Technology Needs Assessments
Evaluating the Business Case for ERP and Financial Management Systems

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Foreword

Advances in information technology have led many governments to consider replacing their current financial systems. Replacement decisions are more complex today because newer systems must be capable of supporting e-Commerce and e-Government functions. Financial systems often act as the central nervous system of the entire government. End-users, managers, and staff develop strong opinions over time on features of the current system that are unsatisfactory. Yet many governments find it difficult to comprehensively assess whether the current system meets business needs, whether a sizeable investment should be made in a new system, or if there are other alternatives worthy of consideration. Increasingly, elected officials are insisting that a systematic “case for action” or “business case” be made before funding new technology projects.

This book provides a step-by-step approach for conducting technology needs assessments. Some of the questions addressed include: How should performance of the current system be evaluated? Are there products available in the market that meet our needs? What factors should be considered in a technology investment analysis? If a new system is justified, what are the major risks to be managed?

The Government Finance Officers Association (GFOA) Research and Consulting Center provides technology consulting assistance to its members. It has assisted states, cities, counties, and special districts of all sizes on technology-related tasks such as needs assessment, RFPs, vendor evaluation, contract negotiations, and project management/quality assurance services during implementation. An important criterion we use in deciding whether to undertake a project is whether the work will also be relevant to the GFOA membership as a whole. This book and others in the Technology Solutions Series share with the public finance profession the experience we have gained from GFOA’s technology consulting experiences.

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Introduction

The information technology revolution has led private and public organizations to examine opportunities to improve their operating processes and better serve their customers. More than thirty years ago, government organizations deployed mainframe-based technology to improve *organizational* productivity for repetitive tasks, transactions, and activities. Financial systems were custom built for individual governments easing tasks such as accounting journal entries, payroll processing, standard reports, and voucher payments. Nearly twenty years ago, the PC revolution advanced *personal* productivity by allowing almost anyone in the organization to establish their own customized databases and spreadsheets for analysis and special reports. A large number of software programs became cheaply available, allowing PC-based systems to proliferate within organizations to compensate for some of the missing features of central accounting systems. Today the rigidity of mainframe-based applications and the information fragmentation associated with PC-based systems has led many governments to examine whether a single *integrated* enterprise system can replace the earlier generations of software and thereby optimize both organizational and personal productivity.¹

The new software packages—called Enterprise Resource Planning (ERP) systems—integrate traditional financial management applications (e.g., accounting, budget control, accounts payable, payroll) with non-financial applications (e.g., human resources, purchasing, inventory) through a common database standard. Unlike previous generations of systems that had to be tightly customized to each installation, ERP software is “pre-configured” and referred to as “commercial-off-the-shelf” (COTS). ERP systems promise information integration and opportunities to reengineer processes based on best business practices. Such systems also serve as the gateway and infrastructure for electronic commerce (e-Commerce) and Web-based service delivery to citizens (e-Government). Although these systems are more expensive to acquire and install than traditional systems, the total cost of ownership can be lower than it would be to maintain an environment that fragments application development and support.

Because of the large volume of transactions that fall under the scope of ERP systems, significant complexity surrounds implementation. ERP systems may force governments to make significant changes to their operating processes and organizational structure. An important aspect in deciding whether to pursue ERP is an assessment of an organization’s readiness to absorb changes. ERP may require and impose specific technology standards. In short, ERP systems can often appear to be more expensive to implement than traditional systems, but they may also improve transaction processing for a far broader range of organizational functions than their predecessors. In essence, does the government want to merge/migrate all its
separate software applications into one enterprise package, lower its maintenance costs, and make access to administrative applications (e.g., budgeting, payroll, grants) as ubiquitous as the telephone system?

While the benefits of ERP are highly touted, these systems are not for every government because to successfully implement them some preconditions must be met. This book describes in a step-by-step manner how governments can evaluate their financial systems and decide whether there is a “case for action” or “business case” to undertake system upgrades, partial replacement alternatives, focus on a niche application software vendor, or undertake a more ambitious ERP implementation project.2

Chapter 1 presents a methodology for needs assessments that the GFOA has used in its consulting projects. Subsequent sections expand on major components of the methodology. Chapter 2 describes how to evaluate existing financial systems. Chapter 3 describes ERP systems and outlines market research techniques to assess whether “off-the-shelf” software exists that may meet a government’s needs. Chapter 4 presents a method for analyzing the cost and the value of an ERP investment. Chapter 5 discusses system procurement strategies (to be used if the needs assessment study justifies system replacement). A question-and-answer format is used in Chapter 6 to address issues that often arise in needs assessment projects.

This book has five main objectives:

1. To outline a method that allows governments to conduct needs assessments in-house or through outside consultants;

2. To provide a step-by-step approach for evaluating the current financial system;

3. To describe the types of product offerings for ERP and financial management software and explain how to conduct market research;

4. To establish a general methodology for cost/benefit analysis that provides a basis to determine key decision criteria such as return on investment (ROI) or estimated payback period for the new system; and,

5. To answer frequently asked questions (FAQs) with the intention of improving the odds that governments will develop needs assessments that will lead them to make appropriate technology decisions.

Progress in any profession is ultimately made through collaboration among its members. GFOA plans to update this book periodically to keep pace with the evolution of the ERP and financial systems marketplace. We would appreciate receiving needs assessment documents that readers have created using this publication. Best practices examples will be duly recognized in future GFOA publications. Please send the documents in electronic form via e-mail to RCENTER@GFOA.ORG.
Endnotes


2 The terms ERP and financial system are used interchangeably throughout this book, although when the distinction matters it is recognized in the text.
Methodology for Needs Assessments

It is not uncommon to read or hear about a government that has spent millions of dollars on a technology initiative only to halt the project and either abandon it altogether or start over again. Such events are even more commonplace in the private sector. Take the case of the large candy company, which compressed the rollout of a $112 million ERP system to meet the Halloween and Christmas candy rush. Problems with inventory data and new orders led sales to fall by $150 million compared to the previous year. An agricultural cooperative purchased $6 million of ERP software and services, only to file a $20 million lawsuit against the software manufacturer and claim bankruptcy several months later. A large drug distributor filed a $1 billion lawsuit against the software and services firm because of a “bungled” ERP implementation. It also claimed bankruptcy several months later. Why have such projects failed even though vendors tout their products as being “off-the-shelf”?

There are many reasons for project failure. The software products may have been newly introduced with significant bugs and defects. The implementation services firms were inexperienced in their knowledge of a particular industry. Organizations implementing the systems did not understand the staff commitment required. Perhaps the software required radical process change that managers were not prepared to make. Then again, perhaps contingency resources were not budgeted or the technology being implemented was not adequately tested. And then there is always the issue of organizational readiness—though senior managers were convinced that their current system was not meeting executive or end-user needs, they did not carefully evaluate the organization’s capacity to install a new system. For all of these reasons and many others, before purchasing and implementing a new system, public and private organizations alike periodically conduct
a systematic review of existing systems and evaluate the benefits of new technology through a process known as needs assessment.

A technology needs assessment evaluates whether there is a “case for action” or “business case” for modifying, enhancing, or replacing the current system. A quality needs assessment process provides decision makers with an objective evaluation of the various choices that the organization faces. The term objective is emphasized because it is important that the entity conducting the assessment be unbiased. Independence is often required to attain objectivity. Thus, if the needs assessment is conducted internally, it is important that the agency conducting it not be affected materially one way or another by the conclusions it may develop. For example, an information technology organization that is steadfastly committed to the current mainframe system or the existing software product (because this state imposes less work on them) is not in a position to render an objective analysis. Neither is the consulting firm that is evaluating whether to replace the current financial system but stands to gain because it provides implementation services for new systems. Independence and objectivity are not enough: since technology needs assessments will affect numerous stakeholders, it is also important that the source conducting the needs assessment is experienced in each operational area in which it is rendering advice.

The process of conducting a needs assessment requires the organization to assess where it is headed from both a technology and service delivery vantage point. The Internet is forcing nearly all organizations to reassess their service delivery model. Most improvements to service models require a solid information access and analysis infrastructure that requires integration across applications. Decisions on how the government wants to improve its service delivery model in turn influence the type of integrated administrative applications it will seek to implement.

The Government Finance Officers Association (GFOA) has provided consulting services to many state and local governments on technology needs assessments for financial systems and other administrative applications. Over the course of these engagements, GFOA has developed and refined a method that is based on four main steps: (1) define the problem, (2) identify and research alternatives, (3) establish options and develop recommendations, and (4) finalize decisions and take action. This chapter presents this method in a step-by-step manner.

PHASE I: DEFINE THE PROBLEM
In an era of tax limitations and other citizen initiatives, state and local governments are being pressured to find ways to reduce costs and improve service delivery. Many governments consider a sound financial management system as a necessary ingredient for controlling and managing costs. Financial management technology serves as an organization’s nervous system; it constrains and directs day-to-day operations. Governments purchase these systems with the expectation that the system will provide benefits for at least a decade. Like capital assets, the useful life of a financial system is determined by several factors, including whether adequate sys-
tem maintenance occurs. In addition, just as some capital equipment is replaced for obsolescence, financial systems may need to be replaced when alternatives become available that provide additional functionality or lower operating costs. The term *functionality* is used in the industry to describe capabilities of software that improve operations management. “Additional” functionality simply means a system can do more than a previous generation of systems.

A technology needs assessment attempts to systematically determine gaps between user needs and current system capabilities. The impetus to undertake a needs assessment can come from a wide range of sources. The mayor’s office may be overwhelmed by complaints from vendors asking about payment status. The state legislature may be frustrated in its inability to access agency performance measures or program costs as it tries to set budget priorities. The budget office may find it impractical to paste together hundreds of department spreadsheets to prepare a budget. The city attorney is unable to conduct labor negotiations because the system cannot analyze alternative wage and benefits scenarios. Public works managers have difficulty tracking the equipment usage costs of capital projects that are reimbursable through federal grants. The housing authority is uncomfortable about having to defend the indirect cost component of its programs to federal agencies. Departments have difficulty getting their hands on the information “real-time” and find that the information technology department is too slow in running standard reports. The controller’s office finds itself struggling to conduct a year-end close, just when the demand for year-end information is increasing. Although these are all valid problems that might be solved by better technology, these problems do not in themselves constitute a solid case to purchase a new system. Instead, elected officials and governing boards typically require a systematic business case analysis—one that clearly identifies the benefits, costs, and risks of different alternatives—before they approve a large investment in enhancing or replacing the current financial management system.

The first step in a needs assessment is to understand the problem. Problem definition consists of three main tasks: (1) *executive visioning*, (2) *stakeholder analysis*, and (3) *evaluation of the current system*.
Executive Visioning

The objective of this step is to get senior administrators and officials to articulate a vision for the ideal enterprise system. The visioning exercise is a half-day or full-day workshop that is facilitated by a consultant or government staff member. It attempts to succinctly define the scope of the financial system, the long-term functionality that the system is expected to have, and the major organizational issues that the existing or new system must address. The exercise itself is similar to developing a mission statement for an organization, although what is being defined here is the mission for the financial system itself. Since needs assessments are undertaken to help decide whether the current system is satisfactory, a formal vision statement sets the expectations for system performance in both the short and long run. Exhibit 1-2 describes the results of a visioning exercise GFOA conducted for a large county. The county developed the following mission at its visioning session:

By 2005, the county will have developed and be sustaining an information technology system that provides electronic service to the public (marketplace) from anywhere in the County and supports the staff (workforce) in the effective delivery of services to that public.

In the case of this county, “supporting the staff” involved three levels: (1) enterprise level (board and executives), (2) central agencies/departments (CAO, auditor, purchasing, etc.), and (3) service delivery departments.

Stakeholder Analysis

Stakeholder analysis generally involves individual and group meetings with different constituencies that support and use the financial system. The main objective of stakeholder analysis is to identify information needs and assess the extent to which the current system meets those needs. Executives, department heads, elected officials, information technology analysts, and finance staff are some of the major internal constituencies. Interested parties external to the government include citizens, taxpayers, vendors, banks, rating agencies, investors, grant agencies, and the media. Although stakeholder analysis relies heavily on internal participants for formal interviews, many of these participants serve as intermediaries for the external constituencies as well.

Evaluation of the Current System

A system consists of people, processes (including policies and procedures), and technology. This step involves systematically reviewing the technology, policy and procedures, and staffing by function (e.g., accounting, human resources). Sometimes these steps are also conducted as part of an organization’s IT Strategic Plan. The overall objective of examining the current system is to permit the evaluator to develop appropriate options and recommendations. This step examines the main financial system as well as the many standalone systems that proliferate throughout modern organizations. The system evaluation examines questions such as:
GFOA consultants conducted a half-day visioning exercise with senior executives from a mid-size county government. The main findings are presented below.

**Strengths**
When members of the Technology Steering Committee were asked to identify what they considered to be the major strengths of the current administrative systems, the following items emerged from the discussion:

- E-mail system is effective.
- Systems provide accessible information.
- The county has established a help-desk for user problems.
- Systems are designed tightly for the customer.
- Departments have a say in the planning and prioritizing of IT projects.
- Systems produce accurate data.
- Systems have a comprehensive reliable network in place.
- Systems run on standardized desktop software.
- The county has a large group of well-trained and mature end-users with a low turnover rate.
- The county has invested in a state-of-the-art training facility.
- There are good relationships between analysts and departments.
- County departments have a strong customer service orientation.
- Good leadership from the CAO.
- There is user-to-user coordination for computer help and problem solving.
- Departments are technology proficient.
- A culture of cooperation exists within the county.
- Voice-mail is effective.
- Individual department systems are solid and stable.

**Weaknesses**
When the members of the Technology Steering Committee were asked to identify what they considered to be the major limitations of the current administrative system, the following items emerged from the discussion:

- Systems require a double-entry system for payroll.
- Systems are labor intensive.
- Systems are non-integrated.
- Inability to allow customers access to information.
- Non-transportability of some software.
- Grant funding solves a piece of the IT problem at the expense of the whole.
- System is driven by the availability of financial resources.
- Absence of standardized cost accounting projects.
- Incremental changes are unsatisfactory.
- Results are not auditable—"real time."
- Absence of a long-range financial plan for IT projects.
- Users are resistant to new standards.
- IT projects have a long implementation cycle.
- County’s IT benchmarking is unclear.
- Lack of executive level support for IT decisions.
- There is a lack of long-range technology planning.
- System lacks flexibility.
- Funding limitations reduce the ability to provide support to direct operations.
- Financing approach does not recognize long-term impact of IT projects.
EXHIBIT 1-2 ■ Visioning Exercise Results (Continued)

Characteristics of a Future Information Technology System
Members of the Technology Steering Committee were then asked to develop a vision of an improved system five years into the future, using the previously identified strengths and weaknesses of the current system. The following characteristics emerged from the discussion:

- Systems are integrated.
- Systems are configured/implemented to meet department needs.
- Provide electronic service to the public.
- Systems are user friendly.
- Business processes are paperless.
- Perceived and actual output/data from the system is accurate and reliable.
- Skills of the IT staff will have been reengineered.
- Data is available at the customer level.
- There is a clear understanding of IT staff and departmental roles.
- Responsibility is assigned at the most decentralized level possible.
- A well financed and understood IT plan is in place.
- System is capable of reacting to user requirements and demands rapidly.
- Elimination of redundant data and applications.

What are the major deficiencies in the current system? Are the problems due to obsolete technology, ineffective organization, or poor management? What is the level of staff resources supporting each sub-system? Are staff members properly trained to fully utilize features of the current system?

Standalone systems take up a significant portion of the work involved in this step of the needs assessment process. For each standalone system, the following questions must be considered: Does a standalone system support the individual department only or the organization as a whole? Is the standalone system holding the same information as the main financial system? If it is, how much staff effort is put into reconciliation activities? Which system is correct if the data does not match? How much work goes into system maintenance? Which entity within the government upgrades the standalone system?

PHASE II: IDENTIFY AND RESEARCH ALTERNATIVES
Both in their organizational and personal lives, managers have learned that the technology marketplace is dynamic and unstable. For this reason, technology decisions are the cause of considerable anxiety for those individuals charged with making them. One aspect of understanding the technology marketplace is to conduct research on the various products and services. What are the major software products? Who uses these products in the public sector? What are the major problems with the products? Can the government obtain and support the underlying technology needed for these systems? What do the products cost to purchase and implement?
Of course there are also many alternatives to consider with respect to the current system. Is it possible to upgrade the system to eliminate some of the deficiencies? Can a third-party reporting product be purchased to meet user needs? Is there an option to buy a client/server version of the current system at a discount? Should we consider Web-based systems only? These are just some of the questions that illustrate the fundamental point that the choices facing the evaluator are typically not confined simply to “keep” versus “replace.”

It is also important to understand alternative options for procuring, implementing, and maintaining the technology under consideration. The best solution today may look far different a year from now when a new option becomes available. For example, at the time this book is being written, most governments purchase and support financial software and hardware. Yet the expense and risk of implementation is pressuring the market to develop new offerings for meeting these needs, such as renting software, application hosting, and outsourcing. It is therefore important that needs assessment studies dedicate resources to identify, research, and analyze different alternatives. This phase of the needs assessment consists of three major tasks: (1) Best Practice Definition, (2) Market Research, and (3) Identification of Alternatives.

Best Practice Definition

Although the term “best practice” is loosely used in the technology industry, it is useful to research innovative approaches organizations and governments are using to improve their operations. A comparison of current capabilities of a particular function against an organizational process that is a best practice can help identify tangible benefits of new technology. It is possible that there are many best practices to a single process. The entire reengineering revolution in the 1990s was based on a rather simple precept that technology should be used to improve processes, not simply automate them. A sample of recent best practices associated with financial systems include activity based costing capabilities (accounting), vendor registration through the Internet (purchasing), payment status inquiry through the Internet (accounts payable), employee self service (benefits administration), limiting spending power to revenues collected (budget control), and permit/license acquisition via the Internet (revenue management). While these practices are relatively rare today in government, within a few years they will be commonplace. Research on such practices is often obtained from interaction with peers, publications, conferences of professional associations, and training seminars.

Market Research

Market research is an important source of information to properly structure the options and recommendations in a needs assessment. This step has several objectives, including answering questions such as: Is there an off-the-shelf software package available that meets our needs? Is a new system a significant improvement over the current one? What is the breadth or scope of the software solution? What are the
major costs of implementing particular packages? Are there established firms with experience in implementing the software? What is the customer service reputation of different firms? Is the total cost of ownership higher for some packages than others? How much customization is required for a specific product to meet fund accounting functionality? How much customization is typical for comparable public-sector organizations? What is the overall satisfaction level of government clients with specific software and implementation service companies? In the dynamic and unstable technology industry, market research is a key step to improving the decision-making process.

**Identification of Alternatives**

After evaluating the current system, identifying best practices, and conducting market research, an evaluator should have sufficient information to identify realistic and credible alternatives for the government. Needs assessments are conducted to examine a number of problems with the current system and for this reason it is unlikely that the only alternative is to sustain the status quo. GFOA consultants generally provide their clients with a short-list of alternatives (three to five) that are improvements to the status quo. Once alternatives are identified, further research is used to assess whether these alternatives serve as viable options for the government.

**PHASE III: ESTABLISH OPTIONS AND DEVELOP RECOMMENDATIONS**

Phase III consists of using information from the two previous phases—problem definition and identification/research of alternatives—to develop options and recommendations that will ultimately shape the course of action that the government will take. In this phase, alternatives are converted to options. Put differently, the evaluators will use their experience, analysis, and judgment to develop a short-list of options and recommendations from all of the alternatives that previous steps have identified. The main criteria for an alternative to be retained as an option is improvement over the status quo as well as the government having the ability and willingness to implement that course of action.

**Evaluate Alternatives**

This step involves specification of the benefits, costs, and risks of each alternative. It is also a point in the needs assessment process where the evaluators may “trial balloon” some of the options to get an initial reaction from stakeholders about the feasibility of implementation. The latter step helps ensure that significant resources are not used to develop an option that is irrelevant to an organization. For example, replacing the current financial system by outsourcing the information technology staff supporting it may not be possible under current labor contracts. It would therefore be futile to conduct a request for information (RFI) process to obtain ranges for outsourcing costs.
Present Options
The elimination and refinement of alternatives during the evaluation step leads to a small number of options (three to five). The options can vary from actions that marginally enhance the current system to replacing it entirely. Within each option, there may be still more choices on how to structure the organization or information technology to support the option. Again, for alternatives to become options, the government must have the ability and willingness to implement that course of action. Each option clearly specifies a course of action, estimates costs, outlines benefits, and lists pros and cons. In some instances, GFOA consultants outline the short-run, mid-range, and long-term actions the governments can take to improve the status quo. As with any other major organization-wide decision, the final course of action is likely to entail “give and take” among the main stakeholders. For this reason, a list of options, rather than a single option, is often desirable.

Develop Recommendations
Some of our clients have also asked GFOA consultants to make an independent recommendation from the list of alternatives. It is important that any recommendation be strongly supported with data and analysis that shows why it is superior to other options under consideration. If a clear recommendation does not emerge, it is probably better not to force one and instead conduct a workshop or discussion with the senior administrators before attempting to construct a recommendation.

