11.6.1 Control Risks: Inputs

11.6.1.1 Project Management Plan

Described in Section 4.2.3.1. The project management plan, which includes the risk management plan, provides guidance for risk monitoring and controlling.

11.6.1.2 Risk Register

The risk register has key inputs that include identified risks and risk owners, agreed-upon risk responses, control actions for assessing the effectiveness of response plans, risk responses, specific implementation actions, symptoms and warning signs of risk, residual and secondary risks, a watch list of low-priority risks, and the time and cost contingency reserves. The watch list is within the risk register and provides a list of low-priority risks.

11.6.1.3 Work Performance Data

Described in Section 4.3.3.2. Work performance data related to various performance results possibly impacted by risks includes, but is not limited to:

- Deliverable status,
- Schedule progress, and
- Costs incurred.

11.6.1.4 Work Performance Reports

Described in Section 4.4.3.2. Work performance reports take information from performance measurements and analyze it to provide project work performance information including variance analysis, earned value data, and forecasting data. These data points could be impactful in controlling performance related risks.

11.6.2 Control Risks: Tools and Techniques

11.6.2.1 Risk Reassessment

Control Risks often results in identification of new risks, reassessment of current risks, and the closing of risks that are outdated. Project risk reassessments should be regularly scheduled. The amount and detail of repetition that are appropriate depends on how the project progresses relative to its objectives.

11.6.2.2 Risk Audits

Risk audits examine and document the effectiveness of risk responses in dealing with identified risks and their root causes, as well as the effectiveness of the risk management process. The project manager is responsible for ensuring that risk audits are performed at an appropriate frequency, as defined in the project's risk management plan. Risk audits may be included during routine project review meetings, or the team may choose to hold separate risk audit meetings. The format for the audit and its objectives should be clearly defined before the audit is conducted.

11.6.2.3 Variance and Trend Analysis

Many control processes employ variance analysis to compare the planned results to the actual results. For the purposes of controlling risks, trends in the project's execution should be reviewed using performance information. Earned value analysis and other methods of project variance and trend analysis may be used for monitoring overall project performance. Outcomes

from these analyses may forecast potential deviation of the project at completion from cost and schedule targets. Deviation from the baseline plan may indicate the potential impact of threats or opportunities.

11.6.2.4 Technical Performance Measurement

Technical performance measurement compares technical accomplishments during project execution to the schedule of technical achievement. It requires the definition of objective quantifiable measures of technical performance, which can be used to compare actual results against targets. Such technical performance measures may include weight, transaction times, number of delivered defects, storage capacity, etc. Deviation, such as demonstrating more or less functionality than planned at a milestone, can help to forecast the degree of success in achieving the project's scope.

11.6.2.5 Reserve Analysis

Throughout execution of the project, some risks may occur with positive or negative impacts on budget or schedule contingency reserves. Reserve analysis compares the amount of the contingency reserves remaining to the amount of risk remaining at any time in the project in order to determine if the remaining reserve is adequate.

11.6.2.6 Meetings

Project risk management should be an agenda item at periodic status meetings. The amount of time required for that item will vary, depending upon the risks that have been identified, their priority, and difficulty of response. The more often risk management is practiced, the easier it becomes. Frequent discussions about risk make it more likely that people will identify risks and opportunities.

11.6.3 Control Risks: Outputs

11.6.3.1 Work Performance Information

Work performance information, as a Control Risks output, provides a mechanism to communicate and support project decision making.

11.6.3.2 Change Requests

Implementing contingency plans or workarounds sometimes results in a change request. Change requests are prepared and submitted to the Perform Integrated Change Control process (Section 4.5). Change requests can include recommended corrective and preventive actions as well.

- **Recommended corrective actions.** These are activities that realign the performance of the project work with the project management plan. They include contingency plans and workarounds. The latter are responses that were not initially planned, but are required to deal with emerging risks that were previously unidentified or accepted passively.
- **Recommended preventive actions.** These are activities that ensure that future performance of the project work is aligned with the project management plan.

11.6.3.3 Project Management Plan Updates

If the approved change requests have an effect on the risk management processes, the corresponding component documents of the project management plan are revised and reissued to

reflect the approved changes. The elements of the project management plan that may be updated are the same as those in the Plan Risk Responses process.

11.6.3.4 Project Documents Updates

Project documents that may be updated as a result of the Control Risk process include, but are not limited to the risk register. Risk register updates may include:

- **Outcomes of risk reassessments, risk audits, and periodic risk reviews.** These outcomes may include identification of new risks, updates to probability, impact, priority, response plans, ownership, and other elements of the risk register. Outcomes can also include closing risks that are no longer applicable and releasing their associated reserves.
- **Actual outcomes of the project's risks and of the risk responses.** This information can help project managers to plan for risk throughout their organizations, as well as on future projects.

11.6.3.5 Organizational Process Assets Updates

The risk management processes produce information that may be used for future projects, and should be captured in the organizational process assets. The organizational process assets that may be updated include, but are not limited to:

- Templates for the risk management plan, including the probability and impact matrix and risk register,
- Risk breakdown structure, and
- Lessons learned from the project risk management activities.

These documents should be updated as needed and at project closure. Final versions of the risk register and the risk management plan templates, checklists, and risk breakdown structure are included.

12

PROJECT PROCUREMENT MANAGEMENT

Project Procurement Management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team. The organization can be either the buyer or seller of the products, services, or results of a project.

Project Procurement Management includes the contract management and change control processes required to develop and administer contracts or purchase orders issued by authorized project team members.

Project Procurement Management also includes controlling any contract issued by an outside organization (the buyer) that is acquiring deliverables from the project from the performing organization (the seller), and administering contractual obligations placed on the project team by the contract.

Figure 12-1 provides an overview of the Project Procurement Management processes which include the following:

12.1 Plan Procurement Management—The process of documenting project procurement decisions, specifying the approach, and identifying potential sellers.

12.2 Conduct Procurements—The process of obtaining seller responses, selecting a seller, and awarding a contract.

12.3 Control Procurements—The process of managing procurement relationships, monitoring contract performance, and making changes and corrections as appropriate.

12.4 Close Procurements—The process of completing each project procurement.

These processes interact with each other and with processes in other Knowledge Areas as described in detail in Section 3 and Annex A1.
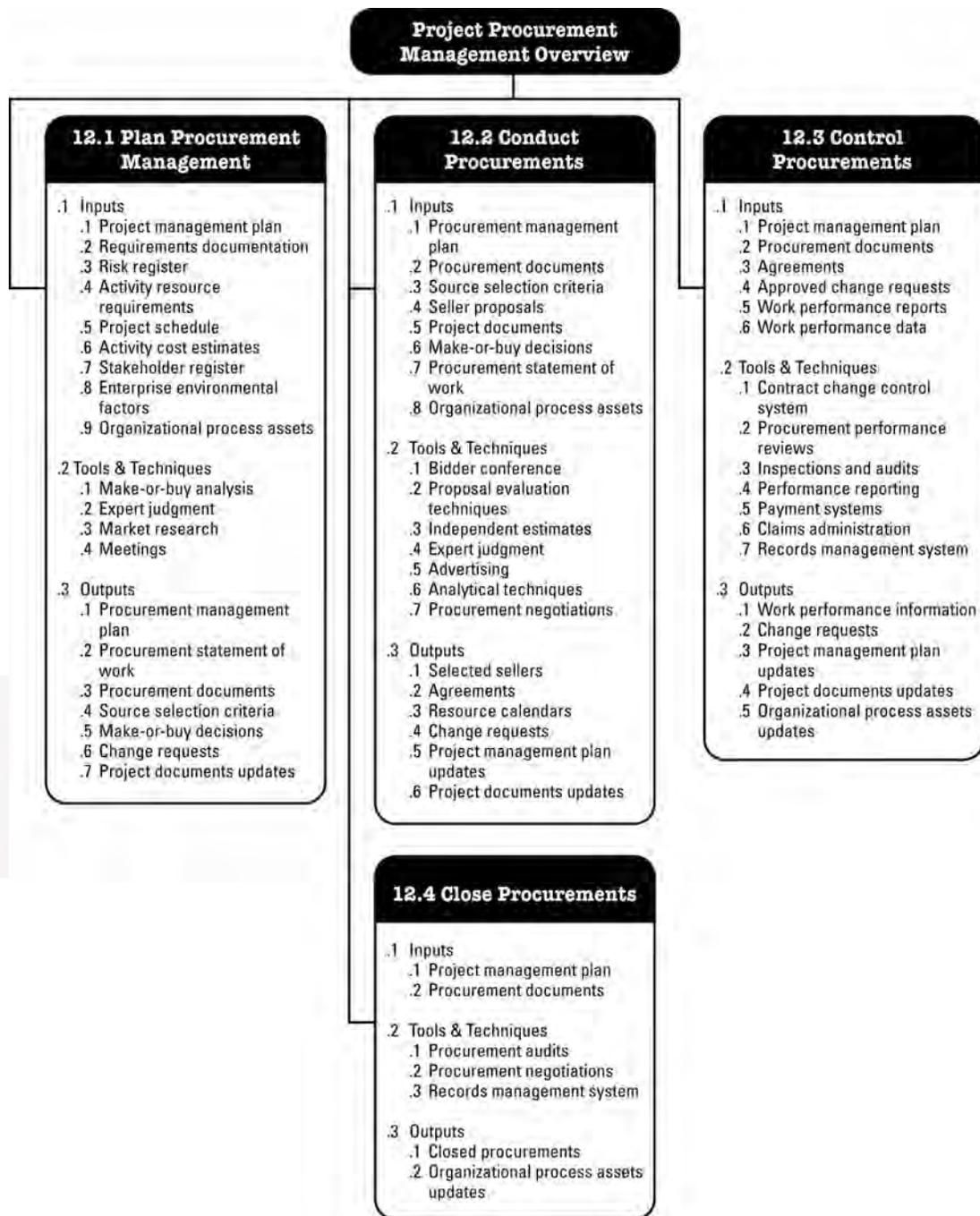
Project Procurement Management Overview

12.1 Plan Procurement Management

.1 Inputs
  .1 Project management plan
  .2 Requirements documentation
  .3 Risk register
  .4 Activity resource requirements
  .5 Project schedule
  .6 Activity cost estimates
  .7 Stakeholder register
  .8 Enterprise environmental factors
  .9 Organizational process assets

.2 Tools & Techniques
  .1 Make-or-buy analysis
  .2 Expert judgment
  .3 Market research
  .4 Meetings

.3 Outputs
  .1 Procurement management plan
  .2 Procurement statement of work
  .3 Procurement documents
  .4 Source selection criteria
  .5 Make-or-buy decisions
  .6 Change requests
  .7 Project documents updates

12.2 Conduct Procurements

.1 Inputs
  .1 Procurement management plan
  .2 Procurement documents
  .3 Source selection criteria
  .4 Seller proposals
  .5 Project documents
  .6 Make-or-buy decisions
  .7 Procurement statement of work
  .8 Organizational process assets

.2 Tools & Techniques
  .1 Bidder conference
  .2 Proposal evaluation techniques
  .3 Independent estimates
  .4 Expert judgment
  .5 Advertising
  .6 Analytical techniques
  .7 Procurement negotiations

.3 Outputs
  .1 Selected sellers
  .2 Agreements
  .3 Resource calendars
  .4 Change requests
  .5 Project management plan updates
  .6 Project documents updates

12.3 Control Procurements

.1 Inputs
  .1 Project management plan
  .2 Procurement documents
  .3 Agreements
  .4 Approved change requests
  .5 Work performance reports
  .6 Work performance data

.2 Tools & Techniques
  .1 Contract change control system
  .2 Procurement performance reviews
  .3 Inspections and audits
  .4 Performance reporting
  .5 Payment systems
  .6 Claims administration
  .7 Records management system

.3 Outputs
  .1 Work performance information
  .2 Change requests
  .3 Project management plan updates
  .4 Project documents updates
  .5 Organizational process assets updates

12.4 Close Procurements

.1 Inputs
  .1 Project management plan
  .2 Procurement documents

.2 Tools & Techniques
  .1 Procurement audits
  .2 Procurement negotiations
  .3 Records management system

.3 Outputs
  .1 Closed procurements
  .2 Organizational process assets updates

Figure 12-1. Project Procurement Management Overview

The Project Procurement Management processes involve agreements, including contracts, which are legal documents between a buyer and a seller. A contract represents a mutually binding agreement that obligates the seller to provide something of value (e.g., specified products, services, or results) and obligates the buyer to provide monetary or other valuable compensation. An agreement can be simple or complex, and may reflect the simplicity or complexity of the deliverables or required effort.

A procurement contract includes terms and conditions, and may incorporate other items that the buyer specifies what the seller is to perform or provide. It is the project management team's responsibility to make certain that all procurements meet the specific needs of the project while adhering to organizational procurement policies. Depending upon the application area, a contract can also be called an agreement, an understanding, a subcontract, or a purchase order. Most organizations document policies and procedures specifically defining the procurement rules and specifying who has authority to sign and administer such agreements on behalf of the organization.

Although all project documents may be subject to some form of review and approval, the legally binding nature of a contract or agreement usually means it will be subjected to a more extensive approval process. In all cases, the primary focus of the review and approval process is to ensure that the contract language describes the products, services, or results that will satisfy the identified project need.

The project management team may seek support in early phases from specialists in contracting, purchasing, law, and technical disciplines. Such involvement can be mandated by an organization's policies.

The various activities involved in the Project Procurement Management processes form the life cycle of an agreement. By actively managing the agreement life cycle and carefully wording the terms and conditions of a procurement, some identifiable project risks may be shared or transferred to a seller. Entering into an agreement for products or services is one method of allocating the responsibility for managing or sharing potential risks.

A complex project may involve managing multiple contracts or subcontracts simultaneously or in sequence. In such cases, each contract life cycle may end during any phase of the project life cycle. Project Procurement Management is discussed within the perspective of the buyer-seller relationship. The buyer-seller relationship may exist at many levels on any one project, and between organizations internal to and external to the acquiring organization.

Depending on the application area, the seller may be identified as a contractor, subcontractor, vendor, service provider, or supplier. Depending on the buyer's position in the project acquisition cycle, the buyer may be called a client, customer, prime contractor, contractor, acquiring organization, service requestor, or purchaser. The seller can be viewed during the contract life cycle first as a bidder, then as the selected source, and then as the contracted supplier or vendor.

The seller will typically manage the work as a project if the acquisition is not just for shelf material, goods, or common products. In such cases:

- The buyer becomes the customer, and is thus a key project stakeholder for the seller.
- The seller's project management team is concerned with all the processes of project management, not just with those of this Knowledge Area.
- Terms and conditions of the contract become key inputs to many of the seller's management processes. The contract can actually contain the inputs (e.g., major deliverables, key milestones, cost objectives), or it can limit the project team's options (e.g., buyer approval of staffing decisions is often required on design projects).

In this section, it is assumed that the buyer of an item for the project is assigned to the project team and that the seller is organizationally external to the project team. It is also assumed that a formal contractual relationship will be developed and exists between the buyer and the seller. However, most of the discussion in this section is equally applicable to non-contractual work entered into with other units of the project team's organization.

12.1 Plan Procurement Management

Plan Procurement Management is the process of documenting project procurement decisions, specifying the approach, and identifying potential sellers. The key benefit of this process is that it determines whether to acquire outside support, and if so, what to acquire, how to acquire it, how much is needed, and when to acquire it. The inputs, tools and techniques, and outputs of this process are depicted in Figure 12-2. Figure 12-3 depicts the data flow diagram of the process.

Inputs	Tools & Techniques	Outputs
.1 Project management plan	.1 Make-or-buy analysis	.1 Procurement management plan
.2 Requirements documentation	.2 Expert judgment	.2 Procurement statement of work
.3 Risk register	.3 Market research	.3 Procurement documents
.4 Activity resource requirements	.4 Meetings	.4 Source selection criteria
.5 Project schedule		.5 Make-or-buy decisions
.6 Activity cost estimates		.6 Change requests
.7 Stakeholder register		.7 Project documents updates
.8 Enterprise environmental factors		
.9 Organizational process assets		

Figure 12-2. Plan Procurements: Inputs, Tools & Techniques, and Outputs
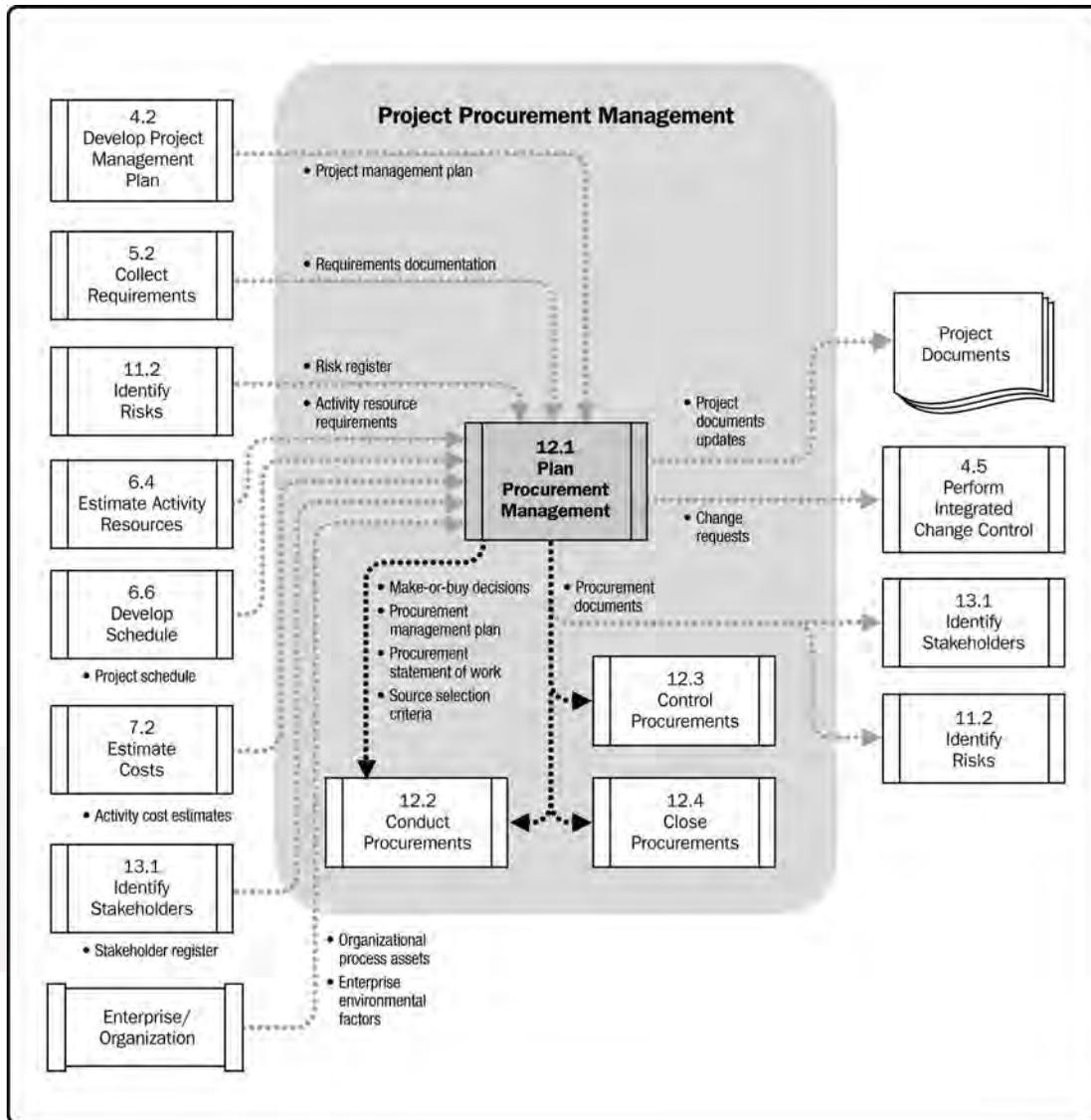
Figure 12-3. Plan Procurement Management Data Flow Diagram

Plan Procurement Management identifies those project needs that can best be met or should be met by acquiring products, services, or results outside of the project organization, versus those project needs which can be accomplished by the project team. When the project obtains products, services, and results required for project performance from outside of the performing organization, the processes from Plan Procurement Management through Close Procurements are performed for each item to be acquired.

