform project activities.

Cost Estimating—developing an approximation (estimate) of the costs of the resources needed to complete project activities.

Cost Budgeting—allocating the overall cost estimate to individual work items.

Cost Control—controlling changes to the project budget.

Project cost management is primarily concerned with the cost of the resources needed to complete project activities. However, project cost management should also consider the effect of project decisions on the cost of using the project product. For example, limiting the number of design reviews may reduce the cost of the project at the expense of an increase in the customer's operating costs. This broader view of project cost management is often called life-cycle costing.

In many application areas predicting and analyzing the prospective financial performance of the project product is done outside the project. In others (e.g., capital facilities projects), project cost management also includes this work. When such predictions and analysis are included, project cost management will include additional processes and numerous general management techniques such as return on investment, discounted cash flow, payback analysis, and others.

Project cost management should consider the information needs of the project stakeholders—different stakeholders may measure project costs in different ways and at different times. For example, the cost of a procurement item may be measured when committed, ordered, delivered, incurred, or recorded for accounting purposes.

When project costs are used as a component of a reward and recognition system, controllable and uncontrollable costs should be estimated and budgeted separately to ensure that rewards reflect actual performance.

Resource planning

Resource planning involves determining what physical resources (people, equipment, materials) and what quantities of each should be used to perform project activities. It must be closely coordinated with cost estimating. For example:

• A construction project team will need to be familiar with local building codes. Such knowledge is often readily available at virtually no cost by using local labor. However, if the local labor pool lacks experience with unusual or specialized construction techniques, the additional cost for a consultant might be the most effective way to secure knowledge of the local building codes.

• An automotive design team should be familiar with the latest in automated assembly techniques. The requisite knowledge might be obtained by hiring a consultant, by sending a designer to a seminar on robotics, or by including someone from manufacturing as a member of the team.

Inputs to Resource Planning

1. **Work breakdown structure.** (The work breakdown structure) identifies the project elements that will need resources and thus is the primary input to resource planning. Any relevant outputs from other planning processes should be provided to ensure proper control.
2. **Historical information.** Historical information regarding what types of resources were required for similar work on previous projects should be used if available.
3. **Scope statement.** The scope statement contains the project justification and the project objectives, both of which should be considered explicitly during resource planning.
4. **Resource pool description**. Knowledge of what resources (people, equipment, material) are potentially available is necessary for resource planning. The amount of detail and the level of specificity of the resource pool description will vary. For example, during the early phases of an engineering design project, the pool may include "junior and senior engineers" in large numbers. During later phases of the same project, however, the pool may be limited to those individuals who are knowledgeable about the project as a result of having worked on the earlier phases.
5. **Organizational policies.** The policies of the performing organization regarding staffing and the rental or purchase of supplies and equipment must be considered during resource planning.

CHAPTER IV

As you read Chapter IV, look for answers to the following questions, put them down, translate them in a written way and then translate the whole text:

- What processes does project quality management include?
- Why should the project management team have a working knowledge of statistical quality control?
- What are tools and techniques for quality control?

Project Quality Management

Project Quality Management includes the processes required to ensure that the project will satisfy the needs for which it was undertaken. It includes "all activities of the overall management function that determine the quality policy, objectives, and responsibilities and implements them by means such as quality planning, quality control, quality assurance, and quality improvement, within the quality system":

Quality Planning — identifies which quality standards are relevant to the project and determining how, to satisfy them.

Quality Assurance — evaluates overall project performance on a regular basis to provide confidence that the project will satisfy the relevant quality standards.

Quality Control — monitors specific project results to determine if they comply with relevant quality standards and identifying ways to eliminate causes of unsatisfactory performance.

Project quality management must address both the management of the project and the product of the project. Failure to meet quality requirements in either dimension can have serious negative consequences for any or all of the project stakeholders. For example:

• Meeting customer requirements by overworking the project team may produce negative consequences in the form of increased employee turnover.

• Meeting project schedule objectives by rushing planned quality inspections may produce negative consequences when errors go undetected.

Quality is "the totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs". A critical aspect of quality management in the project context is the necessity to turn implied needs into stated needs through project scope management.

The project management team must be careful not to confuse quality with grade. Grade is "a category or rank given to entities having the same functional use bun different requirements for quality". Low quality is always a problem; low grade may not be. For example, a software product may be of

high quality (no obvious bugs, readable manual) and low grade (a limited number of features), or of low quality (many bugs, poorly organized user documentation) and high grade (numerous features). Determining and delivering the required levels of both quality and grade are the responsibilities of the project manager and the project management team.

The project management team should also be aware that modern quality management complements modern project management. For example, both disciplines recognize the importance of:

• Customer satisfaction—understanding, managing, and influencing needs so that customer expectations are met or exceeded. This requires a combination of conformance to specifications (the project must produce what it said would produce) and fitness for use (the product or service produced must satisfy real needs).