At the completion of Phase III, the evaluator develops the draft needs assessment report. All government staff involved in making the decision should have read the draft report completely. The evaluator should then schedule a workshop meeting to review the major findings, answer questions, and facilitate a decision. The report can be finalized after collecting and addressing stakeholder comments.

PHASE IV: FINALIZE DECISION AND TAKE ACTION
Decide on a Course of Action
The executive steering committee that sponsored the needs assessment should meet to decide on a course of action. The meeting should begin with the evaluator presenting the major findings from the study and answering any questions that may arise. Members of the steering committee may request additional information and analysis. It may also take several meetings to decide on a course of action. Once a course of action is chosen, and assuming the decision favors the procurement of a new system, the next steps are to prepare the organization for the procurement and implementation phases. The decision should now lead to steps to establish a procurement strategy and implementation readiness plan.

Design Procurement Strategy
The procurement strategy step is used to establish a process for the selection, contracting, and implementation of the new system. This step typically seeks to an-
swer the following questions: What is the timetable for the procurement? What is the level of resources and staff time commitment needed? Which department or agency will manage the procurement? Who will be the project manager for the procurement? Will an outside consultant be used to develop the RFP and advise in system selection? Will a single RFP be used to procure both software and implementation services? How long will it take to implement the software?

Assess Implementation Readiness

It is never too early for government organizations to get prepared for implementation. The authors have served as consultants to numerous governments that scramble to dedicate full-time staff to a system implementation even when they had more than a year to prepare. It is the recommendation of GFOA consultants to dedicate a staff member, ideally the future project manager, to get the organization prepared to implement as soon as the procurement phase begins. Implementation readiness includes issues such as obtaining funds for software and consulting services, developing the government’s staffing plan, identifying subject-matter-experts, negotiating with departments to release specific individuals to staff the project, assisting departments with “back filling” select jobs, finding facilities to house the project and training activities, and building the required technology environment. If the government cannot resolve such implementation readiness issues, it is often better to cancel the project, or modify the decision, rather than proceed with an incomplete resolution of the important issues.

SUMMARY

This chapter described a method for conducting a needs assessment based on four steps: (1) define the problem, (2) evaluate the current system, (3) identify and research alternatives, and (4) finalize decision and take action. Each of these steps will be discussed further in the foregoing sections of the book. Several points of advice also were provided to those undertaking a needs assessment process:

- Select independent consultants that can provide objective advice;
- Work with senior executives to establish a vision for the future financial system;
- Engage stakeholders—internal and external to the organization—as part of the system evaluation process;
- Conduct research to identify best practices and understand the marketplace for financial software; and,
- Prepare for implementation at the earliest stage of the procurement process (if it is decided that a new system is desirable).

Endnote

Many public managers believe that a sound financial management system is the key to controlling and managing costs. What are the characteristics of such a system? How does a government identify the gap between their existing system and a new system? This chapter outlines steps to evaluate an organization’s existing financial system and examines common deficiencies of legacy systems.

**OBJECTIVE OF A NEEDS ASSESSMENT STUDY**

The objective of a needs assessment is to evaluate the current system and determine whether or not there is a “case for action” to enhance, modify, or replace it based on the gap between the capabilities of the current system and the future needs of the organization. The assessment also develops appropriate options and recommendations. The needs assessment is usually conducted by function (e.g., general ledger, accounts payable) with the following types of questions in mind:

- What are the major deficiencies of the current system?
- Are the problems due to obsolete technology, ineffective organization structures, poor policies and procedures, or other factors?
- Does a stand-alone system support only the individual department or the entire organization?
- What is the level of staff resources supporting each function?
- Is staff properly trained to fully utilize features of the current system?
- Which of the unmet needs might be addressed by utilizing new technology?
- How are the current financial system modules being used?
• Have business processes been modified to accommodate embedded processes in the software?
• Is the technology organization capable of supporting the current system?
• What are the future business needs of the organization?

This chapter outlines a step-by-step method for answering these and other important questions regarding the retention or replacement of a financial management system.

DATA COLLECTION STRATEGIES
Assessing the capabilities of the current financial system and gaining a clear understanding of the future needs of the organization require a comprehensive analysis consisting of surveys, staff interviews, and system observation. These methods are used to produce information to analyze options and potentially develop an RFP that will enable the government to procure the best possible ERP or financial system given its available resources.

Questionnaires
There are two types of questionnaires that are used in needs assessments conducted by the GFOA. The first probes end-users on general system capabilities and future requirements. Staff experts that have knowledge of current business processes generally fill out this survey. The survey is often conducted by module (i.e., general ledger, payroll) and respondents are asked to identify manual and electronic processes required for key business functions. The number of surveys varies by organization size. The main goal is to understand the views of representative end-users for a particular function or business process.

A second questionnaire is often needed to establish detailed business and technology requirements. Because governments have many needs in common (e.g., compliance with GASB 34, encumbrance accounting), it is wise to base the questionnaire on what other governments have done or electronic documents that accompany GFOA’s book *A Guide to Preparing an RFP for Enterprise Financial Systems* (2000). It is industry practice to develop this questionnaire in the form of a checklist of requirements using a spreadsheet. The detailed requirements are established by managers and end-users and are usually listed as brief statements. Respondents are then asked to validate, modify, or delete them. The completed list of requirements provides important information for the needs assessment and can later serve as content for the RFP. Exhibit 2-1 illustrates the types of information that might be collected in a needs assessment.

Process Mapping
Some governments map current “as is” business processes and future “ideal” processes. The differences between the current (“what we have”) and future (“what we
EXHIBIT 2-1 Sample Needs Assessment Questionnaire

General Ledger Evaluation

This questionnaire is part of a needs assessment for a new financial management system. The information will be used to help the evaluator understand the processes and systems that support the accounting function. As a subject matter expert, you are being asked to complete or facilitate the gathering of the information.

Address all questions and items as thoroughly as possible, based on your own knowledge, and input from appropriate representatives within your organization. Your assistance in this process is greatly appreciated.

**Contact Information**

Name: ___________________________  
Agency: ____________________________

Department: ____________________________  
Phone: ___________________________  Email: ___________________________

**Primary Systems**

Identify the primary General Ledger System(s). (Is there a single system that encompasses all funds for the entire government? If not, list each system, and identify the associated departments for each system listed).

(a) Describe the overall purpose/functionality for each General Ledger system;

(b) List system strengths; and,

(c) List system weaknesses.

**Standalone Systems**

List all other standalone systems (software, spreadsheets, etc.) that are needed to help employees perform the tasks associated with the General Ledger. For each of these systems, address the following:

(a) What functionality is provided by this system?

(b) Why is this functionality outside of the primary General Ledger system?

(c) How is data from this system sent to or interfaced with the primary General Ledger system?

**Manual Processes**

Identify any manual processes (e.g., paper logs, forms) associated with General Ledger. For each identified process, address the following:

(a) Describe the process.

(b) Why is this process performed?

(c) Why is this process performed manually?
### EXHIBIT 2-1 ■ Sample Needs Assessment Questionnaire (Continued)

<table>
<thead>
<tr>
<th>General Ledger</th>
<th>Current Performance</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module Capabilities</td>
<td>Unsatisfactory</td>
<td></td>
</tr>
<tr>
<td>A. GAAP basis financial reporting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Cost Accounting functionality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Chart of accounts flexibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Journal entry process (editing/data entry)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Store/retrieve transactions detail</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Budget control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. Integration w/accounting related modules (e.g., AP, Fixed Assets)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. Standard reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. Custom reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J. Upload/download (integration w/desktop applications)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Respondents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score Multiplier</td>
<td>x1 x2 x3 x4 x5 x1 x2 x3</td>
<td></td>
</tr>
<tr>
<td>Total Score</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Average Score for Current Performance Satisfaction
Average Score for Priority

### General Ledger

<table>
<thead>
<tr>
<th>Score Multiplier</th>
<th>x1 x2 x3 x4 x5 x1 x2 x3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Score</td>
<td></td>
</tr>
</tbody>
</table>

Average Score for Current Performance Satisfaction
Average Score for Priority
are highlighted to enable executives to better understand the value of a new system. GFOA generally recommends that while mapping current “as is” processes can be useful to a needs assessment, significant effort should not be placed in developing future process maps because the software that is selected already has those processes embedded. More discussion on this point is provided in Chapter 4.

**Interviews**

Interviews are used to collect qualitative information and to validate the questionnaire responses. GFOA consultants recommend that interviews be conducted on a group basis where participants have similar interests and stakes in a function or process. The group should consist of end-users in departments and bureaus as well as those working in central areas that serve the whole organization (e.g., purchasing). During the interviews, participants should be given the opportunity to clarify information provided in the questionnaires. Although technology staff can participate, the emphasis of the interviews should be on gathering information from end-users that have ideas on how to improve business processes.

**System Observations**

System observations are used to examine first hand the limitations of current systems. The observations are based on a script or agenda developed in advance. For example, end-users might be asked to enter or edit a transaction. Factors to observe include the number of screens required to complete a transaction, the number of “work arounds” developed to overcome system limitations, and any manual processes used to complete a transaction. The system observation step is useful for identifying problems with the current system that end-users may not recognize because it is part of their daily routine.

**EVALUATING THE CURRENT SYSTEM**

Using data collected through the methods described above, GFOA consultants generally evaluate the existing system on the basis of (1) system features, and (2) modular functionality (including the use of stand-alone databases or programs to accomplish specific functions).

**System Features**

System features are those software characteristics that are similar across all modules. These features are usually related to the underlying technology, which in turn influences security, workflow, reporting, and (ultimately) the ability to accommodate process change and meet the operational requirements of the government. One consideration that is increasingly important is the system’s ability to serve as a “backbone” for future e-government and e-commerce initiatives.
Security

Security is used to regulate who has access to information as well as how and when such access is granted. From an end-user standpoint, security refers to a user name and password. For the technology staff, security is a broader concept that may include database security, menu security, record security, field security, class security, network security, digital certificates, and virtual private networks.

The first step in assessing security needs is to gain a basic understanding of the current system’s performance by interviewing the security administrator for the existing financial system. Questions to examine include:

- Which modules have the highest security needs?
- Is security layered (i.e., application security and database security)?
- Is security now administered in a centralized or decentralized manner?
- Is data encrypted during transaction processing?
- Does security require programming?
- How is Internet access controlled?
- How are querying and reporting taking place?
- What are the top security requests from end-users?
- What are the weaknesses (defined as business process weaknesses or security “holes”) of the current security system?
- What security features would technology staff and users like in a new system?
- What is the data backup process?

The second step in the assessment is to interview system administrators and department managers. The objective here is to gain an understanding of security from a business perspective. For instance, many sub-units in organizations desire decentralized administration of security that allows managers to control who gets access to certain information without having to wait for a security administrator to make changes. There may still be a central security administrator overseeing and setting standards for the whole security process.

When interviewing security administrators and department managers about their current system, the following questions should be considered:

- What information do executives, managers, occasional users, and Internet users need to see?
- What type of flexibility (e.g., edit, change, add, delete) is needed by users?
- What are the main security requests from users?
- What are future security needs?

The third step in the assessment of security is system observation. The evaluator should focus on business process impacts of security and seek to gain a basic understanding of applications and menus available within the system. This informa-
tion can usually be obtained from the system administrator. The evaluator should then ask to meet with various department personnel to view modules within the system. Items to examine include:

- Whether a user must logon once to access all of the financial modules;
- Restricted or grayed out menu items;
- Ability to access tables and fields; and,
- Any “end runs” the demonstrator used to overcome security problems.

Workflow

Workflow refers to the electronic routing of key documents that are produced from a business process or transaction. Older systems have used workflow capabilities to accommodate functions such as purchasing where a buyer’s actions within the system may be approved by a supervisor before a requisition is processed. Modern systems have workflow capabilities for functions beyond purchasing. Workflow is the major feature of ERP systems that helps governments move to a “paperless” environment.

Assessing workflow capabilities requires system administrator interviews and extensive system observations. Workflow analysis can be conducted during the functional assessments. The system administrator should clarify what, if any, workflow technology is installed in the financial system. The administrator should also be asked to what extent it is being used. System observations should include operator interviews as well as visual demonstrations. Items to observe include:

- The extent to which on-line approval processes are being used;
- The amount of paperwork being used to support on-line processes; and,
- The extent of work-arounds, if any, that are being used by operators.

Reporting

Reporting features are a key characteristic of how end-users rate the overall performance of a financial system. Reporting is also one of the main areas of complaints by end-users of older systems. COBOL statements and query languages were often required to produce standard reports within legacy financial systems. The concepts of ad-hoc queries and reporting were not widely available in systems until the advent of client/server computing. One irony in modern ERP systems is that they can provide so much flexibility that there is a possibility that it can actually increase complexity for end-users if not implemented properly.

Inadequate reporting is often an important reason why governments consider purchasing a new system. “Inability to access data,” “reporting requires too much programmer intervention,” and “reporting is too complex” are often cited as major problems with existing systems. Complexity, accessibility, and the number of reporting systems are factors that should be considered in needs assessments.
The evaluation of reporting functionality relies heavily on staff interviews. The objective during the interview is to learn about the reporting needs, understand why the data is needed, and what, if any, additional software packages are required to extract the data. Questions to focus on include:

- What are the most requested reports by end-users? Why?
- What types of reports do executives and senior management typically request?
- Does the financial system require programmer intervention to produce ad-hoc reports?
- Can data be easily extracted from within the system?
- What formats are used for report presentation (e.g., spreadsheet, word processing, desktop database, etc.)?

**Platform for Future Initiatives**

ERP has become firmly established in the public sector. Technology continues to advance and presents new opportunities to improve services to internal and external stakeholders. All of these systems have a foundation in the back-office—the dominion of ERP. Therefore, the government must consider what technologies it would like to implement beyond ERP in order to ensure that the package that is eventually selected is able to successfully serve as a platform for new initiatives. This may not mean that the ERP software firm offers those technologies today. It is important that the system is capable of supporting such applications through open-architecture.

The needs assessment phase is an ideal time at which to consider the government’s overall e-government strategy and how ERP fits into that strategy. Some of the components of e-government that ERP would be most heavily related to include:

- **Constituent Relationship Management (CRM).** Manages constituent contacts through a variety of channels (e.g., e-mail, telephone, walk-in).
- **E-Commerce.** Includes paperless procurement designed to reduce transaction costs, electronic payment features, and “marketplace” functionality that enhance transparency between buyer and seller.
- **Executive Information Systems (EIS).** EIS, also sometimes known as business intelligence software, seeks to gather information from across the enterprise and permit analysis that allows decision makers to have a quick and complete view of organizational information. By focusing on presenting organization-wide indicators, EIS systems seek to remedy the shortcomings in ERP systems that emphasize a “transactional” focus.

Exhibit 2-2 describes the basic structure for a comprehensive digital government system, with the square boxes representing the major components, the circles rep-
representing “e-stakeholder” groups, and the arrows representing transactions between stakeholders and the subsystem.

**Modular Functionality**

Major areas to examine in a needs assessment include general ledger, budget preparation, accounts payable, accounts receivable, fixed assets, inventory, human resources management, and payroll. The evaluator must examine the procedures and level of system centralization for each of these areas (including the existence of separate, stand-alone systems and databases). Modular integration is an important feature of modern financial systems from which many other benefits flow.

**General Ledger**

The general ledger (GL) represents the foundation of a financial system because it records a broad range of business transactions. The GL is the electronic version of double-entry bookkeeping and defines the types of areas that transactions are ultimately recorded in (e.g., revenues, expenditures, assets, liabilities, and fund balance). It serves as the central point for collecting financial information and reporting on it. A key feature of the GL structure is the chart of accounts (COA). The COA dictates how information is recorded and reported; it is a critical element in the de-
sign of cost accounting systems. The GL is also the main vehicle for imposing automated budgetary control.

**Budget Development**

Budgeting functionality includes budget preparation (and document production), maintenance and monitoring, analysis and forecasting, and salary and position control. Since, the budget control feature typically resides in the GL, the module itself focuses mostly on preparation, analysis, and reporting tasks. The needs assessment should examine all of these components. It is not uncommon for governments to use stand-alone or third-party products for budget preparation because many financial system vendors have not provided an adequate solution for the public sector.

**Accounts Receivable**

A typical accounts receivable (AR) system consists of customer records, receivables, and billings. Many systems provide limited AR capabilities, mostly consisting of summary level journal entries. Detailed customer tracking features often require another module such as a utility billing, or a more general customer information system toolset that is configured for specific purposes. Problem areas in older AR systems include the inability to establish relational records, such as multiple addresses to a single customer.

**Purchasing**

Purchasing modules include requisition, purchase order, contract management, and vendor maintenance processes. Purchasing systems may also contain features such as bid tabulation and processing. Increasingly important is the ability of purchasing systems to permit Internet-based transactions with vendors and suppliers.

**Accounts Payable**

The accounts payable (AP) system consists of vendor, accounting, and payment processing information. It is closely related to purchasing functionality due to “matching” capabilities (invoice, purchase orders, receipt of goods). Before a payment is processed, it must be verified that the item was received and accepted and that there is sufficient budget appropriation to make the payment. The payment must be matched to the vendor and sent to the correct address. The AP assessment requires an analysis of how these basic functions are addressed in the current system.

**Fixed Assets**

Information recorded in these systems includes original purchase price, type of asset, location, and physical description data. Current asset value information is kept up to date through depreciation schedules. Some systems are integrated with the purchasing system and will record a purchased item as a fixed asset if it exceeds a
specific capitalization threshold (e.g., $5,000). Some systems have the ability to record separate characteristics of an asset. The fixed asset system evaluation attempts to examine such issues.

Inventory

The inventory module consists of inventory acquisition, storage, distribution, and verification. The module may be integrated with the financial system or interface to it. GFOA consultants typically find that the inventory system is not integrated in older systems or in those organizations that are specialized (e.g., hospitals, wastewater treatment).

Human Resources

The human resources (HR) area is a comprehensive system used to track employee activity from application to retirement and beyond. HR modules contain applicant tracking, employee records, benefits administration (including enrollment), skills tracking and training administration, grievance tracking, post employment tracking, and position control. Governments with older systems run them separately from the financial system. In modern ERP systems, the integration between HR/Payroll and GL is a major reason for enhanced cost tracking and reporting as well as elimination of redundant data entry.

Payroll

The payroll function consists of time-entry, payroll processing, and check processing. Historically, the payroll system has been run as a separate system, with interfaces to the financial and HR modules. Older systems are often heavily customized to accommodate complex pay schedules that vary across organizations and employee groups. The payroll assessment should examine the basis for the existing system’s complexity and the reasons for the customization. Modern ERP systems increasingly offer time and labor tracking and travel reimbursement functions. It is also common for governments to use specialized third-party products for timekeeping, especially in public-sector industry segments that are more complex than general purpose governments (e.g., utilities, transit).

Fleet Management

The fleet management function consists of asset identification, parts inventory, parts processing, and work order processing (preventive and on-demand). A fully integrated system may also include fuel supply management, driver licensing, and accident tracking or vehicle risk management.

In many organizations, responsibility for the many functions of fleet management are spread across various departments and this has made it difficult to integrate fleet management. The fleet management assessment should begin with a detailed inventory of fleet-related information systems and a determination of how a modern integrated system can facilitate management reorganization. Departments
and areas where fleet data may reside can include fleet garages, purchasing, contracting, legal, risk or insurance, and warehousing.

This section provided an overview of how to evaluate a current financial system’s performance by functional area. Exhibit 2-3 summarizes current system evaluation considerations by module.

LEGACY SYSTEM RESEARCH
During the examination of the current system, specific patterns are often identified that appear similar across modules. Most of these can be attributed to the commonalities in features of older technologies, such as flat file architecture, centralized report generation processes, and proprietary programming code. This section presents the problems that are typically found in older systems. To appreciate the benefits a new system has to offer, it is important to recognize deficiencies in legacy systems. Research has identified the following problems with legacy systems:

Technology Deficiencies

*Limitations on Capturing New Information*

Once databases are designed, legacy systems are difficult and expensive to modify, especially when it is later desirable to capture other information. For example, a data entry screen may permit the recording of aggregate revenues but efforts to disaggregate that category by changing data entry forms (e.g., to record commercial and residential property data) may be expensive. To cope, MIS managers may use cumbersome manual or programming routines to circumvent the problem. Similarly, data entry screens related to grants management programs may be difficult to modify to permit compliance with new federal regulations.

*Inability to Expand the System*

Many legacy systems rely on software that was customized to fit specific operational processes. Early generations of software focused on single applications (e.g., payroll or benefits administration) that did not “speak to one another.” Even in instances where limited integration has occurred (e.g., payroll and general ledger), expansion of the system to include other applications (e.g., maintenance management or revenue administration) remains difficult in legacy systems.

