CHAPTER 12

PROJECT PROCUREMENT MANAGEMENT

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

- Understand 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
- Understand the process of controlling procurements by managing procurement relationships and monitoring contract performance
- Describe the process of closing procurements
- Discuss types of software that are available to assist in project procurement management

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?

12.1 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 in 2014 at $3.8 trillion, an increase of about 3.2 percent from 2013. The largest spending category is telecommunication services at 45 percent of the total or about $1.7 trillion.[1] According to a study by the Center for International Business Education (CIBER) and the International Offshoring Research Network's (ORN) Project at Duke University, the outsourcing market continues to grow:

- U.S. companies are transferring more work abroad, especially in the areas of IT infrastructure, application development and maintenance, and innovation processes.

- India, China, and the Philippines are the preferred locations for outsourcing, and Latin America is growing in popularity.
- A shortage of qualified personnel, not cost savings, is the top reason for global outsourcing of IT services.
- According to Arie Lewin, director of CIBER, "For companies that are engaged in offshoring, we've seen a significant jump in the number of respondents who say offshoring activities have led to improved organizational flexibility."[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. For example, Atlanta-based Delta Air Lines created 1,000 call-center jobs in India in 2003, saving $25 million, which enabled it to add 1,200 jobs for reservations and sales agents in the United States.[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 2012–2015. See the What Went Right? feature for a description of how Zulily uses in-house software development to provide a competitive advantage.

WHAT WENT RIGHT?

Retailer Zulily 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 emails containing deals targeted to what they've bought from the site and to their page viewing patterns. Zulily is also working on software to more efficiently route merchandise within its fulfillment centers, and they are upgrading an internal website it uses to exchange order information with vendors.

"'You almost have to build the technology… from scratch because there won't be something out there on the market that fits perfectly,' said Mr. Friang. Zulily's sales soared 97 percent to $285 million in one quarter, enabling the company to slightly raise its forecast for 2014 sales to at least $1.2 billion, which would represent 74 percent growth from last year. Zulily's net income rose 94 percent to $7.8 million."[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 microprocessor 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.

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

continued

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 2015 article stated that the job market for IT workers in Australia did improve as several companies brought jobs back to the country. The only downside was that pay increases were declining.[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 seller of products or services under a contract or other agreement.

There are four 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 statements of work, procurement documents, source selection criteria, make-or-buy decisions, change requests, and project documents updates.
2. *Conducting procurements* involves obtaining seller responses, selecting sellers, and awarding contracts. Outputs include selected sellers, agreements, resource calendars, change requests, and updates to the project management plan and other project documents.
3. *Controlling procurements* involves managing relationships with sellers, monitoring contract performance, and making changes as needed. The main outputs of this process include work performance information, change requests, and updates to the project management plan, project documents, and organizational process assets.
4. *Closing procurements* involves completion and settlement of each contract or agreement, including resolution of any open items. Outputs include closed procurements and organizational process assets updates.