• Prevention over inspection—the cost of avoiding mistakes is always much I than the cost of correcting them.

Quality planning

Quality planning involves identifying which quality standards are relevant to the project and determining how to satisfy them. It is one of the key facilitating processes during project planning (Planning Processes) and should be performed regularly and in parallel with the other project planning processes. For example, the desired management quality may require cost or schedule adjustments, or the desired product quality may require a detailed risk analysis of an identified problem. The activities described here as quality planning was widely discussed as part of quality assurance.

The quality planning techniques discussed here are those used most frequently on projects. There are many others that may be useful on certain projects or in some application areas.

The project team should also be aware of one of the fundamental tenets of modern quality management—quality is planned in, not inspected in.

Quality control

Quality control involves monitoring specific project results to determine if they comply with relevant quality standards and identifying ways to eliminate causes of unsatisfactory results. It should be performed throughout the project. Project results include both product results such as deliverables and management results such as cost and schedule performance. Quality control is often performed by a Quality Control Department or similarly titled organizational unit, but it does not have to be.

The project management team should have a working knowledge of statistical quality control, especially sampling and probability, to help them evaluate quality control outputs. Among other subjects, they should know the differences between:

• Prevention (keeping errors out of the process) and inspection (keeping errors out of the hands of the customer).
• Attribute sampling (the result conforms or it does not) and variables sampling (the result is rated on a continuous scale that measures the degree of conformity).
• Special causes (unusual events) and random causes (normal process variation).
• Tolerances (the result is acceptable if it falls within the range specified by the tolerance) and control limits (the process is in control if the result falls within the control limits).

Tools and Techniques for Quality Control

1. Inspection. Inspection includes activities such as measuring, examining, and testing undertaken to determine whether results conform to requirements. Inspections may be conducted at any level (e.g., the results of a single activity may be inspected or the final product of the project may be inspected). Inspections are variously called reviews, product reviews, audits, and walk-throughs; in some application areas, these terms have narrow and specific meanings.

2. Control charts. Control charts are a graphic display of the results, over time, of a process. They are used to determine if the process is "in control" (e.g., are differences in the results created by random variations or are unusual events occurring whose causes must be identified and corrected?). When a process is in control, the process should not be adjusted. The process may be changed in order to provide improvements but it should not be adjusted when it is in control.

Control charts may be used to monitor any type of output variable. Although used most frequently to track repetitive activities such as manufactured lots, control charts can also be used to monitor cost and schedule variances, volume and frequency of scope changes, errors in project documents, or other management results to help determine if the "project management process" is in control.

3. Pareto diagrams. A Pareto diagram is a histogram, ordered by frequency of occurrence, that shows how many results were generated by type or category of identified cause. Rank ordering is used to guide corrective action—the project team should take action to fix the problems that are

causing the greatest number of defects first. Pareto diagrams are conceptually related to Pareto's Law; which holds that a relatively small number of causes will typically produce a large majority of the problems or defects.

4. Statistical sampling. Statistical sampling involves choosing part of a population of interest for inspection. Appropriate sampling can often reduce the cost of quality control. There is a substantial body of knowledge on statistical sampling; in some application areas, it is necessary for the project management team to be familiar with a variety of sampling techniques.

5. Flowcharting. Flowcharting is used in quality control to help analyze how problems occur.

CHAPRET V

As you read Chapter V, look for answers to the following questions, put them down, translate them in a written way and then translate the whole text:

- What individuals does project human resource management include?
- What is organizational planning often tightly linked with?
- What are the inputs of organizational planning?
- What is cultural to the projects ability to meet its objects?
- What are the tools and techniques for team development?

Project Human Resource Management

Project Human Resource Management includes the processes required to make the most effective use of the people involved with the project. It includes all the project stakeholders—sponsors, customers, individual contributors, and others overview. The following major processes are:

Organizational Planning—identifying, documenting, and assigning project roles, responsibilities, and reporting, relationships.

Staff Acquisition—getting the human resources needed assigned to and working on the project.

Team Development—developing individual and group skills to enhance project performance.

Organizational planning

Organizational planning involves identifying, documenting, and assigning project roles, responsibilities**,** and reporting relationships. Roles, responsibilities, and reporting relationships may be assigned to individuals or

to groups. The individuals and groups may be part of the organization performing the project or they may be external to it. Internal groups are often associated with a specific functional department such as engineering, marketing, or accounting.

On most projects, the majority of organizational planning is done as part of the earliest project phases. However, the results of this process should be reviewed regularly throughout the project to ensure continued applicability. If the initial organization is no longer effective, it should be revised promptly.

Organizational planning is often tightly linked with communications planning since the project's organizational structure will have a major effect on the project's communications requirements.

