

CHAPTER 12

PROJECT PROCUREMENT MANAGEMENT

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

- Explain the importance of project procurement management and the increasing use of outsourcing for information technology (IT) projects
- Describe the work involved in planning procurements for projects, including determining the proper type of contract to use and preparing a procurement management plan, statement of work, source selection criteria, and make-or-buy analysis
- Discuss how to conduct procurements and strategies for obtaining seller responses, selecting sellers, and awarding contracts
- Describe the process of controlling procurements by managing procurement relationships and monitoring contract performance
- Discuss types of software that are available to assist in project procurement management
- Discuss considerations for agile/adaptive environments

OPENING CASE

Marie McBride could not believe how much money her company was paying for outside consultants to help finish an important system conversion project. The consulting company's proposal said it would provide experienced professionals who had completed similar conversions, and that the job would be finished in six months or less with four consultants working full time. Nine months later her company was still paying high consulting fees, and half of the original consultants on the project had been replaced with new people. One new consultant had graduated from college only two months before and had extremely poor communications skills. Marie's internal staff complained that they were wasting time training some of these "experienced professionals." Marie talked to her company's purchasing manager about the contract, fees, and special clauses that might be relevant to the problems they were having.

Marie was dismayed at how difficult it was to interpret the contract. It was very long and obviously written by someone with a legal background. When she asked what her company could do because the consulting firm was not following its proposal, the purchasing manager stated that the proposal was not part of the official contract. Marie's company was paying for time and materials, not specific deliverables. There was no clause stating the minimum experience level required for the consultants, nor were there penalty clauses for not completing the work on time. There was a termination clause, however, meaning that the company could terminate the contract. Marie wondered why her company had signed such a poor contract. Was there a better way to procure services from outside the company?

THE IMPORTANCE OF PROJECT PROCUREMENT MANAGEMENT

Procurement means acquiring goods and services from an outside source. The term *procurement* is widely used in government; many private companies use the terms *purchasing* and *outsourcing*. Organizations or individuals who provide procurement services are referred to as suppliers, vendors, contractors, subcontractors, or sellers; of these terms, *suppliers* is the most widely used. Many IT projects involve the use of goods and services from outside the organization. The Project Management Institute defines an outside source as a source outside the project team, so the same organization can be a supplier to the project team, or the project team can be a supplier to another group in the organization. In fact, many IT departments in organizations are in direct competition with outside vendors, and they are subject to the same kind of requirements definition, statements of work, and bids. The rules and methods of sound project procurement practices are good to follow regardless of who provides the services to whom.

As you learned in Chapter 2, outsourcing is a hot topic for research and debate, especially the implications of outsourcing to other countries, which is called offshoring. Gartner estimated the value of the global IT industry to reach \$3.7 trillion, an increase of 4 percent from 2017. The largest spending category is communications services at 39 percent of the total or about \$1.4 trillion.¹ According to a study by Deloitte, the outsourcing market continues to grow:

- Outsourcing more mature business functions such as IT, human resources, and finance continued to grow, as did additional functions, like real estate, facilities management, and procurement.
- Survey respondents cited the top reasons for outsourcing as cost cutting, focusing on core business, and solving capacity issues.
- “Companies are redefining the benefits of outsourcing by asking their service providers to add value in ways beyond cost cutting, such as enabling mergers and acquisitions (M&A activity, providing needed capacity, and advancing functional capabilities).”²



GLOBAL ISSUES

A recent approach to bringing IT jobs back to the U.S. is called urban onshoring. Software testing in particular has sparked several organizations to work together to meet the need for jobs in low income, high unemployment urban areas, improve quality and efficiency, and reduce overseas costs. For example, Doran Jones Inc., a startup consulting firm that does testing work for banks and media companies in Manhattan, partnered with Per Scholas to create the first Urban Development Center (UDC) for software testing projects. The UDC model develops the infrastructure, resources, and jobs in low-income urban neighborhoods as part of a company's Corporate Social Responsibility strategy. Per Scholas is the oldest and largest professional IT workforce development program in New York City. They provide technology education, training, and job placement services for over 4,500 unemployed and low-income adults.

Several start-up companies are applying similar models in an effort to improve bleak neighborhoods, like Hunts Point in the South Bronx. Startup Box, founded by husband and wife team Majora Carter and James Chase, is initially focusing on quality assurance testing for games and apps like Game Chaser. To recruit testers, they hold gaming tournaments in and around Hunts Point and provide feedback on the games to developers, similar to a focus group.

Doran Jones Inc. and Startup Box do not want their work to be viewed as charity projects. “As offshoring becomes more and more problematic in the ever-changing tech world ... on-shoring is a major market opportunity. They can make outsourcing more efficient and diversify the talent pipeline in tech, in addition to bringing some much needed jobs back to the US. Both Startup Box and Doran Jones have plans to replicate this urban on shoring thing in other cities.”³

Politicians debate whether offshoring helps their own country or not. Andy Bork, chief operating officer of a computer network service provider, described outsourcing as an essential part of a healthy business diet. He described the idea of good versus bad outsourcing as something like good versus bad cholesterol. He said that most people view offshoring as being bad because it takes jobs away from domestic workers. However, many companies are realizing that they can use offshoring *and* create more jobs at home.⁴ Other companies, like Walmart, successfully manage the majority of their IT projects

in-house with very little commercial software and no outsourcing at all. Other organizations are moving IT services back in-house, such as General Motors (GM). Randy Mott, the CIO of GM and former CIO of Walmart, Dell, and Hewlett-Packard, overhauled GM's IT operations and switched from outsourcing 90 percent of its IT services to only 10 percent from 2012 to 2015. See the What Went Right? feature for a description of how Zulily continues to use in-house software development to provide a competitive advantage.



WHAT WENT RIGHT?

Retailer Zulily, a \$1.5 billion company that celebrated its eight birthday in 2018, is one of a growing number of organizations developing software in-house to meet their need for speed and innovation. CIO Luke Friang said it would be nearly impossible for off-the-shelf software to keep up with their pace. Zulily offers flash sales where items are available for limited times only, and its website technology to track and customize the shopping experience are an essential part of their business strategy. Other companies gaining competitive advantages by developing innovative, in-house software include General Motors and Tesla Motors Inc.

Zulily developed proprietary algorithms that track customers throughout the site and quickly make adjustments to meet changing consumer preferences. The retailer, based in Seattle, sends customers e-mails containing deals targeted to what they've bought from the site and to their page viewing patterns.

Under Friang's leadership for over seven years, the technology team has grown 20-fold. "We're currently making huge investments in our Big Data platform, our AWS migration and our proprietary warehouse management software," Friang said. "We're looking to make significant technology hires this year—currently hiring across product, data science, supply chain and operations."⁵

Deciding whether to outsource, what to outsource, and how to outsource are important topics for many organizations throughout the world. Organizations are turning to outsourcing to accomplish the following:

- *Access skills and technologies.* Organizations can gain access to specific skills and technologies when they are required by using outside resources. As mentioned earlier, a shortage of qualified personnel is the main reason that companies outsource IT services. A project may require experts in a particular field for several months, or it might require specific technologies from an outside source. Planning for this procurement ensures that the needed skills and technologies will be available for the project.
- *Reduce both fixed and recurrent costs.* Outsourcing suppliers often can use economies of scale that may not be available to the client alone, especially for hardware and software. It can also be less expensive to outsource some labor costs to other organizations in the same country or offshore. Companies can use outsourcing to reduce labor costs on projects by avoiding the costs of hiring, firing, and reassigning people to projects or paying their salaries when they are between projects.

- *Allow the client organization to focus on its core business.* Most organizations are not in business to provide IT services, yet many have spent valuable time and resources on IT functions when they should have focused on core competencies such as marketing, customer service, and new product design. By outsourcing many IT functions, employees can focus on jobs that are critical to the success of the organization.
- *Provide flexibility.* Outsourcing to provide extra staff during periods of peak workloads can be much more economical than trying to staff entire projects with internal resources. Many companies cite better flexibility in staffing as a key reason for outsourcing. As you learned in Chapter 2, Apple says it could not produce several of its products fast enough without outsourcing.
- *Increase accountability.* A well-written **contract**—a mutually binding agreement that obligates the seller to provide specified products or services and obligates the buyer to pay for them—can clarify responsibilities and sharpen focus on key deliverables of a project. Because contracts are legally binding, there is more accountability for delivering the work as stated in the contract.

Organizations must also consider reasons they might *not* want to outsource. When an organization outsources work, it often does not have as much control over the aspects of projects that suppliers carry out. In addition, an organization could become too dependent on particular suppliers. If those suppliers went out of business or lost key personnel, it could cause great damage to a project. Organizations must also be careful to protect strategic information that could become vulnerable in the hands of suppliers. According to Scott McNealy, co-founder and former CEO of Sun Microsystems, Inc., “What you want to handle in-house is the stuff that gives you an edge over your competition—your core competencies. I call it your ‘secret sauce.’ If you’re on Wall Street and you have your own program for tracking and analyzing the market, you’ll hang onto that. At Sun, we have a complex program for testing micro-processor designs, and we’ll keep it.”⁶ Project teams must think carefully about procurement issues and make wise decisions based on the unique needs of their projects and organizations. They must also be aware of political issues, as described in the following example.



WHAT WENT WRONG?