The Plan Procurement Management process also includes evaluating potential sellers, particularly if the buyer wishes to exercise some degree of influence or control over acquisition decisions. Thought should also be given to who is responsible for obtaining or holding any relevant permits and professional licenses that may be required by legislation, regulation, or organizational policy in executing the project.

The requirements of the project schedule can significantly influence the strategy during the Plan Procurement Management process. Decisions made in developing the procurement management plan can also influence the project schedule and are integrated with Develop Schedule, Estimate Activity Resources, and make-or-buy analysis.

The Plan Procurement Management process includes evaluating the risks involved with each make-or-buy analysis. It also includes reviewing the type of contract planned to be used with respect to avoiding or mitigating risks, sometimes transferring risks to the seller.

12.1.1 Plan Procurement Management: Inputs

12.1.1.1 Project Management Plan

Described in Section 4.2.3.1. The project management plan describes the need, justification, requirements, and current boundaries for the project. It includes, but is not limited to, the scope baseline contents:

- **Project scope statement.** The project scope statement contains the product scope description, service description and result description, the list of deliverables, and acceptance criteria, as well as important information regarding technical issues or concerns that could impact cost estimating. Identified constraints may include required delivery dates, available skilled resources, and organizational policies.
- **WBS.** The work breakdown structure (WBS) contains the components of work that may be resourced externally.
- **WBS dictionary**. The WBS dictionary and related detailed statements of work provide an identification of the deliverables and a description of the work in each WBS component required to produce each deliverable.

12.1.1.2 Requirements Documentation

Described in Section 5.2.3.1. Requirements documentation may include:

- Important information about project requirements that is considered during planning for procurements, and
- Requirements with contractual and legal implications that may include health, safety, security, performance, environmental, insurance, intellectual property rights, equal employment opportunity, licenses, and permits—all of which are considered when planning for procurements.

12.1.1.3 Risk Register

Described in Section 11.2.3.1. The risk register provides the list of risks, along with the results of risk analysis and risk response planning. Updates to the risk register are included with project document updates described in Section 11.5.3.2, from the Plan Risk Responses process.

12.1.1.4 Activity Resource Requirements

Described in Section 6.4.3.1. Activity resource requirements contain information on specific needs such as people, equipment, or location.

12.1.1.5 Project Schedule

Described in Section 6.6.3.2. Project schedule contains information on required timelines or mandated deliverable dates.

12.1.1.6 Activity Cost Estimates

Described in Section 7.2.3.1. Cost estimates developed by the procuring activity are used to evaluate the reasonableness of the bids or proposals received from potential sellers.

12.1.1.7 Stakeholder Register

Described in Section 13.1.3.1. The stakeholder register provides details on the project participants and their interests in the project.

12.1.1.8 Enterprise Environmental Factors

Described in Section 2.1.5. The enterprise environmental factors that can influence the Plan Procurement Management process include, but are not limited to:

- Marketplace conditions;
- Products, services, and results that are available in the marketplace;
- Suppliers, including past performance or reputation;
- Typical terms and conditions for products, services, and results or for the specific industry; and
- Unique local requirements.

12.1.1.9 Organizational Process Assets

Described in Section 2.1.4. The various types of contractual agreements used by the organization also influence decisions for the Plan Procurement Management process. The organizational process assets that influence the Plan Procurement Management process include, but are not limited to:

- Formal procurement policies, procedures, and guidelines. Most organizations have formal procurement policies and buying organizations. When such procurement support is not available, the project team should supply both the resources and the expertise to perform such procurement activities.
- Management systems that are considered in developing the procurement management plan and selecting the contractual relationships to be used.
- An established multi-tier supplier system of pre-qualified sellers based on prior experience.

All legal contractual relationships generally fall into one of two broad families: either fixed-price or cost reimbursable. Also, there is a third hybrid-type commonly in use called the time and materials contract. The more popular contract types in use are discussed below as discrete types, but in practice it is not unusual to combine one or more types into a single procurement.

- **Fixed-price contracts.** This category of contracts involves setting a fixed total price for a defined product, service, or result to be provided. Fixed-price contracts may also incorporate financial incentives for achieving or exceeding selected project objectives, such as schedule delivery dates, cost and technical performance, or anything that can be quantified and subsequently measured. Sellers under fixed-price contracts are legally obligated to complete such contracts, with possible financial damages if they do not. Under the fixed-price arrangement, buyers need to precisely

specify the product or services being procured. Changes in scope may be accommodated, but generally with an increase in contract price.

- o *Firm Fixed Price Contracts (FFP).* The most commonly used contract type is the FFP. It is favored by most buying organizations because the price for goods is set at the outset and not subject to change unless the scope of work changes. Any cost increase due to adverse performance is the responsibility of the seller, who is obligated to complete the effort. Under the FFP contract, the buyer should precisely specify the product or services to be procured, and any changes to the procurement specification can increase the costs to the buyer.

- o *Fixed Price Incentive Fee Contracts (FPIF).* This fixed-price arrangement gives the buyer and seller some flexibility in that it allows for deviation from performance, with financial incentives tied to achieving agreed upon metrics. Typically such financial incentives are related to cost, schedule, or technical performance of the seller. Performance targets are established at the outset, and the final contract price is determined after completion of all work based on the seller's performance. Under FPIF contracts, a price ceiling is set, and all costs above the price ceiling are the responsibility of the seller, who is obligated to complete the work.

- o *Fixed Price with Economic Price Adjustment Contracts (FP-EPA).* This contract type is used whenever the seller's performance period spans a considerable period of years, as is desired with many long-term relationships. It is a fixed-price contract, but with a special provision allowing for pre-defined final adjustments to the contract price due to changed conditions, such as inflation changes, or cost increases (or decreases) for specific commodities. The EPA clause needs to relate to some reliable financial index, which is used to precisely adjust the final price. The FP-EPA contract is intended to protect both buyer and seller from external conditions beyond their control.

- **Cost-reimbursable contracts.** This category of contract involves payments (cost reimbursements) to the seller for all legitimate actual costs incurred for completed work, plus a fee representing seller profit. Cost-reimbursable contracts may also include financial incentive clauses whenever the seller exceeds, or falls below, defined objectives such as costs, schedule, or technical performance targets. Three of the more common types of cost-reimbursable contracts in use are Cost Plus Fixed Fee (CPFF), Cost Plus Incentive Fee (CPIF), and Cost Plus Award Fee (CPAF).

A cost-reimbursable contract provides the project flexibility to redirect a seller whenever the scope of work cannot be precisely defined at the start and needs to be altered, or when high risks may exist in the effort.

- o *Cost Plus Fixed Fee Contracts (CPFF).* The seller is reimbursed for all allowable costs for performing the contract work, and receives a fixed-fee payment calculated as a percentage of the initial estimated project costs. A fee is paid only for completed work and does not change due to seller performance. Fee amounts do not change unless the project scope changes.

- o *Cost Plus Incentive Fee Contracts (CPIF).* The seller is reimbursed for all allowable costs for performing the contract work and receives a predetermined

incentive fee based upon achieving certain performance objectives as set forth in the contract. In CPIF contracts, if the final costs are less or greater than the original estimated costs, then both the buyer and seller share costs from the departures based upon a pre-negotiated cost-sharing formula, for example, an 80/20 split over/under target costs based on the actual performance of the seller.

o *Cost Plus Award Fee Contracts (CPAF).* The seller is reimbursed for all legitimate costs, but the majority of the fee is earned only based on the satisfaction of certain broad subjective performance criteria defined and incorporated into the contract. The determination of fee is based solely on the subjective determination of seller performance by the buyer, and is generally not subject to appeals.

- **Time and Material Contracts (T&M).** Time and material contracts are a hybrid type of contractual arrangement that contain aspects of both cost-reimbursable and fixed-price contracts. They are often used for staff augmentation, acquisition of experts, and any outside support when a precise statement of work cannot be quickly prescribed. These types of contracts resemble cost-reimbursable contracts in that they can be left open ended and may be subject to a cost increase for the buyer. The full value of the agreement and the exact quantity of items to be delivered may not be defined by the buyer at the time of the contract award. Thus, T&M contracts can increase in contract value as if they were cost-reimbursable contracts. Many organizations require not-to-exceed values and time limits placed in all T&M contracts to prevent unlimited cost growth. Conversely, T&M contracts can also resemble fixed unit price arrangements when certain parameters are specified in the contract. Unit labor or material rates can be preset by the buyer and seller, including seller profit, when both parties agree on the values for specific resource categories, such as senior engineers at specified rates per hour, or categories of materials at specified rates per unit.

12.1.2 Plan Procurement Management: Tools and Techniques

12.1.2.1 Make-or-Buy Analysis

A make-or-buy analysis is a general management technique used to determine whether particular work can best be accomplished by the project team or should be purchased from outside sources. Sometimes a capability may exist within the project organization, but may be committed to working on other projects, in which case, the project may need to source such effort from outside the organization in order to meet its schedule commitments.

Budget constraints may influence make-or-buy decisions. If a buy decision is to be made, then a further decision of whether to purchase or lease is also made. A make-or-buy analysis should consider all related costs—both direct costs as well as indirect support costs. For example, the buy-side of the analysis includes both the actual out-of-pocket costs to purchase the product, as well as the indirect costs of supporting the purchasing process and purchased item.

Available contract types are also considered during the buy analysis. The risk sharing between the buyer and seller determines the suitable contract types, while the specific contract terms and conditions formalize the degree of risk being assumed by the buyer and seller. Some jurisdictions have other types of contracts defined, for example, contract types based on the

obligations of the seller—not the customer—and the contract parties have the obligation to identify the appropriate type of contract as soon as the applicable law has been agreed upon.

12.1.2.2 Expert Judgment

Expert judgment is often used to assess the inputs to and outputs from this process. Expert purchasing judgment can also be used to develop or modify the criteria that will be used to evaluate seller proposals. Expert legal judgment may involve the services of legal staff to assist with unique procurement issues, terms, and conditions. Such judgment, including business and technical expertise, can be applied to both the technical details of the acquired products, services, or results and to various aspects of the procurement management processes.

12.1.2.3 Market Research

Market research includes examination of industry and specific vendor capabilities. Procurement teams may leverage information gained at conferences, online reviews and a variety of sources to identify market capabilities. The team may also refine particular procurement objectives to leverage maturing technologies while balancing risks associated with the breadth of vendors who can provide the materials or services desired.

12.1.2.4 Meetings

Research alone may not provide specific information to formulate a procurement strategy without additional information interchange meetings with potential bidders. By collaborating with potential bidders, the organization purchasing the material or service may benefit while the supplier can influence a mutually beneficial approach or product.

12.1.3 Plan Procurement Management: Outputs

12.1.3.1 Procurement Management Plan

The procurement management plan is a component of the project management plan that describes how a project team will acquire goods and services from outside the performing organization. It describes how the procurement processes will be managed from developing procurement documents through contract closure. The procurement management plan can include guidance for:

- Types of contracts to be used;
- Risk management issues;
- Whether independent estimates will be used and whether they are needed as evaluation criteria;
- Those actions the project management team can take unilaterally, if the performing organization has a prescribed procurement, contracting, or purchasing department;
- Standardized procurement documents, if needed;
- Managing multiple suppliers;
- Coordinating procurement with other project aspects, such as scheduling and performance reporting;
- Any constraints and assumptions that could affect planned procurements;
- Handling the long lead times to purchase certain items from sellers and coordinating the extra time needed to procure these items with the development of the project schedule;

- Handling the make-or-buy decisions and linking them into the Estimate Activity Resources and Develop Schedule processes;
- Setting the scheduled dates in each contract for the contract deliverables and coordinating with the schedule development and control processes;
- Identifying requirements for performance bonds or insurance contracts to mitigate some forms of project risk;
- Establishing the direction to be provided to the sellers on developing and maintaining a work breakdown structure (WBS);
- Establishing the form and format to be used for the procurement/contract statements of work;
- Identifying prequalified sellers, if any, to be used; and
- Procurement metrics to be used to manage contracts and evaluate sellers.

A procurement management plan can be formal or informal, can be highly detailed or broadly framed, and is based upon the needs of each project.

12.1.3.2 Procurement Statement of Work

The statement of work (SOW) for each procurement is developed from the project scope baseline and defines only that portion of the project scope that is to be included within the related contract. The procurement SOW describes the procurement item in sufficient detail to allow prospective sellers to determine if they are capable of providing the products, services, or results. Sufficient detail can vary based on the nature of the item, the needs of the buyer, or the expected contract form. Information included in a SOW can include specifications, quantity desired, quality levels, performance data, period of performance, work location, and other requirements.

The procurement SOW is written to be clear, complete, and concise. It includes a description of any collateral services required, such as performance reporting or post-project operational support for the procured item. In some application areas, there are specific content and format requirements for a procurement SOW. Each individual procurement item requires a SOW; however, multiple products or services can be grouped as one procurement item within a single SOW.

The procurement SOW can be revised and refined as required as it moves through the procurement process until incorporated into a signed agreement.

12.1.3.3 Procurement Documents

Procurement documents are used to solicit proposals from prospective sellers. Terms such as bid, tender, or quotation are generally used when the seller selection decision will be based on price (as when buying commercial or standard items), while a term such as proposal is generally used when other considerations, such as technical capability or technical approach are paramount. Common terms are in use for different types of procurement documents and may include request for information (RFI), invitation for bid (IFB), request for proposal (RFP), request for quotation (RFQ), tender notice, invitation for negotiation, and invitation for seller's initial response. Specific procurement terminology used may vary by industry and location of the procurement.

The buyer structures procurement documents to facilitate an accurate and complete response from each prospective seller and to facilitate easy evaluation of the responses. These

documents include a description of the desired form of the response, the relevant procurement statement of work (SOW) and any required contractual provisions. With government contracting, some or all of the content and structure of procurement documents may be defined by regulation.

The complexity and level of detail of the procurement documents should be consistent with the value of, and risks associated with, the planned procurement. Procurement documents are required to be sufficient to ensure consistent, appropriate responses, but flexible enough to allow consideration of any seller suggestions for better ways to satisfy the same requirements.

Issuing a procurement request to potential sellers to submit a proposal or bid is normally done in accordance with the policies of the buyer's organization, which can include publication of the request in public newspapers, in trade journals, in public registries, or on the internet.

12.1.3.4 Source Selection Criteria

Source selection criteria are often included as a part of the procurement documents. Such criteria are developed and used to rate or score seller proposals, and can be objective or subjective.

Selection criteria may be limited to only the purchase price if the procurement item is readily available from a number of acceptable sellers. Purchase price in this context includes both the cost of the item and all ancillary expenses such as delivery.

Other selection criteria can be identified and documented to support an assessment for more complex products, services, or results. Some possible source selection criteria are:

- **Understanding of need.** How well does the seller's proposal address the procurement statement of work?
- **Overall or life-cycle cost.** Will the selected seller produce the lowest total cost of ownership (purchase cost plus operating cost)?
- **Technical capability.** Does the seller have, or can the seller be reasonably expected to acquire, the technical skills and knowledge needed?
- **Risk.** How much risk is embedded in the statement of work, how much risk will be assigned to the selected seller and how does the seller mitigate risk?
- **Management approach.** Does the seller have, or can the seller be reasonably expected to develop, management processes and procedures to ensure a successful project?
- **Technical approach.** Do the seller's proposed technical methodologies, techniques, solutions, and services meet the procurement documents requirements or are they likely to provide more or less than the expected results?
- **Warranty.** What does the seller propose to warrant for the final product, and through what time period?
- **Financial capacity.** Does the seller have, or can the seller reasonably be expected to obtain, the necessary financial resources?
- **Production capacity and interest.** Does the seller have the capacity and interest to meet potential future requirements?
- **Business size and type.** Does the seller's enterprise meet a specific category of business such as small business (disadvantaged, specific programs, etc.) as defined by

the organization or established by governmental agency and set forth as a condition of the agreement award?