Inputs to Organizational Planning

1. Project interfaces. Project interfaces generally fall into one of three categories:

- Organizational interfaces—formal and informal reporting relationships among different organizational units. Organizational interfaces may be highly complex or very simple. For example, developing a complex telecommunications system may require coordinating numerous subcontractors over several years, while fixing a programming error in a system installed at a single site may require little more than notifying the user and the operations staff upon completion.
- Technical interfaces—formal and informal reporting relationships among different technical disciplines. Technical interfaces occur both within project phases (e.g., the site design developed by the civil engineers must be compatible with the superstructure developed by the structural engineers) and between project phases (e.g., when an automotive design team passes the results of its work along to the retooling team that must create the manufacturing capability for the vehicle).
- Interpersonal interfaces—formal and informal reporting relationships among different individuals working on the project.

These interfaces often occur simultaneously, as when an architect employed by a design firm explains key design considerations to an unrelated construction contractor's project management team.

2. Staffing requirements. Staffing requirements define what kinds of skills are required from what kinds of individuals or groups and in what time frames. Staffing requirements are a subset of the overall resource requirements identified during resource planning.

3. Constraints. Constraints are factors that limit the project team's options. A project's organizational options may be constrained in many ways. Common factors that may constrain how the team is organized include, but are not limited to, the following:

• Organizational structure of the performing organization—an organization whose basic structure is a *strong matrix* means a relatively stronger role for the project manager than one whose basic structure is a weak matrix (for a more detailed discussion of organizational structures).

• Collective bargaining agreements—contractual agreements with unions or other employee groups may require certain roles or reporting relationships (in essence, the employee group is a stakeholder).

• Preferences of the project management team—if members of the project management team have had success with certain structures in the past, they are likely to advocate similar structures in the future.

• Expected staff assignments—how the project is organized is often influenced by the skills and capabilities of specific individuals.

Staff acquisition

Staff acquisition involves getting the human resources needed (individuals or groups) assigned to and working on the project. In most environments, the "best" resources may not be available, and the project management team must take care to ensure that the resources which are available will meet project requirements.

Inputs	Tools & Techniques	Outputs
1 Staffing management plan	1 Negotiations	1 Project staff assigned
2 Staffing pool description	2 Pre-assignment	2 Project team directory
3 Recruitment practices	3 Procurement	

Team development

Team development includes both enhancing the ability of stakeholders to contribute as individuals as well as enhancing the ability of the team to function as a team. Individual development (managerial and technical) is the foundation necessary to develop the ream. Development as a team is critical to the project's ability to meet its objectives.

Team development on a project is often complicated when individual team members are accountable to both a functional manager and to the project manager. Effective management of this dual reporting relationship is often a critical success factor for the project and is generally the responsibility of the project manager.

Tools and Techniques for Team Development

1. *Team-building activities.* Team-building activities include management and individual actions taken specifically and primarily to improve team performance. Many actions, such as involving non-management-level team members in the planning process, or establishing ground rules for surfacing and dealing with conflict, may enhance team performance as a secondary effect. Team-building activities can vary from a five-minute agenda item in a regular status review meeting to an extended, off-site, professionally facilitated experience designed to improve interpersonal relationships among key stakeholders.

There is a substantial body of literature on team building. The project management team should be generally familiar with a variety of team-building activities.

2. *General management skills.* General management skills are of particular importance to team development.

3. *Reward and recognition systems.* Reward and recognition systems are formal management actions which promote or reinforce desired behavior. To be effective, such systems must make the link between performance and reward clear, explicit, and achievable. For example, a project manager who is to be rewarded for meeting the project's cost objective should have an appropriate level of control over staffing and procurement decisions.

Projects must often have their own reward and recognition systems since the systems of the performing organization may not be appropriate. For example, the willingness to work overtime in order to meet an aggressive schedule objective *should* be rewarded or recognized; needing to work overtime as the result of poor planning *should not* be.

Reward and recognition systems must also consider cultural differences. For example, developing an appropriate team reward mechanism in a culture that prizes individualism may be very difficult.

4. *Collocation.* Collocation involves placing all, or almost all, of the most active project team members in the same physical location to enhance their ability to perform as a team. Collocation is widely used on larger projects and can also be effective for smaller projects (e.g., with a "war room" where the team congregates or leaves in-process work items).

5. *Training.* Training includes all activities designed to enhance the skills, knowledge, and capabilities of the project team. Some authors distinguish among training, education, and development, but the distinctions are neither consistent nor widely accepted. Training may be formal (e.g., classroom training, computer-based training) or informal (e.g., feedback from

other team members). There is a substantial body of literature on how to provide training to adults.

If the project team members lack necessary management or technical skills, such skills must be developed as part of the project, or steps must be taken to restaff the project appropriately. Direct and indirect costs for training are generally paid by the performing organization.

Outputs from Team Development

1. *Performance improvements.* The primary output of team development is improved project performance. Improvements can come from many sources and can affect many areas of project performance, for example:

• Improvements in individual skills may allow a specific person to perform their assigned activities more effectively.