In 2011, New York City’s mayor, Michael Bloomberg, acknowledged that City Hall had mismanaged its major IT projects and vowed to improve their oversight. He even said that city administrators would not oppose legislation requiring them to alert the City Council when projects ran into serious problems. These statements were made at a Council hearing called in response to reports of troubled technology projects. For example, prosecutors said the \$700 million price tag for the CityTime payroll system was inflated by fraud, and the mayor demanded \$600 million back from the main contractor. The automated personnel system, NYCAPS, suffered significant delays and cost overruns due to leadership issues, increasing from an original estimate of \$66 million to over \$363 million.

(continued)

Caswell F. Holloway, the deputy mayor for operations, testified at the hearing that the administration had begun an overhaul of how it manages complex technology projects. He said it would seek more use of off-the-shelf software and avoid paying consultants by the hour when it could specify completion of key deliverables for payment. He also said the city would stop letting individual agencies negotiate their own contracts and bring in the city's Law Department and the Mayor's Office of Contract Services to negotiate IT contracts worth more than \$5 million.

"Other speakers at the hearing said that much of what Mr. Holloway was promising to do was already written into city policy, to little effect. Henry Garrido, research director for District Council 37, the municipal workers' union, said a standard clause in the city's IT contracts allowed the city to sue contractors for damages. 'But the city doesn't exercise it,' he said."⁷

Outsourcing can also cause problems in other areas for companies and nations as a whole. For example, in 2004 many people in Australia were concerned about outsourcing software development. "The Australian Computer Society says sending work offshore may lower the number of students entering IT courses, deplete the number of skilled IT professionals, and diminish the nation's strategic technology capability. Another issue is security, which encompasses the protection of intellectual property, integrity of data, and the reliability of infrastructure in offshore locations."⁸ A 2018 article stated that the job market for IT workers in Australia did improve as several companies brought jobs back to the country. "We start 2018 off the back of a strong, stable run of jobs growth where the labour market grew by over 383,000 positions in the past 12 months," said Nick Deligiannis, Managing Director of Hays in Australia and New Zealand. "Basically, more people are looking for and finding work."⁹

The success of many IT projects that use outside resources is often due to good project procurement management. **Project procurement management** includes the processes required to acquire goods and services for a project from outside the performing organization. Organizations can be either the buyer or the seller of products or services under a contract or other agreement.

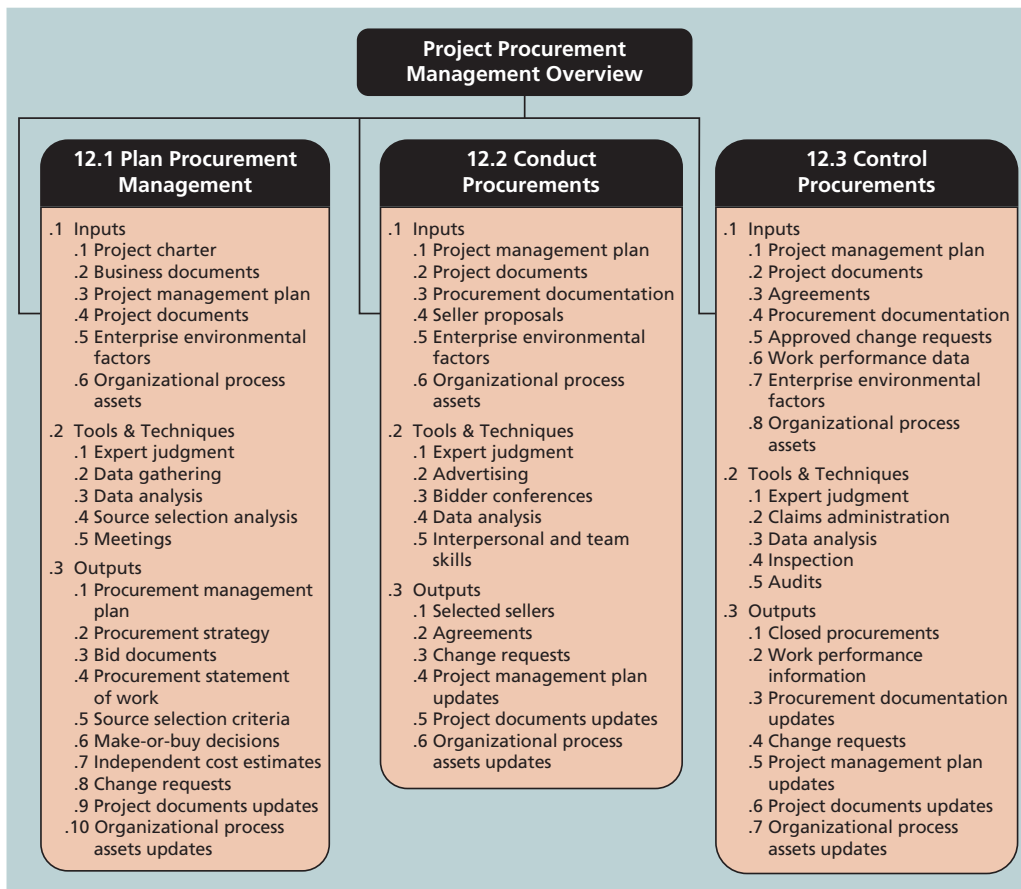
There are three main processes in project procurement management:

1. *Planning procurement management* involves determining what to procure and when and how to do it. In procurement planning, one must decide what to outsource, determine the type of contract, and describe the work for potential sellers. **Sellers** are providers, contractors, or suppliers who provide goods and services to other organizations. Outputs of this process include a procurement management plan, procurement strategy, bid documents, procurement statement of work, source selection criteria, make-or-buy decisions, independent cost estimates, change request, project documents updates, and organizational process assets updates.
2. *Conducting procurements* involves obtaining seller responses, selecting sellers, and awarding contracts. Outputs include selected sellers, agreements,

change requests, and updates to the project management plan, project documents, and organizational process assets.

3. *Controlling procurements* involves managing relationships with sellers, monitoring contract performance, making changes as appropriate, and closing out contracts. The main outputs of this process include closed procurements, work performance information, procurement documentation updates, change requests, project management plan updates, project documents updates, and organizational process assets.

Figure 12-1 summarizes the inputs, tools and techniques, and outputs of project procurement management.



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FIGURE 12-1 Project procurement management overview

PLANNING PROCUREMENT MANAGEMENT

Planning procurements involves identifying which project needs can best be met by using products or services outside the organization. It involves deciding whether to procure, how to procure, what to procure, how much to procure, and when to procure. An important output of this process is the **make-or-buy decision**, in which an organization decides whether it should make certain products and perform certain services inside the organization, or if it is better to buy those products and services from an outside organization. If there is no need to buy products or services from outside the organization, then further procurement management is not needed.

Inputs needed for planning procurements include the project charter, business documents, the project management plan, project documents enterprise environmental factors, and organizational process assets, such as types of contracts.

Types of Contracts

Contract type is an important consideration in procurement management. Different types of contracts can be used in different situations. Three broad categories of contracts are fixed price or lump sum, cost reimbursable, and time and material. A single contract can actually include all three of these categories if it makes sense for a particular procurement. For example, you could have a contract with a seller that includes purchasing specific hardware for a fixed price or lump sum, some services that are provided on a cost-reimbursable basis, and other services that are provided on a time-and-material basis. Project managers and their teams must understand and decide which approaches to use to meet their project needs. It is also important to understand when and how to take advantage of unit pricing in contracts.

Fixed-price or lump-sum contracts involve a fixed total price for a well-defined product or service. The buyer incurs little risk in this situation because the price is predetermined. The sellers often pad their estimate to reduce their risk, although they realize their price must still be competitive. For example, a company could award a fixed-price contract to purchase 100 laser printers with a certain print resolution and print speed to be delivered to one location within two months. In this example, the product and delivery date are well defined. Several sellers could create fixed-price estimates for completing the job. Fixed-price contracts may also include incentives for meeting or exceeding selected project objectives. For example, the contract could include an incentive fee paid if the laser printers are delivered within one month. A firm-fixed-price (FFP) contract has the least amount of risk for the buyer, followed by a fixed-price incentive fee (FPIF) contract. A fixed-price with economic price adjustment contract (FP-EPA) includes a special provision for predefined final adjustments to the contract price due to changes in conditions such as inflation or the cost of specific commodities. An FP-EPA contract is intended to protect both the buyer and seller from external conditions beyond their control.

Contracts can also include incentives to prevent or reduce cost overruns. For example, according to the U.S. Federal Acquisition Regulation (FAR) 16.4, fixed-price incentive fee contracts can include a **Point of Total Assumption (PTA)**, which is the cost at which the contractor assumes total responsibility for each additional dollar of contract cost.

Contractors do not want to reach the PTA because it hurts them financially, so they have an incentive to prevent cost overruns. The PTA is calculated with the following formula:

$$\text{PTA} = (\text{ceiling price} - \text{target price}) / \text{government share} + \text{target cost}$$

For example, given the following information, and assuming that all dollar amounts are in thousands, the PTA will be \$1.2 million:

Ceiling price = \$1,250

Target price = \$1,100

Target cost = \$1,000

Government share: 75 percent

$$\text{PTA} = (\$1,250 - \$1,100) / .75 + \$1,000 = \$1,200^{10}$$

Contracts for the U.S. federal government can be very complex. Consult FAR 16.4 and similar references for more details.

