

## PROJECT PLANNING

A Project Management Process Area at Maturity Level 2

### Purpose

The purpose of Project Planning (PP) is to establish and maintain plans that define project activities.

### Introductory Notes

The Project Planning process area involves the following activities:

- Developing the project plan
- Interacting with stakeholders appropriately
- Getting commitment to the plan
- Maintaining the plan

Planning begins with requirements that define the product and project.

Project planning is based on the acquisition strategy, which is a guide for directing and controlling the project and a framework for integrating activities essential to acquiring an operational product or service. The acquisition strategy outlines acquisition objectives and constraints, availability of assets and technologies, consideration of acquisition methods, potential supplier agreement types and terms, accommodation of end-user considerations, considerations of risk, and support for the project throughout the project lifecycle.

Planning includes estimating the attributes of work products and tasks, determining the resources needed, negotiating commitments, producing a schedule, and identifying and analyzing project risks. Iterating through these activities may be necessary to establish the project plan. The project plan provides the basis for performing and controlling project activities that address commitments with the project's customer.

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Project Planning involves the development and maintenance of plans for all acquirer processes, including those required for effective acquirer-supplier interaction. Once the supplier agreement is signed and schedule, costs, and resources from the supplier are established, the acquirer takes the supplier estimations for the project into account at an appropriate level of detail in its project plan.

Project planning includes establishing and maintaining a plan for the orderly, smooth transition of the acquired product from a supplier to its use by the acquirer or its customers. In addition, if an existing product is to be replaced as part of the acquisition, the acquirer may be required to consider the disposal of the existing product as part of the planning for acquiring the new product. All transition activities are included in the project plan and provisions for accommodating such specialized requirements are also included.

All relevant stakeholders should be involved in the planning process from all lifecycle phases to ensure all technical and support activities are adequately addressed in project plans.

The project plan is usually revised as the project progresses to address changes in requirements and commitments, inaccurate estimates, corrective actions, and process changes. Specific practices describing both planning and replanning are contained in this process area.

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Changes to the supplier agreement can also affect the project's planning estimates, budget, schedules, risks, project work tasks, commitments, and resources.

The term project plan is used throughout the generic and specific practices in this process area to refer to the overall plan for controlling the project.

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Related Process Areas

Refer to the *Acquisition Requirements Development* process area for more information about developing requirements.

Deleted: that define the product and product components. Product and product component requirements and changes to those requirements serve as a basis for planning and replanning

Refer to the *Requirements Management* process area for more information about managing requirements needed for planning and replanning.

Refer to the *Risk Management* process area for more information about identifying and managing risks.

Refer to the *Acquisition Technical Management* process area for more information about evaluations and reviews that must be included in technical planning.

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Refer to the *Solicitation and Supplier Agreement Development* process area for more information about establishing and maintaining supplier agreements.

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Refer to the *Measurement and Analysis* process area for more information about specifying measures.

Project Planning (PP)

### Specific Goal and Practice Summary

#### SG 1 Establish Estimates

- SP 1.1 Establish the Acquisition Strategy
- SP 1.2 Estimate the Scope of the Project
- SP 1.3 Establish Estimates of Work Product and Task Attributes
- SP 1.4 Define Project Lifecycle Phases
- SP 1.5 Estimate Effort and Cost

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#### SG 2 Develop a Project Plan

- SP 2.1 Establish the Budget and Schedule
- SP 2.2 Identify Project Risks
- SP 2.3 Plan Data Management
- SP 2.4 Plan the Project's Resources
- SP 2.5 Plan Needed Knowledge and Skills
- SP 2.6 Plan Stakeholder Involvement
- SP 2.7 Plan Transition to Operations and Support
- SP 2.8 Establish the Project Plan

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#### SG 3 Obtain Commitment to the Plan

- SP 3.1 Review Plans That Affect the Project
- SP 3.2 Reconcile Work and Resource Levels
- SP 3.3 Obtain Plan Commitment

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### Specific Practices by Goal

#### SG 1 Establish Estimates

***Estimates of project planning parameters are established and maintained.***

Project planning parameters include all information needed by the project to perform necessary planning, organizing, staffing, directing, coordinating, reporting, and budgeting.

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The acquirer develops estimates for project work based on the acquisition strategy, including high-level estimates for the work to be done by suppliers. Initial estimates may be revised based on supplier estimates in response to the solicitation package.

Estimates of planning parameters should have a sound basis to instill confidence that plans based on these estimates are capable of supporting project objectives.

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- Factors that are typically considered when estimating these parameters include the following:
- The acquisition strategy
  - Project requirements, including product requirements, requirements imposed by the organization, requirements imposed by the customer, and other requirements that impact the project
  - The scope of the project
  - Identified tasks and work products
  - The technical approach
  - The selected project lifecycle model (e.g., waterfall, incremental, or spiral)
  - Attributes of work products and tasks (e.g., size or complexity)
  - The schedule
  - Models or historical data used for converting attributes of work products and tasks into labor hours and costs
  - The methodology (e.g., models, data, algorithms) used to determine needed material, skills, labor hours, and cost

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The acquisition strategy is a key factor when estimating the project.

Documentation of the estimating rationale and supporting data is needed for stakeholder review and commitment to the plan and for maintenance of the plan as the project progresses.

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**SP 1.1 Establish the Acquisition Strategy**

**Establish and maintain the acquisition strategy.**

The acquisition strategy is the business and technical management framework for planning, executing, and managing agreements for a project. The acquisition strategy relates to the objectives for the acquisition, the constraints, availability of resources and technologies, consideration of acquisition methods, potential supplier agreement types, terms and conditions, accommodation of business considerations, considerations of risk, and support for the acquired product over its lifecycle. The acquisition strategy reflects the entire scope of the project. It encompasses the work to be performed by the acquirer and the supplier, or in some cases multiple suppliers, for the full lifecycle of the product.

The acquisition strategy results from a thorough understanding of both the acquisition project and the general acquisition environment. The acquirer accounts for the potential value or benefit of the acquisition in the light of potential risks, considers constraints, and takes into account experiences with different types of suppliers, agreements, and terms. A well-developed strategy minimizes the time and cost required to satisfy approved capability needs, and maximizes affordability throughout the project lifecycle.

The acquisition strategy is the basis for formulating solicitation packages, supplier agreements, and project plans. The strategy evolves over time and should continuously reflect the current status and desired end point of the project.