- **Past performance of sellers.** What has been the past experience with selected sellers?

- **References.** Can the seller provide references from prior customers verifying the seller's work experience and compliance with contractual requirements?

- **Intellectual property rights.** Does the seller assert intellectual property rights in the work processes or services they will use or in the products they will produce for the project?

- **Proprietary rights.** Does the seller assert proprietary rights in the work processes or services they will use or in the products they will produce for the project?

12.1.3.5 Make-or-Buy Decisions

A make-or-buy analysis results in a decision of whether particular work can best be accomplished by the project team or needs to be purchased from outside sources. If the decision is to make the item, then the procurement plan may define processes and agreements internal to the organization. A buy decision drives a similar process of reaching agreement with a supplier for the product or services.

12.1.3.6 Change Requests

A decision that involves procuring goods, services, or resources typically requires a change request. Other decisions during procurement planning can also create the need for additional change requests. Change requests are processed for review and disposition through the Perform Integrated Change Control process (Section 4.5). Changes to the project management plan, its subsidiary plans, and other components may result in change requests that impact procurement actions. Change requests are processed for review and disposition through the Perform Integrated Change Control process (Section 4.5).

12.1.3.7 Project Documents Updates

Project documents that may be updated include, but are not limited to:

- Requirements documentation,
- Requirements traceability matrix, and
- Risk register.

12.2 Conduct Procurements

Conduct Procurements is the process of obtaining seller responses, selecting a seller, and awarding a contract. The key benefit of this process is that it provides alignment of internal and external stakeholder expectations through established agreements. The inputs, tools and techniques, and outputs of this process are depicted in Figure 12-4. Figure 12-5 depicts the data flow diagram of the process.

Figure 12-4. Conduct Procurements: Inputs, Tools & Techniques, and Outputs
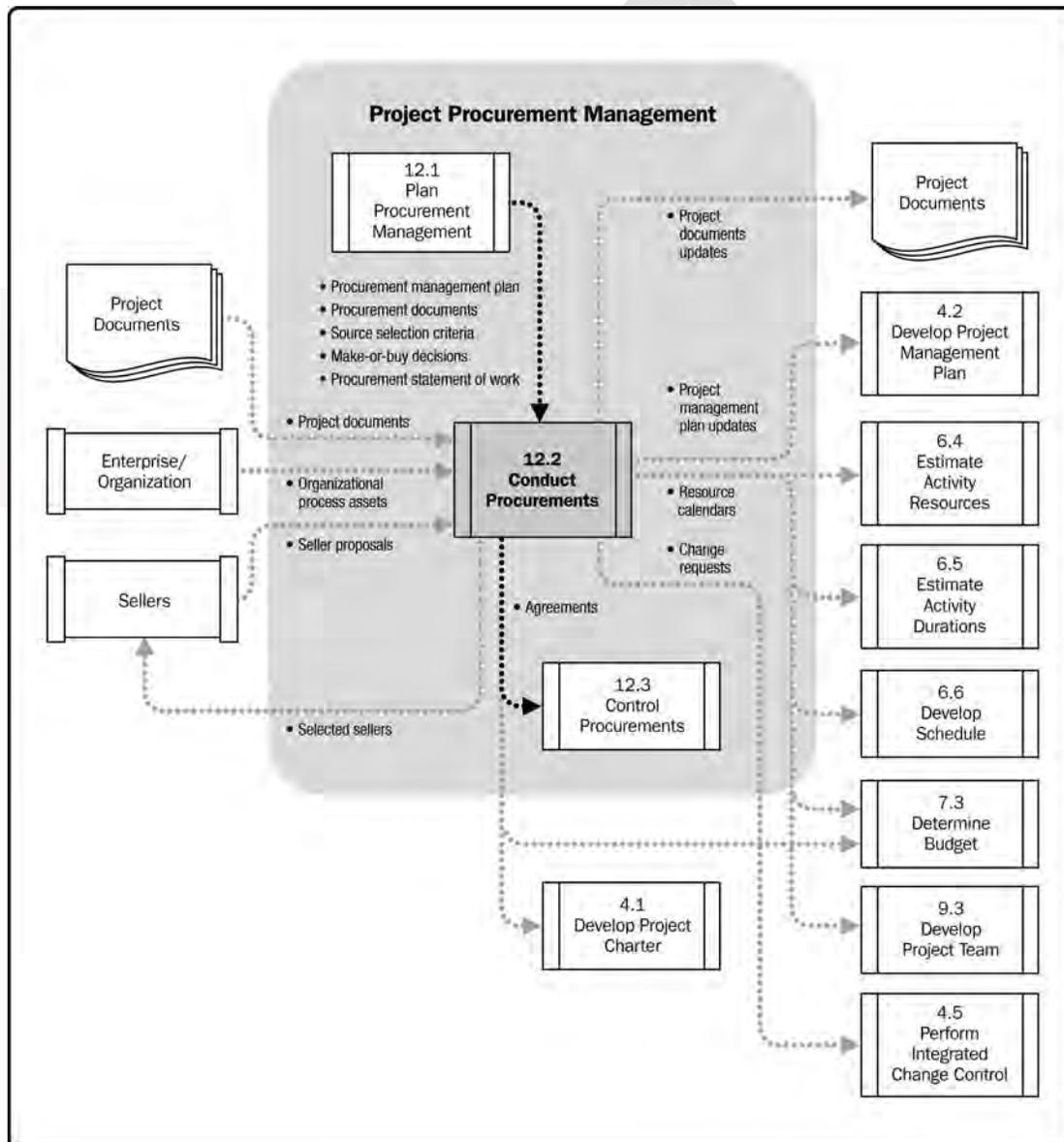

Figure 12-5. Conduct Procurements Data Flow Diagram

During the Conduct Procurements process, the team will receive bids or proposals and will apply previously defined selection criteria to select one or more sellers who are qualified to perform the work and acceptable as a seller.

On major procurement items, the overall process of requesting responses from sellers and evaluating those responses can be repeated. A short list of qualified sellers can be established based on a preliminary proposal. A more detailed evaluation can then be conducted based on a more specific and comprehensive requirements document requested from the sellers on the short list. In addition, tools and techniques described here may be used alone or in combination with select sellers. For example, a weighting system can be used to:

- Select a single seller that will be asked to sign a standard contract; and
- Establish a negotiating sequence by ranking all proposals by the weighted evaluation scores assigned to each proposal.

12.2.1 Conduct Procurements: Inputs

12.2.1.1 Procurement Management Plan

Described in Section 4.2.3.1. The procurement management plan describes how the procurement processes will be managed from developing procurement documentation through contract closure.

12.2.1.2 Procurement Documents

Described in Section 12.1.3.3. Procurement documents provide an audit trail for contracts and other agreements.

12.2.1.3 Source Selection Criteria

Described in Section 12.1.3.4.

Source selection criteria can include information on the supplier's required capabilities, capacity, delivery dates, product cost, life-cycle cost, technical expertise, and the approach to the contract.

12.2.1.4 Seller Proposals

Seller proposals, prepared in response to a procurement document package, form the basic information that will be used by an evaluation body to select one or more successful bidders (sellers).

12.2.1.5 Project Documents

Described in Section 11.5.3.2. Project documents that are often considered include the risk-related contract decisions included within the risk register.

12.2.1.6 Make-or-Buy Decisions

Described in Section 12.1.3.5. Organizations procuring goods or services analyze the need, identify resources, and then compare procurement strategies when deciding to buy. Organizations also evaluate the need of buying products versus making the items themselves. Factors that influence make-or-buy decisions may include:

- Core capabilities of the organization,
- Value delivered by vendors meeting the need,
- Risks associated with meeting the need in a cost effective manner, and

● Capability internally compared with the vendor community.

12.2.1.7 Procurement Statement of Work

Described in Section 12.1.3.2. The procurement statement of work provides suppliers with a clearly stated set of goals, requirements, and outcomes from which they can provide a quantifiable response. The statement of work is a critical component of the procurement process and can be modified as needed through this process until a final agreement is in place. The statements of work may include, but are not limited to:

● Specifications,
● Quantity desired,
● Quality levels,
● Performance data,
● Period of performance,
● Work location, and
● Other requirements

12.2.1.8 Organizational Process Assets

Described in Section 2.1.4. Elements of the organizational process assets that can influence the Conduct Procurements process include, but are not limited to:

● Listings of prospective and previously qualified sellers,
● Information on relevant past experience with sellers, both good and bad, and
● Prior agreements.

Whenever a prior agreement is in place, the buyer and seller roles will have already been decided by executive management. In some cases, the seller may already be working under a contract funded by the buyer or jointly by both parties. The effort of the buyer and seller in this process is to collectively prepare a procurement statement of work that will satisfy the requirements of the project. The parties will then negotiate a final contract for award.

12.2.2 Conduct Procurements: Tools and Techniques

12.2.2.1 Bidder Conferences

Bidder conferences (sometimes called contractor conferences, vendor conferences, and pre-bid conferences) are meetings between the buyer and all prospective sellers prior to submittal of a bid or proposal. They are used to ensure that all prospective sellers have a clear and common understanding of the procurement requirements), and that no bidders receive preferential treatment. To be fair, buyers should take great care to ensure that all prospective sellers hear every question from any individual prospective seller and every answer from the buyer. Typically fairness is addressed by techniques such as collecting questions from bidders or arranging field visits in advance of the bidder conference. Responses to questions can be incorporated into the procurement documents as amendments.

12.2.2.2 Proposal Evaluation Techniques

On complex procurements, where source selection will be made based on seller responses to previously defined weighted criteria, a formal evaluation review process will be defined by the

buyer's procurement policies. The evaluation committee will make their selection for approval by management prior to the award.

12.2.2.3 Independent Estimates

For many procurement items, the procuring organization may elect to either prepare its own independent estimate, or have an estimate of costs prepared by an outside professional estimator, to serve as a benchmark on proposed responses. Significant differences in cost estimates can be an indication that the procurement statement of work was deficient, ambiguous, and/or that the prospective sellers either misunderstood or failed to respond fully to the procurement statement of work.

12.2.2.4 Expert Judgment

Expert judgment may be used in evaluating seller proposals. The evaluation of proposals may be accomplished by a multi-discipline review team with expertise in each of the areas covered by the procurement documents and proposed contract. This can include expertise from functional disciplines such as contracting, legal, finance, accounting, engineering, design, research, development, sales, and manufacturing.

12.2.2.5 Advertising

Existing lists of potential sellers often can be expanded by placing advertisements in general circulation publications such as selected newspapers or in specialty trade publications. Some organizations use online resources to communicate solicitations to the vendor community. Some government jurisdictions require public advertising of certain types of procurement items, and most government jurisdictions require public advertising or online posting of pending government contracts.

12.2.2.6 Analytical Techniques

Procurements involve defining a need in such a way that vendors can bring value through their offerings. To ensure that the need can be and is met, analytical techniques can help organizations identify the readiness of a vendor to provide the desired end state, determine the cost expected to support budgeting, and avoid cost overruns due to changes. By examining past performance information, teams may identify areas that may have more risk and that need to be monitored closely to ensure success of the project.

12.2.2.7 Procurement Negotiations

Procurement negotiations clarify the structure, requirements and other terms of the purchases so that mutual agreement can be reached prior to signing the contract. Final contract language reflects all agreements reached. Subjects covered should include responsibilities, authority to make changes, applicable terms and governing law, technical and business management approaches, proprietary rights, contract financing, technical solutions, overall schedule, payments, and price. Negotiations conclude with a contract document that can be executed by both buyer and seller.

For complex procurement items, contract negotiation can be an independent process with inputs (e.g., issues or an open items listing) and outputs (e.g., documented decisions) of its own. For simple procurement items, the terms and conditions of the contract can be previously set and nonnegotiable, and only need to be accepted by the seller.

The project manager may not be the lead negotiator on procurements. The project manager and other members of the project management team may be present during negotiations to provide assistance, and, if needed, to add clarification of the project's technical, quality, and management requirements.

12.2.3 Conduct Procurements: Outputs

12.2.3.1 Selected Sellers

The selected sellers are those who have been judged to be in a competitive range based upon the outcome of the proposal or bid evaluation, and who have negotiated a draft contract that will become the actual contract when an award is made. Final approval of all complex, high-value, high-risk procurements will generally require organizational senior management approval prior to award.

12.2.3.2 Agreements

A procurement agreement includes terms and conditions, and may incorporate other items that the buyer specifies regarding what the seller is to perform or provide. It is the project management team's responsibility to make certain that all agreements meet the specific needs of the project while adhering to organizational procurement policies. Depending upon the application area, an agreement can also be called an understanding, a contract, a subcontract, or a purchase order. Regardless of the document's complexity, a contract is a mutually binding legal agreement that obligates the seller to provide the specified products, services, or results, and obligates the buyer to compensate the seller. A contract is a legal relationship subject to remedy in the courts. The major components in an agreement document will vary, but may include the following:

- Statement of work or deliverables,
- Schedule baseline,
- Performance reporting,
- Period of performance,
- Roles and responsibilities,
- Seller's place of performance,
- Pricing,
- Payment terms,
- Place of delivery,
- Inspection and acceptance criteria,
- Warranty,
- Product support,
- Limitation of liability,
- Fees and retainer,
- Penalties,
- Incentives,
- Insurance and performance bonds,
- Subordinate subcontractor approvals,

- Change request handling, and
- Termination clause and alternative dispute resolution (ADR) mechanisms. The ADR method can be decided in advance as a part of the procurement award.

12.2.3.3 Resource Calendars

The quantity and availability of contracted resources and those dates on which each specific resource or resource group can be active or idle are documented.

12.2.3.4 Change Requests

Change requests to the project management plan, its subsidiary plans, and other components are processed for review and disposition through the Perform Integrated Change Control process (Section 4.5).

12.2.3.5 Project Management Plan Updates

Elements of the project management plan that may be updated include, but are not limited to:

- Cost baseline,
- Scope baseline,
- Schedule baseline,
- Communications management plan, and
- Procurement management plan.

12.2.3.6 Project Documents Updates

Project documents that may be updated include, but are not limited to:

- Requirements documentation,
- Requirements traceability documentation,
- Risk register, and
- Stakeholder register.

12.3 Control Procurements

Control Procurements is the process of managing procurement relationships, monitoring contract performance, and making changes and corrections to contracts as appropriate. The key benefit of this process is that it ensures that both the seller's and buyer's performance meets procurement requirements according to the terms of the legal agreement. The inputs, tools and techniques, and outputs of this process are depicted in Figure 12-6. Figure 12-7 depicts the data flow diagram of the process.

Inputs	Tools & Techniques	Outputs
.1 Project management plan .2 Procurement documents .3 Agreements .4 Approved change requests .5 Work performance reports .6 Work performance data	.1 Contract change control system .2 Procurement performance reviews .3 Inspections and audits .4 Performance reporting .5 Payment systems .6 Claims administration .7 Records management system	.1 Work performance information .2 Change requests .3 Project management plan updates .4 Project documents updates .5 Organizational process assets updates

Figure 12-6. Control Procurements: Inputs, Tools & Techniques, and Outputs
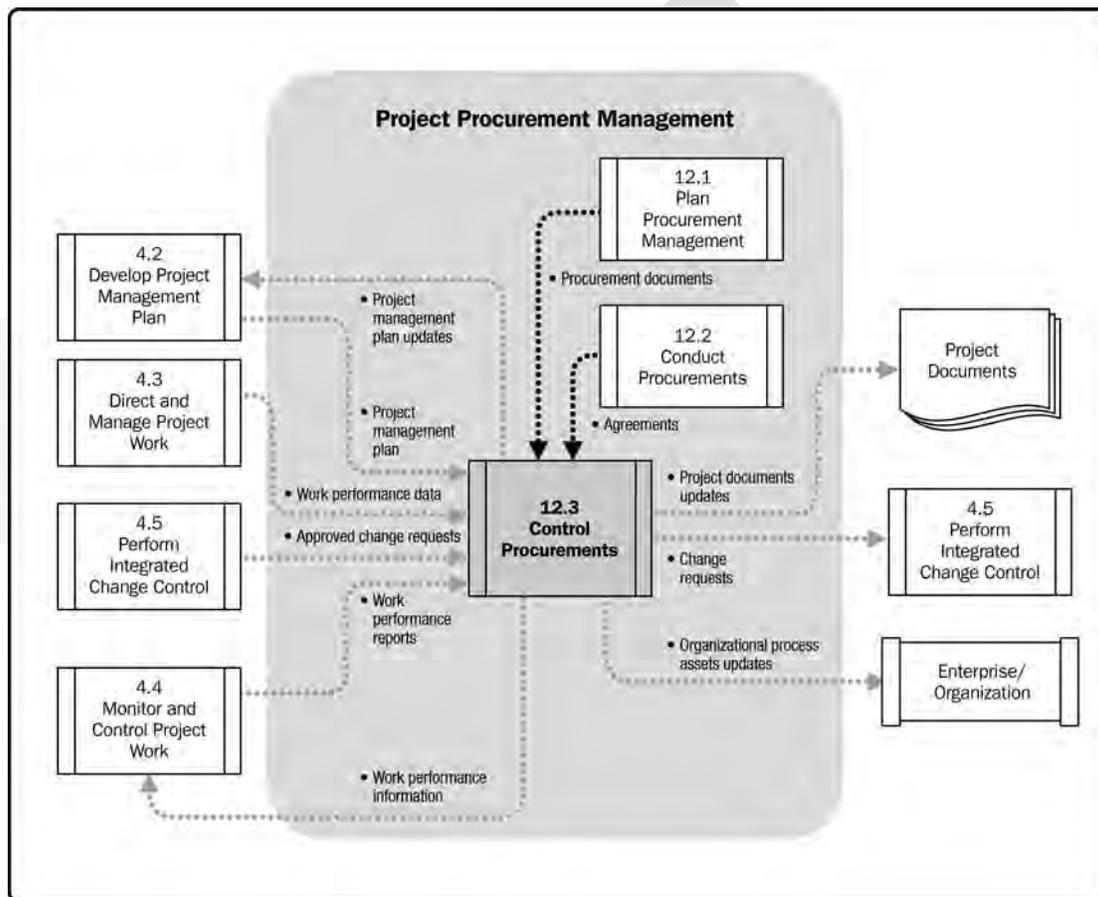
Figure 12-7. Control Procurements Data Flow Diagram

Both the buyer and the seller will administer the procurement contract for similar purposes. Each are required to ensure that both parties meet their contractual obligations and that their own legal rights are protected. The legal nature of the contractual relationship makes it imperative that the project management team is aware of the legal implications of actions taken when controlling any procurement. On larger projects with multiple providers, a key aspect of contract administration is managing interfaces among the various providers.