Cost-reimbursable contracts involve payment to the supplier for direct and indirect actual costs. Recall from Chapter 7 that direct costs can be directly related to producing a project's products and services. Normally, these costs can be traced back to a project in a cost-effective way. Indirect costs are not directly related to the products or services of the project, but they are indirectly related to performing the project. Normally, these costs cannot be traced back to the project in a cost-effective way. For example, direct costs include the salaries for people working directly on a project and hardware or software purchased for a specific project. Indirect costs include the cost of providing a work space with electricity and an employee cafeteria. Indirect costs are often calculated as a percentage of direct costs. Cost-reimbursable contracts often include fees, such as a profit percentage or incentives for meeting or exceeding selected project objectives. These contracts are often used for projects that include providing goods and services that involve new technologies. The buyer absorbs more of the risk with cost-reimbursable contracts than with fixed-price contracts. Three types of cost-reimbursable contracts, in order of lowest to highest risk to the buyer, include cost plus incentive fee, cost plus fixed fee, and cost plus percentage of costs.

- With a **cost plus incentive fee (CPIF) contract**, the buyer pays the supplier for allowable costs (as defined in the contract) along with a predetermined fee and an incentive bonus. See the Media Snapshot for an example of providing financial incentives to complete an important construction project ahead of schedule. Also, incentives are often provided to suppliers for reducing contract costs. If the final cost is less than the expected cost, both the buyer and the supplier benefit from the cost savings, according to a negotiated share formula. For example, suppose that the expected cost of a project is \$100,000, the fee to the supplier is \$10,000, and the share formula is 85/15, meaning that the buyer absorbs 85 percent of the uncertainty and the supplier absorbs 15 percent. If the final cost is \$80,000, the cost savings are \$20,000. The supplier would be paid the final cost and the fee plus an incentive of \$3,000 (15 percent of \$20,000), for a total reimbursement of \$93,000.
- With a **cost plus fixed fee (CPFF) contract**, the buyer pays the supplier for allowable costs (as defined in the contract) plus a fixed fee payment that



MEDIA SNAPSHOT

Contract incentives can be extremely effective. On August 1, 2007, tragedy struck Minneapolis, Minnesota, when an Interstate bridge over the Mississippi River suddenly collapsed, killing 13 motorists and injuring 150 people. The Minnesota Department of Transportation (MnDOT) acted quickly to find a contractor to rebuild the bridge. MnDOT also provided a strong incentive to finish the bridge as quickly as possible, ensuring quality and safety along the way.

Peter Sanderson, project manager for the joint venture of Flatiron-Manson, led his team in completing the rebuilding project three months ahead of schedule, and the new bridge opened on September 18, 2008. The contractors earned \$25 million in incentive fees on top of their \$234 million contract for completing the bridge ahead of schedule.

Why did MnDOT offer such a large incentive fee for finishing the project early? “I-35W in Minneapolis is a major transportation artery for the Twin Cities and entire state. Each day this bridge has been closed, it has cost road users more than \$400,000,” MnDOT Commissioner Tom Sorel remarked. “Area residents, business owners, motorists, workers and others have been affected by this corridor’s closure. The opening of this bridge reconnects our community.”¹¹

is usually based on a percentage of estimated costs. This fee does not vary, however, unless the scope of the contract changes. For example, suppose that the expected cost of a project is \$100,000 and the fixed fee is \$10,000. If the actual cost of the contract rises to \$120,000 and the scope of the contract remains the same, the contractor will still receive the fee of \$10,000.

- With a **cost plus award fee (CPAF) contract**, the buyer pays the supplier for allowable costs (as defined in the contract) plus an award fee based on the satisfaction of subjective performance criteria. A tip or gratuity that you would give a server in a restaurant would qualify as a simple example, as long as there is no set gratuity percentage. You still pay for the cost of your meal, but you can decide on the tip amount based on your satisfaction with the food, drinks, and service provided. This type of contract is not usually subject to appeals.
- With a **cost plus percentage of costs (CPPC) contract**, the buyer pays the supplier for allowable costs (as defined in the contract) along with a predetermined percentage based on total costs. From the buyer’s perspective, this is the least desirable type of contract because the supplier has no incentive to decrease costs. In fact, the supplier may be motivated to increase costs, because doing so will automatically increase profits based on the percentage of costs. This type of contract is prohibited for U.S. government use, but it is sometimes used in private industry, particularly in the construction industry. All of the risk is borne by the buyer.

Time and material (T&M) contracts are a hybrid of fixed-price and cost-reimbursable contracts. For example, an independent computer consultant might have a contract with a company based on a fee of \$80 per hour for services, plus a fixed price of \$10,000 for providing specific project materials. The materials fee might also be based on approved receipts for purchasing items, with a ceiling of \$10,000. The consultant would send an invoice to the company each week or month; the invoice would list the materials fee, the number of hours worked, and a description of the work produced. This type of contract is often used for required services when the work cannot be specified clearly and total costs cannot be estimated in a contract. Many contract programmers and consultants, such as those Marie's company hired in the chapter's opening case, prefer time and material contracts.

Unit pricing can also be used in various types of contracts to require the buyer to pay the supplier a predetermined amount per unit of product or service. The total value of the contract is a function of the quantities needed to complete the work. Consider an IT department that might have a unit price contract for purchasing computer hardware. If the company purchases only one unit, the cost might be \$1,000. If the company purchases 10 units, the cost might be \$10,000. This type of pricing often involves volume discounts. For example, if the company purchases between 10 and 50 units, the contracted cost might be \$900 per unit. If the company purchases more than 50 units, the cost might go down to \$800 per unit. This flexible pricing strategy is often advantageous to both the buyer and the seller.

Any type of contract should include specific clauses that account for unique project issues. For example, if a company uses a time and material contract for consulting services, the contract should stipulate different hourly rates based on the level of experience of the individual contractors. The services of a junior programmer with no Bachelor's degree and less than three years' experience might be billed at \$40 per hour, whereas the services of a senior programmer with a Bachelor's degree and more than 10 years of experience might be billed at \$80 per hour.

Figure 12-2 summarizes the spectrum of risk to the buyer and the supplier for different types of contracts. Buyers have the least risk with firm-fixed-price contracts, because they know exactly what they must pay the supplier. Buyers have the most risk with cost plus percentage of costs (CPPC) contracts because they do not know the supplier's costs in advance, and the suppliers may be motivated to keep increasing costs. From the supplier's perspective, a CPPC contract carries the least risk and a firm-fixed-price contract carries the most risk.

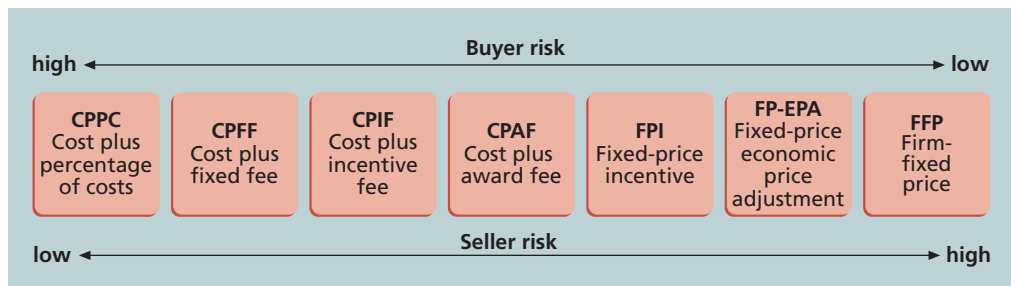


FIGURE 12-2 Contract types versus risk

Time and material contracts and unit-price contracts can be high or low risk, depending on the nature of the project and other contract clauses. For example, if an organization is unclear in describing the work that needs to be done, it cannot expect a supplier to sign a firm-fixed-price contract. However, the buyer could find a consultant or group of consultants to work on specific tasks based on a predetermined hourly rate. The buying organization could evaluate the work produced each day or week to decide if it wants to continue using the consultants. In this case, the contract would include a **termination clause**—a contract clause that allows the buyer or supplier to end the contract. Some termination clauses state that the buyer can terminate a contract for any reason and give the supplier only 24 hours' notice. Suppliers, by contrast, must often give a one-week notice to terminate a contract and must have sufficient reasons for the termination. The buyer could also include a contract clause that specifies hourly rates based on the education and experience of consultants. These contract clauses reduce the risk incurred by the buyer while providing flexibility for accomplishing the work.

It is important to understand why a company would want to procure goods or services and what inputs are needed to plan purchases and acquisitions. In the opening case, Marie's company hired outside consultants to help complete an operating system conversion project because it needed people with specialized skills for a short period of time. This is a common occurrence in many IT projects. It can be more effective to hire skilled consultants to perform specific tasks for a short period of time than to hire or keep employees on staff full time.

However, it is also important to define clearly the scope of the project, the products, services, or results required, market conditions, and constraints and assumptions. In Marie's case, the scope of the project and services required were relatively clear, but her company may not have adequately defined the market conditions or constraints and assumptions involved in using outside consultants. Could other companies provide consultants to help with similar conversion projects? Did the project team investigate the background of the company that provided the consultants? Did the team list important constraints and assumptions for using the consultants, such as limiting the time that the consultants had to complete the conversion project or the minimum years of experience for any consultant assigned to the project? It is important to answer these types of questions before signing an outsourcing agreement.

Tools and Techniques for Planning Procurement Management

Several tools and techniques are available to help project managers and their teams in planning procurement management, including make-or-buy analysis (a type of data gathering), expert judgment, and market research (a type of data gathering).