#### Typical Work Products

##### 1. Acquisition strategy

#### Subpractices

##### 1. Identify the capabilities and objectives the acquisition is intended to satisfy or provide.

The capabilities describe what the organization intends to acquire. Typically, the capabilities included in the acquisition strategy summary highlight product characteristics driven by interoperability or families of products. The acquisition strategy also identifies dependencies on planned or existing capabilities of other projects or products.

*Refer to the Acquisition Requirements Development process area for more information about determining capabilities and customer requirements.*

The acquirer defines objectives in terms of cost, schedule, and key process, product, and service level measures and technical performance measures as defined in requirements. These measures reflect customer expectations and threshold values representing acceptable limits that, in the customer's judgment, provide the needed capability. While the number and specificity of measures may change over the duration of an acquisition, the acquirer typically focuses on the minimum number of measures that, if thresholds are not met, will require a re-evaluation of the project.

The acquisition strategy establishes the milestone decision points and acquisition phases planned for the project. It prescribes the accomplishments for each phase and identifies the critical events affecting project management. Schedule parameters include, at a minimum, the projected dates for project initiation, other major decision points, and initial operational capability.

Examples of cost parameters include the following:

- Research, development, test, and evaluation costs
- Acquisition costs
- Acquisition-related operations, support, and disposal costs
- Total product quantity (to include both fully configured development and production units)

##### 2. Identify the acquisition approach.

The acquirer defines the approach the project will use to achieve full capability—either evolutionary or single step—and includes a brief rationale to justify the choice. When a project uses an evolutionary acquisition approach, the acquisition strategy describes the initial capability and how it will be funded, developed, tested, produced, and supported. The acquisition strategy previews similar

planning for subsequent increments and identifies the approach to integrate or retrofit earlier increments with later increments.

Examples of additional considerations for the acquisition approach include the following:

- Actions a project team can take on its own if the acquiring organization has an acquisition, contracting, or purchasing department
- Who will prepare independent estimates and if these estimates are needed as evaluation criteria
- Managing multiple suppliers
- Anticipated lead times from potential suppliers to acquire items

### 3. Document business considerations.

Business considerations include the type of competition planned for all phases of the acquisition or an explanation of why competition is not practicable or not in the best interests of the acquirer. Also included are considerations for establishing or maintaining access to competitive suppliers for critical products or product components.

Availability and suitability of commercial items and the extent to which interfaces for these items have broad market acceptance, standards, organization support, and stability are other business considerations. Also included are considerations for both international and domestic sources that can meet the required need as primary sources of supply consistent with organizational policies and regulations.

Other examples of business considerations for an acquisition strategy include the following:

- Product and technology areas critical to satisfying or providing the desired capabilities
- Data rights
- Socio-economic constraints
- Safety and health issues
- Security issues (physical and information technology)

### 4. Identify major risks and which risks will be addressed jointly with the supplier.

Major acquisition risks, whether primarily managed by the acquirer or supplier, should be identified and assessed by the acquirer. The acquisition strategy identifies major risks, which risks are to be shared with the supplier, and which are retained by the acquirer.

*Refer to the Risk Management process area for more information about establishing and maintaining a risk management strategy.*

### 5. Identify the preferred supplier agreement type.

The acquirer identifies standardized acquisition documents (e.g., standard supplier agreements), if any. The acquirer also determines the preferred type of supplier agreement (e.g., firm fixed-price; fixed-price incentive, firm target; cost

plus incentive fee; or cost plus award fee) and the reasons it is suitable, including considerations of risk and reasonable risk-sharing by the acquirer and supplier.

The acquisition strategy explains the planned incentive structure for the acquisition and how it encourages the supplier to provide the product or service at or below the established cost objectives and satisfy the schedule and key measurement objectives. Considerations should be given to using incentives to reduce primary project risks. If more than one incentive is planned for a supplier agreement, the acquisition strategy explains how the incentives complement one other and do not interfere with one another. The acquisition strategy identifies unusual terms and conditions of the planned supplier agreement and all existing or contemplated deviations to an organization's terms and conditions, if any.

**6. Identify the product support strategy.**

The acquirer develops a product support strategy for lifecycle sustainment and continuous improvement of product affordability, reliability, and supportability, while sustaining readiness. The support strategy addresses how the acquirer will maintain oversight of the fielded product.

If support is going to be performed by an organization different from the supplier, a sufficient overlap period should be defined to ensure smooth transition.

The acquirer's sustainment organization or supplier typically participates in the development of the product support strategy.

**7. Review and obtain agreement with senior management on the acquisition strategy.**

The development of the acquisition strategy for a project typically requires senior management sponsorship. Appropriate senior management must approve the acquisition strategy before initiating a project.

**SP 1.2 Estimate the Scope of the Project**

***Establish a top-level work breakdown structure (WBS) to estimate the scope of the project.***

The acquirer establishes the objectives of the project in the acquisition strategy. An initial set of requirements and project objectives form the basis for establishing the WBS or for selecting a standard WBS from the organization's process assets. To ensure the full scope of the project is estimated, the WBS includes activities performed by the acquirer as well as milestones and deliverables for suppliers.

The acquisition strategy drives a key decision in this practice, specifically how much work, and what work, to give to a supplier. The acquirer develops a WBS that clearly identifies the project work performed by the acquirer and the project work performed by the supplier. The supplier work identified in the WBS becomes the foundation for the statement of work defined in the Solicitation and Supplier Agreement Development process area. The WBS identifies deliverables from the supplier and work products developed by the acquirer.

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The WBS evolves with the project. Initially a top-level WBS can serve to structure initial estimating. The development of a WBS divides the overall project into an interconnected set of manageable components. Typically, the WBS is a product-oriented structure that provides a scheme for identifying and organizing the logical units of work to be managed, which are called work packages. The WBS provides a reference and organizational mechanism for assigning effort, schedule, and responsibility and is used as the underlying framework to plan, organize, and control the work done on the project. Some projects use the term contract WBS to refer to the portion of the WBS placed under contract (possibly the entire WBS). Not all projects have a contract WBS (e.g., internally funded development).

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**Typical Work Products**

1. Task descriptions
2. Work package descriptions
3. WBS

**Subpractices**

1. Develop a WBS based on the product architecture.

The WBS should permit the identification of the following items:

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- Risks and their mitigation tasks
- Tasks for deliverables and supporting activities
- Tasks for skill and knowledge acquisition
- Tasks for the development of needed support plans, such as configuration management, quality assurance, and verification plans
- Tasks for the integration and management of nondevelopmental items

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2. Identify the work packages in sufficient detail to specify estimates of project tasks, responsibilities, and schedule.