• Improvements in team behaviors (e.g., surfacing and dealing with conflict) may allow project team members to devote a greater percentage of their effort to technical activities.

• Improvements in either individual skills or team capabilities may facilitate identifying and developing better ways of doing project work.

2. *Input to performance appraisals.* Project staff should generally provide input to the performance appraisals of any project staff members that they interact with in a significant way.

CHAPTER VI

As you read Chapter VI, look for answers to the following questions, put them down, translate them in a written way and then translate the whole text:

- What are major processes of project communications management?
- What do communications planning involve?
- What does information for determining project communications requirement include?
- What are information distribution techniques?
- What are performance reporting techniques?

Project Communications Management

Project Communications Management includes the processes required to ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information. It provides the

critical links among people, ideas, and information that are necessary for success. Everyone involved in the project must be prepared to send and receive communications in the project "language" and must understand how the communications they are involved in as individuals affect the project as a whole. The following major processes are:

Communications Planning—determining the information and communications needs of the stakeholders: who needs what information, when will they need it, and how will it be given to them.

Information Distribution—making needed information available to project stakeholders in a timely manner.

Performance Reporting—collecting and disseminating performance information. This includes status reporting, progress measurement, and forecasting.

Administrative Closure—generating, gathering, and disseminating information to formalize phase or project completion.

Communicating is the broad subject and involves a substantial body of knowledge that is not unique to the project context. For example:

• Sender-receiver models—feedback loops, barriers to communications, etc.

• Choice of media—when to communicate in writing versus when to communicate orally, when to write an informal memo versus when to write a formal report, etc.

• Writing style—active versus passive voice, sentence structure, word choice, etc.

• Presentation techniques—body language, design of visual aids, etc.

• Meeting management techniques—preparing an agenda, dealing with conflict, etc.

Communications planning

Communications planning involves determining the information and communications needs of the stakeholders: who needs what information, when will they need it, and how will it be given to them. While all projects share the need to communicate project information, the informational needs and the methods of distribution vary widely. Identifying the informational needs of the stakeholders and determining a suitable means of meeting those needs is an important factor for project success.

On most projects, the majority of communications planning is done as part of the earliest project phases. However, the results of this process should be reviewed regularly throughout the project and revised as needed to ensure continued applicability.

Communications planning is often tightly linked with organizational planning since the project's organizational structure will have major effect on the project's communications requirements.

Inputs to Communications Planning

1. Communications requirements. Communications requirements are the sum of the information requirements of the project stakeholders. Requirements are defined by combining the type and format of information required with an analysis of the value of that information. Project resources should be expended only on communicating information which contributes to success or where lack of communication can lead to failure. Information typically required to determine project communications requirements includes:

- Project organization and stakeholder responsibility relationships.
- Disciplines, departments, and specialties involved in the project.
- Logistics of how many individuals will be involved with the project and at which locations.
- External information needs (e.g., communicating with the media).

2. Communications technology. The technologies or methods used to transfer information back and forth among project elements can vary significantly: from brief conversations to extended meetings, from simple written documents to immediately accessible on-line schedules and databases. Communications technology factors which may affect the project include:

- The immediacy of the need for information—is project success dependent upon having frequently updated information available on a moment's notice, or would regularly issued written reports suffice?
- The availability of technology—are the systems that are already in place appropriate, or do project needs warrant change?
- The expected project staffing—are the communications systems proposed compatible with the experience and expertise of the project participants, or will extensive training and learning be required?
- The length of the project—is the available technology likely to change before the project is over in a manner that would warrant adopting the newer technology?

Information distribution

Information distribution involves making needed information available to project stakeholders in a timely manner. It includes implementing the communications management plan as well as responding to unexpected requests for information.

Inputs	Tools & Techniques	Outputs
1 Work results	1 Communications skills	1 Project records
2 Communications management plan	2 Information retrieval systems	
3 Project plan	3 Information distribution systems	

Tools and Techniques for Information Distribution

1. Communications skills. Communications skills are used to exchange information. The sender is responsible for making the information clear, unambiguous, and complete so that the receiver can receive it correctly and for confirming that it is properly understood. The receiver is responsible for making sure that the information is received in its entirety and understood correctly. Communicating has many dimensions:

- Written and oral, listening and speaking.
- Internal (within the project) and external (to the customer, the media, the public, etc.).
- Formal (reports, briefings, etc.) and informal (memos, ad hoc conversations, etc.).
- Vertical (up and down the organization) and horizontal (with peers).

2. Information retrieval systems. Information can be shared by team members through a variety of methods including manual filing systems, electronic text databases, project management software, and systems which allow access to technical documentation such as engineering drawings.

3. Information distribution systems. Project information may be distributed using a variety of methods including project meetings, hard copy document distribution, shared access to networked electronic databases, fax, electronic mail, voice mail, and video conferencing.