Make-or-Buy Analysis

Make-or-buy analysis is a general management technique used to determine whether an organization should make a product or perform a service inside the organization or buy it from someone else. This form of analysis involves estimating the internal costs of providing a product or service and comparing the estimate to the cost of outsourcing. Consider a company that has 1,000 international salespeople with laptops. Using make-or-buy

analysis, the company could compare the cost of providing those services using internal resources to the cost of buying the same services from an outside source. If supplier quotes were less than the company's internal estimates, the company would have to consider outsourcing the training and user support services. Another common make-or-buy decision, though more complex, is whether a company should develop an application itself or purchase software from an outside source and customize it to the company's needs.

Many organizations also use make-or-buy analysis to decide whether to purchase or lease items for a project. For example, suppose that a project requires a piece of equipment that has a purchase price of \$12,000 and daily operating costs of \$400. Suppose that you could lease the same piece of equipment for \$800 per day, including the operating costs. You can set up an equation so that you can see when the purchase cost equals the lease cost and determine when it makes sense financially to lease or buy the equipment. In this example, d is the number of days you need the piece of equipment. The equation would be

$$\$800/\text{day} = \$12,000 + \$400/\text{day}$$

Subtracting \$400/day from both sides, you get

$$\$400/\text{day} = \$12,000$$

Dividing both sides by \$400, you get

$$d = 30$$

In other words, the purchase cost would equal the lease cost in 30 days. So, if you need the equipment for less than 30 days, leasing would be more economical. If you need the equipment for more than 30 days, you should purchase it. In general, leasing is often cheaper for meeting short-term needs, but more expensive for long-term needs.

Expert Judgment

Experts both from inside and outside an organization can provide excellent advice in planning purchases and acquisitions. Project teams often need to consult experts within their organization as part of good business practice. Internal experts might suggest that the company in the preceding example could not provide training and support for the 1,000 laptop users because the service involves so many people with different skill levels in so many different locations. Experts in the company might also know that most of their competitors outsource this type of work and know who the qualified outside suppliers are. It is also important to consult legal experts because contracts for outsourced work are legal agreements.

Experts outside the company, including potential suppliers themselves, can also provide expert judgment. For example, suppliers might suggest an option for salespeople to purchase the laptops themselves at a reduced cost. This option would solve problems that would otherwise be created during employee turnover—exiting employees would own their laptops and new employees would purchase a laptop through the program. An internal expert might then suggest that employees receive a technology bonus to help offset what they might view as an added expense. Expert judgment, both internal and external, is an asset in making many procurement decisions.

Market Research

Market research is very important in planning procurements. Many potential suppliers are often available for goods and services, so the project team must choose suppliers carefully. Some organizations have a preferred vendor list and detailed information about them. A wealth of information is also available online, and numerous conferences are held where attendees can see and discuss new products.

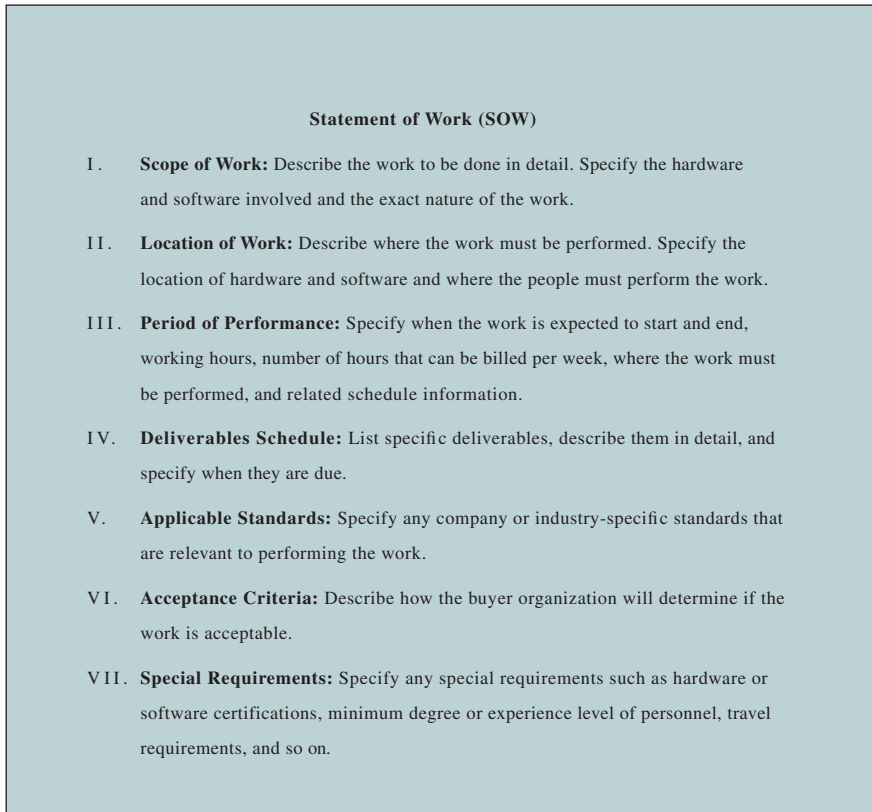
Procurement Management Plan

As you have learned, every project management knowledge area includes some planning. The procurement management plan is a document that describes how the procurement processes will be managed, from developing documentation for making outside purchases or acquisitions to contract closure. Like other project plans, contents of the procurement management plan will vary with project needs. The following materials can be included in a procurement management plan:

- Guidelines for types of contracts to be used in different situations
- Standard procurement documents or templates to be used, if applicable
- Guidelines for creating contract work breakdown structures, statements of work, and other procurement documents
- Roles and responsibilities of the project team and related departments, such as the purchasing or legal department
- Guidelines for using independent estimates to evaluate sellers
- Suggestions for managing multiple providers
- Processes for coordinating procurement decisions with other project areas, such as scheduling and performance reporting
- Constraints and assumptions related to purchases and acquisitions
- Lead times for purchases and acquisitions
- Risk mitigation strategies for purchases and acquisitions, such as insurance contracts and bonds
- Guidelines for identifying prequalified sellers and organizational lists of preferred sellers
- Procurement metrics to assist in evaluating sellers and managing contracts

Statement of Work

The **statement of work (SOW)** is a description of the work required for the procurement. Some organizations use the term *statement of work* for a document that describes internal work as well. If a SOW is used to describe only the work required for a particular contract, it is called a *contract statement of work*. The contract SOW is a type of scope statement that describes the work in sufficient detail to allow prospective suppliers to determine if they can provide the required goods and services and to determine an appropriate price. A contract SOW should be clear, concise, and as complete as possible. It should describe all services required and include performance reporting. It is important to use appropriate wording in a contract SOW, such as *must* instead of *may*. For example, *must* means that something has to be done; *may* implies that a choice is involved in doing something or not. The contract SOW should specify the products and services required for the project, use industry terms, and refer to industry standards.

A light blue rectangular box containing a template for a Statement of Work (SOW). The title 'Statement of Work (SOW)' is centered at the top. Below it is a numbered list from I to VII, each with a bolded title and a descriptive sentence. I. **Scope of Work:** Describe the work to be done in detail. Specify the hardware and software involved and the exact nature of the work. II. **Location of Work:** Describe where the work must be performed. Specify the location of hardware and software and where the people must perform the work. III. **Period of Performance:** Specify when the work is expected to start and end, working hours, number of hours that can be billed per week, where the work must be performed, and related schedule information. IV. **Deliverables Schedule:** List specific deliverables, describe them in detail, and specify when they are due. V. **Applicable Standards:** Specify any company or industry-specific standards that are relevant to performing the work. VI. **Acceptance Criteria:** Describe how the buyer organization will determine if the work is acceptable. VII. **Special Requirements:** Specify any special requirements such as hardware or software certifications, minimum degree or experience level of personnel, travel requirements, and so on.

Statement of Work (SOW)

I. **Scope of Work:** Describe the work to be done in detail. Specify the hardware and software involved and the exact nature of the work.

II. **Location of Work:** Describe where the work must be performed. Specify the location of hardware and software and where the people must perform the work.

III. **Period of Performance:** Specify when the work is expected to start and end, working hours, number of hours that can be billed per week, where the work must be performed, and related schedule information.

IV. **Deliverables Schedule:** List specific deliverables, describe them in detail, and specify when they are due.

V. **Applicable Standards:** Specify any company or industry-specific standards that are relevant to performing the work.

VI. **Acceptance Criteria:** Describe how the buyer organization will determine if the work is acceptable.

VII. **Special Requirements:** Specify any special requirements such as hardware or software certifications, minimum degree or experience level of personnel, travel requirements, and so on.

FIGURE 12-3 Statement of work (SOW) template

Many organizations use samples and templates to generate SOWs. Figure 12-3 provides a basic outline or template for a contract SOW that Marie's organization could use when hiring outside consultants or purchasing other goods or services. For example, for the operating system conversion project, Marie's company should specify the manufacturer and model number for the hardware involved, the former operating systems and new ones for the conversion, and the number of pieces of each type of hardware involved. The contract SOW should also specify the location of the work, the expected period of performance, specific deliverables and when they are due, applicable standards, acceptance criteria, and special requirements. A good contract SOW gives bidders a better understanding of the buyer's expectations. A contract SOW should become part of the official contract to ensure that the buyer gets what the supplier bid on.

Procurement or Bid Documents

Planning procurements also involves preparing the documents needed for potential sellers to bid on a project and determining the evaluation criteria for the contract award. The project team often uses standard forms and expert judgment as tools to help create relevant procurement documents and evaluation criteria.