*Proliferation of Independent “Shadow” Systems*

Limitations on legacy system expansion led individuals to take matters into their own hands. With the introduction of personal computers, independent applications and databases proliferated throughout most government organizations without planning their relationships to the core financial system. Low cost but sophisticated desktop applications such as spreadsheets, relational database programs, and suite packages put computing power in the hands of individuals. Independent
databases increase personal efficiency but make the reliability of and access to data more problematic. In some cases, the overall cost of computing increased because data entry redundancies and additional checks on validating and updating data associated with shadow systems required staff time. Coping with the fragmentation of the data processing organization remains one of the major IT challenges facing governments today.

**Difficulty in Sharing, Accessing, and Analyzing Information**

Legacy systems limit accessibility of information and their designs do not recognize that the power of any database lies in the end-user’s ability to manipulate it. Legacy systems restrict analysis to a select group of queries available through standard report formats. When independent databases proliferated, they did so in a proprietary manner: databases were “owned” by particular departments or users. If users were fortunate enough to get another department’s data, it is likely that such data would have to be re-entered and validated.

**Untimely Data**

Because of batch processing, data tape transfer, or physical hardcopy transfer, data is often produced when it is too late to impact a decision. For information to be relevant for decision making, it needs to be readily accessible. In legacy systems, information often has to be batch processed with jobs scheduled to run at fixed times so that the system is not overburdened. Users generally have to wait before the results of their queries are produced. Although legacy systems can permit more interactive programming, they do not permit the flexible interaction that modern Web-based and client/server technology does. A major goal of new ERP systems is to put information at the fingertips of users so it can be accessed when it is most likely to influence a decision.

**Hardware and Other Limitations**

Under legacy systems, the idea of the mainframe crashing, complex job control language (JCL), memory and space allocation limitations, are all factors that reduce the ability of the end-user to access the database. Space limitations require that historical data be archived or discarded instead of being part of the existing database. Also, once batch-processing code is written, only individuals with an understanding of programming can change it for new tasks. For the common user, this means either taking cumbersome work-around steps or making decisions without the information.

**Functional Deficiencies**

**Fragmentation of Finance Tasks**

Legacy financial systems generally have a narrow view of finance tasks. The core legacy system typically includes the general ledger, payroll, and budget control.
Other finance related functions—billing, fixed assets, inventory, purchasing, and budget preparation—employ stand-alone applications or manual processes. Such system fragmentation of the finance function results in several problems that are discussed below.

**Loss of Useful Data**

A major output of legacy financial systems is the production of financial reports that meet mandatory requirements of standard-setting bodies, state and federal laws, and local ordinances. In the context of system space limitations, the designers of legacy systems sought to capture only limited transactional data for minimal financial reporting needs; other useful information generated by transactions was simply discarded. Departments coped with these deficiencies by building shadow systems to capture data unavailable in the core system or simply made decisions without it. Payroll systems, for example, may discard data related to workload that would be useful for activity based costing or performance measurement comparisons. As another example, an accounts payable application may process an invoice by recording the vendor’s identity and the amount owed. Other information about the purchase that could have been used to update fixed asset or inventory records is simply discarded by the system. Finally, a system-wide focus of recording transactions only on the basis of budgeted spending levels can also lead to the loss of useful information.

**Proliferation of Conflicting Information**

Independent databases or shadow systems and fragmentation of finance tasks can produce conflicting information. Considerable organizational effort then goes into reconciling the diverse databases before a decision is made. For those areas of the administrative system that the public has access to via the Internet, the stakes are raised on the question of “Which system has the right information?”

**Rudimentary Budgetary Controls**

Legacy systems provide rudimentary budget controls such as appropriations, encumbrances, and position controls. Some systems can also provide allotment controls that enable governments to parcel out the ability to spend in increments over time. Although such controls are important to any financial system, legacy systems generally require that these controls be imposed system-wide. There are instances where more sophisticated controls or customized control strategies may be desirable (i.e., application of more restrictive controls to “problem” agencies) but are beyond legacy system capabilities.

**Inflexible Budgetary Formats**

Legacy budgeting systems mainly rely on line-item formats for budgetary control. Rigid databases make it difficult to convert such formats into information useful for decision making. By using integrated and relational databases across applica-
### EXHIBIT 2-3 Needs Assessment Checklist by Module

<table>
<thead>
<tr>
<th>Function/Elements</th>
<th>Staff Interviewed</th>
<th>Information to Collect</th>
<th>System Requirement Categories</th>
<th>Things to Look For</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Ledger</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chart of accounts design</td>
<td>Accounting policy and procedure manuals</td>
<td>General design</td>
<td>Size of staff supporting system</td>
</tr>
<tr>
<td></td>
<td>Budget accounts design</td>
<td>Sample forms for major processes</td>
<td>Account structure</td>
<td>Extent of centralization</td>
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<td>Fund accounting structure and types</td>
<td>Copy of CAFR</td>
<td>Journal transactions</td>
<td>Document “handoffs”</td>
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<td>Transaction processing and journal entries</td>
<td>Statistical information such as number of accounts, types of accounts, transaction volumes and journal size</td>
<td>Budget control</td>
<td>Adequacy of training for staff</td>
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<td>Opening and closing processes</td>
<td>Process to create and maintain accounts</td>
<td>Closings</td>
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<td>Financial reporting capabilities</td>
<td>Beginning and end of year processing</td>
<td>Querying/reporting</td>
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<td></td>
<td>Project accounting</td>
<td>Standard and ad-hoc reporting requirements</td>
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<td></td>
<td>Cost accounting</td>
<td>Data retention requirements</td>
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<tr>
<td><strong>Budget Preparation</strong></td>
<td></td>
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<tr>
<td></td>
<td>Budget controls for single years and multi-year budget items</td>
<td>Copy of budget documents (operating, capital, revenue estimates, and enterprise)</td>
<td>General design</td>
<td>Forecasting systems</td>
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<td>Rollover procedures</td>
<td>Copy of budget preparation instructions memorandum issued by budget department</td>
<td>Budget worksheets</td>
<td>Extent of decentralized procedures</td>
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<td>Budget preparation procedures</td>
<td>Sample budget to actual reports</td>
<td>Forecasting</td>
<td>Budget review procedures</td>
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<td>Forecasting</td>
<td>Sample year-end open encumbrance report</td>
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<td><strong>Accounts Receivable</strong></td>
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<td>Customer records</td>
<td>General design</td>
<td>Integration of cashiering systems</td>
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<td>Billing procedures</td>
<td>Customer records</td>
<td>Internal vs. external receivables policies</td>
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<td></td>
<td>Receipts processing</td>
<td>Invoice</td>
<td>External billing systems (i.e., solid waste meters)</td>
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<td>On-line payment processing</td>
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<td>Sample dunning notices</td>
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<td></td>
<td></td>
<td>Sample receipts</td>
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<td></td>
<td></td>
<td>Penalties and late fees policies</td>
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<td></td>
<td>Internal service fund policies</td>
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<tr>
<td></td>
<td></td>
<td>Number of customer records</td>
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<tr>
<td></td>
<td></td>
<td>Number of invoices processed per year</td>
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</tbody>
</table>
### EXHIBIT 2-3 ■ Needs Assessment Checklist by Module (Continued)

<table>
<thead>
<tr>
<th>Function/Elements</th>
<th>Staff Interviewed</th>
<th>Information to Collect</th>
<th>System Requirement Categories</th>
<th>Things to Look For</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purchasing</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Vendor records</td>
<td>Purchasing Agent</td>
<td>Number of purchase</td>
<td>General design</td>
<td>Centralized vs.</td>
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<td>orders</td>
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<tr>
<td>Requisition</td>
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<tr>
<td>processing</td>
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<td>Contracts</td>
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<td>Number of requisitions</td>
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<td>Purchasing policy</td>
<td>processing</td>
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<td>Bids/quotes</td>
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<td>documents</td>
<td>Receiving/inspection</td>
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<td>Contracts/Blanket</td>
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<td>Rollover policies</td>
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<td>Orders</td>
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<td>Inventory</td>
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<tr>
<td>Replenishment</td>
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<td>Receiving</td>
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<td>accounting</td>
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<tr>
<td><strong>Accounts Payable</strong></td>
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<td>Number of active</td>
<td>General design</td>
<td>Check printing</td>
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<td>vendors</td>
<td>Vendor records</td>
<td>systems</td>
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<td>Number of checks</td>
<td>Requisition</td>
<td>Approval processes</td>
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<td>processed (automated</td>
<td>processing</td>
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<td></td>
<td></td>
<td>and manual) per year</td>
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<tr>
<td><strong>Fixed Assets/Inventory</strong></td>
<td></td>
<td>Number of items</td>
<td>General design</td>
<td></td>
</tr>
<tr>
<td>Accounting</td>
<td>Purchasing Agent</td>
<td>Fixed asset policy</td>
<td>Acquisition</td>
<td>Integration with</td>
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<tr>
<td>requirements</td>
<td>Warehouse Managers</td>
<td>(what is the definition</td>
<td>Maintenance</td>
<td>bar coding systems</td>
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<td>of a fixed asset)</td>
<td>Reconciliation</td>
<td>and other input</td>
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<td>Querying/reporting</td>
<td>devices</td>
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<td>Replenishment</td>
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<tr>
<td><strong>Human Resources</strong></td>
<td></td>
<td>Number of employees</td>
<td>Applicant tracking</td>
<td>Number of systems</td>
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<td>(full-time, part-time,</td>
<td>Employee records</td>
<td>(manual and auto-</td>
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<td>temporary)</td>
<td>Benefits administration</td>
<td>mated) in place to</td>
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<td></td>
<td>Performance reviews</td>
<td>support employee</td>
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<td>Grievance tracking</td>
<td>records</td>
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<td>Training/certification</td>
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<td>Post-employment</td>
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<td>tracking</td>
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<td>Self-service requirements</td>
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<td>Querying/reporting</td>
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<td>Applicant tracking</td>
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<td>Web access</td>
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<tr>
<td><strong>Controller</strong></td>
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<tr>
<td><strong>Accounts Payable Clerks</strong></td>
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<tr>
<td><strong>Purchasing Agent</strong></td>
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<tr>
<td><strong>Warehouse Managers</strong></td>
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<tr>
<td><strong>Web Access</strong></td>
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</table>
tions, the informational limitations of line-item budgets may be addressed. Under modern ERP systems, if systems are properly designed, information can be organized and reported in many different ways and be readily available at the fingertips of decision makers.³

**Timeliness of Financial Reports**

Legacy financial systems are often associated with considerable lag times for the production of interim and year-end financial reports. The reasons for this stem from manual mechanisms to conduct year-end closing entries and poorly designed subsystems (e.g., budgeting and purchasing) that take months to reconcile. For example, it is difficult to expect accurate quarterly “budget to actual” projections if the purchasing system is months behind on processing requisitions. It is also not uncommon for larger jurisdictions to issue their comprehensive annual financial report (CAFR) six to nine months after the end of the fiscal year. Automated closing entries in financial systems can enable more timely release of the CAFR but necessitate integration with other applications.

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### Exhibit 2-3: Needs Assessment Checklist by Module (Continued)

<table>
<thead>
<tr>
<th>Function/Elements</th>
<th>Staff Interviewed</th>
<th>Information to Collect</th>
<th>System Requirement Categories</th>
<th>Things to Look For</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payroll</td>
<td>Human Resources Director</td>
<td>Number of payroll records</td>
<td>Payroll records</td>
<td>Automated time entry systems</td>
</tr>
<tr>
<td></td>
<td>Payroll Supervisor</td>
<td>Sample paycheck/advice</td>
<td>Time entry</td>
<td>Third-party payroll systems</td>
</tr>
<tr>
<td></td>
<td>Payroll Personnel</td>
<td>Salary schedule</td>
<td>Benefits/deductions</td>
<td>Other transactions that are accommodated through payroll (i.e., travel reimbursements)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sample time entry sheet</td>
<td>Payroll processing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Querying/reporting</td>
<td></td>
</tr>
<tr>
<td>System Assessment</td>
<td>Inventory of systems</td>
<td>Name of applications (automated and manual)</td>
<td>Base technology requirements</td>
<td>Interfaces with legacy systems</td>
</tr>
<tr>
<td></td>
<td>Interfaces</td>
<td>Purpose for applications</td>
<td>Security</td>
<td>Interfaces with Internet users</td>
</tr>
<tr>
<td></td>
<td>Reporting</td>
<td>Operating system/platform</td>
<td>Interfaces</td>
<td>Number of operating systems/platforms</td>
</tr>
<tr>
<td></td>
<td>Ratings</td>
<td>Interface data (batch, direct, manual)</td>
<td>Querying/reporting</td>
<td>Reporting needs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reporting requirements</td>
<td></td>
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<td></td>
<td></td>
<td>System strengths</td>
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<tr>
<td></td>
<td></td>
<td>System weaknesses</td>
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</tbody>
</table>
This chapter provided the detailed steps involved in evaluating a government’s existing system. Questionnaires, interviews, and reviews of policies and procedures are the main methods used. Evaluators must conduct a detailed analysis by module and examine system-wide features such as security, workflow, and reporting. Because older systems typically rely on an earlier generation of technology, the types of problems governments face with such systems are similar. Advances in technology are the principal drivers of the business benefits provided by new systems. The next chapter presents ways to research the benefits of new systems and the best practices associated with them.

Endnotes
Best Practice Definition and Market Research

After the current system has been evaluated and the improvements the government seeks have been identified, the next step is to study what the available solutions are. The movement to best business practices is one of the foremost attractions of modern ERP and financial software. However, neither software vendors nor industry sources directly identify what constitutes “best.” Therefore, the government needs to look into the matter to examine key process improvements and the implications of adopting new business practices. This chapter describes the structure of the financial system industry, the advantages of new systems, a general approach for conducting market research, as well as a means for making a final recommendation on the issue of system replacement.

BEST BUSINESS PRACTICE DEFINITION

Best business practices or best practices are two phrases casually used to describe process features of ERP software products. Unfortunately, no authoritative source exists that defines “best” practices in either the public or the private sector. In fact, what is a “best” practice may differ across industries depending on factors such as organizational mission, legal environment, and organizational culture. The lack of an authoritative source to define such practices enables nearly any software company to claim that best business practices are the basis for their “vanilla” or “out-of-the-box” business processes.

So how does someone in the market for new software assess vendor claims? The utilization of a particular software product at Fortune 1000 companies and research and development spending are two proxies, albeit imperfect ones, for whether the software is indeed based on best business practices. But this approach may not help small and mid-size governments because the type of larger systems that have a
worldwide user base and have research and development budgets at the billion dollar level may very well be beyond the price range of small and mid-sized governments.

Even if the claims of software vendors are accepted at face value, there are other more serious implications to the phrase best business practices. The concept itself is based on the notion that some organizations have adopted specific changes to processes that have significantly improved their operations. Presumably, what makes a practice “best” is the decided advantage it gives to one organization over its competitors, at least until that innovation diffuses throughout a particular industry. Although best business practices may mean something else altogether in other industries, for financial software two features are paramount: (1) enabling technology—new software has the flexibility to redesign important processes and functions (e.g., using the Internet to streamline purchasing); and (2) embedded technology—new software is embedded with processes that have been refined and validated by repeated implementations in an industry. Thus, the first point suggests that an organization can choose to use the software to do things better; the second implies that the very act of implementing the software forces changes in some practices.

In their zeal to research and adopt best practices, governments need to step back and understand the often far-reaching organizational implications. First, the application of best business practices promotes standardization of processes across the organization. In essence, organizations must change their processes to fit the objectives of the software. Organizations often find incremental change difficult; even greater difficulty will be posed by ERP systems that force radical process change. For organizations operating below the median level of efficiency in their industry, adopting such practices may improve operational efficiency or customer service. However, success in a global economy relies on an organization’s versatility to pursue process innovation and standardization of some processes may stifle an organization’s long-term ability to compete.

Second, best business practice adoption promotes organizational discipline (i.e., all business units must submit purchase orders or conduct time entry reporting using the same process). Especially in large organizations, where control and coordination are more difficult to impose, discipline is desirable for many processes. For example, it may be desirable to have all departments and bureaus in a government follow the same rules for submitting annual budget requests.

Third, one of the main benefits of using best business practices is that this approach promotes cross-functionality. Traditionally, large bureaucracies are organized along functional lines with “gatekeepers” for each of the major sub-functions (e.g., operations, marketing, and finance). Cross-functionality emphasizes a process orientation and focuses on getting business units to see a process through to its logical end. Cross-functionality also changes job responsibilities and the perception of accountability: individuals now “owning” the new processes become accountable for outcomes, not tasks.
A fourth implication, almost by definition, is that software companies who do business solely in the public sector may not be selling software based on best business practices. The top ERP companies are modeling their processes after learning from their implementation experiences at major corporations. This enables the public sector as a whole to “piggyback” on the experience and investments of the private sector. Software firms focused solely on the public sector may not have this advantage.

Software companies focusing exclusively on the public sector might in turn cite another implication: transporting business practices to the public sector may not be desirable or even possible. Functionality related to fund accounting, capital planning, and grants may differ materially in the public sector, leading to repeated efforts in software customization or modification. Some may also point out that the greater burden of accountability in the public sector is intentional and that processes that appear cumbersome to those unfamiliar with government are simply the price to be paid for the stringent checks and balances demanded by the citizenry.

**STRATEGIES TO RESEARCH BEST PRACTICES**

The marketing of software products on the Internet and the rise of dozens of industry analysis firms have led to an information explosion. The challenge for those seeking to conduct research is to find a way to sift through all the information. The initial scope of research should focus on the major problems with the current system that alternative practices or process changes may remedy. After research has been conducted on ways new or enhanced software might solve the major problems, a second step would examine organizations that have implemented similar software and derived benefits due to specific process changes that might be relevant to the evaluator. A third step is to examine the features of the latest products in the industry and outline specific process improvements permitted by the software.

There are several sources for such information. The best sources are trade association magazines or conferences that highlight innovators and success stories. Another source includes the user conferences of the software firms that may have customers on public-sector industry panels. Awards programs such as the Ford Foundation Innovation Awards or the Government Finance Officers Association’s (GFOA) Awards for Excellence are yet another source of researching best practices. The Internet is an excellent source of inexpensive research, especially government Web sites or those of the software firms that provide white papers on product features and case studies. While governments need to be wise consumers of information meant to increase product sales, some of this information can be tabulated permitting a comparison of products.

Another source of information is the many industry analyst firms that have risen to meet the growing demand of objective information on technology products and services. The quality of research among industry analyst firms varies greatly. Moreover, many software companies sponsor the analyst firms for specific research,
### EXHIBIT 3-1  ■  Best Practices Examples by Function

<table>
<thead>
<tr>
<th>Module/Function</th>
<th>Major Best Practices</th>
<th>Implications for Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCOUNTS PAYABLE</td>
<td>Implementing electronic funds transfer (EFT)</td>
<td>EFT payments reduce processing time, lower cost and reduce errors associated with paper mailings</td>
</tr>
<tr>
<td></td>
<td>Decentralized on-line receiving</td>
<td>Reduces paper flow, accommodates systematic match of documents</td>
</tr>
<tr>
<td></td>
<td>Electronic three-way match of goods received (purchase order, invoice, receiving report)</td>
<td>Reduces paper flow and cycle time, results in fewer processing errors, redirects staff time from manual matching to exception processing</td>
</tr>
<tr>
<td></td>
<td>Web-based invoice management</td>
<td>Reduced invoice processing time and operational costs through electronic approval and validity checking</td>
</tr>
<tr>
<td></td>
<td>Decentralized payment approval with online central review</td>
<td>Reduces paper flow, improves cycle time for approval, provides security control over proper approval authority</td>
</tr>
<tr>
<td></td>
<td>Automated vendor access to payment information through automated telephone systems or the Internet</td>
<td>Reduces accounts payable staff time devoted to answering vendor inquiries for more value-added tasks</td>
</tr>
<tr>
<td>ACCOUNTS RECEIVABLE</td>
<td>Decentralized cash receipt data entry</td>
<td>Shortens revenue recognition cycle and reduces paper flow</td>
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<tr>
<td></td>
<td>Integrated or interfaced point-of-sale cash registers</td>
<td>Ensures that general ledger is updated on a timely basis and reduces duplicate entry of data</td>
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<td></td>
<td>Use of lockbox processing</td>
<td>More timely processing of receipts, possibility of document management and reconciliation services</td>
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<tr>
<td></td>
<td>Integrated billing/ receivables with decentralized bill creation and centralized receipts collection</td>
<td>Reduces data entry, results in timelier update of financial information in the general ledger</td>
</tr>
<tr>
<td>BUDGET DEVELOPMENT</td>
<td>Budget consolidations are executed automatically through a single common tool</td>
<td>Facilitates consistency and ease in consolidating individual department budgets</td>
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<tr>
<td></td>
<td>Modeling tools support using multiple &quot;what-if&quot; scenarios and developing sensitivity analyses</td>
<td>Robust analysis/ &quot;slice and dice&quot; tools allow budget analysts and department managers to make better decisions</td>
</tr>
<tr>
<td></td>
<td>Ability to perform real-time budget to actual reporting</td>
<td>Accommodates appropriation funds checking and better managerial decision-making capabilities</td>
</tr>
<tr>
<td>FIXED ASSETS</td>
<td>Update of fixed assets balance each month</td>
<td>Eliminates the need for lengthy, arduous year-end reconciliation</td>
</tr>
<tr>
<td></td>
<td>Link with accounts payable module to ensure capture of fixed assets, based on cost threshold</td>
<td>Reduces chance of capital purchases going unrecorded</td>
</tr>
<tr>
<td></td>
<td>$5,000 threshold for tracking assets and department level control of non-capitalized assets</td>
<td>Ensures centralized account and reporting of capitalized assets but allows tracking and management of non-capitalized assets to be tailored to specific department needs</td>
</tr>
<tr>
<td>GRANT ACCOUNTING</td>
<td>Tracking of grants from application to final reporting upon closure</td>
<td>Ensures that reporting is done on time; permits grant data to be accessed at all times by those with proper authority</td>
</tr>
</tbody>
</table>
which may reduce the objectivity of the analysis. Research from industry analyst firms can be very expensive, so such research should generally be used for larger projects.