The top-level WBS is intended to help gauge the project work effort for tasks and organizational roles and responsibilities. The amount of detail in the WBS at this level helps in developing realistic schedules, thereby minimizing the need for management reserve.

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3. Identify products and product components to be externally acquired.

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4. Identify work products to be reused.

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**SP 1.3 Establish Estimates of Work Product and Task Attributes**

**Establish and maintain estimates of work product and task attributes.**

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Size is the primary input to many models used to estimate effort, cost, and schedule. The models can also be based on inputs such as connectivity, complexity, and structure.

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Examples of types of work products for which size estimates are made include the following:

- Deliverable and nondeliverable work products
- Documents and files
- Operational and support hardware, firmware, and software

Estimation methods include using historical acquirer and supplier data and standard estimating models to compare projects of similar complexity. Where historical size data are not available, develop an estimate based on the understanding of the design of similar products.

Estimation models can be built based on historical data as part of organizational process performance, and estimates for any project can be validated using these models.

Refer to the Organizational Process Performance process area for more information about process-performance models.

Examples of size measures include the following:

- Number of functions
- Function points
- Source lines of code
- Number of classes and objects
- Number of requirements
- Number and complexity of interfaces
- Number of pages
- Number of inputs and outputs
- Number of technical risk items
- Volume of data
- Number of logic gates for integrated circuits
- Number of parts (e.g., printed circuit boards, components, and mechanical parts)
- Physical constraints (e.g., weight and volume)

The estimates should be consistent with project requirements to determine the project's effort, cost, and schedule. A relative level of difficulty or complexity should be assigned for each size attribute.

#### **Typical Work Products**

1. Technical approach
2. Size and complexity of tasks and work products
3. Estimating models
4. Attribute estimates

**Subpractices**

1. Determine the technical approach for the project.

The technical approach defines a top-level strategy for development of the product. It includes decisions on architectural features, such as distributed or client/server; state-of-the-art or established technologies to be applied, such as robotics, composite materials, or artificial intelligence; and breadth of the functionality expected in the final products, such as safety, security, and ergonomics.

The technical approach provides a basis for interoperability and supportability of the technical solution developed by the supplier.

2. Use appropriate methods to determine the attributes of the work products and tasks to be used to estimate resource requirements.

Methods for determining size and complexity should be based on validated models or historical data.

Examples of attributes include the following:

- Maturity of the technology specified in the technical solution
- Amount and complexity of the work potentially assigned to suppliers
- Number of locations where the product is to be installed

The methods for determining attributes evolve as the understanding of the relationship of product characteristics to attributes increases.

Examples of current methods include the following:

- Number of logic gates for integrated circuit design
- Lines of code or function points for software
- Number and complexity of requirements for systems engineering
- Number of square feet for standard-specified residential homes

3. Estimate the attributes of work products and tasks.

**SP 1.4 Define Project Lifecycle Phases**

***Define project lifecycle phases on which to scope the planning effort.***

The determination of a project's lifecycle phases provides for planned periods of evaluation and decision making. These periods are normally defined to support logical decision points at which significant commitments are made concerning resources and technical approach. Such points provide planned events at which project course corrections and determinations of future scope and cost can be made.

Project lifecycle phases must be defined depending on the scope of requirements, estimates for project resources, and the nature of the project.

The acquirer includes the entire project lifecycle (i.e., from user needs through initial and subsequent upgrades) when planning lifecycle

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Deleted: Larger projects may contain multiple phases, such as concept exploration, development, production, operations, and disposal. Within these phases, subphases may be needed. A development phase may include subphases such as requirements analysis, design, fabrication, integration, and verification. The determination of project phases typically includes selection and refinement of one or more development models to address interdependencies and appropriate sequencing of the activities in the phases.

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phases and refines the acquisition strategy as appropriate. The acquirer considers all supplier agreements in the context of the acquisition so that an integrated approach results. A complex project can involve managing multiple supplier agreements simultaneously or in sequence. In such cases, any acquisition lifecycle can end during any phase of the project lifecycle. Depending on the acquisition strategy, there may be intermediate phases for the creation of prototypes, increments of capability, or spiral model cycles.

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Refer to the Establish Lifecycle Model Descriptions specific practice in the Organizational Process Definition process area for more information about acquisition lifecycles.

During establishment of the supplier agreement, the acquirer works with the supplier to understand supplier lifecycle models and processes, especially those that interact directly with acquirer processes. Agreement on the lifecycle models and processes to be used during the project enables seamless interactions between supplier and acquirer, resulting in a successful acquirer-supplier relationship.

Understanding the project lifecycle is crucial in determining the scope of the planning effort and the timing of initial planning, as well as the timing and criteria (critical milestones) for replanning.

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**Typical Work Products**

- 1. Project lifecycle phases

**SP 1.5 Estimate Effort and Cost**

**Estimate the project's effort and cost for work products and tasks.**

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Estimates of effort and cost are generally based on results of analysis using models or historical data applied to size, activities, and other planning parameters. Confidence in these estimates is based on rationale for the selected model and the nature of the data. There may be occasions when available historical data does not apply, such as when efforts are unprecedented or when the type of task does not fit available models. An effort is unprecedented (to some degree) if a similar product or component has never been built. An effort may also be unprecedented if the development group has never built such a product or component.

Unprecedented efforts are more risky, require more research to develop reasonable bases of estimate, and require more management reserve. The uniqueness of the project must be documented when using these models to ensure a common understanding of assumptions made in the initial planning stages.

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Estimates address all processes and activities performed by the project for the project lifecycle, including an estimate of effort and cost for supplier work. The project estimate includes detailed estimates for activities performed by the acquirer and its stakeholders. The acquirer should include members of their technical community (e.g., systems,

hardware, and software engineers) to ensure all technical considerations have been accounted for in the estimates. As the project evolves, these estimates may be revised based on changed conditions (e.g., new circumstances encountered during execution of the supplier agreement).

In addition to creating an estimate for the project work products, the acquirer is encouraged to have its estimate and WBS independently reviewed by individuals external to the project to ensure that the project estimation and WBS can be validated.

**Typical Work Products**

1. Estimation rationale
2. Project effort estimates
3. Project cost estimates

**Subpractices**

1. Collect models or historical data to be used to transform the attributes of work products and tasks into estimates of labor hours and costs.

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Effort estimation at the work product and task level needs to be established for acquirer work. Effort estimation for supplier deliverables and processes must be established as well.

Many parametric models have been developed to help estimate cost and schedule. The use of these models as the sole source of estimation is not recommended because these models are based on historical project data that may or may not be pertinent to your project. Multiple models and methods can be used to ensure a high level of confidence in the estimate.