Three common examples of procurement documents include a Request for Proposal (RFP), a Request for Quote (RFQ), and a Request for Information (RFI). A **Request for Proposal (RFP)** is a document used to solicit proposals from prospective suppliers. A **proposal** is a document prepared by a seller when there are different approaches for meeting buyer needs. For example, if an organization wants to automate its work practices or solve a business problem, it can write and issue an RFP so suppliers can respond with proposals. Suppliers might propose various hardware, software, and networking solutions to meet the organization's need. Selections of winning sellers are often made on a variety of criteria, not just the lowest price. Developing an RFP is often a time-consuming process. Organizations must plan properly to ensure that they adequately describe what they want to procure, what they want sellers to include in their proposals, and how they will evaluate proposals.

Although RFPs have been used for many years, outsourcing experts say the process is becoming less appealing in several IT procurement processes. "In today's dynamic era of technology change, the traditional RFP simply takes too long and costs too much. By the time the proposals come in, the business requirements have often changed."¹² Enterprise marketplaces, such as app stores that provide a collection of software and services for sale (i.e., Google Play, App Store, and IBM Cloud Marketplace) and other new purchasing processes will emerge as companies collaborate with service providers to figure out better IT solutions.

A **Request for Quote (RFQ)** is a document used to solicit quotes or bids from prospective suppliers. A **bid**, also called a *tender* or *quote* (short for *quotation*), is a document prepared by sellers to provide pricing for standard items that the buyer has clearly defined. Organizations often use an RFQ for solicitations that involve specific items. For example, if a company wanted to purchase 100 personal computers with specific features, it might issue an RFQ to potential suppliers. RFQs usually do not take nearly as long to prepare as RFPs, nor do responses to RFQs. Selections are often based on the lowest bid. A Request for Information (RFI) is sometimes used before issuing an RFP or RFQ to get more information on the goods and services to be acquired.

Writing a good RFP is a critical part of project procurement management, but many people have never had to write or respond to one. To generate a good RFP, expertise is invaluable. Many examples of RFPs are available within different companies, from potential contractors, and from government agencies. Legal requirements are often involved in issuing RFPs and reviewing proposals, especially for government projects. It is important to consult with experts who know the contract planning process for particular organizations. To make sure that an RFP has enough information to provide the basis for a good proposal, the buying organization should try to put itself in the suppliers' shoes. Could the organization develop a good proposal based on the information it provided in the RFP? Could it determine detailed pricing and schedule information based on the RFP? Developing a good RFP is difficult, as is writing a good proposal.

The main sections of an RFP usually include its statement of purpose, background information on the organization issuing the RFP, the basic requirements for the products and services being proposed, the hardware and software environment (which is usually important for IT-related proposals), a description of the RFP process, the statement of work and schedule information, and possible appendices. A simple RFP might be three to five pages long, but an RFP for a larger, more complicated procurement might take hundreds of pages.

Other terms used for RFQs and RFPs include *invitations for bid*, *invitations for negotiation*, and *initial contractor responses*. Regardless of what they are called, all procurement documents should be written to facilitate accurate and complete responses from prospective sellers. Procurement documents should include background information on the organization and project, a relevant statement of work, a schedule, a description of the desired form of response, evaluation criteria, pricing forms, and any required contractual provisions. The documents should also be rigorous enough to ensure consistent, comparable responses, but flexible enough to allow consideration of sellers' suggestions for better ways to satisfy the requirements.

Examples from a Real RFP

Government agencies are often required to make procurement information open to the public. For example, Houston First Corporation provides access to several documents from www.houstonfirst.com/do-business/. One of these documents is an RFP issued in October, 2017 for project management services to assist the organization in overseeing rebuilding after flooding from Hurricane Harvey. The initial RFP was nine pages long. A few excerpts are provided in Table 12-1. Notice the detailed list of tasks in the section called "Scope of Services." Also notice the detailed instructions in the section called "Proposal Format." This RFP included the evaluation criteria, as discussed in more detail in the next section.

Even though the RFP in Table 12-1 seems pretty detailed, there were several questions submitted from potential proposers. As a result, HFC issued three letters of clarification. Table 12-2 lists a few items from these letters. Notice that the first item asks for hourly rates instead of a lump-sum fee as initially requested. Proposers must have questioned the appropriateness of a lump-sum or fixed-price contract for this type of work. HFC responded by asking for rates and mentioning a "not-to-exceed amount" for the eight-month contract. There is also a new section describing a pre-proposal conference, which the initial RFP said would not be held. Again, potential proposers must have asked for this conference to help clarify the procurement. Also notice the straightforward questions that were asked. As you can see, it's very important for buyers to clarify what they want so that sellers can respond appropriately.

TABLE 12-1 Example RFP for project management services

<p>I. Purpose of RFP: Houston First Corporation ("HFC") requests proposals from experienced project management firms with the ability to assist HFC in the oversight of recovery and reconstruction projects at Wortham Theater Center and the Theater District Underground Parking Garages in downtown Houston, Texas. . . . The rough order of magnitude for the reconstruction phase, including ongoing emergency services underway as of October 5, 2017, is estimated at 40–45 million dollars. Potential proposers are advised that the contract resulting from the RFP will be a professional services contract. This RFP is not for construction work.</p> <p>II. Scope of Services: As the emergency remediation phase draws to a close, HFC seeks to engage a project management firm to provide comprehensive coordination and support services throughout the reconstruction phase, including the following tasks:</p>
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(continued)

TABLE 12-1 Example RFP for project management services (*continued*)

- a. Cost-estimating individual projects and advising HFC on matters pertaining to the overall project budget;
- b. Regular meetings with HFC, City of Houston officials, and their contractors;
- c. Assisting HFC in the preparation of contract documents, including review of drawings and specifications;
- d. Reviewing questions received from potential contractors during the bidding process;
- e. Providing recommendations on construction feasibility, availability of materials and labor, time requirements for installation and construction, and factors related to cost;
- f. Overall project management, including facilitating all phases of projects concurrently, from predesign through construction completion;
- g. Project schedule development, including adjustments based on the progress of work and specific recommendations for prioritizing and accelerating critical path items;
- h. Identification of long-lead items to facilitate the earliest feasible date for project completion;
- i. Value engineering assistance and best construction practices recommendations;
- j. Project worksheet and other pertinent report preparation, review, content recommendations, and hazard mitigation proposals required for reimbursement by FEMA and any other applicable agency;
- k. Collecting and organizing contracts, reports, logs, and other supporting documentation necessary for project worksheets;
- l. Managing third-party architectural and engineering contracts entered into by HFC and meeting with design professionals;
- m. Reviewing, reconciling and validating payment applications and invoices from third-party construction contractors, architects and engineers;
- n. Ensuring compliance with prevailing wage and hour requirements;
- o. Close-out document review, including punch-list documentation; and
- p. Other tasks and matters reasonably relating to the foregoing.

III. Term/Schedule Information: The duration of services to be performed by the proposer selected is eight calendar months, subject to extension under the Project Management Services Agreement.

IV. Proposal Format: Proposers are asked to include all of the following information in their proposal:

- a. Transmittal Letter: Briefly summarizing the proposer's understanding of the work to be completed signed by a person authorized to make representations on behalf of the firm, including a direct phone number and email address. Proposers must make a specific, unambiguous statement accepting and agreeing to comply, if selected, with the Material Contract Terms and Conditions. Proposers may identify any objections within or immediately following the letter; provided, however, that proposals including material exceptions are deemed non-responsive and will be rejected without consideration.

(*continued*)

TABLE 12-1 Example RFP for project management services (*continued*)

- b. **Project Team:** A seasoned project management team is an essential element of a successful proposal. Please identify the essential personnel who would be assigned to work with HFC and provide a summary of their qualifications and experience.
- c. **Experience:** The proposer selected must have substantial experience in disaster-recovery projects and demonstrable ability to manage a broad multi-disciplinary construction and professional services contracts simultaneously. Please discuss (no more than) three completed project management contracts completed by members of the Project Team that are comparable, in scope and complexity, to the requirements of this solicitation. Provide references for each project.
- d. **Pricing:** Proposers must include a single lump-sum fee based on the information provided in the RFP, including the Material Contract Terms and Conditions and assuming an eight-month term. Additionally, proposers must provide a written and formulaic explanation of how the proposer calculated the lump-sum fee.
- e. **Diversity Commitment:** Proposers should indicate how they intend to meet the 30 percent Diversity Goal for this solicitation. Proposers are asked to identify any probable MWBE and HUB subcontractors or consultants.
Proposals should be organized, clear and concise. Proposers are asked to avoid excessive graphics, title pages, or other information other than requested in this Proposal Format section.

V. Evaluation: HFC will review and rank every proposal received in response to this RFP based on the following weighted criteria: Transmittal Letter (15 percent); Project Team (25 percent); Experience (25 percent); Pricing (25 percent); and Diversity (10 percent).

HFC reserves the right to select or reject all or part of any proposal, waive minor technicalities, and select proposals in the manner and to the extent that they serve the best interests of HFC. This RFP does not commit HFC to award a contract, issue a purchase order, or to pay any costs incurred in the preparation of a proposal in response to this RFP. HFC reserves the right to request oral interviews, proposal clarifications/additional information, and/or best-and-final offers from some or all proposers prior to making a final selection.

Source: Houston First Corporation (2017).

TABLE 12-2 Letters of clarification information from RFP

Proposal Format: Subsection “d” of the “Proposal Format” section of the RFP, titled “Pricing” is hereby deleted in its entirety and replaced with the following provision:

- Proposers must provide a current hourly rate service schedule for their project team, including all personnel expected to provide services for HFC.
- Salaries and other employment costs of the project manager’s personnel, overhead, other general/administrative costs, and the cost of insurance required to be maintained must be included in such rates.
- The proposer selected will be reimbursed for the actual amount of reasonable expenses incurred in the performance of contractual services for HFC to the extent such expenses are approved in advance and in writing by HFC.