Due to varying organizational structures, many organizations treat contract administration as an administrative function separate from the project organization. While a procurement administrator may be on the project team, this individual typically reports to a supervisor from a different department. This is usually true if the performing organization is also the seller of the project to an external customer.

Control Procurements 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 will often occur at multiple levels when there are multiple sellers and multiple products, services, or results involved. The project management processes that are applied may include, but are not limited to:

- **Direct and Manage Project Work.** To authorize the seller's work at the appropriate time.
- **Control Quality.** To inspect and verify the adequacy of the seller's product.
- **Perform Integrated Change Control.** To assure that changes are properly approved and that all those with a need to know are aware of such changes.
- **Control Risks.** To ensure that risks are mitigated.

Control Procurements also has a financial management component that involves monitoring payments to the seller. This ensures that payment terms defined within the contract are met and that seller compensation is linked to seller progress, as defined in the contract. One of the principal concerns when making payments to suppliers is that there is a close relationship of payments made to the work accomplished.

The Control Procurements process reviews and documents how well a seller is performing or has performed based on the contract and establishes corrective actions when needed. This performance review may be used as a measure of the seller's competency for performing similar work on future projects. Similar evaluations are also carried out when it is necessary to confirm that a seller is not meeting the seller's contractual obligations and when the buyer contemplates corrective actions. Control Procurements includes capturing the necessary details for managing any early terminations of the contracted work (for cause, convenience, or default) in accordance with the termination clause of the agreement. These details are used in the Close Procurements process to terminate the agreement.

Agreements can be amended at any time prior to contract closure by mutual consent, in accordance with the change control terms of the agreement. Such amendments are typically captured in writing.

12.3.1 Control Procurements: Inputs

12.3.1.1 Project Management Plan

Described in Section 4.2.3.1. The project management plan describes how the procurement processes will be managed from developing procurement documentation through contract closure.

12.3.1.2 Procurement Documents

Described in Section 12.1.3.3. Procurement documents contain complete supporting records for administration of the procurement processes; this includes procurement contract awards and the statement of work.

12.3.1.3 Agreements

Described in Section 12.2.3.2. Agreements are understandings between parties, including understanding of the duties of each party.

12.3.1.4 Approved Change Requests

Approved change requests can include modifications to the terms and conditions of the contract, including the procurement statement of work, pricing, and descriptions of the products, services, or results to be provided. All procurement-related changes are formally documented in writing and approved before being implemented through the Control Procurements process.

12.3.1.5 Work Performance Reports

Described in Section 4.4.3.2. Seller performance-related documentation includes:

- **Technical documentation.** Seller-developed technical documentation and other deliverable information are provided in accordance with the terms of the contract.
- **Work performance information.** The seller's performance reports indicate which deliverables have been completed and which have not.

12.3.1.6 Work Performance Data

Described in Section 4.3.3.2. Work performance data includes (1) the extent to which quality standards are being satisfied, (2) the costs that have been incurred or committed, and (3) identification of the seller invoices that have been paid. All data are collected as part of project execution.

12.3.2 Control Procurements: Tools and Techniques

12.3.2.1 Contract Change Control System

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

12.3.2.2 Procurement Performance Reviews

A procurement performance review is a structured review of the seller's progress to deliver project scope and quality, within cost and on schedule, as compared to the contract. It can include a review of seller-prepared documentation and buyer inspections, as well as quality audits conducted during seller's execution of the work. The objective of a performance review is to identify performance successes or failures, progress with respect to the procurement statement of work, and contract noncompliance, which allow the buyer to quantify the seller's demonstrated ability or inability to perform work. Such reviews may take place as a part of project status reviews, which would include key suppliers.

12.3.2.3 Inspections and Audits

Inspections and audits required by the buyer and supported by the seller, as specified in the procurement contract, can be conducted during execution of the project to verify compliance in the seller's work processes or deliverables. If authorized by contract, some inspection and audit teams can include buyer procurement personnel.

12.3.2.4 Performance Reporting

Work performance data and reports supplied by sellers are evaluated against the agreement requirements. Work performance information from this evaluation is then reported as appropriate. Performance reporting provides management with information about how effectively the seller is achieving the contractual objectives.

12.3.2.5 Payment Systems

Payments to the seller are typically processed by the accounts payable system of the buyer after certification of satisfactory work by an authorized person on the project team. All payments should be made and documented in strict accordance with the terms of the contract.

12.3.2.6 Claims Administration

Contested changes and potential constructive changes are those requested changes where the buyer and seller cannot reach an agreement on compensation for the change or cannot agree that a change has occurred. These contested changes are variously called claims, disputes, or appeals. Claims are documented, processed, monitored, and managed throughout the contract life cycle, usually in accordance with the terms of the contract. If the parties themselves do not resolve a claim, it may have to be handled in accordance with alternative dispute resolution (ADR) typically following procedures established in the contract. Settlement of all claims and disputes through negotiation is the preferred method.

12.3.2.7 Records Management System

A records management system is used by the project manager to manage contract and procurement documentation and records. It consists of a specific set of processes, related control functions, and automation tools that are consolidated and combined as part of the project management information system (Section 4.4.2.3). The system contains a retrievable archive of contract documents and correspondence.

12.3.3 Control Procurements: Outputs

12.3.3.1 Work Performance Information

Work performance information provides a basis for identification of current or potential problems to support later claims or new procurements. By reporting on the performance of a vendor, the organization increases knowledge of the performance of the procurement, which supports improved forecasting, risk management and decision making. Performance reports also assist in the event there is a dispute with the vendor.

Work performance information includes reporting compliance of contracts, which provides procuring organizations a mechanism to track specific deliverables expected and received from vendors. Contract compliance reports support improved communications with vendors so that potential issues are addressed promptly to the satisfaction of all parties.

12.3.3.2 Change Requests

Change requests to the project management plan, its subsidiary plans, and other components, such as the cost baseline, schedule baseline, and procurement management plan, may result from the Control Procurements process. Change requests are processed for review and approval through the Perform Integrated Change Control process.

Requested but unresolved changes can include direction provided by the buyer, or actions taken by the seller, that the other party considers a constructive change to the contract. Since any

of these constructive changes may be disputed by one party and can lead to a claim against the other party, such changes are uniquely identified and documented by project correspondence.

12.3.3.3 Project Management Plan Updates

Elements of the project management plan that may be updated include, but are not limited to:

- **Procurement management plan.** The procurement management plan is updated to reflect any approved change requests that affect procurement management, including impacts to costs or schedules.
- **Schedule baseline.** If there are slippages that impact overall project performance, the schedule baseline may need to be updated to reflect the current expectations.
- **Cost baseline.** If there are changes that impact overall project costs, the cost baseline may need to be updated to reflect the current expectations.

12.3.3.4 Project Documents Updates

Project documents that may be updated include, but are not limited to, procurement documentation. Procurement documentation may include the procurement contract with all supporting schedules, requested unapproved contract changes, and approved change requests. Procurement documentation also includes any seller-developed technical documentation and other work performance information, such as deliverables, seller performance reports and warranties, financial documents including invoices and payment records, and the results of contract-related inspections.

12.3.3.5 Organizational Process Assets Updates

Elements of the organizational process assets that may be updated include, but are not limited to:

- **Correspondence.** Contract terms and conditions often require written documentation of certain aspects of buyer/seller communications, such as the need for warnings of unsatisfactory performance and requests for contract changes or clarification. This can include the reported results of buyer audits and inspections that indicate weaknesses the seller needs to correct. In addition to specific contract requirements for documentation, a complete and accurate written record of all written and oral contract communications, as well as actions taken and decisions made, are maintained by both parties.
- **Payment schedules and requests.** All payments should be made in accordance with the procurement contract terms and conditions.
- **Seller performance evaluation documentation.** Seller performance evaluation documentation is prepared by the buyer. Such performance evaluations document the seller's ability to continue to perform work on the current contract, indicate if the seller can be allowed to perform work on future projects, or rate how well the seller is performing the project work. These documents may form the basis for early termination of the seller's contract or determine how contract penalties, fees, or incentives are administered. The results of these performance evaluations can also be included in the appropriate qualified seller lists.

12.4 Close Procurements

Close Procurements is the process of completing each procurement. The key benefit of this process is that it documents agreements and related documentation for future reference. The inputs, tools and techniques, and outputs of this process are depicted in Figure 12-8. Figure 12-9 depicts the data flow diagram of the process.

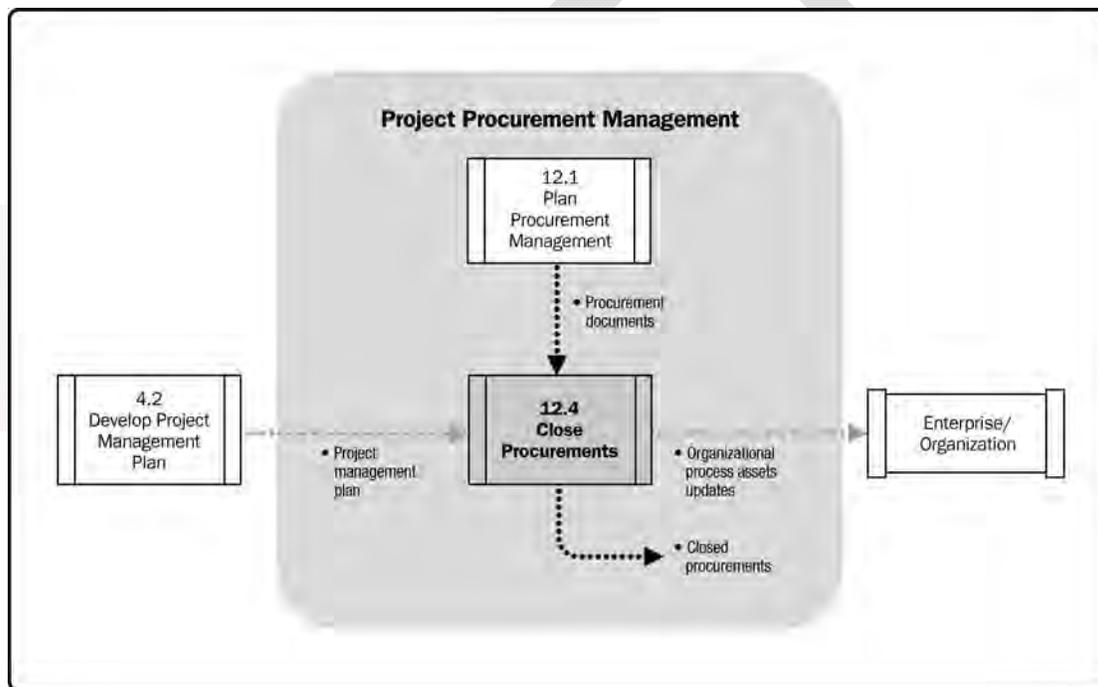**Figure 12-8. Close Procurements: Inputs, Tools & Techniques, and Outputs**

Figure 12-9. Close Procurements Data Flow Diagram

The Close Procurements process also involves administrative activities such as finalizing open claims, updating records to reflect final results, and archiving such information for future use. Close Procurements addresses each contract applicable to the project or a project phase. In multiphase projects, the term of a contract may only be applicable to a given phase of the project. In these cases, the Close Procurements process closes the procurement(s) applicable to that phase of the project. Unresolved claims may be subject to litigation after closure. The contract terms and conditions can prescribe specific procedures for agreement closure. The Close Procurements process supports the Close Project or Phase process (Section 4.6) by ensuring contractual agreements are completed or terminated.

Early termination of a contract is a special case of procurement closure that can result from a mutual agreement by both parties, from the default of one party, or for convenience of the buyer if provided for in the contract. The rights and responsibilities of the parties in the event of an early termination are contained in the terminations clause of the contract. Based upon those procurement terms and conditions, the buyer may have the right to terminate the whole contract or a portion of the contract, at any time, for cause or convenience. However, based upon those contract terms and conditions, the buyer may have to compensate the seller for seller's preparations and for any completed and accepted work related to the terminated part of the contract.

12.4.1 Close Procurements: Inputs

12.4.1.1 Project Management Plan

Described in Section 4.2.3.1. The project management plan contains the procurement management plan, which provides the details and guidelines for closing out procurements.

12.4.1.2 Procurement Documents

To close the contract, all procurement documentation is collected, indexed, and filed. Information on contract schedule, scope, quality, and cost performance along with all contract change documentation, payment records, and inspection results are cataloged. This information can be used for lessons learned information and as a basis for evaluating contractors for future contracts.

12.4.2 Close Procurements: Tools and Techniques

12.4.2.1 Procurement Audits

A procurement audit is a structured review of the procurement process originating from the Plan Procurement Management process through Control Procurements. The objective of a procurement audit is to identify successes and failures that warrant recognition in the preparation or administration of other procurement contracts on the project, or on other projects within the performing organization.

12.4.2.2 Procurement Negotiations

In all procurement relationships, the final equitable settlement of all outstanding issues, claims, and disputes by negotiation is a primary goal. Whenever settlement cannot be achieved through direct negotiation, some form of alternative dispute resolution (ADR) including mediation or arbitration may be explored. When all else fails, litigation in the courts is the least desirable option.

12.4.2.3 Records Management System

Described in Section 12.3.2.7. A records management system is used by the project manager to manage contract and procurement documentation and records. Contract documents and correspondence are archived through the records management system as part of the Close Procurements process.

12.4.3 Close Procurements: Outputs

12.4.3.1 Closed Procurements

The buyer, usually through its authorized procurement administrator, provides the seller with formal written notice that the contract has been completed. Requirements for formal

procurement closure are usually defined in the terms and conditions of the contract and are included in the procurement management plan.

12.4.3.2 Organizational Process Assets Updates

Elements of the organizational process assets that may be updated include, but are not limited to:

- **Procurement file.** A complete set of indexed contract documentation, including the closed contract, is prepared for inclusion with the final project files.

- **Deliverable acceptance.** Documentation of formal acceptance of seller-provided deliverables may be required to be retained by the organization. The Close Procurement process ensures this documentation requirement is satisfied. Requirements for formal deliverable acceptance and how to address nonconforming deliverables are usually defined in the agreement.

- **Lessons learned documentation.** Lessons learned, what has been experienced, and process improvement recommendations, should be developed for the project file to improve future procurements.

13

PROJECT STAKEHOLDER MANAGEMENT

Project Stakeholder Management includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution. Stakeholder management also focuses on continuous communication with stakeholders to understand their needs and expectations, addressing issues as they occur, managing conflicting interests and fostering appropriate stakeholder engagement in project decisions and activities. Stakeholder satisfaction should be managed as a key project objective.

Figure 13-1 provides an overview of the Project Stakeholder Management processes that include the following:

13.1 Identify Stakeholders—The process of identifying the people, groups, or organizations that could impact or be impacted by a decision, activity, or outcome of the project; and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success.

13.2 Plan Stakeholder Management—The process of developing appropriate management strategies to effectively engage stakeholders throughout the project life cycle, based on the analysis of their needs, interests, and potential impact on project success.

13.3 Manage Stakeholder Engagement—The process of communicating and working with stakeholders to meet their needs/expectations, address issues as they occur, and foster appropriate stakeholder engagement in project activities throughout the project life cycle.

13.4 Control Stakeholder Engagement—The process of monitoring overall project stakeholder relationships and adjusting strategies and plans for engaging stakeholders.

These processes interact with each other and with processes in other Knowledge Areas as described in detail in Section 3 and Annex A1.

Every project will have stakeholders who are impacted by or can impact the project in a positive or negative way. While some stakeholders may have a limited ability to influence the project, others may have significant influence on the project and its expected outcomes. The ability of the project manager to correctly identify and manage these stakeholders in an appropriate manner can mean the difference between success and failure.

Project Stakeholder Management Overview

13.1 Identify Stakeholders

.1 Inputs
  .1 Project charter
  .2 Procurement documents
  .3 Enterprise environmental factors
  .4 Organizational process assets

.2 Tools & Techniques
  .1 Stakeholder analysis
  .2 Expert judgment
  .3 Meetings

.3 Outputs
  .1 Stakeholder register

13.2 Plan Stakeholder Management

.1 Inputs
  .1 Project management plan
  .2 Stakeholder register
  .3 Enterprise environmental factors
  .4 Organizational process assets

.2 Tools & Techniques
  .1 Expert judgment
  .2 Meetings
  .3 Analytical techniques

.3 Outputs
  .1 Stakeholder management plan
  .2 Project documents updates

13.3 Manage Stakeholder Engagement

.1 Inputs
  .1 Stakeholder management plan
  .2 Communications management plan
  .3 Change log
  .4 Organizational process assets

.2 Tools & Techniques
  .1 Communication methods
  .2 Interpersonal skills
  .3 Management skills

.3 Outputs
  .1 Issue log
  .2 Change requests
  .3 Project management plan updates
  .4 Project documents updates
  .5 Organizational process assets updates

13.4 Control Stakeholder Engagement

.1 Inputs
  .1 Project management plan
  .2 Issue log
  .3 Work performance data
  .4 Project documents

.2 Tools & Techniques
  .1 Information management systems
  .2 Expert judgment
  .3 Meetings

.3 Outputs
  .1 Work performance information
  .2 Change requests
  .3 Project management plan updates
  .4 Project documents updates
  .5 Organizational process assets updates

Figure 13-1. Project Stakeholder Management Overview

13.1 Identify Stakeholders

Identify Stakeholders is the process of identifying the people, groups, or organizations that could impact or be impacted by a decision, activity, or outcome of the project, analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success. The key benefit of this process is that it allows the project manager to identify the appropriate focus for each stakeholder or group of stakeholders. The inputs, tools and techniques, and outputs of this process are depicted in Figure 13-2. Figure 13-3 depicts the data flow diagram of the process.