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Historical data include the cost, effort, and schedule data from previously executed projects and appropriate scaling data to account for differing sizes and complexity.

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2. Include supporting infrastructure needs when estimating effort and cost.

Examples of supporting infrastructure typically provided by the supplier include the following:

- Critical computing resources in the host and testing environment (e.g., memory, disk, and network capability)
- Test equipment.

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Consider the infrastructure resource needs in the development environment, the test environment, the production environment, the target environment, or any appropriate combination of these when estimating effort and cost.¶  
Examples of infrastructure resources

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3. Estimate effort and cost using models and historical data.

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Facilities, machinery, and

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- Effort and cost inputs used for estimating typically include the following:
- Judgmental estimates provided by an expert or group of experts (e.g., Delphi Method)
  - Estimates for the development of requirements
  - Risks, including the extent to which the effort is unprecedented
  - Critical competencies and roles needed to perform the work
  - The WBS
  - Costs of acquired work products
  - Selected project lifecycle model and processes
  - Lifecycle cost estimates
  - Skill levels of managers and staff needed to perform the work
  - Knowledge, skill, and training needs
  - Facilities needed (e.g., office and meeting space and workstations)
  - Travel required
  - Level of security required for tasks, work products, hardware, software, personnel, and the work environment
  - Service level agreements for call centers and warranty work
  - Direct labor and overhead

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; Cost of externally acquired products

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<#>Capability of manufacturing process(es)¶

The amount of supplier work for a project largely determines the amount of acquirer work required to manage the project and the supplier. Effort for the acquirer includes (1) effort associated with defining the scope of the project; (2) effort associated with the development of the solicitation and supplier agreement; agreement and technical management; project planning, monitoring, and control; acquisition requirements development, verification, and validation; configuration management; measurement and analysis; process and product quality assurance; requirements management; and risk management; (3) operating and maintenance effort associated with the sustainment of the solution; and (4) disposal effort.

**SG 2 Develop a Project Plan**

***A project plan is established and maintained as the basis for managing the project.***

A project plan is a formal, approved document used to manage and control the execution of the project. It is based on project requirements and established estimates.

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The project plan should consider all phases of the project lifecycle. Project planning should ensure that all plans affecting the project are consistent with the overall project plan.

**SP 2.1 Establish the Budget and Schedule**

***Establish and maintain the project's budget and schedule.***

The project's budget and schedule are based on developed estimates and ensure that budget allocation, task complexity, and task dependencies are appropriately addressed.

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The project's budget and schedule (including the lifecycle-related activities of the acquirer) the supplier's efforts and those of supporting organizations and other stakeholders (including any supplier that supports the acquirer) are established, tracked, and maintained for the duration of the project. In addition to creating a schedule for project work products, the acquirer should have the schedule independently reviewed by individuals external to the project to ensure that the project schedule can be validated.

Event-driven, resource-limited schedules have proven to be effective in dealing with project risk. Identifying accomplishments to be demonstrated before initiation of an event provides some flexibility in the timing of the event, a common understanding of what is expected, a better vision of the state of the project, and a more accurate status of the project's tasks.

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#### Typical Work Products

1. Project schedules
2. Schedule dependencies
3. Project budget

#### Subpractices

1. Identify major milestones.

Milestones are often imposed to ensure completion of certain deliverables by the milestone. Milestones can be event based or calendar based. If calendar based, once milestone dates have been agreed on, it is often difficult to change them.

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2. Identify schedule assumptions.

When schedules are initially developed, it is common to make assumptions about the duration of certain activities. These assumptions are frequently made on items for which little if any estimation data is available. Identifying these assumptions provides insight into the level of confidence (i.e., uncertainties) in the overall schedule.

3. Identify constraints.

Factors that limit the flexibility of management options must be identified as early as possible. The examination of the attributes of work products and tasks often bring these issues to the surface. Such attributes can include task duration, resources, inputs, and outputs.

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Since key characteristics of pre-qualified or other potential suppliers are elements of project success, the acquirer considers these characteristics (e.g., technical and financial capability, management and delivery processes, production capacity, and business type and size) in identifying constraints for the project.

4. Identify task dependencies.

Typically, the tasks for a project can be accomplished in some ordered sequence that minimizes the duration of the project. This sequencing involves the identification of predecessor and successor tasks to determine optimal ordering.

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Examples of tools that can help determine optimal ordering of task activities include the following:

- Critical Path Method (CPM)
- Program Evaluation and Review Technique (PERT)
- Resource-limited scheduling
- Critical chain method

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5. Define the budget and schedule.

An example of a system used for documenting the costs and schedule of a project is an EVMS [GEIA 748 2002].

Establishing and maintaining the project's budget and schedule typically includes the following:

- Defining the committed or expected availability of resources and facilities
- Determining the time phasing of activities
- Determining a breakout of subordinate schedules
- Defining dependencies among activities (predecessor or successor relationships)
- Defining schedule activities and milestones to support accuracy in progress measurement
- Identifying milestones for the delivery of products to the customer
- Defining activities of appropriate duration
- Defining milestones of appropriate time separation
- Defining a management reserve based on the confidence level in meeting the schedule and budget
- Using appropriate historical data to verify the schedule
- Defining incremental funding requirements
- Documenting project assumptions and rationale
- Determining the approach to incorporating supplier schedules at an appropriate level of detail

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6. Establish corrective action criteria.

Criteria are established for determining what constitutes a significant deviation from the project plan. A basis for gauging issues and problems is necessary to determine when corrective action should be taken. Corrective actions may require replanning, which may include revising the original plan, establishing new agreements, or including mitigation activities in the current plan.

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Criteria for corrective action are based on key objectives defined in the acquisition strategy using process, product, and service level measures. The measures represent key stakeholder needs and threshold values of acceptable limits that, in the stakeholder's judgment, will provide the needed capability. All measures that represent key stakeholder needs and other measures for monitoring the supplier are defined in the Statement of Work (SOW), along with their associated minimum allowed performance levels. These measures are used to identify issues and

problems and gauge whether corrective actions should be taken. The plan should define how these measures will be assessed and evaluated.

## SP 2.2 Identify Project Risks

### **Identify and analyze project risks.**

*Refer to the Risk Management process area for more information about risk management activities.*

*Refer to the Monitor Project Risks specific practice in the Project Monitoring and Control process area for more information about risk monitoring activities.*

Risks are identified or discovered and analyzed to support project planning. This specific practice should be extended to all plans that affect the project to ensure that appropriate interfacing is taking place among all relevant stakeholders on identified risks.