(*continued*)

TABLE 12-2 Letters of clarification information from RFP (*continued*)

- Subcontracts for estimators, schedulers, payment-application reviewers, document controllers and, subject to mutual agreement, other project consultants also constitute at-cost reimbursable expenses, provided that the selection process is approved in advance by HFC.
- HFC intends to negotiate a not-to-exceed amount with the top-ranked proposer(s) for the eight-month period based on the foregoing. The finalist representing the best value to HFC will be selected.

Pre-Proposal Conference: The “Pre-Proposal Conference” section of the RFP is hereby deleted in its entirety and replaced with the following provision:

- A tour of Wortham Theater Center and the Theater District Parking Garages will be held for the benefit of all prospective proposers at 9:00 a.m. on October 16, 2017.
- A pre-proposal conference will be held on October 16, 2017 at approximately 11:00 a.m. All potential proposers are urged to be present.

Project Questions and Answers

1. How many Project Team members does HFC expect proposers to provide?

Answer: HFC envisions a minimal, experienced Project Team equating to two full-time positions for the duration of the eight-month term.

2. Will HFC provide office space for the Project Team?

Answer: Office space will not be provided; HFC will, however, make meeting space at one or more of its operable facilities as needed. Note that jobsite trailers are not necessary to perform services under this RFP.

3. How many meetings are needed with HFC, City of Houston officials, and their contractors?

Answer: Regular, in-person meetings are an essential element of the project management services required by HFC. HFC anticipates 5–8 meetings per week.

4. Is the project manager expected to be on-site at all times while construction activities are ongoing?

Answer: No.

5. Does HFC require use of any specific project-management software programs?

Answer: No

Source Selection Criteria

It is very important for organizations to prepare some form of evaluation criteria for source selection, preferably before they issue a formal RFP. Organizations use criteria to rate or score proposals, and they often assign a weight to each criterion to indicate its importance. Some examples of criteria and weights include the technical approach (30 percent weight), management approach (30 percent weight), past performance (20 percent weight), and

price (20 percent weight). Notice the criteria provided in Table 12-1: Transmittal Letter (15 percent); Project Team (25 percent); Experience (25 percent); Pricing (25 percent); and Diversity (10 percent). The criteria should be specific and objective. For example, if the buyer wants the supplier's project manager to be a certified Project Management Professional (PMP®), the procurement documents should state that requirement clearly and follow it during the award process. Losing bidders may pursue legal recourse if the buyer does not follow a fair and consistent evaluation process.

Organizations should heed the saying, "Let the buyer beware." It is critical to evaluate proposals based on more than the professionalism of the paperwork submitted. A key factor in evaluating bids, particularly for projects involving IT, is the past performance record of the bidder. The RFP should require bidders to list other similar projects they have worked on and provide customer references for those projects. Reviewing performance records and references reduces the risk of selecting a supplier with a poor track record. Suppliers should also demonstrate their understanding of the buyer's need, their technical and financial capabilities, their management approach to the project, and their price for delivering the desired goods and services. It is also crucial to write the contract to protect the buyer's interests.

Some IT projects also require potential sellers to deliver a technical presentation as part of their proposal. The proposed project manager should lead the potential seller's presentation team. When the outside project manager leads the proposal presentation, the organization can build a relationship with the potential seller from the beginning. Visits to contractor sites can also help the buyer get a better feeling for the seller's capabilities and management style.

CONDUCTING PROCUREMENTS

After planning for procurement management, the next process involves deciding whom to ask to do the work, sending appropriate documentation to potential sellers, obtaining proposals or bids, selecting a seller, and awarding a contract. Prospective sellers do some of the work in this process, normally at no cost to the buyer or project. The buying organization is responsible for advertising the work, and for large procurements, the organization often holds some sort of bidders' conference to answer questions about the job. Two of the main outputs of this process are a selected seller and agreements.

Organizations can advertise to procure outside goods and services in many different ways. Sometimes a specific supplier might be the top choice for the buyer. In this case, the buyer gives procurement information just to that company. If the preferred supplier responds favorably, the organizations proceed to work together. Many organizations have formed good working relationships with certain suppliers.

In many cases, however, more than one supplier might be qualified to provide the goods and services. Providing information to multiple sources and receiving bids from them often takes advantage of the competitive business environment. Offshore outsourcing, as you learned earlier, has increased tremendously as organizations find suitable sellers around the globe. As a result of pursuing a competitive bidding strategy, the buyer can receive better goods and services than expected at a lower price.

A bidders' conference, also called a *supplier conference* or *pre-bid conference*, is a meeting with prospective sellers prior to preparation of their proposals or bids. These

conferences help ensure that everyone has a clear, common understanding of the buyer's desired products or services. In some cases, the bidders' conference might be held online via a webcast or using other communications technology. Buyers will also post procurement information on a website and post answers to frequently asked questions. Before, during, or after the bidders' conference, the buyer may incorporate responses to questions into the procurement documents as amendments. Notice that in the example in the previous section that the buyer added a pre-proposal conference and created several letters of clarification for this fairly small procurement.

Once buyers receive proposals or bids, they can select a supplier or decide to cancel the procurement. Selecting suppliers or sellers, often called *source selection*, involves evaluating proposals or bids from sellers, choosing the best one, negotiating the contract, and awarding the contract. It can be a long, tedious process, especially for large procurements. Several stakeholders in the procurement process should be involved in selecting the best supplier for the project. Often, teams of people are responsible for evaluating various sections of the proposals. There might be a technical team, a management team, and a cost team to focus on each major area. Buyers typically develop a short list of the top three to five suppliers to reduce the work involved in selecting a source.

Experts in source selection highly recommend that buyers use formal proposal evaluation sheets during source selection. Figure 12-4 provides a sample proposal evaluation sheet that the project team might use to help create a short list of the best three to five proposals. Notice that this example is a form of a weighted scoring model, as described in Chapter 4, Project Integration Management. To calculate the score for a criterion, multiply the weight of the criterion by the rating for the proposal. Add the scores to provide the total weighted score for each proposal. The proposals with the highest weighted scores should be included in the short list of possible sellers. Experts also recommend that technical criteria should not be given more weight than management or cost criteria. Many organizations have suffered the consequences of paying too much attention to the technical aspects of proposals. For example, the project might cost much more than expected or take longer to complete because the source selection team focused only on technical aspects of proposals. Paying too much attention to these technical aspects is especially likely to occur on IT projects. However, it is often the supplier's management team—not the technical team—that makes procurement successful.

		Proposal 1		Proposal 2		Proposal 3		Etc.	
Criteria	Weight	Rating	Score	Rating	Score	Rating	Score		
Technical approach	30%	90	27	80	24	70	21		
Management approach	30%	85	25.5	75	22.5	85	25.5		
Past performance	20%	95	19	70	14	75	15		
Price	20%	75	15	95	19	80	16		
Total score	100%		86.5		79.5		77.5		

FIGURE 12-4 Sample proposal evaluation sheet

After developing a short list of possible sellers, organizations often follow a more detailed proposal evaluation process. For example, they might list more detailed criteria for important categories, such as the management approach. They might assign points for the potential project manager's educational background and PMP® certification, the seller's formal presentation if it was part of the evaluation process, top management support for the project, and the organization's project management methodologies. If the criteria and evaluation are done well, the seller with the most points based on all of the criteria should be offered the contract.



ADVICE FOR YOUNG PROFESSIONALS

No matter how much money you have to spend, you should consider your criteria for selecting what you plan to purchase. Too many people make impulse purchases or don't take enough time to make important procurement decisions. For example, think about some major purchases you have made or will make soon—where to live, what car to drive, where to attend college, etc. Try creating an evaluation worksheet, focusing on the criteria and their weights, for a recent purchase. Does it seem like you made the right decision? Now think of a purchase you plan to make soon. Create an evaluation worksheet for that procurement, being careful to develop good criteria and weights.

It is customary to have contract negotiations during the source selection process. Sellers on the short list are often asked to prepare a best and final offer (BAFO). In addition, top managers from both the buying and selling organizations usually meet before making final decisions. The final output is a contract that obligates the seller to provide the specified products or services and obligates the buyer to pay for them. For some projects, it is also appropriate to prepare a contract management plan that describes how the contract will be managed.

CONTROLLING PROCUREMENTS

Controlling procurements ensures that the seller's performance meets contractual requirements. The contractual relationship is a legal relationship, which means it is subject to state and federal contract laws. It is very important that appropriate legal and contracting professionals be involved in writing and administering contracts.

Ideally, the project manager, a project team member, or an active user in the project should help write and administer the contract, so that everyone understands the importance of good procurement management. The project team should also seek expert advice when working with contractual issues. Project team members must be aware of potential legal problems they might cause by not understanding a contract. For example, most projects involve changes, and these changes must be handled properly for items under contract. Without understanding the provisions of the contract, a project manager may unknowingly authorize a contractor to do additional work at greater costs. Therefore, change control is an important part of the contract administration process.

It is critical that project managers and team members watch for constructive change orders. **Constructive change orders** are oral or written acts or omissions by someone with actual or apparent authority that can be construed to have the same effect as a written change order. For example, if a member of the buyer's project team has met with the contractor on a weekly basis for three months to provide guidelines for performing work, the team member can be viewed as an apparent authority. If the team member tells the contractor to redo part of a report that has already been delivered and accepted by the project manager, the action can be viewed as a constructive change order and the contractor can legally bill the buyer for the additional work. Likewise, if the apparent authority tells the contractor to skip parts of a critical review meeting in the interests of time, the omission of that information is not the contractor's fault.