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Procurement documents .3 Enterprise environmental factors .4 Organizational process assets	.1 Stakeholder analysis .2 Expert judgment .3 Meetings	.1 Stakeholder register

Figure 13-2. Identify Stakeholders: Inputs, Tools & Techniques, and Outputs
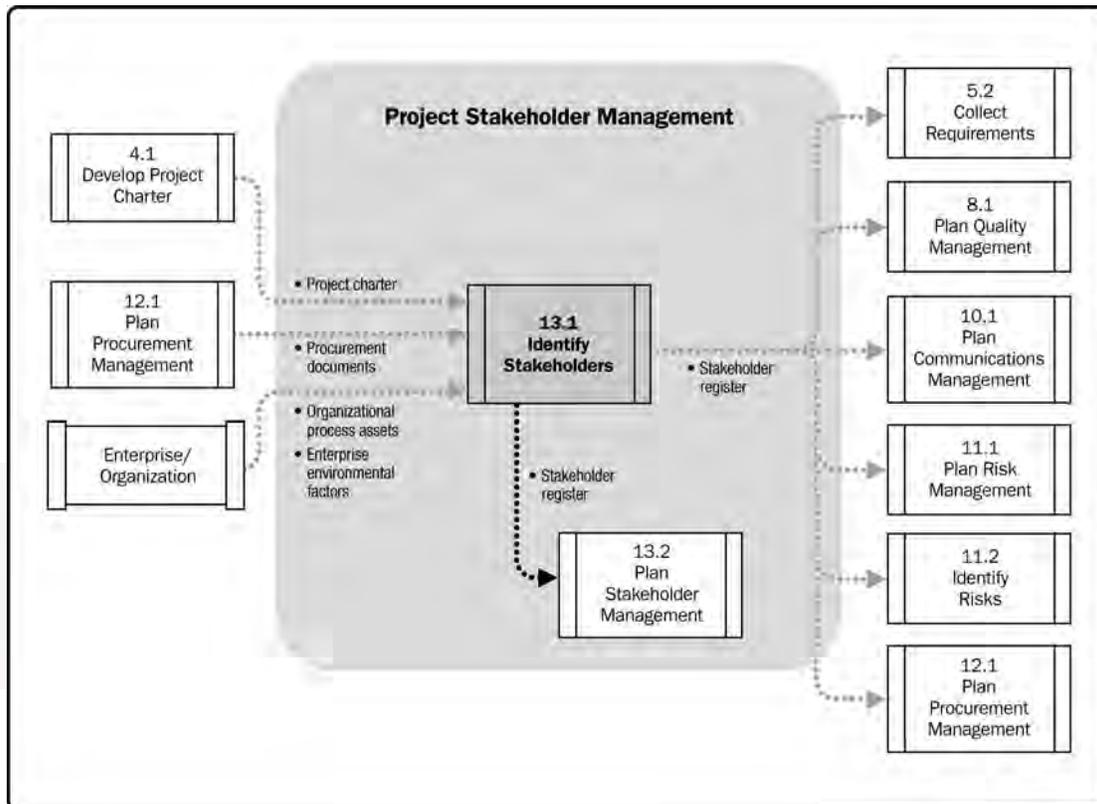
Figure 13-3. Identify Stakeholders Data Flow Diagram

Project stakeholders are individuals, groups, or organizations who may affect, be affected by, or perceive themselves to be affected by a decision, activity, or outcome of a project. They are comprised of persons and organizations such as customers, sponsors, the performing organization, and the public who are actively involved in the project, or whose interests may be positively or negatively affected by the execution or completion of the project. They may also exert influence over the project and its deliverables. Stakeholders may be at different levels within the organization and may possess different authority levels, or may be external to the performing organization for the project. Section 13.1.2.1 identifies various types of project stakeholders.

It is critical for project success to identify the stakeholders early in the project or phase and to analyze their levels of interest, their individual expectations, as well as their importance and influence. This initial assessment should be reviewed and updated regularly. Most projects will have a diverse number of stakeholders depending on their size, type, and complexity. While the project manager's time is limited and should be used as efficiently as possible, these

stakeholders should be classified according to their interest, influence, and involvement in the project, taking into consideration the fact that the affect or influence of a stakeholder may not occur or become evident until later stages in the project or phase. This enables the project manager to focus on the relationships necessary to ensure the success of the project.

13.1.1 Identify Stakeholders: Inputs

13.1.1.1 Project Charter

Described in Section 4.1.3.1. The project charter can provide information about internal and external parties related with the project and affected by the result or the execution of the project, such as project sponsor(s), customers, team members, groups and departments participating in the project, and other people or organizations affected by the project.

13.1.1.2 Procurement Documents

Described in Section 12.1.3.3. If a project is the result of a procurement activity or is based on an established contract, the parties in that contract are key project stakeholders. Other relevant parties, such as suppliers, should also be considered as part of the project stakeholder list.

13.1.1.3 Enterprise Environmental Factors

Described in Section 2.1.5. The enterprise environmental factors that can influence the Identify Stakeholders process include, but are not limited to:

- Organizational culture and structure
- Governmental or industry standards (e.g., regulations, product standards); and
- Global, regional or local trends, and practices or habits.

13.1.1.4 Organizational Process Assets

Described in Section 2.1.4. The organizational process assets that can influence the Identify Stakeholders process include, but are not limited to:

- Stakeholder register templates,
- Lessons learned from previous projects or phases, and
- Stakeholder registers from previous projects.

13.1.2 Identify Stakeholders: Tools and Techniques

13.1.2.1 Stakeholder Analysis

Stakeholder analysis is a technique of systematically gathering and analyzing quantitative and qualitative information to determine whose interests should be taken into account throughout the project. It identifies the interests, expectations, and influence of the stakeholders and relates them to the purpose of the project. It also helps to identify stakeholder relationships (with the project and with other stakeholders) that can be leveraged to build coalitions and potential partnerships to enhance the project's chance of success, along with stakeholder relationships that need to be influenced differently at different stages of the project or phase.

Stakeholder analysis generally follows the steps described below:

- Identify all potential project stakeholders and relevant information, such as their roles, departments, interests, knowledge, expectations, and influence levels. Key

stakeholders are usually easy to identify. They include anyone in a decision-making or management role who is impacted by the project outcome, such as the sponsor, the project manager, and the primary customer. Identifying other stakeholders is usually done by interviewing identified stakeholders and expanding the list until all potential stakeholders are included.

- Analyze the potential impact or support each stakeholder could generate, and classify them so as to define an approach strategy. In large stakeholder communities, it is important to prioritize the stakeholders to ensure the efficient use of effort to communicate and manage their expectations.

- Assess how key stakeholders are likely to react or respond in various situations, in order to plan how to influence them to enhance their support and mitigate potential negative impacts.

There are multiple classification models used for stakeholders analysis, such as:

- *Power/interest grid,* grouping the stakeholders based on their level of authority ("power") and their level or concern ("interest") regarding the project outcomes;
- *Power/influence grid,* grouping the stakeholders based on their level of authority ("power") and their active involvement ("influence") in the project;
- *Influence/impact grid,* grouping the stakeholders based on their active involvement ("influence") in the project and their ability to effect changes to the project's planning or execution ("impact"); and
- *Salience model,* describing classes of stakeholders based on their power (ability to impose their will), urgency (need for immediate attention), and legitimacy (their involvement is appropriate).

Figure 13-4 presents an example of a power/interest grid with A-H representing the placement of generic stakeholders.
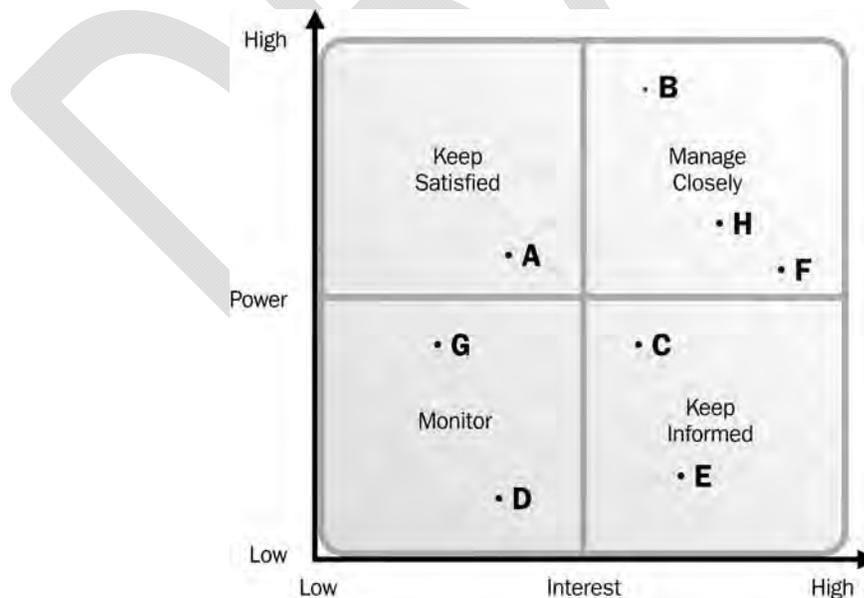
Figure 13-4. Example Power/Interest Grid with Stakeholders

13.1.2.2 Expert Judgment

To ensure comprehensive identification and listing of stakeholders, judgment and expertise should be sought from groups or individuals with specialized training or subject matter expertise, such as:

- Senior management;
- Other units within the organization;
- Identified key stakeholders;
- Project managers who have worked on projects in the same area (directly or through lessons learned);
- Subject matter experts (SMEs) in the business or project area;
- Industry groups and consultants; and
- Professional and technical associations, regulatory bodies, and nongovernmental organizations (NGOs).

Expert judgment can be obtained through individual consultations (one-on-one meetings, interviews, etc.) or through a panel format (focus groups, surveys, etc.).

13.1.2.3 Meetings

Profile analysis meetings are project meetings designed to develop an understanding of major project stakeholders, and they can be used to exchange and analyze information about roles, interests, knowledge, and the overall position of each stakeholder facing the project.

13.1.3 Identify Stakeholders: Outputs

13.1.3.1 Stakeholder Register

The main output of the Identify Stakeholders process is the stakeholder register. This contains all details related to the identified stakeholders including, but not limited to:

- **Identification information**. Name, organizational position, location, role in the project, contact information;
- **Assessment information.** Major requirements, main expectations, potential influence in the project, phase in the life cycle with the most interest; and
- **Stakeholder classification:** Internal/external, supporter/neutral/resistor, etc.

The stakeholder register should be consulted and updated on a regular basis, as stakeholders may change—or new ones identified—throughout the life cycle of the project.

13.2 Plan Stakeholder Management

Plan Stakeholder Management is the process of developing appropriate management strategies to effectively engage stakeholders throughout the project life cycle, based on the analysis of their needs, interests, and potential impact on project success. The key benefit of this process is that it provides a clear, actionable plan to interact with project stakeholders to support the project's interests. The inputs, tools and techniques, and outputs of this process are depicted in Figure 13-5. Figure 13-6 depicts the data flow diagram of the process.

Figure 13-5. Plan Stakeholder Management: Inputs, Tools & Techniques, and Outputs
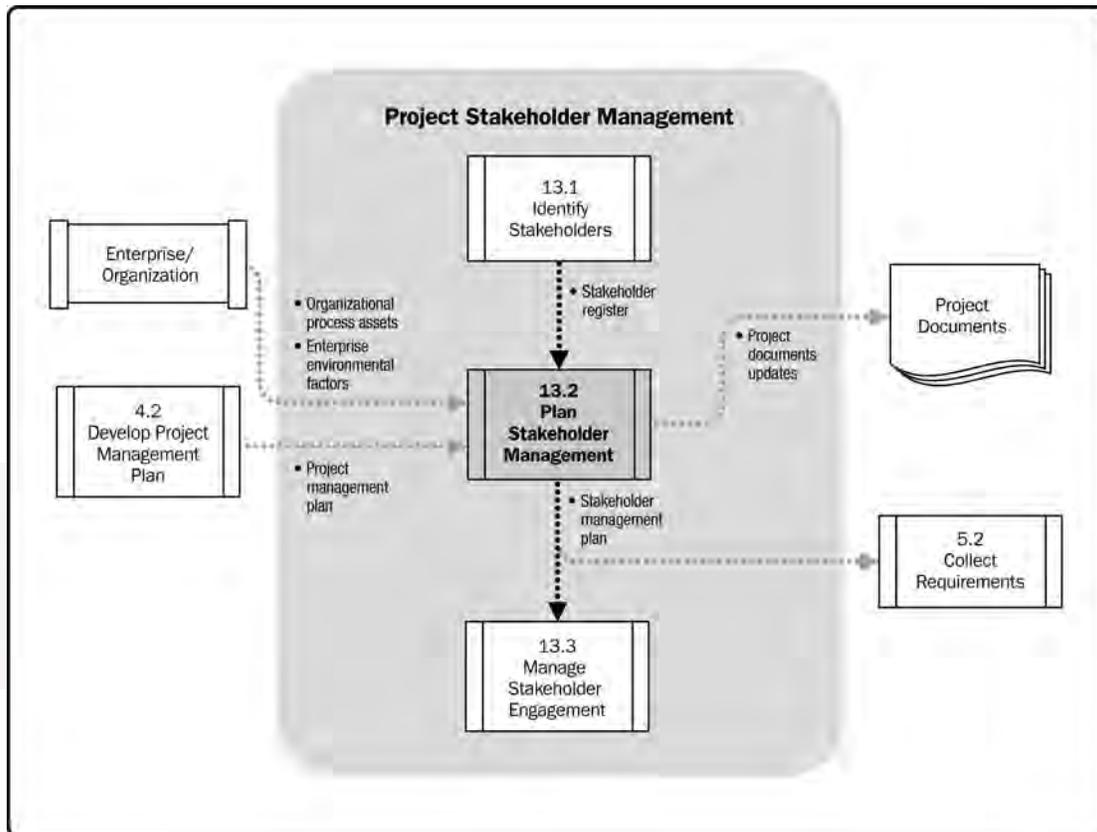
Figure 13-6. Plan Stakeholder Management Data Flow Diagram

Plan Stakeholder Management identifies how the project will affect stakeholders, which then allows the project manager to develop various ways to effectively engage stakeholders in the project, to manage their expectations, and to ultimately achieving the project objectives. Stakeholder management is more than improving communications and requires more than managing a team. Stakeholder management is about creation and maintenance of relationships between the project team and stakeholders, with the aim to satisfy their respective needs and requirements within project boundaries.

This process generates the stakeholder management plan, which contains detailed plans on how effective stakeholder management can be realized. As the project progresses, the membership of the stakeholder community and required level of engagement may change, therefore, stakeholder management planning is an iterative process that is reviewed on a regular basis by the project manager.

13.2.1 Plan Stakeholder Management: Inputs

13.2.1.1 Project Management Plan

Described in Section 4.2.3.1. The information used for the development of the stakeholder management plan includes, but is not limited to:

- Life cycle selected for the project and the processes that will be applied to each phase;
- Description of how work will be executed to accomplish the project objectives;
- Description of how human resources requirements will be met and how roles and responsibilities, reporting relationships, and staffing management will be addressed and structured for the project;
- Change management plan that documents how changes will be monitored and controlled; and
- Need and techniques for communication among stakeholders.

13.2.1.2 Stakeholder Register

Described in Section 13.1.3.1. The stakeholder register provides the information needed to plan appropriate ways to engage project stakeholders.

13.2.1.3 Enterprise Environmental Factors

Described in Section 2.1.5. All enterprise environmental factors are used as inputs to this process, because the management of stakeholders should be adapted to the project environment. Of these, organizational culture, structure, and political climate are of particular importance, because they help in determining the best options to support a better adaptive process for managing stakeholders.

13.2.1.4 Organizational Process Assets

Described in Section 2.1.4. All organizational process assets are used as inputs for the Plan Stakeholder Management process. Of these, lessons learned database and historical information are of particular importance, because they provide insights on previous stakeholder management plans and their effectiveness. These can be used to plan the stakeholder management activities for the current project.

13.2.2 Plan Stakeholder Management: Tools and Techniques

13.2.2.1 Expert Judgment

Based on the project objectives, the project manager should apply expert judgment to decide upon the level of engagement required at each stage of the project from each stakeholder. For example, at the beginning of a project, it may be necessary for senior stakeholders to be highly engaged in order to clear away any obstacles to success. Once these have been successfully removed, it may be sufficient for senior stakeholders to change their level of engagement from leading to supportive, and other stakeholders, such as end users, may become more important.

In order to create the stakeholder management plan, judgment and expertise should be sought from groups or individuals with specialized training or subject matter expertise or insight into the relationships within the organization, such as:

- Senior management;
- Project team members;
- Other units or individuals within the organization;
- Identified key stakeholders;
- Project managers who have worked on projects in the same area (directly or through lessons learned);
- Subject matter experts in business or project area;
- Industry groups and consultants; and
- Professional and technical associations, regulatory bodies, and nongovernmental organization (NGOs).

Expert judgment can be obtained through individual consultations (one-on-one meetings, interviews, etc.) or through a panel format (focus groups, surveys, etc.).

13.2.2.2 Meetings

Meetings should be held with experts and the project team to define the required engagement levels of all stakeholders. This information can be used to prepare the stakeholder management plan.

13.2.2.3 Analytical Techniques

The current engagement level of all stakeholders needs to be compared to the planned engagement levels required for successful project completion. Stakeholder engagement throughout the life cycle of the project is critical to project success.

The engagement level of the stakeholders can be classified as follows:

- **Unaware.** Unaware of project and potential impacts.
- **Resistant.** Aware of project and potential impacts and resistant to change.
- **Neutral.** Aware of project yet neither supportive nor resistant.
- **Supportive.** Aware of project and potential impacts and supportive to change.
- **Leading.** Aware of project and potential impacts and actively engaged in ensuring the project is a success.