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Project planning risk identification and analysis typically include the following:

- Identifying risks
- Analyzing risks to determine the impact, probability of occurrence, and time frame in which problems are likely to occur
- Prioritizing risks

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Risks are identified from multiple perspectives (e.g., acquisition, technical, management, operational, supplier agreement, industry, support, and end user) to ensure all project risks are considered comprehensively in planning activities. Applicable regulatory and statutory requirements with respect to safety and security must be considered while identifying risks.

The acquisition strategy and the risks identified in other project planning activities form the basis for some of the criteria used in evaluation practices in the Solicitation and Supplier Agreement Development process area. As the project evolves, risks may be revised based on changed conditions.

#### **Typical Work Products**

1. Identified risks
2. Risk impacts and probability of occurrence
3. Risk priorities

#### **Subpractices**

1. Identify risks.

The identification of risks involves the identification of potential issues, hazards, threats, vulnerabilities, and so on that could negatively affect work efforts and plans. Risks must be identified and described in an understandable way before they can be analyzed. When identifying risks, it is a good idea to use a standard method for defining risks. Risk identification and analysis tools can be used to help identify possible problems.

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Examples of risk identification and analysis tools include the following:

- Risk taxonomies
- Risk assessments
- Checklists
- Structured interviews
- Brainstorming
- Performance models
- Cost models
- Network analysis
- Quality factor analysis

Numerous risks are associated with acquiring products through suppliers (e.g., the stability of the supplier, the ability to maintain sufficient insight into the progress of their work, the supplier's capability to meet product requirements, and the skills and availability of supplier resources to meet commitments).

The process, product, and service level measures and associated thresholds should be analyzed to identify instances where thresholds are at risk of not being met. These project measures are key indicators of project risk.

2. Document risks.
3. Review and obtain agreement with relevant stakeholders on the completeness and correctness of documented risks.
4. Revise risks, as appropriate.

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Examples of when identified risks may need to be revised include the following:

- When new risks are identified
- When risks become problems
- When risks are retired
- When project circumstances change significantly

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### SP 2.3 Plan Data Management

#### **Plan for the management of project data.**

Data are forms of documentation required to support a project in all of its areas (e.g., administration, engineering, configuration management, finance, logistics, quality, safety, manufacturing, and procurement). The data can take any form (e.g., reports, manuals, notebooks, charts, drawings, specifications, files, or correspondence). The data may exist in any medium (e.g., printed or drawn on various materials, photographs, electronic, or multimedia).

Data may be deliverable (e.g., items identified by a project's contract data requirements) or data may be nondeliverable (e.g., informal data, trade studies and analyses, internal meeting minutes, internal design review documentation, lessons learned, and action items). Distribution can take many forms, including electronic transmission.

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#### **IPPD Addition¶**

When integrated teams are formed, project data includes data developed and used solely within a particular team as well as data applicable across integrated team boundaries, if there are multiple integrated teams.¶

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Data requirements for the project should be established for both data items to be created and their content and form, based on a common or standard set of data requirements. Uniform content and format requirements for data items facilitate understanding of data content and help with consistent management of data resources.

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The reason for collecting each document should be clear. This task includes the analysis and verification of project deliverables and nondeliverables, data requirements, and customer-supplied data. Often, data are collected with no clear understanding of how they will be used. Data are costly and should be collected only when needed.

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Project data include both acquirer and supplier created data. The acquirer identifies the minimal data required to cost-effectively operate, maintain, and improve the acquired product and to foster source-of-support competition throughout the product's lifecycle in the acquirer's intended environment. Data should be available in a format that is compatible with the intended user's environment and a quality assurance program should be implemented to guarantee the accuracy and completeness of data.

The acquirer considers how data will be shared between acquirer and supplier as well as across relevant stakeholders. In many cases, leaving acquirer data in the physical possession of the supplier and having access to supplier data is the preferred solution. In addition to data access, the requirement for acquirer use, reproduction, manipulation, alteration, or transfer of possession of data should be part of the data management plan. The supplier agreement specifies appropriate acquirer rights to the data acquired, in addition to requirements for delivery or access.

Data, when delivered to the acquirer, are formatted according to accepted data standards to ensure its usability by the acquirer. Planning for managing data, including during transition to operations and support, is addressed as part of project planning to avoid unexpected costs to procure, reformat, and deliver data. Plans for managing data within project teams and the infrastructure required to manage data between the supplier, operational users, and other relevant stakeholders are included.

Project data and plans requiring version control or more stringent levels of configuration control are determined and mechanisms established to ensure project data are controlled. The implications of controlling access to classified and sensitive data (e.g., proprietary, export controlled, source selection sensitive) and other access-controlled data also must be considered.

#### Typical Work Products

1. Data management plan
2. Master list of managed data
3. Data content and format description

- 4. Lists of data requirements for acquirers and suppliers
- 5. Privacy requirements
- 6. Security requirements
- 7. Security procedures
- 8. Mechanisms for data retrieval, reproduction, and distribution
- 9. Schedule for the collection of project data
- 10. List of project data to be collected

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**Subpractices**

- 1. Establish requirements and procedures to ensure privacy and the security of data.  
 Not everyone will have the need or clearance necessary to access project data. Procedures must be established to identify who has access to which data as well as when they have access to which data.

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Security and access control are critical when the acquirer provides data access to the supplier. Security and access control includes access lists of authorized supplier personnel and non-disclosure agreements between the acquirer and supplier.

For example, when the supplier performs work for the acquirer off-site (e.g., off-shore development center), the acquirer must consider additional security measures such as a firewall between acquirer and supplier networks and restricted access to the acquirer's work place.

- 2. Establish a mechanism to archive data and to access archived data.

Accessed information should be in an understandable form (e.g., electronic or computer output from a database) or represented as originally generated.

The data management plan is ideally supported by an integrated data system that meets the needs of both initial acquisition and support communities. Integrating acquisition and sustainment data systems into a total lifecycle integrated data environment provides the capability needed to plan effectively for sustainment and to facilitate technology insertion for affordability improvements during re-procurement and post-production support, while ensuring that acquisition planners have accurate information about total lifecycle costs.

- 3. Determine the project data to be identified, collected, and distributed.

- 4. Decide which project data and plans require version control or more stringent levels of configuration control and establish mechanisms to ensure project data are controlled.

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**SP 2.4 Plan the Project's Resources**

***Plan for necessary resources to perform the project.***

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Defining project resources (e.g., labor, machinery/equipment, materials, and methods) and quantities needed to perform project activities, builds on the initial estimates and provides additional information that can be applied to expand the WBS used to manage the project.