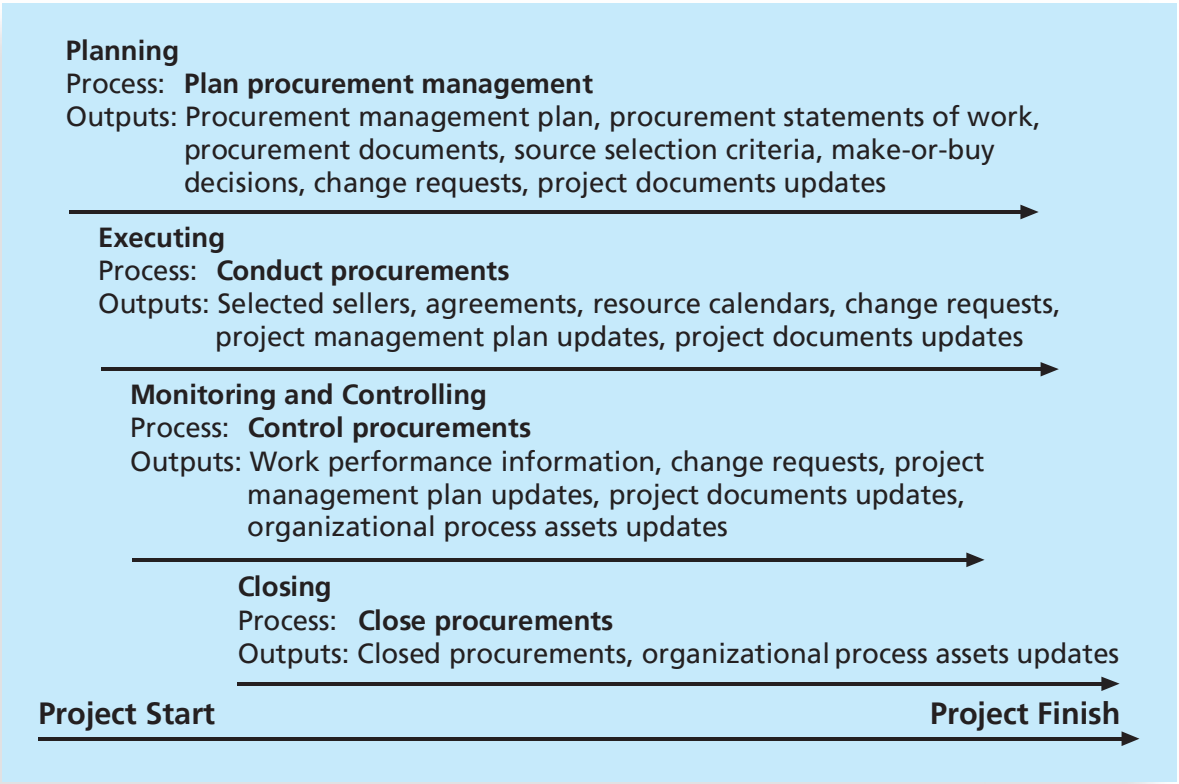

FIGURE 12-1 Project procurement management summary

Figure 12-1 summarizes these processes and outputs, showing when they occur in a typical project.

12.2 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 management plan, requirements documentation, the risk register, activity resource requirements, the project schedule, activity cost estimates, the stakeholder register, enterprise environmental factors, and organizational process assets, such as types of contracts.

12.2a 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 millions, the PTA will be $1.2 million:

Ceiling price = $1,250
Target price = $1,100
Target cost = $1,000
Government share: 75percent

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

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.

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]

- 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 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 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.

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.

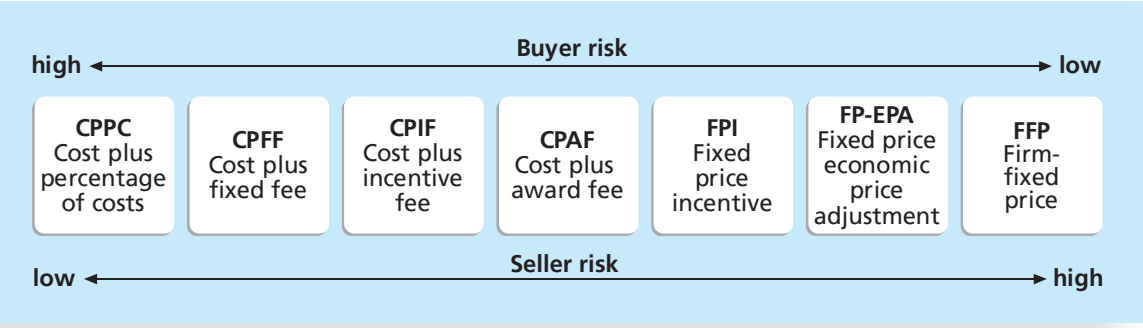

FIGURE 12-2 Contract Types versus risk

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.

12.2b 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, expert judgment, and market research.

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.

In addition to make-or-buy decisions, change requests, and project documents updates, important outputs of planning procurements are a procurement management plan, statement of work, procurement documents such as requests for proposals or quotes, and source selection criteria.

12.2c 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

12.2d 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.

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.

12.2e Procurement 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.

Two common examples of procurement documents include a Request for Proposal (RFP) and a Request for Quote (RFQ). 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

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

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.

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.

Figure 12-4 provides a basic outline or template for an RFP. The main sections of an RFP usually include its statement of purpose, background information on the organization

Request for Proposal Template

I. Purpose of RFP

II. Organization's Background

III. Basic Requirements

IV. Hardware and Software Environment

V. Description of RFP Process

VI. Statement of Work and Schedule Information

VII. Possible Appendices

- A. Current System Overview
- B. System Requirements
- C. Volume and Size Data
- D. Required Contents of Vendor's Response to RFP
- E. Sample Contract

FIGURE 12-4 Request for Proposal (RFP) template

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.

12.2f 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). 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.

12.3 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 procurement contract award.

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.

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 12-5 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%						
Management approach	30%						
Past performance	20%						
Price	20%						
Total score	**100%**						

FIGURE 12-5 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.

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.

12.4 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.

12.5 CLOSING PROCUREMENTS

The final process in project procurement management is 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 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.

Outputs from contract closure include closed procurements and updates to organizational process assets. The buying organization often provides the seller with formal written notice that the contract has been completed.

12.6 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:

- 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.

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.