Exhibit 3-1 presents examples of best practices by module given the current state of technology for financial management. The implications of best business practices and process reengineering must be carefully thought through in a government’s decision to acquire and implement a new system. Public managers must ask software vendors to be more specific about which processes are based on best practices and why such practices are “best.” For some functions, best government practices may indeed be more desirable than those in business (e.g., pre-encumbrance controls and funds checking).

<table>
<thead>
<tr>
<th>Module/Function</th>
<th>Major Best Practices</th>
<th>Implications for Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUMAN RESOURCES</td>
<td>Self-auditing Web-based expense reporting system</td>
<td>Allows employee access anytime, anywhere; reduces turnaround time for reimbursement through electronic workflow and approval</td>
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<tr>
<td>INVENTORY</td>
<td>Central inventory management through bar-coding or radio frequency technology</td>
<td>Increased efficiency in the form of reduced time to process orders and better inventory tracking</td>
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<td></td>
<td>Just-in-time purchasing as a substitute for warehousing (also known as “virtual inventory”)</td>
<td>Allows government to limit inventory to critical or hard-to-get items</td>
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<td></td>
<td>Perpetual inventory systems that are constantly updated</td>
<td>Enables direct access throughout year to reliable information on current balances and eliminates the need for annual inventory</td>
</tr>
<tr>
<td>PROJECT/COST ACCOUNTING</td>
<td>Integrated cost accounting system drawing financial and non-financial data from other modules</td>
<td>Eliminates duplicate entry and facilitates decision-making and analysis; enables departments to monitor project revenues and expenses at a detailed level</td>
</tr>
<tr>
<td>PURCHASING</td>
<td>Supplier catalogs available on-line for all purchasers across the government</td>
<td>Facilitates use of approved suppliers only and verification of current pricing</td>
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<tr>
<td></td>
<td>Centralized strategic procurement/sourcing</td>
<td>Consistent, authorized purchases and business rules across the government</td>
</tr>
<tr>
<td></td>
<td>Distributed requisitioning and automated workflow/approvals</td>
<td>Elimination of paper documents, security control ensures appropriate access to employees, consistent application of business rules</td>
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<td></td>
<td>Maintenance of a single vendor maintenance file</td>
<td>Reduction of duplicate effort, consistent entry of vendor information</td>
</tr>
<tr>
<td></td>
<td>Web-based bidding on contracts and large procurements; use of electronic marketplaces for some transactions</td>
<td>Allows centralized, automated procurement functions, such as sourcing, approval, routing and payments</td>
</tr>
<tr>
<td></td>
<td>Availability of RFPs, contract terms, prices and instructions for purchase on-line</td>
<td>Increased access to information prevents purchases from unauthorized vendors and other procurement errors by decentralized buyers</td>
</tr>
</tbody>
</table>

EXHIBIT 3-1 ▉ Best Practices Examples by Function (Continued)
DIFFERENTIATORS OF MODERN ERP AND FINANCIAL SYSTEMS

A clear understanding of the structure of the ERP and financial systems industry is important to market research and system procurement. Selecting the right product involves going beyond mere technical considerations and including factors related to the potential of the software firm to serve as a true business partner for the government during and after the implementation. Listed below are six major areas that public-sector customers can use to differentiate ERP and financial system products.

1) Technology

Technology is the main determinant of a system’s ability to meet the government’s needs. It influences the extent of integration in back-office systems and the ability to carry forward future e-government initiatives in a cost-effective manner. Financial system technology can be differentiated on the basis of features and components listed below.

Integration

Integration refers to the extent to which different operational functions are tied together in the overall system. Integration is the single most important feature of ERP systems. This is because integration enables information to be shared between modules, thereby eliminating the additional work associated with double-entry of data and providing management with a more comprehensive view of the organization’s position, allowing better decisions to be made. Thus, the value of the whole (i.e., the ERP system) is greater than the sum of its parts (i.e., the modules). Integration also refers to the coupling between back-office systems (accounts receivable) and front-office systems (CRM). Such integration points are important because if they are absent as the organization’s e-government system grows, the government will soon be faced with organization-wide information fragmentation similar to the back-office integration fragmentation that prompted the need for the new system in the first place.

Architecture

The underlying architecture of software products affects system functionality and the ability to reengineer business processes. Architecture influences how widely the system can be deployed. For instance, pure Web-enablement and client-server architectures are more effective means to deploy a system than mainframe technology. Differentiators include:

- Open Architecture. The reality of a comprehensive e-government system is that no one vendor will ever be able to provide all the functionality needed to manage information and provide automation for the many services a government provides. Therefore, a system must provide a means to easily
interface side systems with the main system in order to maintain the integrity of e-government system integration. Open architecture also refers to the degree to which the system interfaces with popular office desktop applications that government staff may need to use to further manipulate or use data. Finally, the more open a system’s architecture the greater the number of hardware, database, and operating system standards it can meet.

- **Powerful Development Tool Set.** ERP systems are accompanied by built-in administrative and programming toolsets. These toolsets enable developers to configure, modify, and customize software packages. Toolsets also aid in the design of interfaces and system-wide security. Toolsets are important because changes made to software using the toolset will more easily migrate to new versions of the software during an upgrade. The most powerful toolsets can be used to create entirely new applications that are not available in the base package.

### 2) Product Functionality

Product functionality is essential for the new system to meet the business requirements of the government. Perhaps the most important aspect of product functionality is the appropriateness of the solution for the public sector. After all, the public sector has a number of unique business requirements that would demand particular functionality from ERP software. Generally, product functionality can be differentiated on the basis of the following areas:

**Accounting**

Accounting functionality serves as the central nervous system of an ERP package. Public-sector accounting has many unique requirements including fund accounting, Governmental Accounting Standards Board reporting requirements, encumbrances, and rigorous budget control. Accounting functionality also includes functions such as accounts payable and accounts receivable.

**Procurement**

Procurement is important because it represents one of the areas in which largest efficiency gains can be had with the implementation of an ERP system. According to a recent (2002) study, 57 percent of the firms responding to an IDC survey reported cost savings from e-procurement within the first year. Compaq Computer Corporation reduced their cost to process a purchase order from $167 to $84. Such savings result because procurement is one of the most rule-bound areas in all organizations, but especially so in government.

**HR/Payroll**

HR/payroll is another area that can have certain nuances in the public sector. The most common difficulty software packages face is meeting the requirements of union contracts. There may also be state government requirements on local govern-
ment, such as statewide pension systems that mandate specific handling of HR/payroll. These requirements demand that a system’s HR/payroll module has the flexibility/capability to accommodate these issues.

**Budget Preparation**

In the public sector, the budget occupies a place of central importance in the government’s operations since it provides the legal authority to spend funds to deliver government services. As such, governments have a much more elaborate and rigorous budget preparation process than private-sector firms. A new system should be able to accomplish these processes and provide analytical abilities to budget analysts.

**EIS/Business Analytics/Data Warehousing**

As the e-government technology network expands, the government will accumulate data that it will have to manage and analyze. This may require the use of specialized tools such as executive information systems (EIS) to keep managers at the helm of government operations, business analytics to allow analysts to provide critical information to managers in a timely fashion, and data warehousing to store and organize the data from various systems and make the data available for analysis and reporting.

**Constituent Relationship Management (CRM)**

CRM encompasses tools for helping government improve constituency service by providing the ability to manage contacts with citizens through of variety of channels (e.g., phone, walk-in, e-mail) and in a variety of contexts (e.g., complaint tracking, case management, public information campaign management). Directly improving service to constituents is the ultimate goal of most e-government initiatives and CRM is a critical vehicle for achieving it. As such, the main system must either be capable of providing CRM functionality or linking third-party packages to the back-office.

**Other Functionality**

There are a number of other functions that would be of interest to a government such as project management, fleet management, treasury, permitting, utility billing, and grants management. Most of the areas listed are provided by third-party firms. The system should either provide the functionality directly or have business partners through which this functionality can be delivered. From the government’s standpoint, integration via direct provision by the main system vendor is more desirable.

**3) Business Partnering Criteria**

When a government purchases a new system it is entering into a long-term relationship with that vendor, a relationship that will play no small part in the success of the government’s e-government strategy. Therefore, it is important that the government understand the quality of the vendor’s relationships with other firms.
Alliances

Alliances are important for two main reasons. First, especially for larger governments, it is important for software vendors to have alliances with other firms certified to implement their software. This gives the government the option of securing another firm if the one initially chosen to work on the implementation does not work out. Second, alliances are important so that software firms who provide the core functionality of the system have relationships with third parties for non-core areas such as work order management or fleet. These alliances between software companies are especially important if the government wants to procure software for a broad range of functions through a single RFP.

Installation Base

Installation base is an important indicator of the quality of products and services of the software firm and its implementation partners. A large installation base of public-sector clients contributes to the overall financial stability of the firm and makes it more likely that they will develop additional features for public-sector clients. Installation base also signals the ability of the government to take advantage of communication among customers through user groups.

Customer Satisfaction

This is an important indicator of the quality of relationships a software firm has with its clients. The government, naturally, would prefer a firm that maintains contact after the initial purchase, as opposed to one that is only interested in selling the software and cares little for what happens afterwards.

Quality of Maintenance and Support

The maintenance and support agreement that a government has with its vendor is perhaps the most tangible aspect of the relationship beyond initial purchase and implementation. High quality maintenance and support services include hot-line support, no cost access to upgrades and bug fixes, and participation in future development efforts. However, a firm commitment for resolving problems in a timely fashion is the most important aspect of support.

Role in Implementation

An important differentiator between software firms is the commitment they will make to a successful implementation. The best software vendors can take an active role in the implementation (if the client requests it) and will commit to contractual provisions that tie payment for software to successful implementation. A software firm need not participate in every implementation. But this is a valuable option if the project runs into problems and some additional “bench strength” is needed to complete the work.
4) Total Cost of Ownership
The total cost of ownership (TCO) can be a differentiator between vendors. Total cost of ownership includes licensing costs, implementation consulting costs (including data conversion/interface development assistance, change management, and training), and the cost of ongoing maintenance and support. TCO also includes the ongoing cost to the government for system support such as system administration, database administration, additional functional support staff, and upgrade costs. Chapter 4 takes up this issue in considerably more detail.

5) Implementation
In order to deliver optimal benefits, a software package must be implemented thoroughly. A system’s potential for successful implementation depends on a number of factors discussed in Chapter 5, including those outlined next.

Best Business Practices
To be successful, new software must be modeled on best business practices. At their best, new systems are flexible enough to accomplish a process in a number of ways, any of which could be considered a best business practice. At their worst, software processes are designed by software engineers without a conception of the core business areas that the software was meant to improve.

Time to Benefit
Time to benefit expresses not only the time between purchase and production (“go-live”), but also the period between go-live and when productivity levels begin to exceed those present prior to the new system. In other words, immediately after implementation is complete, government staff will experience a productivity drop as staff adjusts to the new system. The speed with which the government can stabilize the system and raise productivity levels after go-live determines the time to benefit. This stabilization period is mostly a function of the quality of training provided by the vendor and the ease of use permitted by the system.

Solution Delivery Alternatives
For many reasons, some governments, especially smaller ones, do not find it feasible to undertake a conventional implementation. In these cases, solution delivery alternatives such as application service providers (ASPs) or implementation templates can be an important mechanism for allowing these governments to enjoy the benefits of modern systems without paying the steep price associated with traditional implementations that configure the system tightly to each customer’s needs. Such alternatives are a differentiator not only for the ability to explore creative licensing options (rental, cost per user, etc.) but also whether the costs of the initial installation can be repaid over a longer time period through a leasing-type financing structure.
Reengineering Opportunities

One of the greatest benefits of modern technology stems from using the software to optimize business processes through reengineering. Although modeling of the software after best business practices is important for increasing productivity, software flexibility is the key determinant of reengineering potential. This is because true reengineering demands reorganizing processes around the needs of the customers (both internal and external). Since these needs will be at least somewhat different across governments, configurability (designing new business processes without changing the source code) is critical for the software to optimally support business processes.

Implementation Effort

Implementation effort describes the work hours required to put the software into production. Highly complex software that requires a great deal of effort to install will stress the staffing resources of a government. This factor also addresses the potential for implementation failure, as software that requires more effort to implement will generally present greater risk for failure.

6) Software Features

In addition to software functionality, modern systems will have features that are common to every module across the system. The features include:

Ease of Use

Important features for making software more user friendly include graphical user interface (GUI) with intuitive icon and menu structures; screens that are customizable to user roles; on-line documentation; and software documentation that is customizable to include information specific to the government’s processes.

Drill-Down/Audit Trails

Poor drill-down and audit trail features are often cited by end-users as one of their main points of dissatisfaction with legacy financial systems. Drill-down capabilities permit end-users to reach the source document that supports a journal entry. Audit trails provide the ability to review all of the history of changes to a record in the database. It is often useful to know which user changed a particular record (e.g., wage rates in a payroll file) and audit trails are the feature that provides this information.

Remote/Mobile Access

As the government’s e-government framework expands, it will be important to grant access to those not traditionally considered financial users, such as vendors (for self-service), field workers, and mobile managers. This is because as the new system becomes more central to decision making and operations in general, em-
employees who are not considered back-office workers will need unfettered access to
the system’s information to effectively perform their jobs.

**Flexible COA**

A common complaint of end-users is that legacy systems do not permit the capture of expenditure (or revenue) detail below the budgetary control level. The chart of accounts (COA) is the most important element in determining the overall usefulness of a financial system. The COA supports financial reporting and budgetary requirements. In addition, the COA structure should be flexible enough to incorporate more detailed information often kept outside of the legacy system, while maintaining the integrity of the overall reporting and budgetary structure. A flexible COA structure based on relational database concepts is one element of the new system that can improve reporting and eliminate many “shadow” systems proliferating in an organization.

**Workflow**

Workflow is the automation of business processes within the enterprise system. A target of reengineering is to eliminate “document handoffs” and excessive layers of approval. Workflow capabilities permit users to define event-driven routings, create automated in-boxes and prioritized cues, allow background queries to take place with notification to the user, and, more generally, streamline processes.

**Reporting and Analysis**

ERP systems are associated with powerful reporting and information analysis capabilities available system-wide (i.e., end-users of the human resources module have the same capabilities as those using accounting applications). Unlike legacy systems, new systems focus less on standard reports and more on “ad-hoc” reports that end-users design themselves. Reporting features also ease the burden of information dissemination by using automated scheduling and e-mail distribution features.

**Security**

Security is important for maintaining the integrity of system data. Security is important not only for keeping malicious interlopers from damaging the system, but also from keeping well-meaning employees from modifying data by mistake. Important features for security include role-based security, screen and field level security, and an aggressive testing program by the vendor to detect and rectify security weaknesses.

**INDUSTRY STRUCTURE**

Using the characteristics just outlined as a basis, enterprise software firms can be categorized into four tiers.
Tier I: Industry Leaders

If the vision of an ERP system is to provide software capabilities that permit seamless integration of major processes and functions across the enterprise, no more than a half dozen firms (the Tier I firms) in the industry today provide solutions for the public sector that fit this vision. The advantages of the Tier I firms are superior product performance and a vision focused on utilizing leading-edge technology. Tier I companies dedicate a considerable portion of revenues to research and development (15 percent to 20 percent). Related to this point is that Tier I firms have a clear vision beyond the back-office and towards a total e-government solution. Even if the vendor is not providing every part of the solution itself, it will have forged solid partnerships with other vendors to provide the needed functionality. The main disadvantages relate to cost (often millions of dollars when all costs are considered) and the implementation risk that accompanies installing complex but powerful software.

Tier II: Climbers

Tier II firms are those that are quickly working to catch up to the Tier I firms by adopting some of the features of ERP in new software releases (e.g., Web enablement). Some of the Tier II firms fell behind the times over the past decade when the demand for Y2K compliance (i.e., editing software code) occupied much of their focus. For Tier II firms, the long-term cost of short-term, Y2K-driven profits was poor functionality and adherence to aging technology standards. Among the advantages of Tier II firms is that they provide implementation services directly (i.e., a separate implementation firm is not needed). The main disadvantages relate to narrower product offerings and a lag in meeting new technology standards in comparison to Tier I firms. Tier II firms possess many of the characteristics of true ERP systems, but are clearly not as strong on each of these counts as Tier I vendors.

Tier III: Niche Players

This tier is described as the niche players because while these firms offer basic modules (e.g., general ledger, payroll, accounts payable) with some integration, the software packages lag behind Tiers I and II because of rudimentary reporting tools, simple databases, and (sometimes) aging technology. Simply put, these firms are clearly differentiated from Tier II firms in that they are not nearly as robust in terms of flexibility, technology standards, or in their ability to meet more advanced complex business requirements. But these products are a viable alternative for smaller organizations that simply cannot afford the products and services of Tier II vendors. Tier III firms do provide a basic level of functionality, integration, reporting capability, and reasonable level of customer support at a very affordable price. The research and development efforts of these firms consist primarily of not falling too far behind current technological and functional standards, as well as slowly adopt-
ing product improvements demanded by customers. Also included in this category of niche players are firms focused on a single function or module (e.g., work orders).

Tier IV: Opportunists

Although the label for Tier IV companies seems harsh, discussions with some of GFOA’s clients and members would quickly support the notion that many companies have poor functionality but are able to sell software primarily on the basis of one factor—a lower price. These are firms who may tout the benefits of client/server technology in their promotional literature but offer simple single application and/or PC-based systems. Tier IV firms sell software that is very narrow in functionality (e.g., general ledger only), performs poorly, is technologically obsolete (e.g., text-based, proprietary languages; screen scrapers; non-relational databases), and/or lacks customer support. Tier IV firms do not focus resources on research and development and they do not have to do so to survive under the current industry structure. Tier IV firms face a stable market demand mainly because their price is substantially lower than other tiers. Unfortunately, customers often end up looking for new software shortly after implementation.

A government should determine what tier it is likely to do business with in order to focus its search. Larger governments, such as government organizations with operating budgets exceeding $300 million, are likely to use a Tier I firm, while

EXHIBIT 3-2 ▪ Hierarchy of Market Research Questions

- What Tier Will the Government Do Business In?
- Which Vendor has a True Public-Sector Product?
- What is the Vendor’s Financial Viability?
- What is the Vendor’s Long-Term Plan?
- What Type of Technology is Required?
- What Functionality is Offered?
- How is Functionality Delivered?
- Implementation Effort?
- RFI

Independent Industry Research

Marketing Materials

Conversation with Other Govts.
mid-sized local government would tend towards Tier II, and small governments may use Tier III.

MARKET RESEARCH QUESTIONS

After determining what strata of the market the government is likely to do business in, it should focus on the questions it is seeking to answer through market research. Listed below are some of the basic questions that can be answered using a hierarchy (Exhibit 3-2) of research techniques and sources. A well-planned research strategy using this hierarchy may allow the government to more efficiently gather information.

1. Which vendor tier is the government likely to do business with? This is one of the most fundamental questions the government needs to answer because it provides a basis for assigning costs for a subsequent technology investment analysis (see Chapter 4). It will also help create a bid list and help align the expectations of the government with what it can afford. It is not uncommon for a government to begin the procurement process undecided between two tiers—but hopefully it is not undecided among all four tiers!

2. Which vendors offer public-sector solutions? To answer this question, it is important to understand the main differences between commercial and public-sector applications. For example, most public-sector entities seek systems with fund accounting and budget control features. Commercial applications do not necessarily have budget control capabilities in the public-sector sense of “budget checking” each transaction. Some vendors may offer a commercial version and a public-sector version. Other companies use the same version of software for meeting public-sector and commercial sector needs. Still others may only specialize in commercial applications and may seek to do business with those public-sector entities that utilize enterprise fund accounting. Research can help sort out these issues.

3. What is the financial viability of the vendor? The importance of this question is to avoid choosing a company that is financially unstable or one that may lose interest in the public sector. Another reason is to learn more about a vendor’s commitment to future development. Financial performance information to consider includes the company’s balance sheet, price-to-earnings ratio (for publicly traded companies), and its profits. Other factors to consider include research and development spending, earnings on services, and market share within the public sector. Financial information for privately held companies may be difficult to get. Those companies whose stock is publicly traded will usually post their financial audits or annual reports on their Web sites. The report is usually located in the financials area or in the press information area on the firm’s Web site.