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**IPPD Addition¶**  
When integrated teams are formed, planning for project resources should consider staffing of the integrated teams.¶  
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The top-level WBS developed earlier as an estimation mechanism is typically expanded by decomposing these top levels into work packages that represent single work units that can be separately assigned, performed, and tracked. This subdivision is done to distribute management responsibility and provide better management control.

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Each work package or work product in the WBS should be assigned a unique identifier (e.g., number) to permit tracking. A WBS can be based on requirements, activities, work products, or a combination of these items. A dictionary that describes the work for each work package in the WBS should accompany the work breakdown structure.

The resource plan must include planning for staff with appropriate training and experience to evaluate supplier proposals and participate in negotiations with suppliers. The resource plan identifies the project resources expected from the supplier, including critical facilities or equipment needed to support the work. The resource plan may be revised based on the supplier agreement or changes in conditions during project execution.

**Typical Work Products**

1. WBS work packages
2. WBS task dictionary
3. Staffing requirements based on project size and scope
4. Critical facilities and equipment list
5. Process and workflow definitions and diagrams
6. Project administration requirements list

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**Subpractices**

1. Determine process requirements.

The processes used to manage a project must be identified, defined, and coordinated with all relevant stakeholders to ensure efficient operations during project execution.

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The acquirer must determine how its processes interact with supplier processes to enable seamless execution of the project and successful acquirer-supplier relationships. Considerations include the use of a common process across multiple suppliers and the acquirer or the use of unique but compatible processes. At the very least, processes should be compatible across interfaces.

2. Determine staffing requirements.

The staffing of a project depends on the decomposition of project requirements into tasks, roles, and responsibilities for accomplishing project requirements as laid out in the work packages of the WBS.

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Staffing requirements must consider the knowledge and skills required for each identified position, as defined in the Plan Needed Knowledge and Skills specific practice.

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The acquirer determines its staffing requirements, including staffing for solicitation and supplier agreement management activities and staffing expected by the supplier to complete its portion of the work as defined in the WBS.

3. Determine facility, equipment, and component requirements.

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Most projects are unique in some sense and require a set of unique assets to accomplish project objectives. The determination and acquisition of these assets in a timely manner are crucial to project success.

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Lead-time items must be identified early to determine how they will be addressed. Even when required assets are not unique, compiling a list of all of facilities, equipment, and parts (e.g., number of computers for the personnel working on the project, software applications, and office space) provides insight into aspects of the scope of an effort that are often overlooked.

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The acquirer considers what it may need to provide for acceptance of supplier deliverables and for transition and support of the acquired product.

The acquirer must also identify and ensure that facilities or equipment to be provided to the supplier for project work are accounted for in the project plan.

**SP 2.5 Plan Needed Knowledge and Skills**

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***Plan for knowledge and skills needed to perform the project.***

*Refer to the Organizational Training process area for more information about knowledge and skills information to be incorporated into the project plan.*

Knowledge delivery to projects involves both training project personnel and acquiring knowledge from outside sources.

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Staffing requirements are dependent on the knowledge and skills available to support the execution of the project.

The acquirer plans for knowledge and skills required by the project team to perform their tasks. Knowledge and skill requirements can be derived from project risk.

For example, if the acquirer is purchasing a software-intensive product, it ensures that acquisition personnel assigned to the project have expertise in systems and software engineering or provides training for the project team in these areas.

Orientation and training in acquirer processes and the domain knowledge required to execute the project are also required. The acquirer also plans for knowledge and skills needed from the supplier.

For example, the acquirer can provide role descriptions and skill profiles to the supplier as part of the solicitation package.

Planning for needed knowledge and skills includes ensuring that appropriate training is planned for personnel involved in receiving, storing, using, and supporting the transitioned product. Also included is ensuring that costs and funding sources to pay for training are available and lead times to obtain the funding are identified.

**Typical Work Products**

1. Inventory of skill needs
2. Staffing and new hire plans
3. Databases (e.g., skills and training)

4. Training plans

**Subpractices**

1. Identify the knowledge and skills needed to perform the project.
2. Assess the knowledge and skills available.
3. Select mechanisms for providing needed knowledge and skills.

Example mechanisms include the following:

- In-house training (both organizational and project)
- External training
- Staffing and new hires
- External skill acquisition

The choice of in-house training or outsourced training for needed knowledge and skills is determined by the availability of training expertise, the project's schedule, and business objectives.

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4. Incorporate selected mechanisms into the project plan.

**SP 2.6 Plan Stakeholder Involvement**

***Plan the involvement of identified stakeholders.***

Stakeholders are identified from all phases of the project lifecycle by identifying the people and functions that need to be represented in the project and describing their relevance and the degree of interaction for project activities. A two-dimensional matrix with stakeholders along one axis and project activities along the other axis is a convenient format for accomplishing this identification. Relevance of the stakeholder to the activity in a particular project phase and the amount of interaction expected would be shown at the intersection of the project phase activity axis and the stakeholder axis.

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When integrated teams are formed, stakeholder involvement should be planned down to the integrated team level.¶

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Stakeholders can include operational users and project participants as well as potential suppliers. When acquiring products that must interoperate with other products, the acquirer plans the involvement of stakeholders from other projects or communities to ensure the delivered product can perform as required in its intended environment. Such

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planning often includes steps for establishing and maintaining supplier agreements with these stakeholders (e.g., interagency and intercompany agreements, memorandums of understanding, and memorandums of agreement).

For inputs of stakeholders to be useful, careful selection of relevant stakeholders is necessary. For each major activity, identify stakeholders who are affected by the activity and those who have expertise that is needed to conduct the activity. This list of relevant stakeholders will probably change as the project moves through phases of the project lifecycle. It is important, however, to ensure that relevant stakeholders in the latter phases of the lifecycle have early input to requirements and design decisions that affect them.

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Examples of the type of material that should be included in a plan for stakeholder interaction include the following:

- List of all relevant stakeholders
- Rationale for stakeholder involvement
- Roles and responsibilities of relevant stakeholders with respect to the project, by project lifecycle phase
- Relationships among stakeholders
- Relative importance of the stakeholder to the success of the project, by project lifecycle phase
- Resources (e.g., training, materials, time, and funding) needed to ensure stakeholder interaction
- Schedule for the phasing of stakeholder interaction

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Implementing this specific practice relies on shared or exchanged information with the previous Plan Needed Knowledge and Skills specific practice.