The current engagement can be documented using Stakeholders Engagement Assessment Matrix, as shown in Figure 13-7, where C indicates the current engagement, and D indicates the desired engagement. The project team needs to identify the desired engagement level for the current phase of the project, based on available information.

The example in Figure 13-7 shows that stakeholder 3 is at the desired engagement level, while stakeholders 1 and 2 require further communications and additional actions to move them to the desired level of engagement.

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Stakeholder 1	C			D	
Stakeholder 2			C	D	
Stakeholder 3				D C	

Figure 13-7. Stakeholders Engagement Assessment Matrix

Through this analytical process, gaps between the current and desired engagement levels can be identified. Actions and communications required to close these gaps can be identified by the project team using expert judgment.

13.2.3 Plan Stakeholder Management: Outputs

13.2.3.1 Stakeholder Management Plan

The stakeholder management plan is a component of the project management plan (Section 4.2.3.1) and identifies the management strategies required to effectively engage stakeholders. The stakeholder management plan can be formal or informal, highly detailed or broadly framed, based on the needs of the project.

In addition to the data gathered in the stakeholder register, the stakeholder management plan often provides:

- Desired and current engagement levels of key stakeholders;
- Scope and impact of change to stakeholders;
- Identified interrelationships and potential overlap between stakeholders;
- Stakeholder communication requirements for the current project phase;
- Information to be distributed to stakeholders, including language, format, content, and level of detail;
- Reason for the distribution of that information and the expected impact to stakeholder engagement;
- Time frame and frequency for the distribution of required information to stakeholders; and
- Method for updating and refining the stakeholder management plan as the project progresses and develops.

Project managers should be aware of the sensitive nature of the stakeholder management plan and take appropriate precautions. For example, information on stakeholders who are resistant to the project can be potentially damaging and due consideration should be given regarding the distribution of such information. When updating the stakeholder management plan, the validity of underlying assumptions should be reviewed to ensure continued accuracy and relevancy.

13.2.3.2 Project Documents Updates

Project documents that may be updated include, but are not limited to:

- Project schedule, and
- Stakeholder register.

13.3 Manage Stakeholder Engagement

Manage Stakeholder Engagement is the process of communicating and working with stakeholders to meet their needs/expectations, address issues as they occur, and foster appropriate stakeholder engagement in project activities throughout the project life cycle. The key benefit of this process is that it allows the project manager to increase support and minimize resistance from stakeholders, significantly increasing the chances to achieve project success. The inputs, tools and techniques, and outputs of this process are depicted in Figure 13-8. Figure 13-9 depicts the data flow diagram of the process.
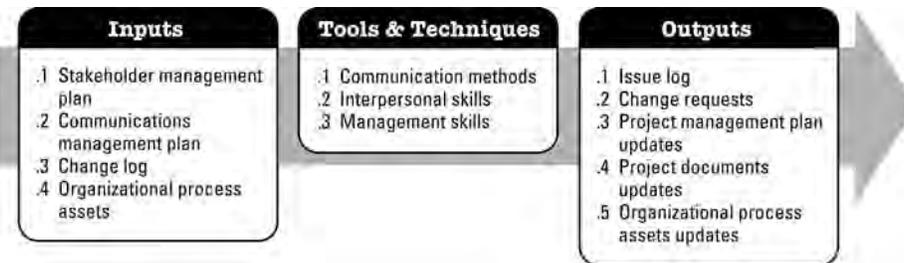
Figure 13-8. Manage Stakeholder Engagement: Inputs, Tools & Techniques, and Outputs
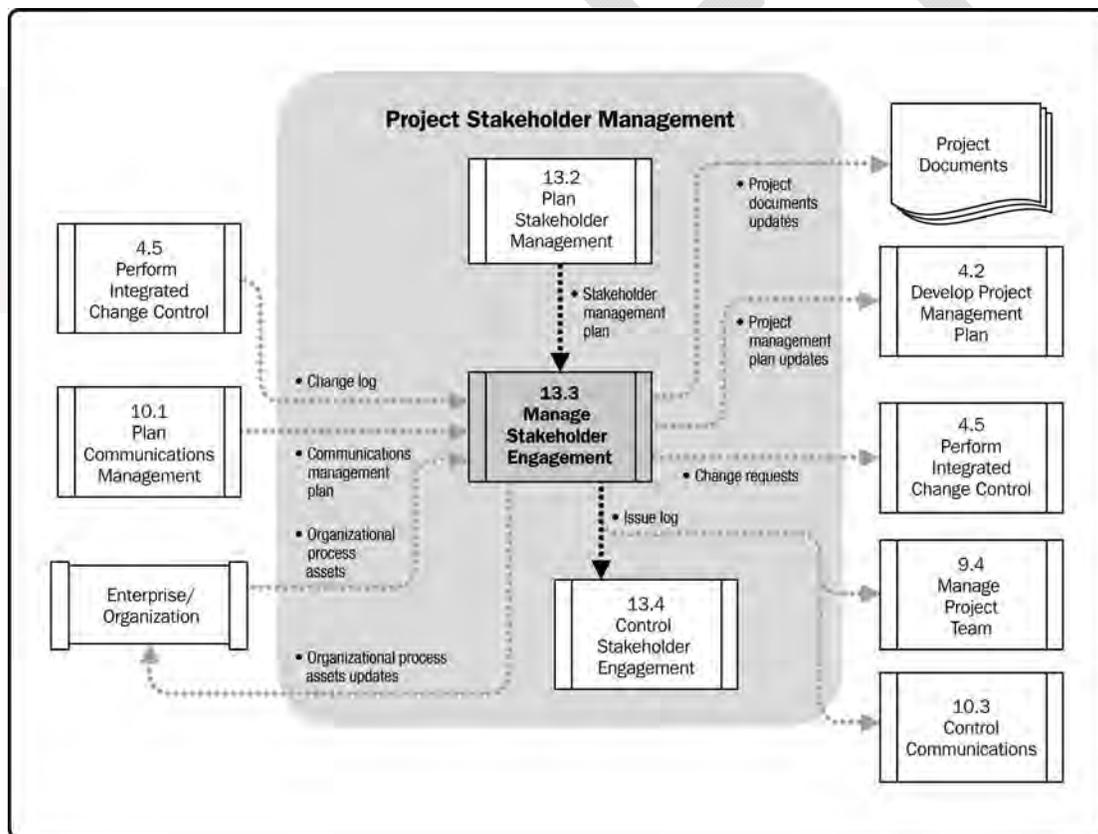
Figure 13-9. Manage Stakeholder Engagement Data Flow Diagram

Manage Stakeholder Engagement involves activities such as:

● Engaging stakeholders at appropriate project stages to obtain or confirm their continued commitment to the success of the project;

- Managing stakeholder expectations through negotiation and communication, ensuring project goals are achieved;

- Addressing potential concerns that have not yet become issues and anticipating future problems that may be raised by stakeholders. Such concerns need to be identified and discussed as soon as possible to assess associated project risks; and

- Clarifying and resolving issues that have been identified.

Managing stakeholder engagement helps to increase the probability of project success by ensuring that stakeholders clearly understand the project goals, objectives, benefits, and risks. This enables them to be active supporters of the project and to help guide activities and project decisions. By anticipating people's reactions to the project, proactive actions can be taken to win support or minimize negative impacts.

The ability of stakeholders to influence the project is typically highest during the initial stages and gets progressively lower as the project progresses. The project manager is responsible for engaging and managing the various stakeholders in a project and may call upon the project sponsor to assist as needed. Active management of stakeholder involvement decreases the risk of the project failing to meet its goals and objectives.

13.3.1 Manage Stakeholder Engagement: Inputs

13.3.1.1 Stakeholder Management Plan

Described in Section 13.2.3.1. The stakeholder management plan provides guidance on how the various stakeholders can be best involved in the project. The stakeholder management plan describes the methods and technologies used for stakeholder communication.

This plan is used to determine the level of interactions of various stakeholders and—together with other documents—helps define a strategy for identifying and managing stakeholders throughout the project life cycle.

13.3.1.2 Communications Management Plan

Described in Section 10.1.3.1. The communications management plan provides guidance and information on managing stakeholder expectations. The information used includes, but is not limited to:

- Stakeholder communications requirements;

- Information to be communicated, including language, format, content, and level of detail;

- Reason for distribution of information;

- Person or groups who will receive information; and

- Escalation process.

13.3.1.3 Change Log

Described in Section 4.5.3.2. A change log is used to document changes that occur during a project. These changes—and their impact on the project in terms of time, cost, and risk—are communicated to the appropriate stakeholders.

13.3.1.4 Organizational Process Assets

Described in Section 2.1.4. The organizational process assets that can influence the Manage Stakeholder Engagement process include, but are not limited to:

- Organizational communication requirements,
- Issue management procedures,
- Change control procedures, and
- Historical information about previous projects.

13.3.2 Manage Stakeholder Engagement: Tools and Techniques

13.3.2.1 Communication Methods

Described in Section 10.1.2.4. The methods of communication identified for each stakeholder in the communications management plan are utilized during stakeholder engagement management. The project manager decides, based on the stakeholders communication requirements, how, when, and which of these communication methods are to be used in the project.

13.3.2.2 Interpersonal Skills

The project manager applies interpersonal skills to manage stakeholders' expectations. For example:

- Building trust,
- Resolving conflict,
- Active listening, and
- Overcoming resistance to change.

13.3.2.3 Management Skills

The project manager applies management skills to coordinate and harmonize the group toward accomplishing the project objectives. For example:

- Facilitate consensus toward project objectives,
- Influence people to support the project,
- Negotiate agreements to satisfy the project needs, and
- Modify organizational behavior to accept the project outcomes.

13.3.3 Manage Stakeholder Engagement: Outputs

13.3.3.1 Issue Log

Managing stakeholder engagement may result in the development of an issue log. This is updated as new issues are identified and current issues are resolved.

13.3.3.2 Change Requests

Managing stakeholder engagement may result in a change request to the product or the project. It may also include corrective or preventive actions to the project itself or to the interaction with the impacted stakeholders, as appropriate.

13.3.3.3 Project Management Plan Updates

Elements of the project management plan that may be updated include, but are not limited to, the stakeholder management plan. This plan is updated when new or changed stakeholders requirements are identified. For example, some communications may no longer be necessary, an ineffective communication method may be replaced by another method, or a new communication requirement may be identified. It is also updated as a result of addressing concerns and resolving issues. For example, it may be determined that a stakeholder has additional informational needs.

13.3.3.4 Project Documents Updates

Project documents that may be updated include, but are not limited to, the stakeholder register. This is updated as information on stakeholders change, when new stakeholders are identified, or if registered stakeholders are no longer involved in or impacted by the project, or other updates for specific stakeholders are required.

13.3.3.5 Organizational Process Assets Updates

The organizational process assets that may be updated include, but are not limited to:

- **Stakeholder notifications**. Information may be provided to stakeholders about resolved issues, approved changes, and general project status.
- **Project reports.** Formal and informal project reports describe project status and include lessons learned, issue logs, project closure reports, and outputs from other Knowledge Areas (Sections 4-12).
- **Project presentations.** Information formally or informally provided by the project team to any or all project stakeholders.
- **Project records.** Project records include correspondence, memos, meeting minutes, and other documents describing the project.
- **Feedback from stakeholders.** Information received from stakeholders concerning project operations can be distributed and used to modify or improve future performance of the project.
- **Lessons learned documentation.** Documentation includes the root cause analysis of issues faced, reasoning behind the corrective action chosen, and other types of lessons learned about stakeholder management. Lessons learned are documented and distributed, and become part of the historical database for both the project and the performing organization.

13.4 Control Stakeholder Engagement

Control Stakeholder Engagement is the process of monitoring overall project stakeholder relationships and adjusting strategies and plans for engaging stakeholders. The key benefit of this process is that it will maintain or increase the efficiency and effectiveness of stakeholder engagement activities as the project evolves and its environment changes. The inputs, tools and techniques, and outputs of this process are depicted in Figure 13-10. Figure 13-11 depicts the data flow diagram of the process.
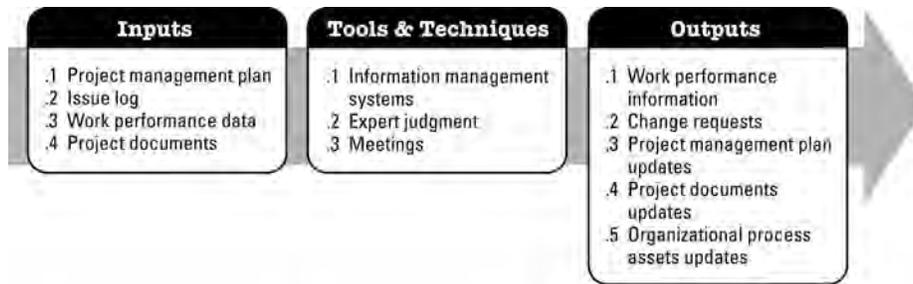
Figure 13-10. Control Stakeholder Engagement: Inputs, Tools & Techniques, and Outputs
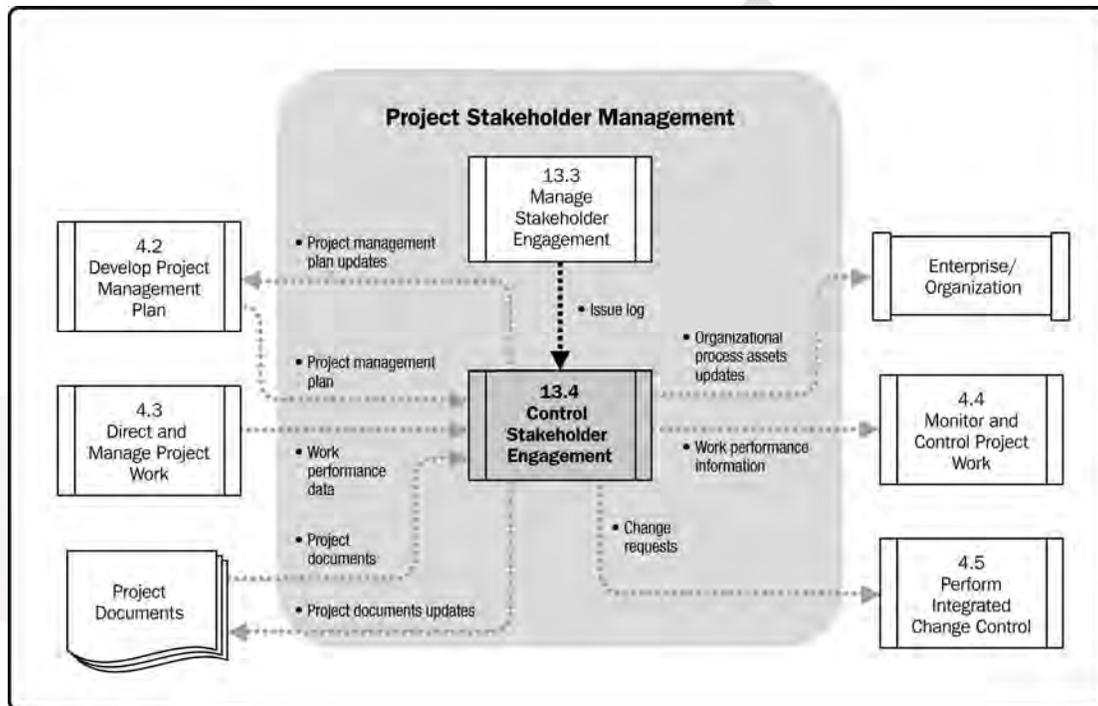

Figure 13-11. Control Stakeholder Engagement: Data Flow Diagram

Stakeholder engagement activities are included in the stakeholder management plan and are executed during the life cycle of the project. Stakeholder engagement should be continuously controlled.

13.4.1 Control Stakeholder Engagement: Inputs

13.4.1.1 Project Management Plan

Described in Section 4.2.3.1. The project management plan is used to develop the stakeholder management plan, as described in Section 13.1.3.1. The information used to Control Stakeholder Engagement includes, but is not limited to:

- The life cycle selected for the project and the processes that will be applied to each phase;
- How work will be executed to accomplish the project objectives;

- How human resources requirements will be met, how roles and responsibilities, reporting relationships, and staffing management will be addressed and structured for the project;
- A change management plan that documents how changes will be monitored and controlled; and
- Needs and techniques for communication among stakeholders.

13.4.1.2 Issue Log

Described in Section 13.3.3.1. The issue log is updated as new issues are identified and current issues are resolved.

13.4.1.3 Work Performance Data

Described in Section 4.3.3.2. The work performance data are the primary observations and measurements identified during activities being performed to carry out the project work. Various measurements on project activities and deliverables are collected during various controlling processes. Data are often viewed as the lowest level of abstraction from which information is derived by other processes.

Examples of work performance data include reported percentage of work completed, technical performance measures, start and finish dates of schedule activities, number of change requests, number of defects, actual costs, actual durations etc.

13.4.1.4 Project Documents

Multiple project documents originating from initiation, planning, execution, or control processes may be used as supporting inputs for controlling stakeholder engagement. These include, but are not limited to:

- Project schedule,
- Stakeholder register,
- Issue log,
- Change log, and
- Project communications.

13.4.2 Control Stakeholder Engagement: Tools and Techniques

13.4.2.1 Information Management Systems

An information management system provides a standard tool for the project manager to capture, store, and distribute information to stakeholders about the project cost, schedule progress, and performance. It also allows the project manager to consolidate reports from several systems and facilitate report distribution to the project stakeholders. Examples of distribution formats may include table reporting, spreadsheet analysis, and presentations. Graphical capabilities can be used to create visual representations of project performance information.

13.4.2.2 Expert Judgment

To ensure comprehensive identification and listing of new stakeholders, reassessment of current stakeholders can be performed. Input should be sought from groups or individuals with specialized training or subject matter expertise, such as:

- Senior management;

- Other units or individuals within the organization;
- Identified key stakeholders;
- Project managers who have worked on projects in the same area (directly or through lessons learned);
- Subject matter experts in the business or project area;
- Industry groups and consultants; and
- Professional and technical associations, regulatory bodies, and nongovernmental organizations.