4. What are the long-term development plans? The firm’s long-term development strategy is an important gauge to assess the cycle for system obsolescence. It does not make sense to purchase a software product that lacks a firm’s commitment to keep pace with technology standards. For example, companies that have no plans to offer versions of their products in client/server or Web-based formats are not a
good bet. Neither are those vendors that rely on proprietary database platforms or hardware. The annual and 10K reports as well as white papers posted on a vendor’s Web site can be good resources to find out more about future development plans.

5. **What type of technology is required?** Administrative systems amass volumes of data and differ on hardware requirements, which can raise storage and network traffic issues. The current trend toward Internet content delivery is dictating network requirements. Enterprise applications are generally flexible in terms of relational database platforms and operating systems. GFOA clients have typically chosen systems that fit within their technology environment and migration plans, but also have an open standards architecture.

6. **What functionality is offered?** This question seeks to determine the breadth of a software firm’s product lines and to what degree the products meet the characteristics of a true ERP system outlined above. Additionally, if the government is interested in a highly specific functional area, such as utility billing or property tax management, it should inquire whether such modules are available either through the main financial software company itself or through a third-party firm. Since many public-sector ERP products are derived from private-sector products, highly specific public-sector functionality may not be available directly from the vendor. Therefore, it is not uncommon for such modules to be offered through a third party.

It is also important to consider how the vendor’s available functionality may be able to meet long-term technology goals of the government, such as CRM or e-commerce. Some Web sites will present “screen shots” of their products, thus allowing potential customers to get a first impression of the software. How a vendor describes its products may also provide users with an idea of whether or not a vendor understands its market needs.

An important sub-component of this question is cost. Market research can help provide the government with a rough idea of the costs of a new system. It is important to realize there are number of factors that would limit the accuracy of pre-RFP cost estimates, such as ambiguity about project scope, the lack of competitive pricing pressures that would be inherent in an RFP process, and the lack of any actual vendor commitment to pre-RFP estimates. Nevertheless, it is useful to obtain a rough idea of potential costs during the needs assessment. Exhibit 3-3 illustrates a cost estimate format for use with obtaining pre-RFP estimates.

7. **How is software delivered?** Vendors will offer various options for how their software is delivered. Currently, top tier vendors are competing to deliver content through the Internet and through wireless technology. Before, emphasis was placed upon a combination of GUI and client/server technologies to deliver content.

Vendors are also beginning to offer their products through ASPs. An ASP will act as a host for the technology required to run the application. A customer will contract with an ASP to run software on servers maintained and supported by the ASP. In some arrangements, the ASP will also provide support and maintenance for the
software application. Pricing can be based on the number of end-users or on trans-
action volumes. The ASP solution is a viable option for customers with little or no
information technology support staff. This option, however, still remains un-
proven in the private and public sectors at the time this book is being written.

8. What level of effort is required to install the software? Implementation is the most
difficult part of a systems project. Components of this question include timeframe
for implementation, staff effort, success rates, and costs. This can be a tricky ques-
tion to answer because vendors will be reluctant to share information on unsuc-
cessful implementations. It is also helpful to know if the vendor does its own im-
plementations or if it relies on implementation partners.

PRODUCT RESEARCH

There are four basic sources of information governments can use to answer ques-
tions listed above: independent industry research, formal requests for information
(RFI), vendor marketing materials and Web sites, and discussions with other gov-

EXHIBIT 3-3 Cost Submission Format for RFI

<table>
<thead>
<tr>
<th>Cost Categories</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software License Fees</td>
<td></td>
</tr>
<tr>
<td>Main Vendor License Fees</td>
<td></td>
</tr>
<tr>
<td>Third-Party License Fees</td>
<td></td>
</tr>
<tr>
<td>Professional Services</td>
<td></td>
</tr>
<tr>
<td>Implementation Services</td>
<td></td>
</tr>
<tr>
<td>Data Conversion and Interfaces Estimate</td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td></td>
</tr>
<tr>
<td>Travel and Other Costs</td>
<td></td>
</tr>
<tr>
<td>Hardware Costs (if any)</td>
<td></td>
</tr>
<tr>
<td>Total Cost During Project Period</td>
<td>$</td>
</tr>
</tbody>
</table>

Maintenance & Support (Years 1–5)

<table>
<thead>
<tr>
<th>Cost Categories</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year One</td>
<td></td>
</tr>
<tr>
<td>Year Two</td>
<td></td>
</tr>
<tr>
<td>Year Three</td>
<td></td>
</tr>
<tr>
<td>Year Four</td>
<td></td>
</tr>
<tr>
<td>Year Five</td>
<td></td>
</tr>
</tbody>
</table>
ernments. These tools are of varying usefulness depending on the questions being asked and the tier the government is likely to do business in.

**Independent Industry Research**

Several organizations publish periodicals, reports, and Web pages that track the ERP and financial system industry. Industry research can provide valuable insight that is not readily available through other channels, as industry researchers are experts in the field and have a high level of access to vendors. Such research can be quite costly, however, and does not have much of a shelf-life, considering the pace of change in the IT industry. Also, industry research is usually not public-sector focused, so it may reference firms that do not have public-sector offerings or not take into account factors that would be critical to a public-sector client, such as poor encumbrance accounting and budget control functionality. Industry research is also focused on upper-echelon ERP firms, so it may be of limited usefulness to governments who cannot afford Tier I or II products.

Independent industry research can be helpful for acquiring materials to simplify and facilitate the procurement process. Research can identify lessons learned, vendor characteristics to look for, and points to address in system procurement. Independent research can be particularly helpful for answering questions 3, 4, 6, and 7. Under some circumstances, it may also be helpful with questions 1 and 2.

**Requests for Information**

Requests for information (RFI) can produce a good deal of information specific to the needs of the government. However, RFIs take time and effort to produce. The quality of an RFI determines the quality of a vendor’s response. An RFI should describe the government’s current system, technology architecture, and preliminary scope and timetable. It should also succinctly summarize the major problems with the current system. Vendors should be asked to provide information on the breadth of product offerings, implementation partners, compatible hardware platforms, client installations, client references, and software/implementation services costs. RFIs should solicit basic background information such as company financial data as well as a list of public-sector clients.

It is important to notify vendors in an RFI that the information provided will be used only for the purposes of making a decision on whether to proceed with the procurement process, in which case a formal RFP would then be issued. They would then have the opportunity to change their responses if an RFP is issued. Vendors that do not respond to an RFI should be allowed to bid on an RFP—unless the RFI is used as a pre-qualification process. As mentioned, RFIs can be useful for obtaining a rough idea of cost, time to implement, and work effort needed. Exhibit 3-3 illustrates what a cost submission format might look like for an RFI. In summary, an RFI can be a useful mechanism for answering many of the questions discussed in this chapter.
Vendor Marketing Materials and Web Sites

Vendor marketing materials and Web sites are useful sources of information. These sources will understandably bolster product capabilities and de-emphasize problems. Nevertheless, such sources can be useful for establishing a basic understanding of issues such as functionality, technological infrastructure requirements, and suitability for the public sector. Internet search engines are good sources, but results can be difficult to sort when searching on phrases such as “enterprise resource planning.” Another option is simply to review advertisements in periodicals such as Government Finance Review to determine which vendors are currently seeking public-sector customers. Professional meetings such as the GFOA Annual Conference also provide a showcase for various vendors who are specifically interested in the public sector. Vendor marketing materials can assist with questions 1, 2, 5, 6, and 7.

Discussions with Other Governments

Communication with other governments can be informal or more structured evaluations of customer satisfaction. Informal contacts with various governments of similar size can be a good starting point to determine which vendors are typically used by like governments. Larger governments who are thinking about using a Tier I or Tier II vendor should contact governments across the nation. Those governments that are considering using Tier III firms would be best served by contacting other governments in their region, as these “niche players” are firms that have limited the territories they serve. More detailed evaluation of references can be conducted once the government’s market research has narrowed the field of potential vendors.

Information exchange with other governments can be both a helpful and confusing source of information. Peer governments are usually willing to cooperate, and can provide detailed information. Yet, the inquiring government has no assurances as to the technical qualifications of the other government staff or their objectivity (they may have had a bad experience with the vendor, for example). Therefore, it is best to inquire through several governments using the same software package to obtain a number of different vantagepoints on software performance. Also, it is a good idea to ensure that the other governments contacted are using the recent versions of the software because there are often important differences between older versions and the latest versions of ERP software packages.

When fact-finding through other governments, it is helpful to have a structured format for questioning. This will impart a greater degree of objectivity and comparability of results. Conversations with other governments can be useful for nearly all the questions outlined in this chapter.
Option #1: Retain Current Systems
The government has the option of maintaining the “status quo” and retaining all current financial and human resource management systems. Among all options, this option may be the least desirable given the unmet needs and process constraints that hamper operational efficiency. Additionally, the government programming staff will continue to develop system enhancements and work-arounds as is currently the case. Departments may also continue to invest in new standalone “best-of-breed” software packages leading to a fragmented IT investment strategy. If this option is chosen, the government will forego process efficiencies and opportunity costs will accumulate as technology increasingly changes business processes in all sectors of the economy.

Advantages
- No New Investment Required
- Hardware Cost Avoidance
- Training Cost Avoidance
- No Disruption of Current Business Processes

Disadvantages
- Software Limitations in Existing Systems
- System Fragmentation
- System Obsolescence
- Inability to Benefit from Advantages of Integrated ERP and the Internet
- High Total Cost of Ownership

Option #2: Pursue a Full ERP Strategy
With this option, the government would purchase and implement a full ERP solution in three phases. Phase I would include core financials (GL, AP/AR, Purchasing, Fixed Assets, Project Accounting). Phase II would include (Human Resources and Payroll). Phase III would install the Fleet Management and Treasury modules.

Advantages
- Single Vendor as the Standard
- IT Efficiencies
- System Integration
- Common Database
- Organizational Discipline
- Audit Trails/Drill-Down Capabilities
- Workflow
- Best Practices Embedded in Software

Disadvantages
- High Up-front Investment
- Long Implementation Timeframe
- High Resource Requirements from Government
- Risk of Implementation Failure
- High Annual Maintenance Costs
MAKING A RECOMMENDATION

After considering the many issues we have covered so far, the evaluator may want to make a recommendation. The recommendation should take into account both the cost issues involved in the potential procurement of a new system (a explanation of investment analysis tools is presented in the next chapter) and the operational improvements realizable with a modern financial system.

### EXHIBIT 3-5  ■ Public-Sector ERP and Financial Software

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Product</th>
<th>Website</th>
<th>Location</th>
<th>Target Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intuit</td>
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<tr>
<td>Consultants, Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oracle</td>
<td>E-Business Suite</td>
<td><a href="http://www.oracle.com">www.oracle.com</a></td>
<td>Redwood Shores, California</td>
<td>Medium – Large</td>
</tr>
<tr>
<td>Mitchell Humphrey</td>
<td>FMS II</td>
<td><a href="http://www.mitchellhumphrey.com">www.mitchellhumphrey.com</a></td>
<td>St. Louis, Missouri</td>
<td>Medium</td>
</tr>
<tr>
<td>Geac Computer Corporation</td>
<td>Geac Enterprise Solution</td>
<td><a href="http://www.geac.com">www.geac.com</a></td>
<td>Ontario, Canada</td>
<td>Medium – Large</td>
</tr>
<tr>
<td>GEMS</td>
<td>GEMS</td>
<td><a href="http://www.scigems.com">www.scigems.com</a></td>
<td>St. Louis, Missouri</td>
<td>Small – Medium</td>
</tr>
<tr>
<td>Microsoft</td>
<td>Great Plains</td>
<td><a href="http://www.greatplains.com">www.greatplains.com</a></td>
<td>Redmond, Washington</td>
<td>Small – Medium</td>
</tr>
<tr>
<td>H T E</td>
<td>H T E</td>
<td><a href="http://www.hteinc.com">www.hteinc.com</a></td>
<td>Lake Mary, Florida</td>
<td>Medium</td>
</tr>
<tr>
<td>Eden Systems</td>
<td>InForum Gold</td>
<td><a href="http://www.edeninc.com">www.edeninc.com</a></td>
<td>Seattle, Washington</td>
<td>Medium</td>
</tr>
<tr>
<td>JD Edwards</td>
<td>JD Edwards</td>
<td><a href="http://www.jdedwards.com">www.jdedwards.com</a></td>
<td>Denver, Colorado</td>
<td>Medium – Large</td>
</tr>
<tr>
<td>Lawson</td>
<td>Lawson</td>
<td><a href="http://www.lawson.com">www.lawson.com</a></td>
<td>St. Paul, Minnesota</td>
<td>Medium – Large</td>
</tr>
<tr>
<td>MainStreet</td>
<td>MainStreet</td>
<td><a href="http://www.mainstreetasp.com">www.mainstreetasp.com</a></td>
<td>Salisbury, Maryland</td>
<td>Small</td>
</tr>
<tr>
<td>Automation Counselors, Inc.</td>
<td>municiPAL</td>
<td><a href="http://www.automationc.com">www.automationc.com</a></td>
<td>Frederick, Maryland</td>
<td>Small</td>
</tr>
<tr>
<td>MUNIS</td>
<td>MUNIS</td>
<td><a href="http://www.munis.com">www.munis.com</a></td>
<td>Falmouth, Maine</td>
<td>Small – Medium</td>
</tr>
<tr>
<td>SAP</td>
<td>MySAP Public Sector</td>
<td><a href="http://www.sap.com">www.sap.com</a></td>
<td>Philadelphia, Pennsylvania</td>
<td>Medium – Large</td>
</tr>
<tr>
<td>Microsoft</td>
<td>NaVision</td>
<td><a href="http://www.navision.com">www.navision.com</a></td>
<td>Duluth, Georgia</td>
<td>Small – Medium</td>
</tr>
<tr>
<td>Sungard</td>
<td>Pentamation</td>
<td><a href="http://www.pentamation.com">www.pentamation.com</a></td>
<td>Bethlehem, Pennsylvania</td>
<td>Medium</td>
</tr>
<tr>
<td>PeopleSoft</td>
<td>PeopleSoft for Public</td>
<td><a href="http://www.peoplesoft.com">www.peoplesoft.com</a></td>
<td>Pleasanton, California</td>
<td>Medium – Large</td>
</tr>
<tr>
<td></td>
<td>Sector</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As we will see in the next chapter, it is impossible to quantify all of the benefits associated with a new system, so a recommendation cannot rely on quantitative reasoning alone. The reality of the situation is that the team conducting the needs assessment, through its considerable efforts to judge the shortcomings of the current system and research the potential benefits offered by a new system, should be able to synthesize a solid recommendation that both makes clear the business case for a new system and sets forth the feasibility of options available to the government. Exhibit 3-4 provides an illustration of how options may be succinctly stated in a needs assessment report. An actual report would provide significant detail on the advantages and disadvantages for each option.

SUMMARY

State and local governments have the mixed blessings of a broad range of financial software products to choose from while simultaneously having to sift through so much information that it can be difficult to reach conclusions. Over the past decade, advances in information technology have substantially improved products and have put some of the most sophisticated features within the reach of the smallest governments. Some of the high-end products are embedded with best business practices from repeated installation at corporate sites. With so many products and sources of information, especially with the expansion of the Internet as a marketing tool, a systematic market research strategy as presented in this chapter can help narrow the range of options. The next chapter examines how information on best practices and market research on costs can be used to evaluate the wisdom of investing in a new system.

Endnotes

4 Lorraine Cosgrove Ware, “By the Numbers,” CIO (April 1, 2002): 36.
CHAPTER 4

Technology Investment Analysis

In the pre-Year 2000 system replacement frenzy, state and local governments were not nearly as pressured to demonstrate concrete benefits from system replacement as they are today. Elected officials are suspicious of spending public money when the benefits are not visible or measurable. Like any other capital investment, technology projects today must be justified in terms of benefits and costs, and ultimately compared against all other competing projects if they are to be funded.

A recent article in CIO magazine stated that for “an increasing number of executives and financial officers, vague promises of productivity enhancements and cost cutting are no longer enough to justify IT’s ever more voracious budgets.” Just how much cost and effort should be invested in measuring something (benefits of technology) that may not be measurable? Technology professionals themselves are divided over the issue of whether IT benefits can be measured. “When you had a new mainframe program that replaced 30 workers, the benefit was obvious,” states one technology consultant. “But with e-business, groupware and expert systems, you’re not doing a head-count reduction, you’re communicating better.” Others argue that benefits can indeed be measured and that there is no such thing as intangibles: “People have made a career out of saying that IT is the exception, that they’re the only ones who can’t do a cost-benefit analysis.”

Whether all of the benefits are measurable or not, given the significant investment that ERP and financial systems require, it is wise for governments to conduct a systematic investment analysis before embarking on the system replacement journey. For many governments, the price tag for a modern, top-tier system can reach millions of dollars after software licenses, hardware upgrades, implementation services, and training. The full cost of a new system can spiral even higher when the government’s own staffing costs are taken into account. The subject of
cost was briefly discussed in Chapter 3; now we will consider the issues of costs and benefits in greater detail and also introduce the tools available to assess the wisdom of investing in a new system. The chapter is organized as follows. The benefits and costs associated with new systems are first presented. Next, we outline the major investment analysis tools. Specific illustrations are then provided that show how investment analysis results can be used to help guide system replacement decisions.

THE BENEFITS OF MODERN SYSTEMS

The benefits associated with a financial management system are either tangible or intangible. A complete analysis should try to account for both types of benefits, since each is important.

Tangible Benefits

There are two major types of tangible benefits to be considered in investment analysis tools: (1) elimination of the costs associated with operating the existing (legacy) system, and (2) staff productivity enhancements stemming from new technology.

Eliminating Legacy System Costs

One of the major benefits of migrating to a new system is the elimination of costs associated with operating the old system and the patchwork of stand-alone systems that support it. A new system eliminates current annual software maintenance fees or other fees paid to consultants that are supporting the system. The government should also include potential increases to legacy system maintenance and support fees in the analysis of costs avoided. Another benefit would be the elimination of staff hours to maintain and support older hardware and operating systems.

A large source of benefits is the elimination of shadow systems. Shadow systems are a variety of homegrown and niche applications designed to extend the functionality of the government’s primary financial management system. These systems commonly take the form of spreadsheets and databases created in popular PC-based programs. Because of integration, new packages often encompass the functionality shadow systems were designed to provide. Reductions of stand-alone systems reduce staff time devoted to maintaining these applications. In the experience of the authors, even small and midsize local governments can have dozens of shadow systems while the number is often in the hundreds for large and complex local governments. For example, a needs assessment found that there were over 300 feeder, back end, and functionally related stand-alone systems in Los Angeles County government.
Staff Productivity Enhancements

The second major benefit of a new system stems from the productivity enhancements to government staff driven by advanced technology features and process reengineering efficiencies. Some of the more important features of a new system include best business practices, ease of navigation for end-users, workflow capabilities, and advanced reporting and analysis tools. While these productivity-enhancing features have obvious positive implications, it can be very difficult to assign a precise number to the productivity boost that the government as a whole will experience. Even with these measurement issues, the government can still account for productivity enhancements in its analysis. Exhibit 4-1 illustrates specific tangible benefits that might occur in an ERP project that includes e-procurement and HR self-service components.

An organization can measure some of these benefits by examining its own business processes for areas of potential savings. For instance, if the HR function is very paper-intensive, then the workflow and document imaging/management functionality of a new HR module might make it possible to reduce headcount. The evaluator should be careful about relying too heavily on potential headcount reductions to justify a new system because it is often difficult to reduce staff in practice. Restrictive clauses in union contracts, the need to get stakeholder acceptance, and a desire to maintain employee morale may all favor a policy of attrition rather than an immediate reduction of headcount through layoffs.

Rather than using blanket assumptions, a more convincing means by which to measure employee productivity gains is to map out the processes that the government feels will improve the most from new system automation. Then the government can identify the specific points at which automation can make improvements. Exhibit 4-2 is an example of a pre- and post-ERP process for procurement. The notations along the side indicate areas in which ERP automation might save the government cycle time and money.

As one might guess, mapping out processes and identifying potential savings can be a very time consuming and costly activity. Process mapping is generally im-

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Finance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A/P - Savings on Purchases</td>
<td>$150</td>
<td>$200</td>
<td>$250</td>
<td>Estimated 2% additional savings</td>
</tr>
<tr>
<td>F/A - Savings on Asset Purchases</td>
<td>$280</td>
<td>$300</td>
<td>$320</td>
<td>Estimated 1.5% additional savings</td>
</tr>
<tr>
<td><strong>Human Resources</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5% reduction in HR headcount</td>
<td>$100</td>
<td>$105</td>
<td>$110</td>
<td>Reduce from 40 to 38</td>
</tr>
<tr>
<td>Reduce recruitment costs</td>
<td>$50</td>
<td>$60</td>
<td>$70</td>
<td>Cut recruitment costs by 15%</td>
</tr>
</tbody>
</table>
practical to conduct as part of a needs assessment. Also, the government may not have the in-house expertise to accurately identify the automation potential that can be offered by the types of systems the government would be considering. A consultant may be able to offer this expertise, but this may entail further costs. Government Finance Officers Association (GFOA) consultants generally recommend that
governments do not expend considerable resources in mapping current and future business process before system procurement. This exercise is generally a part of system implementation. Moreover, if the government has decided to implement a new solution on a “vanilla” basis, the embedded processes in the solution will mirror the future processes of the organization. For that reason, mapping future processes before software purchase can result in wasted effort.