Performance reporting

Performance reporting involves collecting and disseminating performance information in order to provide stakeholders with information about how resources are being used to achieve project objectives. This process includes:

- Status reporting—describing where the project now stands.
- Progress reporting—describing what the project team has accomplished.

• Forecasting—predicting future project status and progress.

Performance reporting should generally provide information on scope, schedule, cost, and quality. Many projects also require information on risk and procurement. Reports may be prepared comprehensively or on an exception basis.

Inputs	Tools & Techniques	Outputs
1 Project plan	1 Performance reviews	1 Performance reports
2 Work results	2 Variance analysis	2 Change requests
3 Other project records	3 Trend analyses	
	4 Earned value analysis	
	5 Information distribution tools and techniques	

Tools and Techniques for Performance Reporting

Performance reviews. Performance reviews are meetings held to assess project status or progress. Performance reviews are typically used in conjunction with one or more of the performance reporting techniques described below.

Variance analysis. Variance analysis involves comparing actual project results to planned or expected results. Cost and schedule variances are the most frequently analyzed, but variances from plan in the areas of scope, quality, and risk are often of equal or greater importance.

Trend analysis. Trend analysis involves examining project results over time to determine if performance is improving or deteriorating.

Earned value analysis. Earned value analysis in its various forms is the most commonly used method of performance measurement. It integrates scope, cost, and schedule measures to help the project management team assess project performance. Earned value involves calculating three key values for each activity:

• The budget, also called the budgeted cost of work scheduled (BCWS), is that portion of the approved cost estimate planned to be spent on the activity during a given period.

• The actual cost, also called the actual cost of work performed (ACWP), is the total of direct and indirect costs incurred in accomplishing work on the activity during a given period.

• The earned value, also called the budgeted cost of work performed (BCWP), is a percentage of the total budget equal to the percentage of the work actually completed. Many earned value implementations use only a few percentages (e.g., 30 percent, 70 percent, 90 percent, 100 percent) to simplify data collection. Some earned value implementations use only 0 percent or

100 percent (done or not done) to help ensure objective measurement of performance.

These three values are used in combination to provide measures of whether or not work is being accomplished as planned. The most commonly used measures are the cost variance (CV == BCWP - ACWP), the schedule variance (SV = BCWP -BCWS), and the cost performance index (CPI = BCWP/ACWP). The cumulative CPI (the sum of all individual BCWPs divided by the sum of all individual ACWPs) is widely used to forecast project cost at completion. In some application areas, the schedule performance index (SPI = BCWP/BCWS) is used to forecast the project completion date.

Administrative closure

The project or phase, after either achieving its objectives or being terminated for other reasons, requires closure. Administrative closure consists of verifying and documenting project results to formalize acceptance of the product of the project by the sponsor, client, or customer. It includes collection of project records, ensuring that they reflect final specifications, analysis of project success and effectiveness, and archiving such information for future use.

Administrative closure activities should not be delayed until project completion. Each phase of the project should be properly closed to ensure that important and useful information is not lost.

CHAPTER VII

As you read Chapter VII, look for answers to the following questions, put them down, translate them in a written way and then translate the whole text:

- What are the major processes of project risk management?
- What does risk identification consist of?
- What are tools and techniques for risk quantification?

Project Risk Management

Project Risk Management includes the processes concerned with identifying, analyzing, and responding to project risk. It includes maximizing the results of positive events and minimizing the consequences of adverse events. The following major processes are:

Risk Identification—determining which risks are likely to affect the project and documenting the characteristics of each.

Risk Quantification—evaluating risks and risk interactions to assess the range of possible project outcomes.

Risk Response Development—defining enhancement steps for opportunities and responses to threats.

Risk Response Control—responding to changes in risk over the course of the project.

Risk identification

Risk identification consists of determining which risks are likely to affect the project and documenting the characteristics of each. Risk identification is not a onetime event; it should be performed on a regular basis throughout the project.

Risk identification should address both internal and external risks. Internal risks are things that the project team can control or influence, such as staff assignments and cost estimates. External risks are things beyond the control or influence of the project team, such as market shifts or government action.

Strictly speaking, risk involves only the possibility of suffering harm or loss. In the project context, however, risk identification is also concerned with opportunities (positive outcomes) as well as threats (negative outcomes).

Inputs to Risk Identification

1. Product description. The nature of the product of the project will have a major effect on the risks identified. Products that involve proven technology will, all other things being equal, involve less risk than products which require innovation or invention. Risks associated with the product of the project are often described in terms of their cost and schedule impact.

2. *Other planning outputs.* The outputs of the processes in other knowledge areas should be reviewed to identify possible risks. For example:

• Work breakdown structure—non-traditional approaches to detail deliverables may offer opportunities that were not apparent from the higher-level deliverables identified in the scope statement.

• Cost estimates and duration estimates—aggressive estimates and estimates developed with a limited amount of information entail more risk.