Expert judgment can be obtained through individual consultations (such as one-on-one meetings or interviews) or through a panel format (such as focus groups or surveys).

13.4.2.3 Meetings

Status review meetings are used to exchange and analyze information about stakeholder engagement.

13.4.3 Control Stakeholder Engagement: Outputs

13.4.3.1 Work Performance Information

The work performance information is the performance data collected from various controlling processes, analyzed in context, and integrated based on relationships across areas. Thus work performance data have been transformed into work performance information. Data per se are not used in the decision-making process, because the meaning may be misinterpreted. Information, however, is correlated and contextualized and provides a sound foundation for project decisions.

Work performance information is circulated through communication processes. Examples of performance information are status of deliverables, implementation status for change requests, and forecasted estimates to complete.

13.4.3.2 Change Requests

Analysis of project performance and interactions with stakeholders often generates change requests. These change requests are processed through the Perform Integrated Change Control process (Section 4.5) as follows:

- Recommended corrective actions include changes that bring the expected future performance of the project in line with the project management plan; and
- Recommended preventive actions can reduce the probability of incurring future negative project performance.

13.4.3.3 Project Management Plan Updates

As stakeholders engage with the project the overall effectiveness of the stakeholder management strategy can be evaluated. As needed changes in approach or strategy are identified, affected sections of the project management plan may need to be updated to reflect these changes. Elements of the project management plan that may be updated include, but are not limited to the:

- Change management plan,
- Communications management plan,

- Cost management plan,

- Human resource management plan,

- Procurement management plan,

- Quality management plan,

- Requirements management plan,

- Risk management plan,

- Schedule management plan,

- Scope management plan, and

- Stakeholder management plan.

13.4.3.4 Project Documents Updates

Project documents that may be updated include, but are not limited to:

- **Stakeholder register.** This is updated as information on stakeholders change, when new stakeholders are identified, or if registered stakeholders are no longer involved in or impacted by the project, or other updates for specific stakeholders are required.

- **Issue log.** This is updated as new issues are identified and current issues are resolved.

13.4.3.5 Organizational Process Assets Updates

The organizational process assets, which may be updated include, but are not limited to:

- **Stakeholder notifications.** Information may be provided to stakeholders about resolved issues, approved changes, and general project status.

- **Project reports.** Formal and informal project reports describe project status and include lessons learned, issue logs, project closure reports, and outputs from other Knowledge Areas (Sections 4-12).

- **Project presentations.** Information formally or informally provided by the project team to any or all project stakeholders.

- **Project records.** Project records include correspondence, memos, meeting minutes, and other documents describing the project.

- **Feedback from stakeholders.** Information received from stakeholders concerning project operations can be distributed and used to modify or improve future performance of the project.

- **Lessons learned documentation.** Documentation includes the root cause analysis of issues faced, reasoning behind the corrective action chosen, and other types of lessons learned about stakeholder management. Lessons learned are documented and distributed so that they become part of the historical database for both the project and the performing organization.

ANNEX A1

THE STANDARD FOR PROJECT MANAGEMENT

OF A PROJECT

A project is a temporary endeavor undertaken to create a unique product, service, or result. The temporary nature of projects indicates a definite beginning and end. The end is reached when the project's objectives have been achieved or when the project is terminated because its objectives will not or cannot be met, or when the need for the project no longer exists.

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. Project management is accomplished through the appropriate application and integration of logically grouped project management processes.

Managing a project typically includes:

- Identifying requirements;
- Addressing the various needs, concerns, and expectations of the stakeholders as the project is planned and carried out;
- Setting and maintaining active communication with stakeholders; and
- Balancing the competing project constraints, which include, but are not limited to:
  - o Scope,
  - o Quality,
  - o Schedule,
  - o Budget,
  - o Resources, and
  - o Risks.

The specific project circumstances will influence the constraints on which the project manager needs to focus and require effective application and management of appropriate project management processes.

A1.1 What is a Standard?

The International Organization for Standardization (ISO) and others define a standard as a *"Document approved by a recognized body, that provides, for common and repeated use, rules, guidelines, or characteristics for products, processes or services with which compliance are not mandatory."* (ISO 9453)

In October 1998, PMI was accredited as a Standards Developer by the American National Standards Institute (ANSI). The processes outlined in this Annex, which are described in the *PMBOK® Guide* – Fifth Edition, provide the standard for project management of a project.

A1.2 Framework for this Standard

This standard describes the nature of project management processes in terms of the integration between the processes, their interactions, and the purposes they serve. For this standard, it is assumed that the project, the project manager and the project team are assigned to the performing organization. Project management processes are grouped into five categories known as Project Management Process Groups (or Process Groups):

- **Initiating Process Group.** Those processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase.

- **Planning Process Group.** Those processes required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve.

- **Executing Process Group.** Those processes performed to complete the work defined in the project management plan to satisfy the project specifications.

- **Monitoring and Controlling Process Group.** Those processes required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes.

- **Closing Process Group.** Those processes performed to finalize all activities across all Process Groups to formally close the project or phase.

Project Management Process Groups are linked by the outputs they produce. The Process Groups are seldom either discrete or one-time events; they are overlapping activities that occur throughout the project. The output of one process generally becomes an input to another process or is a deliverable of the project, subproject, or project phase. Deliverables at the subproject or project level may be called incremental deliverables. The Planning Process Group provides the Executing Process Group with the project management plan and project documents, and, as the project progresses, it often creates updates to the project management plan and the project documents. Figure A1-1 illustrates how the Process Groups interact and shows the level of overlap at various times. If the project is divided into phases, the Process Groups interact within each phase.
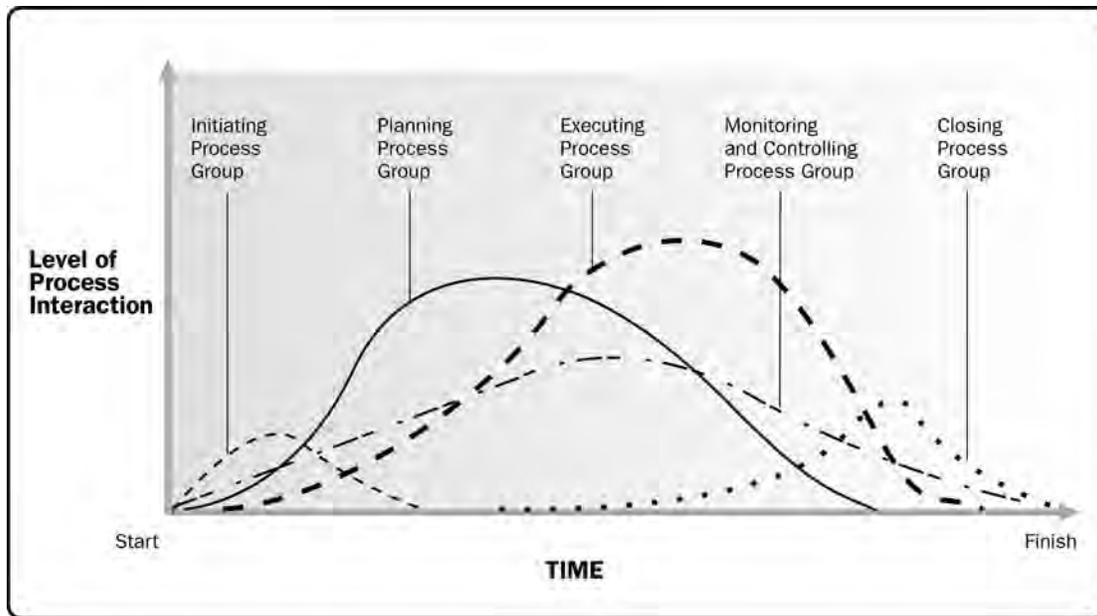
Figure A1-1. Process Group Interactions in a Project

An example of this interaction would be the exit of a design phase, which requires sponsor acceptance of the design document. Once it is available, the design document provides the product description for the Planning and Executing Process Groups in one or more subsequent phases. When a project is divided into phases, the Process Groups are carried out, as appropriate, to effectively drive the project to completion in a controlled manner. In multiphase projects, processes are repeated within each phase until the criteria for phase completion have been satisfied.

A1.3 Project Management Process Groups

The following sections identify and describe the five Project Management Process Groups required for any project. These five Process Groups have clear dependencies and are typically performed in each project and highly interact with one another. These five Process Groups are independent of application areas or industry focus. Individual Process Groups and individual processes are often iterated prior to completing the project and can have interactions within a Process Group and among Process Groups. The nature of these interactions varies from project to project and may or may not be performed in a particular order.

The process flow diagram, Figure A1-2, provides an overall summary of the basic flow and interactions among Process Groups and specific stakeholders. The project management processes are linked by inputs and outputs where the result or outcome of one process becomes the input to another process but not necessarily in the same Process Group. **The Process Groups are not project phases.** In fact, it is possible that all Process Groups could be conducted within a phase. As projects are separated into distinct phases or sub-components, such as concept development, feasibility study, design, prototype, build, or test, etc., all of the Process Groups would normally be repeated for each phase or sub-component along the lines explained above and illustrated in Figure A1-2.
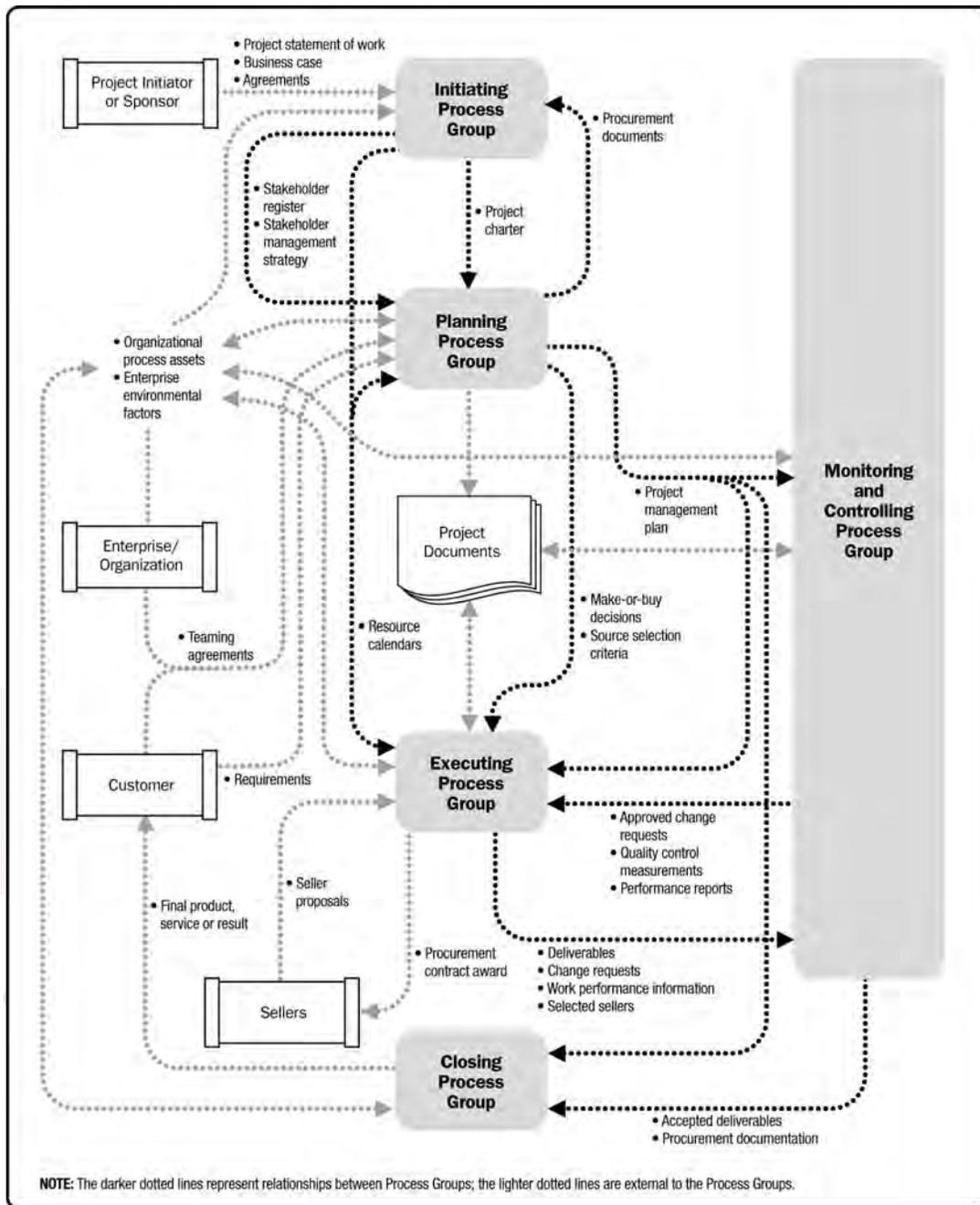
Figure A1-2. Project Management Process Interactions

Table A1-1 reflects the mapping of the 47 project management processes into the 5 Project Management Process Groups and the 10 Project Management Knowledge Areas.

The project management processes are shown in the Process Group in which most of the activity takes place. For example, when a process that normally takes place in the Planning Process Group is updated in the Executing Process Group, it is not considered a new process. The iterative nature of project management means that processes from any group may be used throughout the project life cycle. For example, executing a risk response may trigger the Perform Quantitative Risk Analysis process to evaluate the impact.

Table A1-1. Project Management Process Group and Knowledge Area Mapping

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Time Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Resources 6.5 Estimate Activity Durations 6.6 Develop Schedule		6.7 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Perform Quality Assurance	8.3 Control Quality	
9. Project Human Resource Management		9.1 Plan Human Resource Management	9.2 Acquire Project Team 9.3 Develop Project Team 9.4 Manage Project Team		
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Control Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses		11.6 Control Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	12.4 Close Procurements
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	

A1.4 Initiating Process Group

The Initiating Process Group consists of those processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase. Within the Initiating processes, the initial scope is defined and initial financial resources are committed. Internal and external stakeholders who will interact and influence the overall outcome of the project are identified. If not already assigned, the project manager will be selected. This information is captured in the project charter and stakeholder register. When the project charter is approved, the project becomes officially authorized. Although the project management team may help to write the project charter, this standard assumes that business case assessment, approval and funding are handled external to the project boundaries (Figure A1-3). A project boundary is defined as the point in time that a project or project phase is authorized to its completion. The key purpose of this Process Group is to align the stakeholders' expectations with the project's purpose, give them visibility about the scope and objectives, and show how their participation in the project and it associated phases can ensure that their expectations are achieved. These processes help to set the vision of the project—what is needed to be accomplished.

Large complex projects should be divided into separate phases. In such projects, the Initiating processes are carried out during subsequent phases to validate the decisions made during the original Develop Project Charter and Identify Stakeholders processes. Performing the Initiating processes at the start of each phase helps to keep the project focused on the business need that the project was undertaken to address. The success criteria are verified, and the influence, drivers, and objectives of the project stakeholders are reviewed. A decision is then made as to whether the project should be continued, delayed, or discontinued.

Involving the sponsors, customers, and other stakeholders during initiation creates a shared understanding of success criteria, reduces the overhead of involvement, and generally improves deliverable acceptance, customer, and other stakeholder satisfaction.
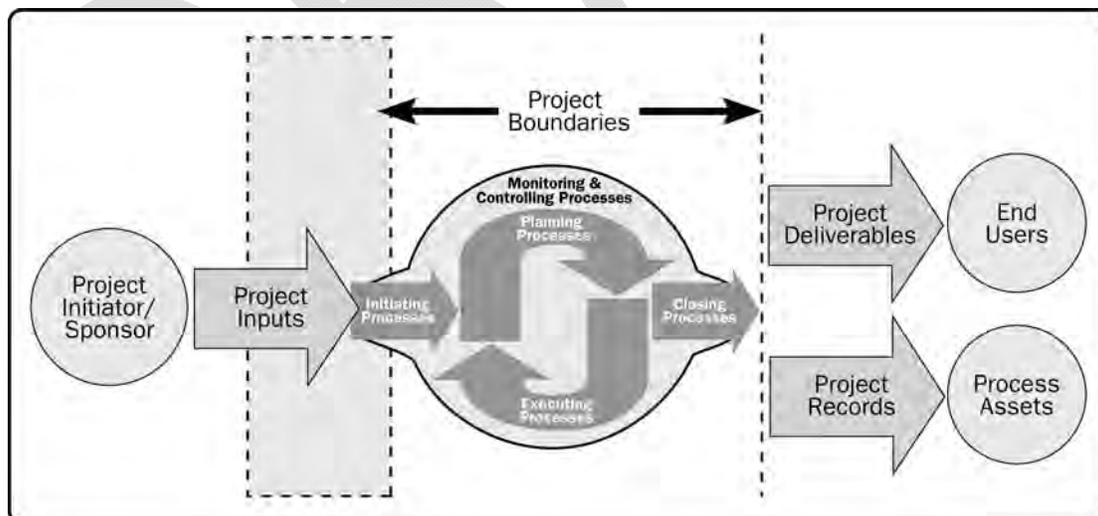