In order to get a general sense of the wisdom of a technology investment, it may be advisable to use a more simplified means of quantifying ERP benefits. This methodology is treated in greater detail later in this chapter, but, briefly, it involves the comparison of a number of productivity enhancement scenarios against the estimated cost. For instance, a moderate productivity increase scenario could assume numbers such as 10 percent (see Exhibit 4-2) productivity increase for those who would use the system directly (e.g., AP clerks), and 2 percent productivity increases for those who would only benefit from the system in a more indirect fashion, such as for inquiry-only users (e.g., a high-level executive). The government could also designate an aggressive (e.g., 15 percent and 5 percent productivity enhancements, for direct and indirect users, respectively) and conservative (e.g., 7 percent and 1 percent, respectively) productivity increase scenario and test the derived benefits of each in separate analyses. All of the figures used in this illustration would change according to the specific organization where the needs assessment is taking place.

EXHIBIT 4-3  □ How Much Is Reengineering Worth?

Public managers may be surprised to hear that ERP will result in an assumed productivity increase of only 10 percent. This is because this 10 percent figure assumes only process automation. ERP implementations are sometimes associated with business process redesign, also known as reengineering. However, the reader should note that the term reengineering is often used with careless abandon in the ERP industry, so what is being referred to as “reengineering” may actually be more akin to simple automation.

Real reengineering differs from automation; the latter uses technology to perform an existing process more efficiently, even if the process itself is not the best process available. Conversely, real reengineering involves a redesign or reinvention of a business process from end-to-end in order to remove inefficiencies, to reorganize employees’ job responsibilities to make best use of their skills, and to take full advantage of the power of ERP software.

Reengineering can result in tremendous increases in employee productivity. A popular example where technology and process redesign work together to reduce costs and dramatically improve customer service can be found among rental car companies. Many now allow customers to pick up the car without waiting in line and permit them to leave the airport within two or three minutes upon arriving at the rental center.

Business process reengineering, however, is an activity that should not to be taken lightly. Undertaking ERP implementation and business process reengineering simultaneously may simply be too much organizational change to absorb at one time.*

Intangible Benefits

A government can also identify a number of intangible benefits of a new system. Intangible benefits generally fall into the following categories:

**Better Resource Control**

As the name “enterprise resource planning” suggests, ERP will enable the government to have greater control over resources. For instance, integration of the purchasing system with general ledger can be used to implement a variety of controls at various levels. The system could issue a warning if budgetary authority is exceeded at the line-item level, but reject any transaction that would cause spending in excess of budgetary authority at the department level. If budget control is not effective under the current system, then an ERP system will produce substantial benefits.

**Enhanced Decision Making**

Another much publicized benefit of a modern system is its ability to enhance decision making by delivering the right information to the right people at the right time. Leading systems should help turn data into information. If lack of real-time data in an organization is hampering decision making, then this area could also be a significant benefit.

**Improved Data Integrity**

It is said that modern technology can help produce “one version of the truth” in an organization through integration, single points of data entry, and quality control features. Modern systems should provide common definitions of data throughout the organization.

Exhibit 4-3 provides some examples of specific intangible benefits as they might apply to functional areas. The fact that they are more difficult to measure does not mean that intangible benefits have less value than tangible benefits. For example, take a large county that has a problem with encumbrance rollovers in its legacy system. At some point, the county may significantly misestimate its fund balance because of this problem. If the current system is failing to the point where it is possible that the data provided for decision support might be wrong, there is a rather compelling case for action, even if it is not possible to quantify the value of this issue.

Sometimes intangible benefits translate quite readily into tangible outcomes. For instance, improved cash flows may result in higher interest yields. These types of benefits are considered intangible because attaching a number to them would require a chain of assumptions. Other intangible benefits, such as improved employee morale, may be quite important, but also very difficult to attach a value to. Attaching assumed dollar values to these types of benefits is probably not advisable as any estimate would be highly subjective and difficult to defend. It is often better to just list the intangible benefits along with a rough order of magnitude of
their value. Fortunately for the evaluator conducting the needs assessment, ERP and financial system benefits are mostly internal to the organization (since these are back-office systems), so the government does not have the difficulty of estimating social or external benefits, as it might with a more constituent-facing system, such as a citizen service Internet portal.

### Measuring Benefits

For any number of reasons, it may not be feasible for the government to conduct a detailed assessment of all of the tangible benefit areas and to determine a quantifiable model of benefits expected. In these cases it is possible to create a simplified

### EXHIBIT 4-4 ■ Intangible Benefits by Functional Area

<table>
<thead>
<tr>
<th>Functional Area</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts Payable</td>
<td>1. Vendor payment status inquiry through Web</td>
</tr>
<tr>
<td></td>
<td>2. Improvement of vendor invoice approval process</td>
</tr>
<tr>
<td></td>
<td>3. Vendor self-service through Web</td>
</tr>
<tr>
<td>Accounts Receivable</td>
<td>4. Improved float through faster collections</td>
</tr>
<tr>
<td></td>
<td>5. Grant billings completed on time</td>
</tr>
<tr>
<td>Budget Development</td>
<td>6. Reduce budget cycle length</td>
</tr>
<tr>
<td></td>
<td>7. Budget analysis/scenario/what-if capabilities</td>
</tr>
<tr>
<td></td>
<td>8. On-line budget preparation (productivity improvement)</td>
</tr>
<tr>
<td></td>
<td>9. Budget document production capabilities</td>
</tr>
<tr>
<td>Fixed Assets</td>
<td>10. Interface between asset tagging and fixed asset module</td>
</tr>
<tr>
<td></td>
<td>11. Reduction to data entry effort via integration with purchasing</td>
</tr>
<tr>
<td>General Ledger</td>
<td>12. Closing process is faster</td>
</tr>
<tr>
<td></td>
<td>13. Depreciation and allocation capabilities</td>
</tr>
<tr>
<td></td>
<td>14. Automation of journal entries</td>
</tr>
<tr>
<td></td>
<td>15. Historical information access</td>
</tr>
<tr>
<td></td>
<td>16. Improved cost and project accounting</td>
</tr>
<tr>
<td>Human Resources</td>
<td>17. Benefits registration via Web</td>
</tr>
<tr>
<td></td>
<td>18. Employee self-service features</td>
</tr>
<tr>
<td></td>
<td>19. Ease management of complex benefit plants</td>
</tr>
<tr>
<td></td>
<td>20. Improve compensation analysis</td>
</tr>
<tr>
<td></td>
<td>21. Improve salary planning and administration</td>
</tr>
<tr>
<td></td>
<td>22. Improve regulatory compliance</td>
</tr>
<tr>
<td></td>
<td>23. Web for recruitment and tracking applicants</td>
</tr>
<tr>
<td></td>
<td>24. Employee safety program administration</td>
</tr>
<tr>
<td></td>
<td>25. Skill sets tracking</td>
</tr>
<tr>
<td>Payroll</td>
<td>26. Management of payroll tax</td>
</tr>
<tr>
<td></td>
<td>27. Automated interface with timekeeping system</td>
</tr>
<tr>
<td></td>
<td>28. Web for payroll stub distribution</td>
</tr>
<tr>
<td>Procurement</td>
<td>29. Vendor registration through Web</td>
</tr>
<tr>
<td></td>
<td>30. Reduction of paper in processes</td>
</tr>
<tr>
<td></td>
<td>31. Faster internal approvals for purchase orders</td>
</tr>
</tbody>
</table>
model for expected benefits. While this model will not have the granularity to identify benefits associated with “micro” processes that support business functions, it can be useful for presenting the government with a general idea of what the quantifiable benefits of the project may be.

The first step is to determine who the beneficiaries of the system will be. Typically, beneficiaries can be categorized as “direct” or “indirect.” Direct beneficiaries are those users that will use the system regularly to complete their work. Administrative employees are generally direct beneficiaries, but field employees may also benefit in the case of inventory management and work order systems. The productivity enhancement assigned to direct beneficiaries will depend on what modules the government intends to install. For instance, if the government is only planning to use core financial modules such as general ledger, purchasing, and accounts payable, and forgo human resources/payroll functionality, then it would be incorrect to assign similar productivity boosts to financial and HR staff. This analysis can become a little trickier as one gets into modules such as fleet management that have the potential to benefit some public works field personnel, but not others.

Another group of beneficiaries could be termed indirect beneficiaries. This group is comprised of managers and other members of the organization who might use the system on an “inquiry only” basis or may not access the system at all, but whose work effort is in some way enhanced by the system. Managers who can make more effective decisions as a result of the greater availability of information and better organization of data are good examples of indirect beneficiaries. Once the government determines the number of direct and indirect beneficiaries, it should group the employees (e.g., financial, accounts payable, HR) and determine an average wage rate for each group of (including costs for fringe benefits), as appropriate. For instance, even if both finance and HR/payroll employees are deemed to be direct beneficiaries, the government may want to consider each separately for analytical purposes, especially if there is the possibility some modules will not be implemented. The government should disaggregate its categories of direct and indirect beneficiaries as much as is practical.

Once the beneficiaries have been established, grouped, and a wage/benefit cost is assigned, benefits can now be calculated. Since it is difficult to determine a precise productivity increase rate, it is recommended that the government create multiple scenarios to represent various productivity increases. For example, the analysis could include a “conservative,” “moderate,” and “aggressive” scenario with ascending productivity increases under each scenario, respectively. In this way, the government can observe the level of benefits of a system under a number of different circumstances. Exhibit 4-5 presents an example of such an analysis.

Note that inflation is also included in the scenario in Exhibit 4-5 because wages will presumably increase in future years. If the government has good reason to believe that average wage increases will either exceed or be less than the rate of inflation, then that factor should be used and documented. Also, note that fringe benefits are added on as a percentage to the base wage (i.e., 48 percent in this example).
Governments could also use dollar amounts and/or assign different benefit ratios to different groups, if appropriate. This assumption of productivity enhancements in Year 1 may be optimistic in some instances because the new system may not be in production by then.

Resulting productivity improvements should be primarily measured as staff hours saved that can be reallocated to higher priorities such as front-line service delivery activities. Seldom do new financial systems lead to immediate workforce reductions. As a more general point, staff reductions should not be emphasized as the principal business case rationale for a new system for several reasons. First, if employees view the new system as a threat to their jobs they are likely to resist its implementation, thereby increasing the risk of project failure. Second, workforce reductions can be very difficult to realize in the public sector, where rigid labor contracts are the norm. As a final point, productivity improvements are not cash gains—they will not directly finance the new system. Ultimately such systems can be labor saving but any hard monetary gains will take time to achieve through events such as workforce attrition and the gradual “unplugging” of shadow systems.

EXHIBIT 4-5 ■ Measuring Employee Productivity Gains

“Moderate” Productivity Improvement Scenario

<table>
<thead>
<tr>
<th>Personnel Productivity</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Beneficiaries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 Human Resource Employees</td>
<td>$168,081</td>
<td>$173,123</td>
<td>$178,317</td>
</tr>
<tr>
<td>114 Finance Employees</td>
<td>$720,826</td>
<td>$742,451</td>
<td>$764,724</td>
</tr>
<tr>
<td>35 Purchasing/Warehousing Employees</td>
<td>$214,949</td>
<td>$221,398</td>
<td>$228,040</td>
</tr>
<tr>
<td>Indirect Beneficiaries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 Other Management Employees</td>
<td>$84,317</td>
<td>$86,847</td>
<td>$89,452</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,188,173</strong></td>
<td><strong>$1,223,819</strong></td>
<td><strong>$1,260,533</strong></td>
</tr>
</tbody>
</table>

**Assumptions**

10% = Direct beneficiary productivity enhancement rate
2% = Indirect beneficiary productivity enhancement rate
$22.75 = Average hourly rate for HR employees
$20.54 = Average hourly rate for finance employees
$19.95 = Average hourly rate for purchasing employees
$27.39 = Average hourly rate for other management employees
2,080 = Hours per worker per year
3% = Inflation
48% = Fringe benefit add-on percentage
COST FACTORS TO CONSIDER

There are a number of cost factors associated with the implementation of a new system. Costs are generally easier to quantify than benefits because most costs involve a measurable financial outlay. The major areas of cost associated with new systems relate to software licensing fees; implementation consulting services; training; travel and other start-up costs; internal staffing costs; hardware; and maintenance and support. Only the last three cost factors are ongoing costs, while the remaining cost factors are one-time, project costs. The cost factors will now be examined using this dichotomy of project and on-going costs.

Project Cost

Most project costs are readily quantifiable. Many governments, however, will not have concrete bids in place during the needs assessment phase. Therefore, it will be necessary to obtain estimates. There are two basic means of obtaining estimates: vendor quotes and benchmarking using other governments. Vendor estimates may be problematic because software and services firms may underestimate costs to prevent the potential customer from getting sticker shock. Cost estimates based on information from other governments are helpful because these are based on actual experience in the bidding and contracting process. But information from other governments is not likely to be entirely comparable because of differences in modules purchased, number of users, implementation timeframe, internal staffing or even technology architecture. Given these issues, the government should be sure to get a number of quotes from different vendors and to examine the parameters (e.g., user counts, number of staff hours by government staff) to extrapolate based on the information collected. Listed below are the components of the total financial outlay a government will typically face to procure a new system.

Software Licensing Fees

Software licensing fees are the most basic element of project costs. It is fairly simple to obtain an estimate on software license fees from software firms based on their list prices. However, firms often employ an array of discount schemes in order to compete and frustrate pricing comparability between customers. Thus, list price estimates will seldom reflect what the end result of bidding and negotiations may produce. While some firms may offer site licenses, with pricing based on a jurisdiction’s population or the operating budget, recent industry trends have been towards licensing software based on the number of users. This “benefit principle” of charging customers based on proxies for usage generally falls under the two approaches discussed below.

Approach 1

Named users are those who have access and transaction processing rights based on a specific user name in the system (e.g., “Jane Doe”). In vendor licensing schemes,
named users are sometimes associated with more intense transaction processing needs but this pattern is not common enough to be considered a rule.

*Concurrent users* are those who may access the system on an as needed basis, so that the government may have any number of users on the system at any time, equal to the total number of concurrent users. In other words, the government may have a total number of “users” greater than the number of licensed concurrent users, but no more than the total number of licensed concurrent users can be using the system at any one time.

**Approach 2**

*Intensive users* include staff such as accounting clerks and buyers who may be accessing the system on a constant “heads down” basis. These are the most expensive user type from a licensing standpoint.

*Limited users* include government executives who use the system for inquiry purposes or for limited functions, such as electronic approvals in a workflow-based transaction.

It is important to understand these approaches and the distinction between the two as the software licensing approaches employed by software companies change over time. The government may find that in the same bidding process one vendor’s structure is similar to Approach 1, while another’s is similar to Approach 2, while still others are a combination of both.

**Other types of users.** The advancement of technology has expanded the opportunity to decentralize work throughout the organization and thereby streamline processes. A good example is that of employee-self service, where employees check their own personal information stored in the system for HR or payroll purposes (e.g., pay stubs). Each individual who “touches” the system must have a license, including employee-self service users. Another example would be outside vendors who are allowed to access the system via the Internet to check on payment status. Software companies usually have specific license designations to deal with these types of situations. Such “Web users” are another category that some software firms charge customers for.

Governments should have a fairly clear idea of how many users fall into each category in order to get the most accurate price estimate possible. Other information that software firms may need to provide an estimate includes the number of full-time employees, the number of active vendors/customers maintained, and the size of the government’s operating budget.

**Implementation Services**

Implementation services are often the largest component of new system project costs. Implementation services are usually one to ten times the cost of the software license, with the variation explained partially by differences in vendor pricing structure, but mainly by complexity of the software, size of the installation, and structure of the implementation effort. Structural factors that can influence the cost
of implementation include whether it is phased or concurrent (phased is usually 
more expensive since consultants must remain on-site for a longer time period); the 
level of government involvement (placing more work on consultants, which drives 
up cost); the number of modules being implemented; the amount and difficulty of 
customization; interfaces and data conversion; and the degree of process change 
desired by the government (it will cost more to redesign key processes and deploy 
additional workflows). The government should have a clear understanding of the 
financial and staff resources it is willing to commit to the project as this will deter-
mine its positioning on these factors.

Implementation estimates for services may be helpful, but will be less accurate 
than the license fee estimate. Firms may not always cooperate on estimating imple-
mentation, as there are far more variables in determining cost (e.g., extent of data 
conversion effort, number of interfaces, level of training being requested, work ef-
fort provided by government). The government should also try to get an estimated 
hourly rate from the vendor if possible, which is important for scenario analysis in 
cost estimation as illustrated further in this chapter.

Training
Train-the-trainer is the standard training approach where the vendor trains the 
core project team, who then, in turn, will train end-users. Under this approach, 
training costs are at least 10 percent to 20 percent of implementation services. It is 
important to include this cost item as it is often overlooked, but critical for the suc-
cess of the project.

Travel and Other Start-Up Costs
Travel and start-up costs can range 10 percent to 20 percent of implementation ser-
dices. Benchmarks are difficult to establish for travel and training because charac-
teristics of projects vary. For example, a city that chooses a regional implementation 
services firm should face lower costs. Similarly, a government in a more remote lo-
cation outside a metropolitan area may face higher costs. Other start-up costs in-
clude the outlay for a consultant to help procure and negotiate with ERP and finan-
cial system vendors.

Hardware Acquisition
The government may have to acquire new hardware to run the application. For ex-
ample, if the government currently operates in a mainframe environment, it may 
have to move to a Web-based or client-server environment to utilize many of the 
modern ERP software packages. These packages might require the purchase of a 
database server, application server, Web servers, and powerful desktop computers. 
Even if a government already has client-server as a standard, it may have to acquire 
additional servers, or upgrade its servers and other network components. Finally, 
it may be necessary to purchase a full or “run-time” (whose permitted use is only 
for the new application) database license. The magnitude of hardware costs is
largely dependent on how advanced the government’s current infrastructure is and the requirements of the new financial system.

**Internal Project Staffing Costs**

A significant cost of implementing an ERP system relates to internal project staff. Implementation requires a substantial effort on the part of the government’s staff, often requiring hours equal to, if not greater than the implementation consultant’s hours. In fact, GFOA consultants recommend a 50/50 split in implementation effort between the government and implementation firm during the project.

How should the cost of internal staff be estimated? Typical positions on a government’s implementation team include the project manager, functional leads (often, one for each module), change manager, training manager, documentation specialist/secretary, technical lead, and database administrator. Governments should put their best people on the project, so the rates assumed for project team members should reflect this fact. Thus, if a government starts with an average wage and salary rate for specific classes of individuals and increases this by a percentage, this figure should serve as a reasonable estimate. A fringe benefit cost factor would be applied to this amount to calculate full costs of a staff member.

Another factor to consider is the cost of “backfilling” staff positions so that the tasks they used to be responsible for will be taken care of. This might require temporary help, funding overtime costs, or hiring full-time personnel.

Finally, the government will also have to put in effort beyond the system implementation tasks. For example, the new system may require the development of new policies and procedures. It could be that the system permits employees with ability to access and manipulate data that they did not have previously, requiring the organization to develop new internal control policies and security procedures.

**Other Costs**

The government may wish to build in a contingency into the analysis to cover things such as unanticipated data conversions, interfaces, customizations, or unexpected costs related to meeting the government’s staffing requirements. Contingencies should be considered by all governments, but are especially appropriate for larger, more complex projects. Contingency funds are typically 10 percent to 20 percent of implementation services costs.

Facilities costs may be another factor to consider. Especially, in larger implementations the government may have to provide a significant amount of space for the project team members to work together effectively.

A brief recap of how to use the foregoing information to construct a cost estimate for start-up costs includes the following steps:

1. Obtain estimates of license fees from software firms and other governments using number of anticipated users and number of modules as a basis.
2. Estimate implementation cost based on the expected parameters of the implementation. For example, a big-bang implementation, with minimal process reengineering and a high level of government staff involvement, will have a lower implementation cost. The implementation costs will increase with a phased approach, increased customization, data conversion, and interfaces.

3. Estimate travel at 10 percent to 20 percent of services costs.

4. Estimate training at 10 percent to 20 percent of services costs.

5. Estimate internal project staffing cost by multiplying an internal staffing hourly rate by the anticipated number of hours to be spent by the government in the implementation.

6. Determine whether there is need for a contingency fund and how large it will be.

To estimate project costs it is useful to have knowledge of software pricing metrics. Generally, a ratio of costs between different aspects of an implementation can serve as a rule of thumb, though some variation is possible and likely due to differences between firms and governments. Exhibit 4-6 illustrates this ratio (please note that this ratio includes only the financial outlays paid out to vendors and does not include staff effort costs).