• Staffing plan—identified team members may have unique skills that would be hard to replace or may have other commitments that make their availability tenuous.

• Procurement management plan—market conditions such as a sluggish local economy may offer opportunities to reduce contract costs.

3. *Historical information.* Historical information about what actually happened on previous projects can be especially helpful in identifying potential risks. Information on historical results is often available from the following sources:

• Project files—one or more of the organizations involved in the project may maintain records of previous project results that are detailed enough to aid in risk identification. In some application areas, individual team members may maintain such records.

• Commercial databases—historical information is available commercially in many application areas.

• Project team knowledge—the individual members of the project team may remember previous occurrences or assumptions. While such recollections may be useful, they are generally less reliable than documented results.

Risk quantification

Risk quantification involves evaluating risks and risk interactions to assess the range of possible project outcomes. It is primarily concerned with determining which risk events warrant response. It is complicated by a number of factors including, but not limited to:

• Opportunities and threats can interact in unanticipated ways (e.g., schedule delays may force consideration of a new strategy that reduces overall project duration).

• A single risk event can cause multiple effects, as when late delivery of a key component produces cost overruns, schedule delays, penalty payments, and a lower-quality product.

• Opportunities for one stakeholder (reduced cost) may be threats to another (reduced profits).

• The mathematical techniques used can create a false impression of precision and reliability.

Tools and Techniques for Risk Quantification

1. *Expected monetary value.* Expected monetary value, as a tool for risk quantification, is the product of two numbers:

• Risk event probability—an estimate of the probability that a given risk event will occur.

• Risk event value—an estimate of the gain or loss that will be incurred if the risk event does occur.

The risk event value must reflect both tangibles and intangibles. For example, Project A and Project B both identify an equal probability of a tangible loss of $100,000 as an outcome of an aggressively priced proposal. If Project A predicts little or no intangible effect, while Project B predicts that such a loss will put its performing organization out of business, the two risks are not equivalent.

In similar fashion, failure to include intangibles in this calculation can severely distort the result by equating a small loss with a high probability to a large loss with a small probability.

The expected monetary value is generally used as input to further analysis (e.g., in a decision tree) since risk events can occur individually or in groups, in parallel or in sequence.

2. *Statistical sums.* Statistical sums can be used to calculate a range of total project costs from the cost estimates for individual work items. (Calculating a range of probable project completion dates from the activity duration estimates requires simulation.

The range of total project costs can be used to quantify the relative risk of alternative project budgets or proposal prices.

3. *Simulation.* Simulation uses a representation or model of a system to analyze the behavior or performance of the system. The most common form of simulation on a project is schedule simulation using the project network as the model of the project. Most schedule simulations are based on some form of Monte Carlo analysis. This technique, adapted from general management, "performs" the project many times to provide a statistical distribution of the calculated results.

The results of a schedule simulation may be used to quantify the risk of various schedule alternatives, different project strategies, different paths through the network, or individual activities.

Schedule simulation should be used on any large or complex project since traditional mathematical analysis techniques such as the Critical Path Method (CPM) and the Program Evaluation and Review Technique (PERT) do not account for path convergence and thus tend to underestimate project durations.

Monte Carlo analysis and other forms of simulation can also be used to assess the range of possible cost outcomes.

4. *Expert judgment.* Expert judgment can often be applied in lieu of or in addition to the mathematical techniques described above. For example, risk events could be described as having a high, medium, or low probability of occurrence and a severe, moderate, or limited impact.

Risk response development

Risk response development involves defining enhancement steps for opportunities and responses to threats. Responses to threats generally fall into one of three categories:

• Avoidance—eliminating a specific threat, usually by eliminating the cause. The project management team can never eliminate all risk, but specific risk events can often be eliminated.

• Mitigation—reducing the expected monetary value of a risk event by reducing the probability of occurrence (e.g., using proven technology to lessen the probability that the product of the project will not work), reducing the risk event value (e.g., buying insurance), or both.

• Acceptance—accepting the consequences. Acceptance can be active (e.g., by developing a contingency plan to execute should the risk event occur) or passive (e.g., by accepting a lower profit if some activities overrun).

Risk response control

Risk response control involves executing the risk management plan in order to respond to risk events over the course of the project. When changes occur, the basic cycle of identify, quantify, and respond is repeated. It is important to understand that even the most thorough and comprehensive analysis cannot identify all risks and probabilities correctly; control and iteration are required.

CHAPTER VIII

As you read Chapter VIII, look for answers to the following questions, put them down, translate them in a written way and then translate the whole text:

- What is procurement planning?
- What are procurement planning tools and techniques?

Procurement planning

Procurement planning is the process of identifying which project needs can be best met by procuring products or services outside the project organization. It involves consideration of whether to procure, how to procure, what to procure, how much to procure, and when to procure it.