It is important to follow other good practices related to project procurement:

- Changes to any part of the project need to be reviewed, approved, and documented by the same people in the same way they approved the original part of the plan.
- Evaluation of any change should include an impact analysis. How will the change affect the scope, time, cost, and quality of the goods or services being provided? There must also be a baseline to understand and analyze changes.
- Changes must be documented in writing. Project team members should document all important meetings and telephone calls.
- When procuring complex information systems, project managers and their teams must stay closely involved to make sure the new system will meet business needs and work in an operational environment. Do not assume that everything will go well because you hired a reputable supplier. The buying organization needs to provide expertise as well.
- Have backup plans in case the new system does not work as planned.
- Several tools and techniques can help in contract administration, such as a formal contract change control system, buyer-conducted procurement performance reviews, inspections and audits, performance reporting, payment systems, claims administration, and records management systems.

Controlling procurement also involves closing procurements, which is sometimes referred to as contract closure. Contract closure involves completion and settlement of contracts and resolution of any open items. The project team should determine if all work required in each contract was completed correctly and satisfactorily. The contract itself should include requirements for formal acceptance and closure. The team should also update records to reflect final results and archive information for future use.

Tools to assist in contract closure include procurement audits, negotiated settlements, and a records management system. Procurement audits are often done during contract closure to identify lessons learned in the entire procurement process. A records management system provides the ability to easily organize, find, and archive procurement-related

documents. It is often an automated system, or at least partially automated, because a large amount of information can be related to project procurement.



BEST PRACTICE

In today's fast-changing competitive environment, it isn't enough to follow traditional procurement best practices. Instead, find innovative ways to improve the procurement process. Mining completely different functional areas and technologies is a great way to discover ideas that can be used to improve procurement. "Supply market intelligence starts from procurement being intelligent about how business requirements can be matched intelligently to what supply markets can offer. So, the greater your diversity of knowledge of solutions from far flung areas, the better you'll be able to match supply [solutions] to demand [requirements]." The following examples illustrate some ideas of how to make procurement more intelligent:

- Data scientists build predictive models to analyze big data related to finance, marketing, etc. Why not model procurement processes?
- Behavioral economists know that people do not act rationally. Why not apply irrationality to your advantage in negotiations?
- Quality control/assurance departments encourage employees to suggest quality improvements all the time. Why not enable your workers to be on the lookout for additional new and innovative suppliers?
- Crowdsourcing solicits ideas from a large group of people. Can it apply to some of your organization's procurements?¹³

Ideally, all procurements should end in a negotiated settlement between the buyer and the seller. If negotiation is not possible, then some type of alternate dispute resolution such as mediation or arbitration can be used; if all else fails, litigation in courts can be used to settle contracts.

Archiving information for future use is particularly important. Organizations should strive to improve all of their business processes, including procurement management. Archiving information, particularly in an automated records management system, supports efforts to improve procurement management.

USING SOFTWARE TO ASSIST IN PROJECT PROCUREMENT MANAGEMENT

Over the years, organizations have used various types of productivity software to assist in project procurement management. For example, most organizations use word-processing software to write proposals or contracts, spreadsheet software to create proposal evaluation worksheets, databases to track suppliers, and presentation software to present procurement-related information.

Many companies are now using more advanced software to assist in procurement management. The term *e-procurement* often describes various procurement functions that are now done electronically, as follows:

- *Web-based ERP (Electronic Resource Planning)*: Creating and approving purchasing requisitions, placing purchase orders, and receiving goods and services by using a software system based on Internet technology.
- *E-MRO (Maintenance, Repair, and Overhaul)*: The same as web-based ERP, except that the goods and services ordered are MRO supplies that are not related to a particular product.
- *E-sourcing*: Identifying new suppliers for a specific category of purchasing requirements using Internet technology.
- *E-tendering*: Sending requests for information and prices to suppliers and receiving the responses of suppliers using Internet technology.
- *E-reverse auctioning*: Using Internet technology to buy goods and services from a number of known or unknown suppliers.
- *E-informing*: Gathering and distributing purchasing information with internal and external parties using Internet technology.
- *E-marketsites*: Expands on web-based ERP to open up value chains. Buying communities can access preferred suppliers' products and services, add to shopping carts, create requisitions, seek approval, receive purchase orders, and process electronic invoices with integration to suppliers' supply chains and buyers' financial systems.

Many websites and software tools can assist in procurement functions. For example, most business travelers use the web to purchase airline tickets and to reserve rental cars and hotel rooms for business trips. With the rise of applications for smartphones, shoppers can even take pictures of barcodes on all types of products and compare prices of competing stores to confirm that they are getting the best deal. Likewise, many organizations can purchase items online, or they can buy specialized software to help streamline their procurement activities.

One type of software that is particularly useful for streamlining procurement is the procure-to-pay suite, which provides support for indirect procurements. Unlike direct procurement, where procurement experts in organizations acquire raw materials and goods for production or services related to their organization's primary business, indirect procurement involves acquiring supplies and services required to keep the day-to-day business functioning, such as equipment repairs, office supplies, and services related to keeping business processes running. According to Gartner, the procurement process has evolved from paper-intensive order processing to a strategic enterprise function. Their qualitative analysis of the procure-to-pay suites market makes the point that because self-service software tools are available, employees at all levels of an organization can buy goods and services without the need for professional procurement expertise. This streamlines the process for indirect procurements, so that procurement experts can focus on the more strategic direct procurements. The four main capabilities of procure-to-pay suites for indirect procurements include the following:

- *E-purchasing functionality*: Provides a self-service solution to requisition and order goods and services through the use of catalogs, e-forms, or free-text orders (for when users cannot find items in a structured format).

- *Catalog management capabilities*: Includes catalog content upload, content update evaluation tools, and catalog search tools.
- *E-invoicing*: Enables the interchange and storage of legally valid invoices in electronic format.
- *Accounts Payable Invoice Automation (APIA)*: Allows approval and control of incoming invoices through either automatic or manual approvals by automatic workflows.

At current software suite prices, organizations with annual revenues of \$800 million or more usually realize a good return on investment from using these tools. Gartner's research identified Ariba (SAP), Coupa, Basware, and SciQuest as market leaders in 2015.¹⁴

Organizations can also take advantage of information available on the web, in industry publications, or in various discussion groups offering advice on selecting suppliers. For example, many organizations invest millions of dollars in enterprise project management software. Before deciding which seller's software to use, organizations use the Internet to find product information provided by various suppliers, prices, case studies, and current customers to assist in making procurement decisions. Buyers can also use the Internet to hold bidders' conferences, as you learned earlier in this chapter, or to communicate procurement-related information.

As with any information or software tool, organizations must focus on using the information and tools to meet project and organizational needs. Many nontechnical issues are often involved in getting the most value out of new technologies, especially new e-procurement software. For example, organizations must often develop partnerships and strategic alliances with other organizations to take advantage of potential cost savings. Organizations should practice good procurement management in selecting new software tools and managing relationships with the chosen suppliers.

CONSIDERATIONS FOR AGILE/ADAPTIVE ENVIRONMENTS

The *PMBOK® Guide – Sixth Edition* provides the following information for project procurement management:

In agile environments, specific sellers may be used to extend the team. This collaborative working relationship can lead to a shared risk procurement model where both the buyer and the seller share in the risk and rewards associated with a project.

Larger projects may use an adaptive approach for some deliverables and a more stable approach for other parts. In these cases, a governing agreement such as a master services agreement (MSA) may be used for the overall engagement, with the adaptive work being placed in an appendix or supplement. This allows changes to occur on the adaptive cope without impacting the overall contract.¹⁵

Recall that the Agile Manifesto values customer collaboration over contract negotiation, setting an important tone for procurement relationships on agile projects. The buyer and seller should work together to create the required products and services throughout the entire procurement process. Another goal of agile/adaptive environments is speed. Several procurements, however, take time. You cannot always find skilled personnel, office space, hardware, equipment, and other resources at the last minute. Some items take

weeks or even months to procure. It's important for project managers and senior managers to plan for those procurement needs in advance.

The processes of project procurement management follow a clear, logical sequence. However, many project managers are not familiar with the issues involved in purchasing goods and services from other organizations. If projects will benefit by procuring goods or services, then project managers and their teams must follow good project procurement management. As outsourcing for IT projects increases, it is important for all project managers to have a fundamental understanding of this knowledge area.

CASE WRAP-UP

After reading the contract for her company's consultants carefully, Marie McBride found a clause giving her company the right to terminate the contract with a one-week notice. She met with her project team to get suggestions. The team still needed help completing the system conversion project. One team member had a friend who worked for a competing consulting firm. The competing firm had experienced people available, and their fees were lower than those in the current contract. Marie asked this team member to help her research other consulting firms that could work on the conversion project. She then requested bids from these companies. She personally interviewed people from the top three suppliers' management teams and checked their references for similar projects.

Marie worked with the purchasing department to terminate the original contract and issue a new one with a new consulting firm that had a much better reputation and lower hourly rates. This time, she made certain the contract included a statement of work, specific deliverables, and requirements for the minimum experience level of consultants provided. The contract also included incentive fees for completing the conversion work within a certain time period. Marie had learned the importance of good project procurement management.