**On-Going Costs**

*Software Maintenance and Support*

After installation of the software, the government will pay an annual fee to the vendor for maintenance and support. These services typically include hotline support,
bug fixes, patches, and periodic upgrades. First-year maintenance and support is usually priced at 17 percent to 22 percent of the license fee. This is a fairly standard industry benchmark, so actual maintenance and support fees will not vary much from this level. Governments should also assume an annual increase in the maintenance and support fee at least equal to the rate of inflation and may wish to choose a higher level for the purpose of producing a conservative analysis.

**On-Going System Administration**
A new system requires that government IT staff expend considerable effort to maintain it. A database administrator and security administrator will be needed for ongoing support purposes. If the move to a new system required the government to make significant IT infrastructure improvements, then new network administration capabilities may be needed as well. How much additional cost will be dependent primarily on the current capabilities of the government IT staff, and how sophisticated a system the government is going to use. An ERP system will require an on-going effort to train existing employees on how to better leverage the capabilities of the software. Also, new employees will have to be trained on how to operate the system. If the government can develop an in-house capacity to do this training, it will reduce expenses on training, but will still require additional internal resources above what would normally be required.

**Infrastructure Maintenance**
As the organization begins to get more and more value out of its new system, the technology infrastructure required to support it will increase. More users may need to be added or more access points to system information may be required. New versions of the software may also allow the government to take advantage of technology advances. These advances may require an update of hardware. For example, enabling mobile access to an ERP system (such as through PDAs or cell phones) might require infrastructure improvements.

The government will have to do its best to estimate hardware maintenance costs as well as any additional personnel costs, based on a realistic assessment of the current quality of their technical infrastructure and the magnitude of the upgrade that can be expected. System vendors are often flexible on hardware requirements and will avoid getting involved in estimating hardware costs. The government can use its own preferred hardware provider for estimates based on the new system’s requirements.

If the government is considering using an application service provider (ASP) to deliver the new solution, this will have to be taken into account during the analysis, as an ASP may allow government to avoid a significant portion of ongoing technology staffing and hardware costs or provide a mechanism to spread the project costs over a longer horizon.
Opportunity Costs
This is the cost of not proceeding with the next best alternative. Usually, for the sake of simplicity, the next-best alternative is considered to be the investment of the funds at the tax-exempt yield available to the government. Opportunity cost can be captured by applying a discount rate to streams of benefits and costs, as shown later in this chapter.

Other On-Going Costs
Most software firms offer periodic upgrades to their products to fix errors and introduce new functionality. Occasionally, firms will release a major version upgrade (i.e., going from version 5 to 6 as opposed to going from version 5.1 to 5.2). Major version upgrades often include significant functional or technical feature enhancements, thereby extending the useful life of the software. Most of the companies provide access to both minor and major upgrades for no additional charge as long as the government is paying annual software maintenance. Also, companies typically discontinue support for older versions of the software after approximately 18 months. For these reasons, most governments will want to implement these upgrades. However, major version upgrades can be complicated activities because they may over-write customizations the government made to the older version. In cases where the government has made significant changes to the software, it may require consulting assistance to migrate these changes to the new version, or even to help train the government staff in new procedures. Consulting assistance with major version upgrades can cost approximately 5 percent to 20 percent of the amount originally paid for implementation.

Another source of ongoing cost is the purchase of additional licenses as the user base grows. The government should be careful only to include the cost for additional user licenses for employees using the software within the scope contemplated by the needs assessment. For instance, if the needs assessment is considering a basic implementation consisting of core financial and human resources modules, additional user licensing costs in future years should only be for core financial and human resource users. If the government wants to implement employee self-service HR functionality five years or so after initial implementation, it should not include the licensing cost for self-service users in its analysis because such functionality would presumably entail a number of offsetting benefits as well. Adding this dimension would confound the analysis. The government would probably be best served to focus the business case on core financials and HR, deferring the decision on other modules until the new system has been implemented.

MAJOR INVESTMENT EVALUATION TOOLS
With an understanding of the benefit and cost drivers associated with ERP and financial system projects, we can now introduce tools that use this data to aid deci-
sions concerning system replacement. There are four major technology investment analysis tools that governments have to evaluate their system options:

1. Cost analysis (CA);
2. Total cost of ownership (TCO) analysis;
3. Net present value (NPV) analysis; and
4. Return on investment (ROI) analysis.

**Cost Analysis**

CA is the simplest (and most limited) of the four tools. CA compares the costs of procuring a new system with the costs of retaining the current system. A new system may impose costs such as additional hardware. The existing system may entail large mainframe maintenance costs. For example, a county government may be

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**EXHIBIT 4-7  Cost Estimation Guidelines**

The following guidelines are presented simply as “rules of thumb” to estimate project costs during a needs assessment process. Market conditions and business models could change, thereby increasing or decreasing some of the parameters provided below.

- Consulting “blended” hourly rates should be between $130 and $190 per hour (in 2002).
- The contingency fund for the project should be **10 percent to 20 percent** of the total consulting services.
- Annual software maintenance should be **about 18 percent of net license fees** (i.e., license fees after any discounting).
- Annual increases in the maintenance charge should be estimated at **CPI + 2 percent** (e.g., if CPI were 3 percent, the government should expect a 5 percent annual increase).
- Travel and reimbursable expenses should be **approximately 10 percent to 20 percent** of total consulting services.
- Training should be **approximately 10 percent to 20 percent** of total consulting services.
- Change management activities (other than training) should be **about 5%** of total services.
- Hours dedicated to core financials implementation (GL, AP, AR, PO, FA) should be **roughly equal** to the hours devoted to human resources/payroll.
- Consulting services can range from **approximately one to ten times** the software license fees. Larger governments will tend to experience implementation costs that are many times the software license fee. This is because larger governments have more complex needs and business processes and that the software larger governments would use is more flexible, and, thus, requires more effort to configure. For very small projects, implementation costs may equal the cost of software licenses or even less if the government is installing the software primarily on its own.
- The government and consultant hours devoted to the project should be **roughly equal**. However, for less flexible and functional products (i.e., Tier III, and, in some cases, Tier II) a coaching approach may be feasible where the government does the vast majority of the work and the vendor performs a more limited role. Such a role may be possible because these products are much less complex, so extensive work effort is not required to configure them.

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able to purchase a new system (software and services) for $3 million with maintenance costs of $150,000 per year. If that government retains its existing system, it may face a maintenance cost of $110,000 per year and $412,000 per year for hardware leasing. The government would use this information to assess whether a new system is justified given the cost.

**Total Cost of Ownership Analysis**

Technology investments have short-term costs (e.g., software and services) as well as long-term costs (e.g., a new position for database administrator, more frequent upgrades requiring additional consulting). The TCO measure was developed to take into account both types of costs. Implementation costs (hardware, software, services, and internal staffing) would be added to post-implementation costs (maintenance and support fees each year, functional and technical staff support, consulting services to install upgrades) to determine TCO.

**Net Present Value Analysis**

NPV analysis seeks to correct inherent weaknesses in the “costs only” emphasis in methods such as CA and TCO. To use NPV, a government would identify the benefits and costs associated with a new system and discount these values over its useful life. The term *discount* represents the use of an interest rate that is used to convert future streams of benefits and costs into current dollars. NPV generates a single number that can be used to evaluate competing alternatives. For many state and local governments, financial systems last at least seven to ten years. If the NPV is positive, it suggests that a system investment is justified. However, there may be a host of other projects with a bigger social impact than a financial system (e.g., development of a senior citizens center). In short, just because a NPV project has a net benefit level greater than zero, does not necessarily imply that the project should be funded. Instead, it is ultimately a political process to decide whether financial systems take priority over other projects facing elected officials and government executives.

**Return-on-Investment Analysis**

ROI analysis attempts to identify the precise rate at which a project’s NPV is zero. The ROI technique is similar to the internal rate of return (IRR) technique in the corporate finance literature. Like NPV, ROI takes into consideration costs and benefits over multiple years but rather than providing a single NPV, it presents multiple NPVs at different rate levels. An ROI analysis does not really generate a government’s discount rate; instead it “calculates a kind of minimum standard that a government’s discount rate would have to meet, in order to break even.” For example, if an ROI analysis shows that an ERP project would break even at a rate of 13 percent, and the government’s discount rate was 3 percent, the project would yield a positive ROI. An illustration of ROI is provided in Exhibit 4-10.
ANALYTICAL TOOLS

We will now illustrate how tools such as NPV and ROI can be used to guide system replacement decisions.

NPV Analysis Illustration

Exhibit 4-8 presents a general formula for NPV analysis. The first step when using either NPV or ROI is to calculate the stream of costs and benefits of the project over its useful life. Exhibit 4-9 shows this calculation for an eighteen-month, “big-bang” type of implementation and presents a ten-year model of costs and benefits associated with an ERP investment.

Several assumptions are used in this analysis. First, the government does not believe it will incur very large hardware and upgrade costs as a result of migrating to a new system. It is also assumed that the government will not budget contingency resources, that it does not need consulting assistance for software upgrades during implementation, and does not experience growth in its user base sufficient to necessitate the purchase of a significant number of additional licenses. These are all simplifying assumptions that could easily be handled by the model presented here.

There are a few specific points worth noting in the illustration shown in Exhibit 4-9. First, benefits do not begin accruing until Year 2 since the ERP system has not been installed. Also, only partial benefits are accruing in Year 2, since this is an 18-month implementation (i.e., the first half of Year 2 is still spent installing the software). Also note that part of the cost of the implementation is allocated to Year 2. This division of cost and benefits within years might also be needed in a phased implementation, though it may be somewhat more complicated because some modules will “go live” (and start delivering benefits) before others. In most phased implementations, financial modules typically “go live” first with human resources next, sometimes followed by a third phase consisting of modules such as grant management or work orders. It should also be noted that in implementations that involve extensive business process reengineering (see Exhibit 4-3 for what reengineering entails), there might actually be productivity dips right after go-live as the entire organization struggles with the learning curve related to the newly designed processes.

The illustrated systems project has a total net present value of $1.34 million (under the assumptions of a “moderate” productivity increase and a discount rate of 5 percent). Because the model can be highly sensitive to small changes in assumptions (e.g., productivity and discount rate), it is a good idea to provide a number of scenarios that vary the key assumptions to enable the evaluator to assess the effect.

To preserve comparability, it is important only to change one assumption at a time in each scenario. For instance, if it is decided to provide “conservative,” “moderate,” and “aggressive” productivity scenarios under discount rates of 5 percent and 7 percent, then the analyst would recalculate the NPV for each discount rate for each scenario, for a total of six scenarios. Of course, choosing to vary more and
more assumptions will result in exponential increases in the number of scenarios produced.

ROI Analysis Illustration

Exhibit 4-10 shows a completed ROI analysis for a moderate productivity increase scenario. Although the calculation of costs and benefits is not shown as in Exhibit 4-8, the ROI analysis uses the net benefits line to perform its calculations.

A government may find it useful to do an NPV analysis for various productivity enhancement scenarios and then perform an ROI analysis for each productivity scenario. This would eliminate the need to produce extra NPV analyses for varying discount rates. In this illustration, the ERP investment turned out to be very favorable by producing a positive return even at a discount rate of 13 percent. In real life, this positive outcome might be explained by the fact that ERP systems do indeed have the potential for increasing government productivity. ERP systems are generally expected to have a minimum life cycle of ten years, so benefits are accruing over a substantial time period with the only associated cost being system maintenance fees and additional system support costs in the out years.

The reader should note that the NPV for the 5 percent discount rate scenario ($1,342,432) in Exhibit 4-10 is the same as the total NPV shown in Exhibit 4-9 (the
**EXHIBIT 4-9**  ■ NPV of an ERP System

**Moderate Productivity Improvement Scenario**

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Total</th>
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<tbody>
<tr>
<td><strong>Benefits</strong></td>
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<tr>
<td>1) Costs Avoided</td>
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<tr>
<td>Maintenance of Legacy Systems</td>
<td>100,000</td>
<td>206,000</td>
<td>212,180</td>
<td>218,545</td>
<td>225,102</td>
<td>231,855</td>
<td>238,610</td>
<td>245,975</td>
<td>253,354</td>
<td>1,931,821</td>
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<tr>
<td>2) Personnel Productivity</td>
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<tr>
<td>Direct Beneficiaries</td>
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<tr>
<td>24 HR Employees</td>
<td>-</td>
<td>86,562</td>
<td>178,317</td>
<td>183,666</td>
<td>189,176</td>
<td>194,852</td>
<td>200,697</td>
<td>206,718</td>
<td>212,920</td>
<td>219,307</td>
<td>1,672,274</td>
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<tr>
<td>112 Finance Employees</td>
<td>-</td>
<td>371,225</td>
<td>746,724</td>
<td>787,666</td>
<td>811,296</td>
<td>835,635</td>
<td>860,704</td>
<td>886,525</td>
<td>913,121</td>
<td>940,514</td>
<td>7,171,468</td>
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<td>Indirect Beneficiaries</td>
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</tr>
<tr>
<td>5% Other Management Employees</td>
<td>-</td>
<td>43,423</td>
<td>86,964</td>
<td>92,136</td>
<td>94,900</td>
<td>97,747</td>
<td>100,679</td>
<td>103,700</td>
<td>106,811</td>
<td>110,015</td>
<td>838,862</td>
</tr>
<tr>
<td><strong>Total Benefits</strong></td>
<td></td>
<td>-</td>
<td>611,909</td>
<td>1,260,533</td>
<td>1,298,349</td>
<td>1,337,299</td>
<td>1,377,418</td>
<td>1,418,741</td>
<td>1,461,303</td>
<td>1,505,142</td>
<td>11,820,997</td>
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<tr>
<td><strong>Costs</strong></td>
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<tr>
<td>1) Initial Project Costs</td>
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<td>Software Licensing Fees</td>
<td>350,000</td>
<td>175,000</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>525,000</td>
</tr>
<tr>
<td>Implementation Consulting Services</td>
<td>1,050,000</td>
<td>525,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>1,575,000</td>
</tr>
<tr>
<td>Training</td>
<td>80,000</td>
<td>30,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>90,000</td>
</tr>
<tr>
<td>Travel &amp; Other Reimbursables</td>
<td>125,000</td>
<td>62,500</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>187,500</td>
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<tr>
<td>Government Implementation Effort</td>
<td>266,025</td>
<td>133,013</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>399,038</td>
</tr>
<tr>
<td>Hardware</td>
<td>472,500</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>472,500</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td>2,383,025</td>
<td>987,988</td>
<td>616,849</td>
<td>647,891</td>
<td>680,076</td>
<td>714,080</td>
<td>749,784</td>
<td>787,273</td>
<td>826,636</td>
<td>867,968</td>
<td>9,261,169</td>
</tr>
<tr>
<td><strong>Net Benefit/(Cost)</strong></td>
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<tr>
<td>(2,383,025)</td>
<td>(376,079)</td>
<td>643,684</td>
<td>650,658</td>
<td>657,224</td>
<td>663,399</td>
<td>668,957</td>
<td>674,030</td>
<td>678,506</td>
<td>682,328</td>
<td>2,559,622</td>
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<tr>
<td><strong>Net Present Value</strong></td>
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</tr>
<tr>
<td>(2,383,025)</td>
<td>(376,079)</td>
<td>583,840</td>
<td>562,063</td>
<td>540,699</td>
<td>519,743</td>
<td>499,186</td>
<td>479,021</td>
<td>459,239</td>
<td>439,835</td>
<td>1,342,432</td>
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</tr>
<tr>
<td><strong>Accumulated NPV</strong></td>
<td>(2,383,025)</td>
<td>(2,741,195)</td>
<td>(2,157,355)</td>
<td>(1,595,292)</td>
<td>(1,054,593)</td>
<td>(534,850)</td>
<td>(35,663)</td>
<td>443,357</td>
<td>902,597</td>
<td>1,342,432</td>
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**Assumptions**

10% Direct Beneficiary Productivity Enhancement Rate 2,080 Hours per worker per year
2% Indirect Beneficiary Productivity Enhancement Rate 3% Inflation
21.75 Average hourly rate for HR employees 1.48 Fringe Benefit Add-on Rate
20.54 Average hourly rate for finance employees 5% Annual ERP Maintenance & Support Fee Increase
19.95 Average hourly rate for purchasing employees
27.39 Average hourly rate for other management employees 5% Assumed Discount Rate

Additional, but Intangible Benefits
- Ability to control the budget at the division level, thereby improving control of resources.
- Better data quality, including the ability to engage in activity-based costing, thereby better positioning the organization to evaluate outsourcing opportunities.
- Automation of routine tasks will allow employee jobs to be expanded and enriched to include more valuable decision support activities. Job expansion and enrichment will improve morale, thus making it easier to retain employees and attract high quality recruits.
under the “total” column in the grayed “Net Present Value” line), which also assumed a 5 percent discount rate. This relationship would hold for any of the other discount rates in these two analysis tools.

Of course, some of the assumptions made in this example may not hold true for other governments, which would lead to different results. For instance, this example assumed the government was relatively up to date technologically and therefore it would not incur very large hardware or IT personnel upgrade costs as a result of this project. A government that has an obsolete technology environment may actually incur substantial hardware and IT personnel costs with an ERP project.

Additionally, the government in the example did not grow its user base substantially and therefore did not have to purchase additional licenses in future years. This government also did not have a complex configuration so as to require outside consulting assistance to perform system upgrades.

On the benefits side, governments may have average wages for their financial or human resources staff that are less than what is used in this example. If this were the case, the benefit values associated with a productivity boost would not be as great. It is important to remember that these estimates are not meant to serve as indicators of cash inflows. Finally, it is important to have a solid rationale behind the time period chosen to represent the useful life of the system (Exhibit 4-11).
SUMMARY

The cost of a new systems project can be quite substantial, often reaching millions of dollars. Therefore, a government seeking to establish a business case would want to investigate the wisdom of such an investment through the use of decision tools such as NPV and ROI analysis. The benefits of a new ERP system generally stem from staff productivity enhancements and elimination of legacy system maintenance costs. The additional costs imposed by system replacement include licensing fees, training, implementation services, travel, internal project staffing, hardware costs, and software maintenance costs. The costs and benefits can be estimated with some accuracy by making use of the government’s own information, information from other governments who have completed similar projects, and estimates from the ERP software and service vendors themselves.

This information and the analytical decision tools described in this chapter can be used to construct a number of different scenarios to demonstrate the viability of the ERP project under variable conditions. Governments attempting to use the decision tools in this chapter need to be realistic about the extent of resources to invest in measuring the various parameters in the model. Such measurement efforts reach a point of diminishing returns very quickly (i.e., an additional $20,000 in consulting or staff effort may not materially increase the precision of the estimates). It is often
sufficient that the tools presented here be used as a heuristic to help frame the discussion on whether there is a sound business case for investing in a new system.

Endnotes
1 Tracy Mayor, “Value Made Visible,” CIO (May 1, 2000): 126.
2 Ibid, 128.
3 Ibid.
6 GFOA consultants generally recommend that larger governments insist on enterprise licenses for ERP and financial system software.
8 In reality, the costs may not be evenly divided over the course of the implementation as assumed in this analysis, because most vendors have a strong preference for front-loaded contracts.

EXHIBIT 4-12 ■ Estimating ROI at a Large School District

Houston Independent School District (HISD) is the seventh largest school system in the nation, having 30,000 full- and part-time employees, serving 207,000 students, and spanning 312 square miles. HISD faced the challenge of a diverse and growing population, which meant that district staff needed to spend less time on administrative duties and focus more on student needs.

According to ROI Report, an internal rate of return of 42 percent was realized on HISD’s $10.1 million technology investment. How was this achieved? Benefits included automation of the procurement process, inventory reduction, improved performance measurement, and real-time information access. Real-time information allows school principals to track funds flow more accurately and make better decisions. Timely access to payables information allowed the District’s Accounts Payable department to manage their aging schedule more effectively. Warehouse inventories were also reduced as a result of more timely information. The transportation parts inventory was cut nearly in half. Overall, the District’s inventory reduction has exceeded $1.1 million. Enhanced analysis capabilities related to transportation contracts resulted in a $1 million warranty claim against a vendor.

Savings were also realized in HISD’s purchasing activities. The procurement process was automated, yielding savings of 50 percent per purchase order processed—with savings in excess of $5,500 each day. The automated purchasing process has also made it easier for the District to find supplies and parts at a lower price.

Prior to implementing the ERP system, HISD had no basis for measuring and evaluating the performance of business units. The ability to track performance metrics has allowed HISD to impose new standards for accountability. The ERP system’s scheduling program has allowed HISD transportation department to cut expenses by 2 percent and still increase its student riders by 9,000.

Note: HISD implemented SAP as its ERP system.
Once the needs assessment is completed, and if the government has decided in favor of a new system, it is time to examine the steps to acquiring and installing the system. Procurement and implementation activities are certainly not simple undertakings, so it is necessary to have a sound project plan for the successful execution of these processes.

Procurement of a financial system is a challenge for a number of reasons. The industry itself is complex with many different companies selling software products of varying capabilities that are changing every few months. Governments also have much more experience in procuring commodities and less experience in the area of intangible, intellectual-property assets that can take months or years to implement. Third, finance directors and/or technology staff often find themselves in a position to choose a system that impacts the operations of areas that they may have little expertise in (e.g., fleet management). Therefore, the government must carefully design and communicate its procurement strategy early on to make sure that stakeholders have input from the very beginning of the procurement process.