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**Typical Work Products**

1. Stakeholder involvement plan

**SP 2.7 Plan Transition to Operations and Support**

**Plan transition to operations and support.**

Planning for transition must be considered part of initial planning for the project.

Transition and support plans include the approach for introducing and maintaining readiness, sustainment, and the operational capability of the products delivered by the supplier. Plans for transitioning to operations and support include assignment of responsibility for transition to operations and support of the product, as well as all activities needed to manage the transition and to support the product in its intended environment (e.g., definition of transition readiness criteria agreed to by relevant stakeholders). These plans may include

reasonable accommodations for potential risks and for the evolution of acquired products and their eventual removal from operational use.

Transition to operations and support plans typically include the following:

- Processes and procedures for the transition to operations and support
- Evaluation methods and acceptance criteria for transitioning the product to operations and support
- Readiness criteria for the product
- Readiness criteria for the operations organization
- Readiness criteria for the product support organization
- Expectations for supplier execution of the transition
- Warranty expectations for the acquired product
- Transition of intellectual property or other acquirer assets to the acquirer's designated repository
- Resolution steps if any problems are encountered

If support is to be provided by an organization different from the supplier, a sufficient overlap period should be included in the plan.

Typically, the acquirer develops initial transition and support plans and then reviews and approves more detailed transition and support plans.

Refer to the Agreement Management process area for more information about acceptance criteria and accepting the product.

Refer to the Acquisition Technical Management process area for more information about evaluation methods for the product.

#### **Typical Work Products**

1. Transition to operations and support plans

#### **Subpractices**

1. Determine the transition scope and objectives.
2. Determine transition requirements and criteria.
3. Determine transition responsibilities and resources to include post-transition support enhancements and lifecycle considerations.
4. Determine configuration management needs of the transition.
5. Determine training needs for operations and support.

### **SP 2.8** **Establish the Project Plan**

#### ***Establish and maintain the overall project plan.***

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A documented plan that addresses all relevant planning items is necessary to achieve the mutual understanding, commitment, and performance of individuals, groups, and organizations that must execute or support the plans. The plan generated for the project defines all aspects of the effort, tying together the following in a logical manner:

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project lifecycle considerations; technical and management tasks; budgets and schedules; milestones; data management, risk identification; resource and skill requirements; and stakeholder identification and interaction. Infrastructure descriptions include responsibility and authority relationships for project staff, management, and support organizations.

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The project plan may include multiple plans such as staffing plans, stakeholder involvement plans, measurement and analysis plans, monitoring and control plans, solicitation plans, agreement management plans, risk mitigation plans, transition plans, quality assurance plans, and configuration management plans. Regardless of form, the plan or plans should address the acquisition strategy as well as the cradle-to-grave considerations for the project and product to be acquired.

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For Software Engineering¶  
For software, the planning document is often referred to as one of the following:¶  
<#>Software development plan¶  
Software

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Software

Examples of plans that have been used in the U.S. Department of Defense community include the following:

- Integrated Master Plan—an event-driven plan that documents significant accomplishments with pass/fail criteria for both business and technical elements of the project and that ties each accomplishment to a key project event.
- Integrated Master Schedule—an integrated and networked multi-layered schedule of project tasks required to complete the work effort documented in a related Integrated Master Plan.
- Systems Engineering Management Plan—a plan that details the integrated technical effort across the project.
- Systems Engineering Master Schedule—an event-based schedule that contains a compilation of key technical accomplishments, each with measurable criteria, requiring successful completion to pass identified events.
- Systems Engineering Detailed Schedule—a detailed, time-dependent, task-oriented schedule that associates dates and milestones with the Systems Engineering Master Schedule.

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For Hardware Engineering¶  
For hardware, the planning document is often referred to as a hardware development plan. Development activities in preparation for production may be included in the hardware development plan or defined in a separate production plan.¶  
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**Typical Work Products**

1. Overall project plan

**SG 3 Obtain Commitment to the Plan**

***Commitments to the project plan are established and maintained.***

To be effective, plans require commitment by those responsible for implementing and supporting the plan.

Refer to the Solicitation and Supplier Agreement Development process area for more information about supplier agreements and finalizing supplier plans.

**SP 3.1 Review Plans That Affect the Project**

***Review all plans that affect the project to understand project commitments.***

Plans developed in other process areas typically contain information similar to that called for in the overall project plan. These plans may provide additional detailed guidance and should be compatible with and support the overall project plan to indicate who has the authority, responsibility, accountability, and control. All plans that affect the project should be reviewed to ensure they contain a common understanding of the scope, objectives, roles, and relationships that are required for the project to be successful. Many of these plans are described by the Plan the Process generic practice.

The project may have a hierarchy of plans (e.g., risk mitigation plans, transition plans, quality assurance plans, and configuration management plans). In addition, stakeholder plans (e.g., operational, test, support, and supplier plans) must be reviewed to ensure consistency among all project participants. Acquirer review of plans must include reviewing cross-supplier dependencies.

**Typical Work Products**

1. Record of the reviews of plans that affect the project

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IPPD Addition¶

When integrated teams are formed, their integrated work plans are among the plans to review.¶

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**SP 3.2 Reconcile Work and Resource Levels**

**Adjust the project plan to reconcile available and estimated resources.**

To establish a project that is feasible, obtain commitment from relevant stakeholders and reconcile differences between estimates and available resources. Reconciliation is typically accomplished by lowering or deferring technical performance requirements, negotiating more resources, finding ways to increase productivity, outsourcing, adjusting the staff skill mix, or revising all plans that affect the project or its schedules.

During supplier selection and negotiation of the supplier agreement, the acquirer reconciles overall project work and resource levels based on proposals from the supplier. Following completion of the supplier agreement, the acquirer incorporates supplier plans at an appropriate level of detail into the project plan to support the alignment of plans. For example, an acquirer may incorporate major supplier milestones, deliverables, and reviews.

**Typical Work Products**

1. Revised methods and corresponding estimating parameters (e.g., better tools and the use of off-the-shelf components)
2. Renegotiated budgets
3. Revised schedules
4. Revised requirements list
5. Renegotiated stakeholder agreements

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IPPD Addition¶

When integrated teams are formed, special attention should be paid to resource commitments in circumstances of distributed integrated teams and when people are on multiple integrated teams in one or more projects.¶

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### SP 3.3 Obtain Plan Commitment

#### **Obtain commitment from relevant stakeholders responsible for performing and supporting plan execution.**

Obtaining commitment involves interaction among all relevant stakeholders, both internal and external to the project. The individual or group making a commitment should have confidence that the work can be performed within cost, schedule, and performance constraints. Often, a provisional commitment is adequate to allow the effort to begin and to permit research to be performed to increase confidence to the appropriate level needed to obtain a full commitment.