When the project obtains products and services from outside the performing organization, the processes from solicitation planning through contract close-out would be performed once for each product or service item.

The project management team should seek support from specialists in the disciplines of contracting and procurement when needed.

When the project does not obtain products and services from outside the performing organization, the processes from solicitation planning through contract close-out would *not* be performed. This often occurs on research and development projects when the performing organization is reluctant to share project technology and on many smaller, in-house projects when the cost of finding and managing an external resource may exceed the potential savings. Procurement planning should also include consideration of potential subcontracts, particularly if the buyer wishes to exercise some degree of influence or control over subcontracting decisions.

Inputs	Tools & Techniques	Outputs
1. Scope statement	1. Make-or-buy analysis	1. Procurement management plan
2. Product description	2. Expert judgment	2. Statement(s) of work
3. Procurement resources	3. Contract type selection	
4. Market conditions		
5. Other planning outputs		
6. Constraints		
7. Assumptions		

Tools and Techniques for Procurement Planning

1. Make-or-buy analysis. This is a general management technique which can be used to determine whether a particular product can be produced cost-effectively by the performing organization. Both sides of the analysis include indirect as well as direct costs. For example, the "buy" side of the analysis should include both the actual out-of-pocket cost to purchase the product as well as the indirect costs of managing the purchasing process.

A make-or-buy analysis must also reflect the perspective of the performing organization as well as the immediate needs of the project. For example, purchasing a capital item (anything from a construction crane to a personal computer) rather than renting it is seldom cost effective. However, if the performing organization has an ongoing need for the item, the portion of the purchase cost allocated to the project may be less than the cost of the rental.

2. Expert judgment. Expert judgment will often be required to assess the inputs to this process. Such expertise may be provided by any group or individual with specialized knowledge or training and is available from many sources including:

• Other units within the performing organization.
• Consultants.
• Professional and technical associations.
• Industry groups.

3. Contract type selection. Different types of contracts are more or less appropriate for different types of purchases. Contracts generally fall into one of three broad categories:

• Fixed price or lump sum contracts—this category of contract involves a fixed total price for a well-defined product. To the extent that the product is not well-defined, the buyer and seller are at risk—the buyer may not receive the desired product or the seller may need to incur additional costs in order to provide it. Fixed price contracts may also include incentives for meeting or exceeding selected project objectives such as schedule targets.

• Cost reimbursable contracts—this category of contract involves payment (reimbursement) to the seller for its actual costs. Costs are usually classified as *direct* costs or *indirect* costs. Direct costs are costs incurred for the exclusive benefit of the project (e.g., salaries of full-time project staff). Indirect costs, also called overhead costs, are costs allocated to the project by the performing organization as a cost of doing business (e.g., salaries of corporate executives). Indirect costs are usually calculated as a percentage of direct costs. Cost reimbursable contracts often include incentives for meeting or exceeding selected project objectives such as schedule targets or total cost.

• Unit price contracts—the seller is paid a preset amount per unit of service (e.g., $70 per hour for professional services or $1.08 per cubic yard of earth removed), and the total value of the contract is a function of the quantities needed to complete the work.

CHAPTER IX

As you read Chapter IX, look for answers to the following questions, put them down, translate them in a written way and then translate the whole text:

- What does solicitation involve?
- What are solicitation tools and techniques?
- What is the process of source selection?

Solicitation

Solicitation involves obtaining information (bids and proposals) from prospective sellers on how project needs can be met. Most of the actual effort in this process is expended by the prospective sellers, normally at no cost to the project.

Inputs	Tools & Techniques	Outputs
1. Procurement documents	1. Bidders conferences	1. Proposals
2. Qualified seller lists	2. Advertising	

Inputs to Solicitation

1. Procurement documents. Procurement documents are described.

2. Qualified seller lists. Some organizations maintain lists or files with information on prospective sellers. These lists will generally have information on relevant experience and other characteristics of the prospective sellers.

If such lists are not readily available, the project team will have to develop its own sources. General information is widely available through library directories, relevant local associations, trade catalogs, and similar sources. Detailed information on specific sources may require more extensive effort, such as site visits or contact with previous customers.

Procurement documents may be sent to some or all of the prospective sellers.

Tools and Techniques for Solicitation

1. Bidder conferences. Bidder conferences (also called contractor conferences, vendor conferences, and pre-bid conferences) are meetings with prospective sellers prior to preparation of a proposal. They are used to ensure that all prospective sellers have a clear, common understanding of the procurement (technical requirements, contract requirements, etc.). Responses to questions may be incorporated into the procurement documents as amendments.

2. Advertising. Existing lists of potential sellers can often be expanded by placing advertisements in general circulation publications such as newspapers or in specialty publications such as professional journals. Some government jurisdictions require public advertising of certain types of procurement items; most government jurisdictions require public advertising of subcontracts on a government contract.