Chapter Summary

Procurement, purchasing, or outsourcing is the acquisition of goods and services from an outside source. IT outsourcing continues to grow, both within an organization's own country and offshore. Organizations outsource to reduce costs, focus on their core business, access skills and technologies, provide flexibility, and increase accountability. It is becoming increasingly important for IT professionals to understand project procurement management.

Project procurement management includes planning procurement management and then conducting and controlling procurements.

Planning procurement management involves deciding what to procure or outsource, what type of contract to use, and how to describe the effort in a statement of work. Make-or-buy analysis helps an organization determine whether it can procure a product or service at a reasonable cost. Project managers should consult with internal and external experts to assist them with procurement planning because many legal, organizational, and financial issues are often involved.

The basic types of contracts are fixed price, cost reimbursable, and time and material. Fixed-price contracts involve a fixed total price for a well-defined product and entail the least risk to buyers. Cost-reimbursable contracts involve payments to suppliers for direct and indirect actual costs and require buyers to absorb some of the risk. Time and material contracts are a hybrid of fixed-price and cost-reimbursable contracts, and are commonly used by consultants. Unit pricing involves paying suppliers a predetermined amount per unit of service and imposes different levels of risk on buyers, depending on how the contract is written. It is important to decide which contract type is most appropriate for a particular procurement. All contracts should include specific clauses that address unique aspects of a project and that describe termination requirements.

A statement of work (SOW) describes the work required for the procurement in enough detail to allow prospective suppliers to determine if they can provide the goods and services and to determine an appropriate price.

Conducting procurements involves obtaining seller responses, selecting sellers, and awarding contracts. Organizations should use a formal proposal evaluation form when evaluating suppliers. Technical criteria should not be given more weight than management or cost criteria during evaluation.

Controlling procurements involves managing relationships with sellers, monitoring contract performance, making changes as needed, and closing out contracts. The project manager and key team members should be involved in writing and administering the contract. Project managers must be aware of potential legal problems they might cause if they do not understand a contract. Project managers and teams should use change control procedures when working with outside contracts and should be especially careful about constructive change orders.

Several types of software can assist in project procurement management. E-procurement software helps organizations save money in procuring various goods and services. Organizations can also use the web, industry publications, and discussion groups to research and compare various suppliers.

Be sure to consider how project integration management can differ in agile/adaptive environments.

Discussion Questions

1. List five reasons why organizations outsource. When should an organization choose not to outsource? Why are some organizations moving their software development work back in-house? Why are some organizations beginning to use onshoring?
2. Explain the make-or-buy decision process and describe how to perform the financial calculations in the simple lease-or-buy example provided in this chapter.
3. What are the main types of contracts if you decide to outsource? What are the advantages and disadvantages of each?
4. Do you think many IT professionals have experience writing RFPs and evaluating proposals for IT projects? What skills would be useful for these tasks?
5. How do organizations decide whom to send RFPs or RFQs?
6. How can organizations use a weighted scoring model to evaluate proposals as part of seller selection?
7. List two suggestions for ensuring adequate change control on projects that involve outside contracts.
8. What is the main purpose of a procurement audit?
9. How can software assist in procuring goods and services? What is e-procurement software? Do you see any ethical issues with e-procurement? For example, should stores be able to block people with smartphones from taking pictures of barcodes to do comparison shopping?

Quick Quiz

1. What is the largest spending category for global outsourcing of IT services?
 - a. Communications services
 - b. Devices
 - c. Enterprise software
 - d. Data center systems
2. Your organization hired a specialist in a certain field to provide training for a short period of time. Which reason for outsourcing would this example fall under?
 - a. Reducing costs
 - b. Allowing the client organization to focus on its core business
 - c. Accessing skills and technologies
 - d. Providing flexibility
3. In which project procurement management process is an RFP often written?
 - a. Planning procurement management
 - b. Conducting procurements
 - c. Controlling procurements
 - d. Selecting sellers

4. An item you need for a project has a daily lease cost of \$200. If you decide to purchase the item, the investment cost is \$6,000 and the daily cost is \$100. After how many days will the lease cost be the same as the purchase cost?
 - a. 30
 - b. 40
 - c. 50
 - d. 60
5. Which type of contract has the least amount of risk for the buyer?
 - a. fixed-price
 - b. cost plus incentive fee (CPIF)
 - c. time and material
 - d. cost plus fixed fee (CPFF)
6. The _____ is the point at which the contractor assumes total responsibility for each additional dollar of contract cost.
 - a. breakeven point
 - b. Share Ratio Point
 - c. Point of Reconciliation
 - d. Point of Total Assumption
7. If your college or university wanted to get information from potential sellers for providing a new sports stadium, what type of document would be required of the potential sellers?
 - a. RFP
 - b. RFQ
 - c. Proposal
 - d. Quote
8. Buyers often prepare a _____ list when selecting a seller to make the process more manageable.
 - a. preferred
 - b. short
 - c. qualified suppliers
 - d. BAFO
9. A proposal evaluation sheet is an example of a(n) _____.
 - a. RFP
 - b. NPV analysis
 - c. earned value analysis
 - d. weighted scoring model

10. _____ is a term used to describe various procurement functions that are now done electronically.
- E-procurement
 - eBay
 - E-commerce
 - EMV

Quick Quiz Answers

1. b; 2. c; 3. a; 4. d; 5. a; 6. d; 7. c; 8. b; 9. d; 10. a

Exercises

- Search the Internet for the term *IT outsourcing* and find at least two articles that discuss outsourcing. Summarize the articles and answer the following questions:
 - What are the main types of goods and services being outsourced?
 - Why are the organizations in the articles choosing to outsource?
 - Have the organizations in the articles benefited from outsourcing? Why or why not?
- Interview someone who was involved in an IT procurement process, such as a manager in your organization's IT department, and have the person explain the process that was followed. Alternatively, find an article describing an IT procurement in an organization. Write a paper describing the procurement and any lessons learned by the organization.
- Suppose that your company is trying to decide whether it should buy special equipment to prepare high-quality publications itself or lease the equipment from another company. Suppose that leasing the equipment costs \$240 per day. If you decide to purchase the equipment, the initial investment is \$6,800, and operations will cost \$70 per day. After how many days will the lease cost be the same as the purchase cost for the equipment? Assume that your company would only use this equipment for 30 days. Should your company buy the equipment or lease it?
- Search online for samples of IT contracts. Use search phrases like "IT contract" or "sample contract." Analyze the key features of the contract. What type of contract was used, and why? Review the language and clauses in the contract. What are some of the key clauses? List questions you have about the contract and try to get answers from someone who is familiar with contracts.
- Review a sample RFP for an IT project. Write a paper summarizing the purpose of the RFP and how well you think it describes the work required.
- Draft the source selection criteria that might be used for evaluating proposals to provide smartphones with wireless plans for all students, faculty, and staff at your college or university or to all business professionals in your organization. Use Figure 12-4 as a guide. Include at least five criteria, and make the total weights add up to 100. Write a paper explaining and justifying the criteria and their weights.

Running Case

As described in earlier chapters, your Global Treps team would pay for a new website and account through an online provider. Bobby would do most of the customization and programming for the site, but you would consider outsourcing or purchasing services to provide some of the capabilities like accepting donations and developing the short videos on the site. You would also buy a new laptop and Internet access for your three team members abroad, which they could share with their contacts in those countries. You have budgeted \$20,000 for outsourced hardware and software. The activities listed in your WBS for outsourced software development include the following:

- 1.3.1.1 Domain name and site hosting
 - 1.3.1.2 Donation acceptance feature of website
 - 1.3.1.3 Video creation for website
1. Bobby is very familiar with purchasing domain names and site hosting and has already looked into options for providing the donation acceptance feature. However, you all agree that you need professionals to create the videos for the website. Brainstorm options for this procurement, and research potential suppliers. Summarize your findings in a short paper, and include at least three references.
 2. Draft a contract statement of work for creating the videos for the website. Use the outline provided in Figure 12-3.
 3. Assume that the source selection criteria for creating the videos for the website are as follows:
 - Management approach, 15 percent
 - Technical approach, 25 percent
 - Past performance, 10 percent
 - Price, 20 percent
 - Sample videos, 30 percent

Using Figure 12-4 and the weighted scoring model template as guides, create a spreadsheet that could be used to enter ratings and calculate scores for each criterion and total weighted scores for three proposals. Enter scores for Proposal 1 as 80, 75, 70, 90, and 85, respectively. Enter scores for Proposal 2 as 90, 50, 95, 80, and 75. Enter scores for Proposal 3 as 80, 90, 95, 80, and 75. Add a paragraph to the spreadsheet that summarizes the results and your recommendation. Print your results on one page.

4. Draft potential clauses that you could include in the contract to provide incentives and/or penalties for on-time and within-budget delivery of high-quality videos that users would enjoy watching. Be creative in your response, and document your ideas in a short paper. Be sure to describe how you will measure if the criteria were met and what the incentives and/or penalties would be.

Key Terms

bid	cost plus award fee (CPAF) contract
constructive change orders	cost plus fixed fee (CPFF) contract
contract	cost plus incentive fee (CPIF) contract

cost plus percentage of costs (CPPC) contract	proposal
cost-reimbursable contracts	Request for Proposal (RFP)
fixed-price contract	Request for Quote (RFQ)
lump-sum contract	sellers
make-or-buy decision	statement of work (SOW)
Point of Total Assumption (PTA)	termination clause
procurement	time and material (T&M) contracts
project procurement management	unit pricing

Endnotes

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