#### **Typical Work Products**

1. Documented requests for commitments
2. Documented commitments

#### **Subpractices**

1. Identify needed support and negotiate commitments with relevant stakeholders.

The WBS can be used as a checklist for ensuring that commitments are obtained for all tasks.

The plan for stakeholder interaction should identify all parties from whom commitment should be obtained.

2. Document all organizational commitments, both full and provisional, ensuring the appropriate level of signatories.

Commitments must be documented to ensure a consistent mutual understanding and for tracking and maintenance. Provisional commitments should be accompanied by a description of risks associated with the relationship.

3. Review internal commitments with senior management, as appropriate.
4. Review external commitments with senior management, as appropriate.

Management may have the necessary insight and authority to reduce risks associated with external commitments.

5. Identify commitments regarding interfaces between project elements and other projects and organizational units so that these commitments can be monitored.

Well-defined interface specifications form the basis for commitments.

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#### **IPPD Addition¶**

When integrated teams are formed, the integrated team plans should have buy-in from the team members, the interfacing teams, the project, and the process owners of the standard processes that the team has selected for tailored application.¶

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Continuous Only

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**Project Planning (PP)**

## Generic Practices by Goal

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### Continuous Only

#### GG 1 Achieve Specific Goals

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***The process supports and enables achievement of the specific goals of the process area by transforming identifiable input work products to produce identifiable output work products.***

#### GP 1.1 Perform Specific Practices

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***Perform the specific practices of the project planning process to develop work products and provide services to achieve the specific goals of the process area.***

#### GG 2 Institutionalize a Managed Process

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***The process is institutionalized as a managed process.***

#### GP 2.1 Establish an Organizational Policy

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***Establish and maintain an organizational policy for planning and performing the project planning process.***

Elaboration:

This policy establishes organizational expectations for estimating the planning parameters, making internal and external commitments, and developing the plan for managing the project.

#### GP 2.2 Plan the Process

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***Establish and maintain the plan for performing the project planning process.***

Elaboration:

Refer to Table 6.2 on page 95 in Generic Goals and Generic Practices for more information about the relationship between generic practice 2.2 and the Project Planning process area.

#### GP 2.3 Provide Resources

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***Provide adequate resources for performing the project planning process, developing the work products, and providing the services of the process.***

Elaboration:

Special expertise, equipment, and facilities in project planning may be required. Special expertise in project planning may include the following:

Experienced estimators

Schedulers

Technical experts in applicable areas (e.g., product domain and technology)

Examples of other resources provided include the following tools:

Spreadsheet programs

Estimating models

Project planning and scheduling packages

#### **GP 2.4 Assign Responsibility**

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***Assign responsibility and authority for performing the process, developing the work products, and providing the services of the project planning process.***

#### **GP 2.5 Train People**

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***Train the people performing or supporting the project planning process as needed.***

Elaboration:

Examples of training topics include the following:

Estimating

Budgeting

Negotiating

Risk identification and analysis

Data management

Planning

Scheduling

#### **GP 2.6 Manage Configurations**

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***Place designated work products of the project planning process under appropriate levels of control.***

Elaboration:

Examples of work products placed under control include the following:

- Work breakdown structure
- Project plan
- Data management plan
- Stakeholder involvement plan

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**GP 2.7 Identify and Involve Relevant Stakeholders**

***Identify and involve the relevant stakeholders of the project planning process as planned.***

Elaboration:

Refer to Table 6.2 on page 95 in Generic Goals and Generic Practices for more information about the relationship between generic practice 2.7 and the Plan Stakeholder Involvement practice in the Project Planning process area.

Examples of activities for stakeholder involvement include the following:

- Establishing estimates
- Reviewing and resolving issues on the completeness and correctness of the project risks
- Reviewing data management plans
- Establishing project plans
- Reviewing project plans and resolving issues on work and resource issues

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**GP 2.8 Monitor and Control the Process**

***Monitor and control the project planning process against the plan for performing the process and take appropriate corrective action.***

Elaboration:

Examples of measures and work products used in monitoring and controlling include the following:

- Number of revisions to the plan
- Cost, schedule, and effort variance per plan revision
- Schedule for development and maintenance of program plans

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**GP 2.9 Objectively Evaluate Adherence**

***Objectively evaluate adherence of the project planning process against its process description, standards, and procedures, and address noncompliance.***

Elaboration:

Examples of activities reviewed include the following:

- Establishing estimates
- Developing the project plan
- Obtaining commitments to the project plan

Examples of work products reviewed include the following:

- WBS
- Project plan
- Data management plan
- Stakeholder involvement plan

**GP 2.10    Review Status with Higher Level Management**

***Review the activities, status, and results of the project planning process with higher level management and resolve issues.***

**Staged Only**

GG3 and its practices do not apply for a maturity level 2 rating, but do apply for a maturity level 3 rating and above.

**Continuous/Maturity Levels 3 - 5 Only**

**GG 3        Institutionalize a Defined Process**

***The process is institutionalized as a defined process.***

**GP 3.1      Establish a Defined Process**

***Establish and maintain the description of a defined project planning process.***

**GP 3.2      Collect Improvement Information**

***Collect work products, measures, measurement results, and improvement information derived from planning and performing the project planning process to support the future***

### Continuous/Maturity Levels 3 - 5 Only

***use and improvement of the organization's processes and process assets.***

Elaboration:

Examples of work products, measures, measurement results, and improvement information include the following:

- Project data library structure
- Project attribute estimates
- Risk impacts and probability of occurrence

### Continuous Only

#### **GG 4 Institutionalize a Quantitatively Managed Process**

***The process is institutionalized as a quantitatively managed process.***

##### **GP 4.1 Establish Quantitative Objectives for the Process**

***Establish and maintain quantitative objectives for the project planning process, which address quality and process performance, based on customer needs and business objectives.***

##### **GP 4.2 Stabilize Subprocess Performance**

***Stabilize the performance of one or more subprocesses to determine the ability of the project planning process to achieve the established quantitative quality and process-performance objectives.***

#### **GG 5 Institutionalize an Optimizing Process**

***The process is institutionalized as an optimizing process.***

##### **GP 5.1 Ensure Continuous Process Improvement**

***Ensure continuous improvement of the project planning process in fulfilling the relevant business objectives of the organization.***

##### **GP 5.2 Correct Root Causes of Problems**

***Identify and correct the root causes of defects and other problems in the project planning process.***