Source selection

Source selection involves the receipt of bids or proposals and the application of the evaluation criteria to select a provider. This process is seldom straightforward:

• Price may be the primary determinant for an off-the-shelf item, but the lowest proposed *price* may not be the lowest *cost* if the seller proves unable to deliver the product in a timely manner.

• Proposals are often separated into technical (approach) and commercial (price) sections with each evaluated separately.

• Multiple sources may be required for critical products.

The tools and techniques described below may be used singly or in combination. For example, a weighting system may be used to:

• Select a single source who will be asked to sign a standard contract.

• Rank order all proposals to establish a negotiating sequence.

On major procurement items, this process may be iterated. A short list of qualified sellers will be selected based on a preliminary proposal, and then a more detailed evaluation will be conducted based on a more detailed and comprehensive proposal.

CHAPTER X

As you read Chapter X, look for answers to the following questions, put them down, translate them in a written way and then translate the whole text:

- What is contract administration?
- What are contract administration tools and techniques?
- What is contract close-out?

Contract administration

Contract administration is the process of ensuring that the seller's performance meets contractual requirements. On larger projects with multiple product and service providers, a key aspect of contract administration is managing the interfaces among the various providers. The legal nature of the contractual relationship makes it imperative that the project team be acutely aware of the legal implications of actions taken when administering the contract.

Contract administration includes application of the appropriate project management processes to the contractual relationship(s) and integration of the outputs from these processes into the overall management

of the project. This integration and coordination will often occur at multiple levels when there are multiple sellers and multiple products involved. The project management processes which must be applied include:

• Project plan execution, to authorize the contractor's work at the appropriate time.

• Performance reporting, to monitor contractor cost, schedule, and technical performance.

• Quality control, described in Section 8.3, to inspect and verify the adequacy of the contractor's product.

• Change control, described in Section 4.3, to ensure that changes are properly approved and that all those with a need to know are aware of such changes.

Contract administration also has a financial management component. Payment terms should be defined within the contract and should involve a specific linkage between progress made and compensation paid.

Inputs to Contract Administration

1 . Contract.

2. Work results. The seller's work results — which deliverables have been completed and which have not, to what extent are quality standards being met, what costs have been incurred or committed, etc. — are collected as part of project plan execution.

3. Change requests. Change requests may include modifications to the terms of the contract or to the description of the product or service to be provided. If the seller's work is unsatisfactory, a decision to terminate the contract would also be handled as a change request. Contested changes, those where the seller and the project management team cannot agree on compensation for the change, are variously called claims, disputes, or appeals.

4. Seller invoices. The seller must submit invoices from time to time to request payment for work performed. Invoicing requirements, including necessary supporting documentation, are usually defined in the contract.

Tools and Techniques for Contract Administration

1. Contract change control system. A contract change control system defines the process by which the contract may be modified. It includes the paperwork, tracking systems, dispute resolution procedures, and approval levels necessary for authorizing changes. The contract change control system should be integrated with the overall change control system.

2. Performance reporting. Performance reporting provides management with information about how effectively the seller is achieving the contractual objectives. Contract performance reporting should be integrated with the overall project performance reporting.

3. Payment system. Payments to the seller are usually handled by the accounts payable system of the performing organization. On larger projects with many or complex procurement requirements, the project may develop its own system. In either case, the system must include appropriate reviews and approvals by the project management team.

Outputs from Contract Administration

Contract terms and conditions often require written documentation of certain aspects of buyer/seller communications, such as warnings of unsatisfactory performance and contract changes or clarifications.

Changes (approved and unapproved) are fed back through the appropriate project planning and project procurement processes, and the project plan or other relevant documentation is updated as appropriate.

This assumes that the project is using an external payment system. If the project has its own internal system, the output here would simply be "payments."

Contract close-out

Contract close-out is similar to administrative closure in that it involves both product verification (Was all work completed correctly and satisfactorily?) and administrative close-out (updating of records to reflect final results and archiving of such information for future use). The contract terms and conditions may prescribe specific procedures for contract close-out. Early termination of a contract is a special case of contract close-out.

Inputs to Contract Close-out

1. Contract documentation. Contract documentation includes, but is not limited to, the contract itself along with all supporting schedules, requested and approved contract changes, any seller-developed technical documentation, seller performance reports, financial documents such as invoices and payment records, and the results of any contract-related inspections.

Tools and Techniques for Contract Close-out

1. Procurement audits. A procurement audit is a structured review of the procurement process from procurement planning through contract

administration. The objective of a procurement audit is to identify successes and failures that warrant transfer to other procurement items on this project or to other projects within the performing organization.

Outputs from Contract Close-out

1. Contract file. A complete set of indexed records should be prepared for inclusion with the final project records.

2. Formal acceptance and closure. The person or organization responsible for contract administration should provide the seller with formal written notice that the contract has been completed. Requirements for formal acceptance and closure are usually defined in the contract.