Figure A1-3. Project Boundaries

Initiating processes may be performed at the organizational, program, or portfolio level and would then be outside of the project's level of control. For example, prior to commencing a

project, the need for high-level requirements may be documented as part of a larger organizational initiative. A process of evaluating alternatives may be utilized to determine the feasibility of the new undertaking. Clear descriptions of the project objectives may be developed, including the reasons why a specific project is the best alternative to satisfy the requirements. The documentation for this decision may also contain the initial project scope statement, deliverables, project duration, and a forecast of the resources for the organization's investment analysis. As part of the Initiating processes, the project manager is given the authority to apply organizational resources to the subsequent project activities.
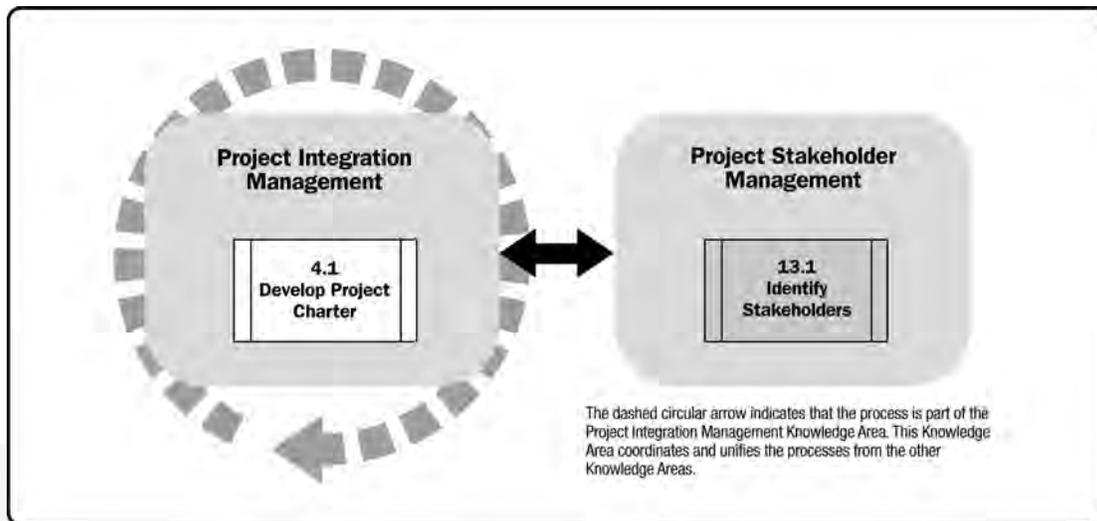
Figure A1-4. Initiating Process Group

A1.4.1 Develop Project Charter

Develop Project Charter is the process of developing a document that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities. The key benefit of this process is a well-defined project start and project boundaries, creation of a formal record of the project, and a direct way for senior management to formally accept and commit to the project. The inputs and outputs for this process are shown in Figure A1-5.
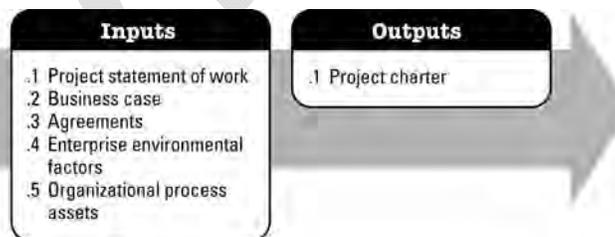
Figure A1-5. Develop Project Charter: Inputs and Outputs

A1.4.2 Identify Stakeholders

Identify Stakeholders is the process of identifying the people, groups, or organizations that could impact or be impacted by a decision, activity, or outcome of the project; and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success. The key benefit of this process is that it

allows the project manager to identify the appropriate focus for each stakeholder or group of stakeholders. The inputs and outputs of this process are depicted in Figure A1-6.
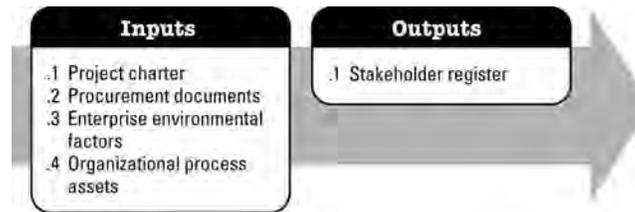

Figure A1-6. Identify Stakeholders: Inputs and Outputs

A1.5 Planning Process Group

The Planning Process Group consists of those processes performed to establish the total scope of the effort, define and refine the objectives, and develop the course of action required to attain those objectives. The Planning processes develop the project management plan and the project documents that will be used to carry out the project. The complex nature of project management may require the use of repeated feedback loops for additional analysis. As more project information or characteristics are gathered and understood, additional planning will likely be required. Significant changes occurring throughout the project life cycle trigger a need to revisit one or more of the planning processes and, possibly, some of the initiating processes. This progressive detailing of the project management plan is called progressive elaboration, indicating that planning and documentation are iterative and ongoing activities. The key benefit of this Process Group is to delineate the strategy and tactics as well as the course of action or a path to successfully complete the project or phase. When the Planning Process Group is well managed, it is much easier to get stakeholder buy-in and engagement. These processes describe how this will be done, resulting in the desired objectives.

The project management plan and project documents developed as outputs from the Planning Process Group will explore all aspects of the scope, time, costs, quality, communications, human resources, risks, procurements, and stakeholder management.

Updates arising from approved changes during the project (generally during Monitoring and Controlling processes and specifically during Direct and Manage Project Work process) may significantly impact parts of the project management plan and the project documents. Updates to these documents provide greater precision with respect to schedule, costs, and resource requirements to meet the defined project scope.

The project team seeks input and encourages involvement from all stakeholders when planning the project and developing the project management plan and project documents. Since the feedback and refinement process cannot continue indefinitely, procedures set by the organization dictate when the initial planning effort ends. These procedures will be affected by the nature of the project, the established project boundaries, appropriate monitoring and controlling activities, as well as the environment in which the project will be performed.

Other interactions among the processes within the Planning Process Group are dependent upon the nature of the project. For example, for some projects there will be little or no identifiable risks until after significant planning has been done. At that time, the team might recognize that the cost and schedule targets are overly aggressive, thus involving considerably

more risk than previously understood. The results of the iterations are documented as updates to the project management plan or to various project documents.

The Planning Process Group (Figure A1-7) includes the project management processes identified in Figures A1-8 through A1-31 (see Sections A1.5.1 through A1.5.24).
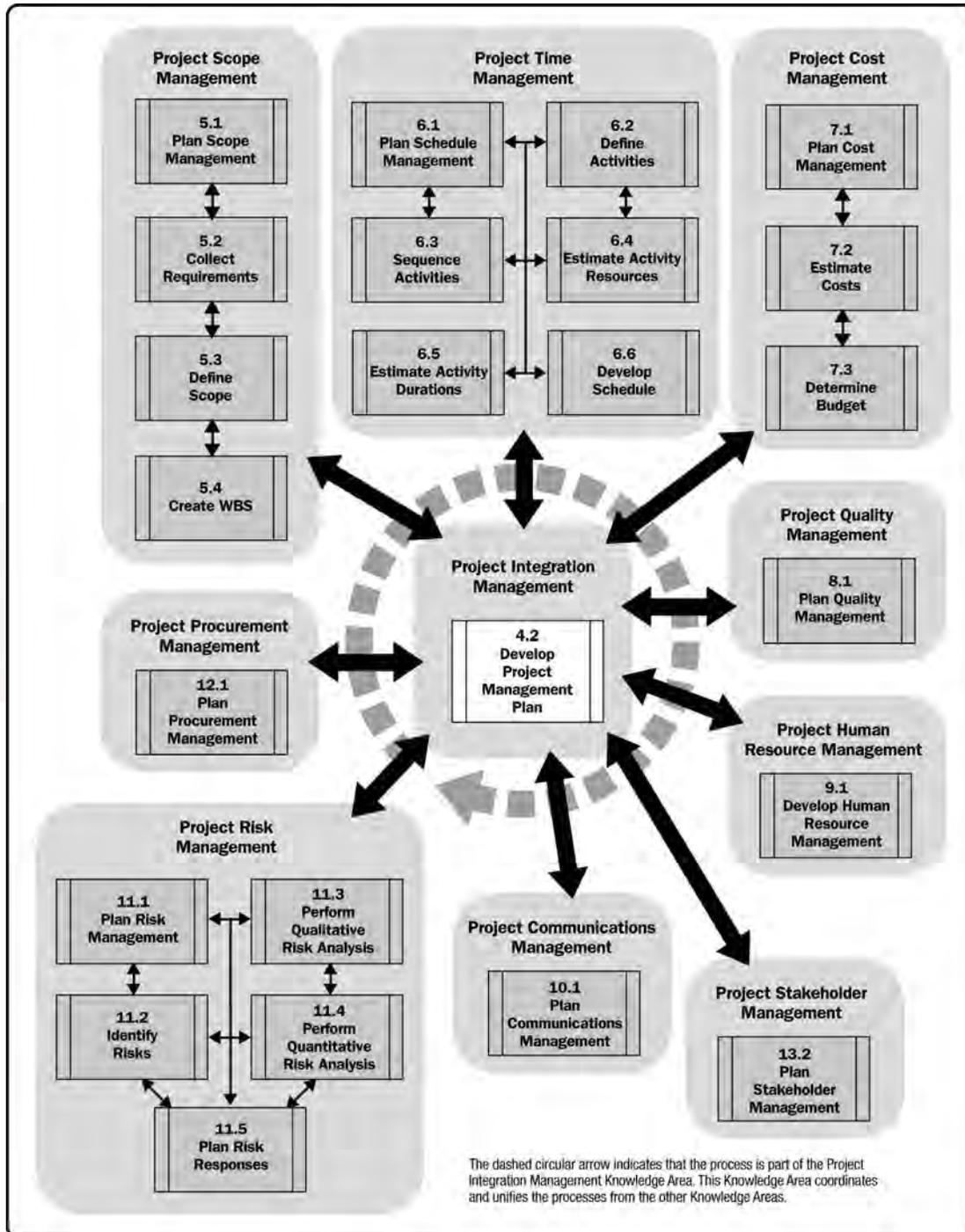

Figure A1-7. Planning Process Group

A1.5.1 Develop Project Management Plan

Develop Project Management Plan is the process of defining, preparing, and coordinating all subsidiary plans and integrating them into a comprehensive project management plan. The key benefit of this process is a central document that defines the basis of all project work. The inputs and outputs for this process are depicted in Figure A1-8.

Inputs	Outputs
.1 Project charter .2 Outputs from other processes .3 Enterprise environmental factors .4 Organizational process assets	.1 Project management plan
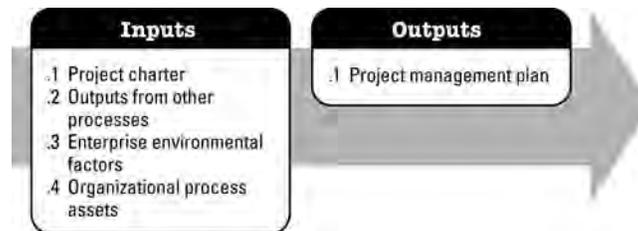
Figure A1-8. Develop Project Management Plan: Inputs and Outputs

A1.5.2 Plan Scope Management

Plan Scope Management is the process of creating a scope management plan that documents how the project scope will be defined, validated, and controlled. The key benefit of this process is that it provides guidance and direction on how scope will be managed throughout the project. The inputs and outputs of this process are depicted in Figure A1-9.

Inputs	Outputs
.1 Project management plan .2 Project charter .3 Enterprise environmental factors .4 Organizational process assets	.1 Scope management plan .2 Requirements management plan
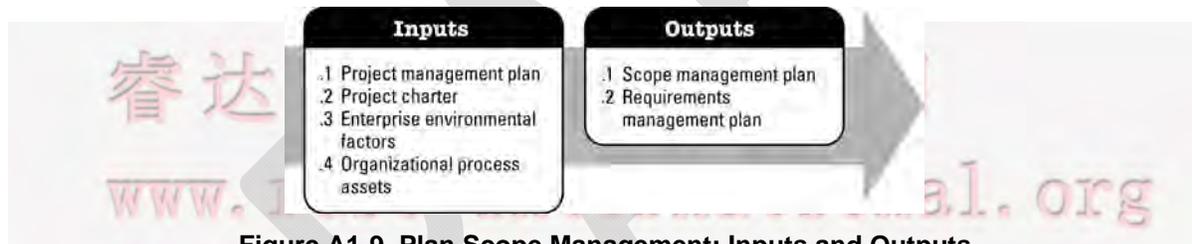
Figure A1-9. Plan Scope Management: Inputs and Outputs

A1.5.3 Collect Requirements

Collect Requirements is the process of determining, documenting, and managing stakeholder needs and requirements to meet project objectives. The key benefit of this process is that it provides the basis for defining and managing the project scope including product scope. The inputs and outputs of this process are depicted in Figure A1-10.
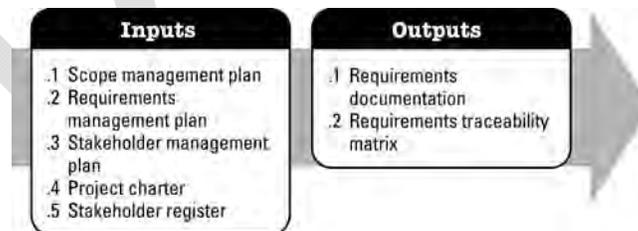
Inputs	Outputs
.1 Scope management plan .2 Requirements management plan .3 Stakeholder management plan .4 Project charter .5 Stakeholder register	.1 Requirements documentation .2 Requirements traceability matrix

Figure A1-10. Collect Requirements: Inputs and Outputs

A1.5.4 Define Scope

Define Scope is the process of developing a detailed description of the project and product. The key benefit of this process is that it describes the project, service, or result

boundaries by defining which of the requirements collected will be included in and excluded from the project scope. The inputs and outputs of this process are depicted in Figure A1-11.
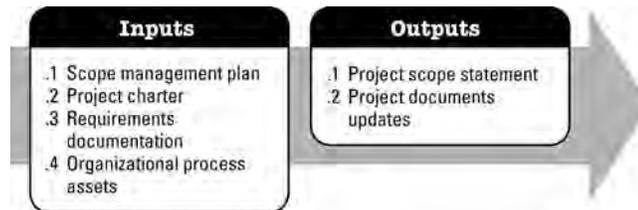
Figure A1-11. Define Scope: Inputs and Outputs

A1.5.5 Create WBS

Create WBS is the process of subdividing project deliverables and project work into smaller, more manageable components. The key benefit of this process is that it provides a structured vision of what has to be delivered. The inputs and outputs of this process are depicted in Figure A1-12.
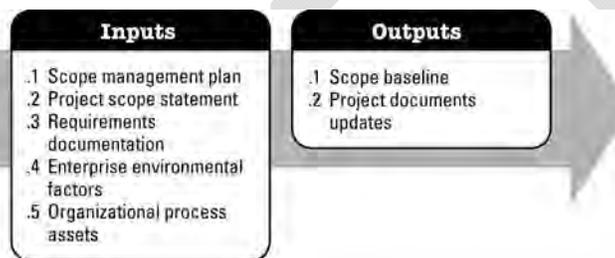
Figure A1-12. Create WBS: Inputs and Outputs

A1.5.6 Plan Schedule Management

Plan Schedule Management is the process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule. The key benefit of this process is that it provides guidance and direction on how the project schedule will be managed throughout the project. The inputs and outputs of this process are depicted in Figure A1-13.
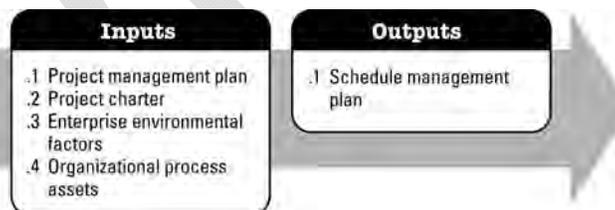
Figure A1-13. Plan Schedule Management: Inputs and Outputs

A1.5.7 Define Activities

Define Activities is the process of identifying and documenting the specific actions to be performed to produce the project deliverables. The key benefit of this process is to break down work packages into activities that provide a basis for estimating, scheduling, executing, monitoring, and controlling the project work. The inputs and outputs of this process are depicted in Figure A1-14.
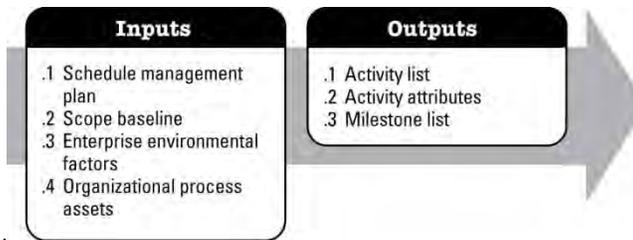
Figure A1-14. Define Activities: Inputs and Outputs

A1.5.8 Sequence Activities

Sequence Activities is the process of identifying and documenting relationships among the project activities. The key benefit of this process is that it defines the logical sequence of work to obtain the greatest efficiency given all project constraints. The inputs and outputs of this process are depicted in Figure A1-15.
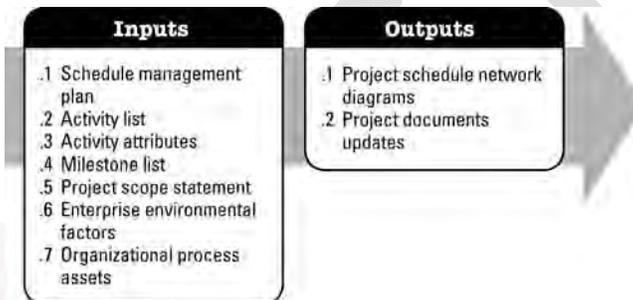

Figure A1-15. Sequence Activities: Inputs and Outputs

A1.5.9 Estimate Activity Resources

Estimate Activity Resources is the process of estimating the type and quantities of material, human resources, equipment, or supplies required to perform each activity. The key benefit of this process is that it identifies the type, quantity, and characteristics of resources required to complete the activity which allows more accurate cost and duration estimates. The inputs and outputs of this process are depicted in Figure A1-16.
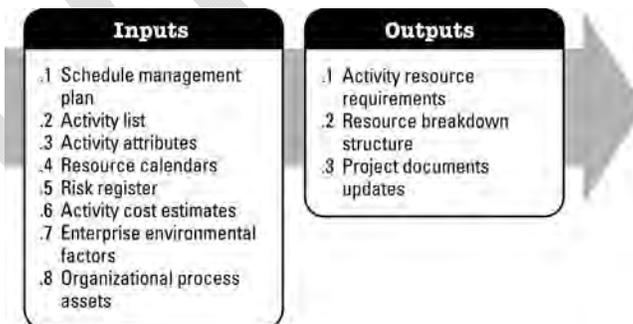

Figure A1-16. Estimate Activity Resources: Inputs and Outputs

A1.5.10 Estimate Activity Durations

Estimate Activity Durations is the process of estimating the number of work periods needed to complete individual activities with estimated resources. The key benefit of this process is that it provides the amount of time each activity will take to complete, which is a major input