PROCUREMENT STRATEGY

A procurement strategy involves deciding the steps and timetable to acquire a new system. The Government Finance Officers Association (GFOA) publication *A Guide to Preparing an RFP for Enterprise Financial Systems* covers the preparation of an RFP and evaluation of vendor responses in some detail, so these factors will not be covered in depth here. Briefly, however, the seven major steps in establishing a procurement process are:
1. **Mobilize Internal Constituencies.** This involves identifying and gaining the commitment of the project sponsor, steering committee, project manager, and users.

2. **Develop a Project Charter.** This is a document that essentially pledges that the various components of the government will work together to complete the project and covers areas such as formal resource commitment, evaluation committee structure, project timeline, and the decision-making process.

3. **Develop a Project Plan.** The plan contains detailed steps on how to complete the procurement phase. The actual implementation is not covered at this point as the implementation consultant is better equipped to do this.

4. **Assemble Major Sections of the RFP Document.** Includes sections such as introduction, general conditions, technology and system-wide requirements, functional requirements by module, mandatory submittals, and standard attachments. Much of the work done for the needs assessment can form the foundation for the construction of the RFP, especially the technology and system-wide requirements.

5. **Issue RFP and Communicate with Vendors.** This includes activities such as a pre-proposal submission conference to answer questions about the proposal and other typical administrative duties associated with the issuance of an RFP.

6. **Evaluation of Proposals.** Once proposals are received they can be evaluated with tools such as “fit-gap” analysis of functional capabilities, reference checks, cost analysis, and site visits.

7. **Contract Negotiations.** Once a finalist vendor has been identified, a software license agreement, implementation services agreement, and statement of work must be constructed.

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**IMPLEMENTATION READINESS ASSESSMENT**

Governments undertake implementation readiness assessments either before deciding to purchase a new system or immediately afterwards. The discussion here assumes that governments have already decided in favor of a new system and are using the readiness assessment activities to maximize their chances of beginning implementation on the right track.

In order to assess the government’s readiness for implementation, it is important to have an understanding of the tasks that will take place during implementation. Both the government and the implementation firm will have some level of involvement in all of these activities. It is important that the government be willing to commit the resources necessary to meet its obligations in the contract. Exhibit 5-1 provides a checklist to conduct a readiness assessment.
Despite the tendencies of software companies to refer to their products as “off-the-shelf,” anyone that has implemented ERP would probably say that this phrase severely simplifies the situation. On the one hand, vendors are correct in implying that pre-fabricated software products cost less and are easier to maintain than custom-built packages. However, ERP packages are complicated software

### EXHIBIT 5-1 Implementation Preparation Checklist

#### Pre-Implementation Planning
- Implementation strategy design and finalization
- Developing a high-level implementation plan
- Validating business requirements
- Mapping select current “as is” processes
- Refining hardware and software requirements
- Assessing needs for software customization, data conversion, and interface development

#### Technology Support
- Installing, testing and tuning the “vanilla” development software
- Assessing the technical architecture and platform
- Defining the production environment
- Architecting the system topology and data distribution
- Selecting the hardware and system support software (e.g., databases, operating systems)
- Preparing the production system and all supporting environments
- Interface design, development, and testing
- Data conversion planning, design and execution
- Performance testing and system tuning
- Disaster recovery and contingency planning

#### Implementation Services
- Installing, testing and tuning the “vanilla” production environment software
- Designing and mapping new processes
- Fit-gap analysis to facilitate reengineering effort
- Developing and documenting new operating procedures
- Configuring the new enterprise software
- Developing and mapping the chart of accounts
- Designing data models and reports
- Setting up security profiles
- Testing and resolving software issues
- Preparing for go-live
- Providing for post-implementation support

#### Training and System Maintenance Services
- Assessing training needs and developing a training strategy
- Developing training materials
- Conducting training sessions
- Assessing training impact and retraining needs

#### Engagement Administration
- Tracking the project budget and timeline
- Resolving issues
- Providing overall project management
- Independent quality assurance (especially for large projects)
programs that can be configured in thousands of ways, requiring the consumption of thousands of hours to complete, and have far reaching implications for the organization’s key business processes. Therefore, implementation of a new system takes a substantial effort on the part of both implementation consultants and the government’s own staff. Before proceeding down the path of system procurement, the government should take stock of what it has learned about its needs through its readiness assessment and structure an appropriate implementation strategy.

**TYPOLOGY FOR ERP IMPLEMENTATIONS**

How should the government structure its implementation? Implementation research has shown that there are two key dimensions in structuring ERP projects—speed (fast or slow) and focus (technical or strategic). In the private sector, pressures from competitors may serve as a push factor in promoting fast implementations (six months to a year). Another reason for fast implementations is sustainability—lengthy implementations can lead to skepticism and an inability to maintain the energy level needed to complete an implementation. The second dimension, focus, categorizes implementations as being driven by technical or strategic considerations. Technical considerations are primarily related to the desire to roll out core functionality without major business process changes. An alternative (and generally desired) focus is a strategic one, which attempts to maximize positive business change and organizational value. In *Mission Critical*, Davenport (2000) develops the typology shown in Exhibit 5-2 based on the dimensions of speed and focus.4

Quick Relief—These implementations are generally the least expensive and try to bring core functionality inadequate in legacy systems up and running quickly. Many organizations adopt this strategy to get ERP a “foot in the door” and plan to later use business process reengineering or to fully roll out other modules. It is unclear, however, the extent to which organizations are successful in having the stamina to come back in the future, get funding, and complete the project. Another motivator behind such an approach is to eliminate potentially crippling deficiencies associated with legacy systems. A good example of this was the widespread imper-

<table>
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<tr>
<th>Speed</th>
<th>Focus</th>
<th>Typology of ERP Implementations</th>
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<tr>
<td>Fast</td>
<td>Technical</td>
<td>Quick Relief</td>
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<tr>
<td>Slow</td>
<td>Strategic</td>
<td>Poor Implementation</td>
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</table>

ative for large organizations to install an ERP system in response to Y2K concerns with legacy systems.

**Quick Advantage**—This option takes longer than the “quick relief” method because it will require some process redesign issues. Because of the “fast-track” speed, it is unlikely that enterprise-wide process changes will be implemented. This option makes sense for organizations that are satisfied with implementing one or two modules and rolling out the system subsequent to that.

**Poor Implementation**—For obvious reasons, no organization would choose *(a priori)* this type of implementation. But organizations can end up here if they take a slow implementation route (three years or longer) and at the same time focus only on technical considerations.

**Long-Term Competitiveness**—This option uses a longer time frame to implement ERP but the reason for stretching out the project is to take full advantage of ERP benefits such as process redesign, implementation of best business practices, and full utilization of leading technology (e.g., Web, Workflow). A longer strategic implementation is also likely to pay more attention to the “human” aspect of change management (e.g., training, communication of new processes).

A government interested in implementing ERP must assess where it fits on this implementation typology. The answer should be apparent from what the government has learned during the needs assessment.

**RISK FACTORS**

New system projects involve large-scale change to the organization. While risk avoidance altogether is simply not possible for ERP or any other major endeavor, it is possible for a government to reduce its implementation failure risk.

Like any complex endeavor, system implementations can fail for a large number of big or small reasons. The first step to managing and reducing risk is to identify it. However, even when risk factors are identified, projects are not necessarily fail-safe. The government must be cognizant of the following implementation risk factors as they relate to the systems project in general, and, to specific vendor proposals. The needs assessment process should contain an assessment of the government’s willingness and ability to do what it takes to mitigate these risk factors.

**Inadequate Implementation Preparation**

To begin the project on time, a number of activities must take place. Facilities planning, design of the technical environment, change management, securing funding and/or financing, and project team staffing decisions are some of the major factors that must be managed to get the project off to a smooth start.

**Unrealistic Timeframe Driving the Project**

Rapid implementations have a unique set of challenges and can be successful if the organization can accept the degree of change required. For organizations slow to
change, such implementations may be unrealistic. Change requires time to assimilate and communicate. Although ERP implementation vendors have developed templates to accelerate implementations, government staff will be challenged by the need to absorb new process changes and learn new technology. Attempting to implement a new system in an unrealistic timeframe will likely result in the government foregoing many of the benefits of the ERP system (i.e., ability to redesign business processes, workflow), which constituted the basis for the original return on investment.

**Poor Implementation Strategy**

This risk factor refers to miscalculating the approach used to roll out the software. While a “big-bang” implementation (i.e., all modules in ERP being configured and put into production at the same time) may decrease the total duration of the project, it is also an approach that is unrealistic for most organizations.

**Identifying Full-Time Staff Resources**

To attain the full benefits of financial systems, many of the government’s core business processes must be redesigned. Such redesign efforts require participation across many departments, bureaus, and functions. As stated above, ERP projects rely on cross-functional teams with subject matter experts from all of the major functional areas.

GFOA’s consultants have found that governments often have difficulty dedicating full-time resources to a project. In separating cases of ERP success from failure, the dedication of full-time staff resources is a major differentiator. In our view, a government must perform at least 50 percent of the implementation work effort if the project is to be economical and successful. This level of resources also increases the chances that post-production (i.e., maintaining the system after it is turned on) is a smooth process. If governments are not capable of providing a critical mass of staffing resources, the risk of implementation failure is real and it is better not to proceed with the project. The readiness assessment should identify likely candidates for the ERP project team. Exhibit 5-3 describes what a staffing plan might look like for an ERP implementation for a fairly large project.

**Inability of Government to Meet the Staffing Requirements of the Project**

Regardless of the design of the implementation, the government will be required to dedicate a significant amount of staff resources to the project on a full-time basis, as stated above. Due to the scope and magnitude typical of ERP projects, the government runs the risk of “shirking” on its commitment by substituting less qualified people or expecting the project team members to do so much of their routine work to the point that their project participation becomes difficult to predict.
## EXHIBIT 5-3  Government Staffing Hours by Month

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*Note: FTE=Hours Per Month/160 hours*
Change Management Needs Not Anticipated

Since the implementation of a new system is going to have a profound impact on the entire organization, it is important for the government to assess the organization’s readiness for change on cultural, environmental, and technical levels. Training, communication of process change, organizational restructuring, and job role analysis are examples of such activities. It is important for the government to avoid following the path of many other organizations that under-invest in this area because of its invisible nature which makes it an easy target for cuts. However, without adequate investment in this area, end-user perceptions of the software are likely to be poor and erode over time.

Bottlenecks in the Issue Resolution Process

System projects inevitably raise many issues that must be resolved if implementation is to proceed. Thousands of questions concerning process changes, chart of accounts, procedural changes, and other issues arise during implementation. Failure to resolve issues in a timely manner increases the overall cost of the project because members of the project team cannot complete their work. An experienced project manager can resolve many of the issues and executive level input is needed for others. In all cases, it is important to have a clearly defined approach for logging and resolving issues to keep a project on track. Implementation firms will increase their risk premium on implementation cost if they assess the environment as difficult for
decision making. The readiness assessment should determine a likely issue resolution process and the government’s willingness to commit to it.5

**System Design Complexity**

Some systems are more difficult to design and configure than other systems. While top-tier ERP packages are considered to be more extensively integrated – which is a plus for functionality – it may be a minus for ease of implementation.

**Project Manager**

The lack of an effective project manager is a major risk in an ERP project. The appointment of a full-time project manager is an essential means to assist in keeping the project on track (budget, time and certified deliverables) and not get sidetracked by other pressing day-to-day operational issues during system rollout. Developing realistic timetables and project plans and fully managing all team members and individual plans is critical to success. The project manager also advises management on project progress with respect to implementation milestones. The project manager should have a solid knowledge of the business issues facing the government.

GFOA consultants generally recommend that functional (as opposed to technology) expertise be tapped for project management because ERP projects are not so much technology projects as they are business projects. Of course, it is possible that there are technology savvy people with extensive business knowledge in the IT department who qualify to manage a systems project. The main point is that expert knowledge of technology is not required but familiarity and comfort with technology is a must for the project manager. The implementation readiness assessment should determine who these potential individuals might be and the government’s willingness to devote them full-time to the project.

This issue of an effective project manager and a few of the other risk factors identified in this chapter, such as issue resolution, beg the question of project governance. Exhibit 5-5 describes a common governance structure approach.

**“Off the Shelf” vs. Homegrown Systems**

Is the government willing to change its business processes to utilize a minimum modification/customization strategy? The government’s strategy should be to purchase as complete a system as possible to meet its financial information needs, with a minimum of customization required. Attempting to reproduce existing system links, screens, and reports could well result in replicating the current situation of data redundancy, inconsistency of user interfaces, and lack of drill-down capability. A single software solution will also reduce or eliminate the need for government-generated homegrown “work-arounds” or special programs to obtain information or track transactions. The risk of modifying systems is primarily related to the inability to keep the project on-budget/on-time and the inability to utilize the upgrade process to prevent product obsolescence. The readiness assessment
Government Executive Sponsor. This is an executive who provides support from the highest level of the organization. This position can be especially important for marshalling resources and securing cooperation from various parts of the organization. The government executive sponsor also takes the lead in making decisions such as policy changes that may result from the implementation of the ERP system.

Steering Committee. The steering committee is a group composed of executives in the government who have a vested interest in project success. The main responsibility of the steering committee is to monitor the general progress on the performance of the project, and to analyze and attempt to resolve problems referred by the project managers. Project steering committees are usually an integral part of the dispute resolution process and the decision on whether or not to undertake customizations that may come up in the course of the implementation. In very small implementations, a steering committee may not be needed. In fact, in the smallest implementations the project manager and executive sponsor may be the same person.

Project Managers. The project managers are the individuals who coordinate the project on a day-to-day basis, including project planning and managing team members. Although the diagram may imply that the government and contract project manager are equals, the actual contractual terms and statement of work may identify the contractor project manager as the lead. This is because the contractor brings the expertise necessary to implement the software, so the contractor should be primarily responsible for project success.
should determine government’s willingness to change its own procedures before changing the software.

Project “Scope Creep”
Government managers must carefully define and manage the scope of the enterprise system project during contract negotiations and project management. At this point the scope may be defined as “financial systems,” but certain applications or portions of applications need to be explicitly defined as within or outside the scope of the conversion. Some applications may continue to exist but be interfaced with the new system; others may be replaced, and their functionality integrated into the new system. Clarity of scope at the beginning of the project will contribute to completion of the project on time and within budget.

Turf Battles Over System Ownership
One of the difficulties ERP projects pose for turf conscious government agencies is their difficulty in getting accustomed to the notion that the system itself belongs to the entire government (and to the citizenry!). Legacy systems were designed and owned by specific offices (e.g., information systems, the auditor/comptroller, or finance). State laws and local ordinances institutionalized such ownership decades ago. But ERP implementation projects necessitate the participation of experts from across the enterprise. Even if the comptroller legally “owns” the accounting system, it is difficult to establish what that means exactly in an integrated package that agglomerates information sources from across the organization. GFOA has found that its most progressive clients resolve turf issues right up front to establish an enterprise system that optimizes that government’s investment.
SUMMARY

Once it has become apparent (based on the government’s work in previous phases of the needs assessment) that it makes sense for the government to purchase a new financial system, it must turn its attention to the details of implementing a system. A coherent procurement and readiness strategy is needed to help ensure that the government acquires the best system possible and can begin implementation smoothly.

This chapter highlighted several risks related to system implementations. With all of the pervasive risks in systems projects, a project charter can be a very useful mechanism to help develop a collective vision and ownership for the ERP system. A project charter defines objectives of the project, the decision-making process during implementation, project sponsorship, and the roles and responsibilities of participants (e.g., steering committee, project manager, general ledger lead). It is also a covenant between all internal parties in an implementation that they will stay the course. This is a point where the procurement strategy and readiness assessment tie together: agreement between the government’s various departments on the project charter will foster the understanding that the system is a shared resource.

Endnotes

5 The authors wish to acknowledge Greg Condell for some of the points in this section.
Many questions arise as part of the needs assessment process. This section presents answers to questions that Government Finance Officers Association (GFOA) consulting clients often ask.

1) Is a needs assessment always necessary?
A needs assessment is not always necessary. If there is already consensus that a new system is needed (e.g., existing vendor will no longer support it) and there is support from executives and governing boards, it is expedient to proceed directly to the RFP process. The RFP process provides an opportunity to capture the detailed business needs of the organization as part of requirements definition. The needs assessment is only necessary when there are stakeholders that will use the results of the report to decide on the appropriate course of action regarding system replacement.

2) How long does the needs assessment process take?
A needs assessment should not be a “paralysis through analysis” process. If the process takes too long, opportunities are missed and current problems continue to mount. At the same time, a needs assessment should not be rushed. A needs assessment that is completed thoroughly may identify short cuts (e.g., having a better understanding of which Tier the RFP should target) to reduce the length of the procurement timetable by eliminating invalid options or by finding ways to reduce the cost of a new system (e.g., by fine-tuning the scope). GFOA consultants typically complete needs assessments in three to four months for large governments and in one to two months for small and mid-size governments.
3) How important is third-party independence?

A quality needs assessment provides decision makers with an objective evaluation of the various technology and system choices that the organization faces. It is entirely possible that a government can do a thorough job on the needs assessment internally, assuming the source conducting it is open to changing current technology practices if there is a case for it. Having governments help themselves is the main motivation for this book. However, larger organizations do engage outside consultants such as GFOA because the consulting costs on needs assessments in these instances are a small portion of the overall system procurement costs. An unbiased consultant should not stand to gain from potential software and services sales. Generally, when hiring a consulting firm to conduct a needs assessment, the government should take steps to ensure that the firm conducting the assessment is not an implementation services firm that would be a bidder or software reseller. If a firm were allowed to complete the needs assessment/RFP and bid on the implementation, other firms might feel that it had the inside track because it had more information in formulating the bid than they did.

4) Should we rely on claims by our existing software vendor that it will “soon” develop a solution for a problem with the current system?

This difficult question is faced by all organizations at one point or another. Your current software vendor (hopefully) has been a solid business partner to you for many years. But advances in technology have been so rapid that the vendor may not have kept pace either because of a lack of financial capital for research and development or a deliberate strategy that turned out to be a mistake. Sooner or later firms that are market leaders in one era are replaced by upstarts—a “survival of the fittest” process. If the requested function is not on the release schedule, the vendor may not choose to pursue it or it may be sent to the design queue. In the latter case, several years may pass before the functionality is released in final form. Whether a requested function is critical and whether the vendor can meet your time constraints should determine if a vendor’s claim of “next release” functionality should be taken seriously.

5) Can an ERP system be built one module at a time?

Yes, but the process can be lengthy and expensive. If a customer chooses to roll out their system one module at a time, the government should examine whether an up-front purchase of other modules produces attractive volume discounts. This exercise should be conducted carefully because maintenance and support fees may have to paid on even those modules that are not used. The main advantage of a slow rollout is that it reduces the degree of change imposed on the organization. The main risk is that lengthy projects of any type can fail because of changing business drivers, employee turnover, executives losing interest, or the project lacking
its priority status. The governments GFOA has provided consulting services for generally do one of two things: (1) implement the entire system sequentially (e.g., financials followed by HR/payroll); or (2) implement one major subset of ERP (e.g., HR/payroll only) and add the other modules at their own pace.

6) Should we map our current and future business processes before we procure an ERP system?

There are several schools of thought on the issue of business process mapping. The mapping of business processes before system procurement is not always necessary. Governments can often identify the major dysfunctions of the current system and establish requirements for a new system without detailed process maps. In larger organizations, however, mapping of current “as is” processes can be a useful exercise if it is conducted in a manner that helps agencies anticipate areas in which ERP will force process change. GFOA consultants generally recommend against investing significant resources in mapping future processes because, if the government has already decided to pursue a “vanilla” installation of ERP, this exercise can be futile in that the software’s embedded processes will be your future processes. Mapping of current and future processes is often an activity that is best reserved for the “conference room pilot” or “design” phase of the implementation itself.

7) How do we estimate the level of work effort required for an ERP implementation?

Governments should generally estimate a one-for-one match between client and implementation consultant (i.e., 50 percent of total work effort is completed by each party). A greater number of consultant hours means the government is paying the consultant to learn its processes. It also does not bode well for the ability of the government to run the system on its own at a future date. It should be noted that for smaller projects using Tier III or IV software it might be feasible for the software to be implemented primarily by the government with the software vendor serving in a limited training or coaching role. Again, these methodologies are usually only appropriate to smaller governments implementing less complex systems. At a minimum, the government should provide the following staff on a full-time basis: project manager; functional leads (one for each requested module); change manager; training manager; documentation specialist/secretary, and one or more technical leads (report writing, security, database administration, etc.). When issuing an RFP, vendors should be required to submit a staffing plan by month for both the customer and the consultants.

8) How should the issue of “back filling” positions be addressed?

The total cost of implementation is incomplete without taking into account the internal costs required to staff the project. Governments take one of three approaches
A “squeeze the slack” approach consists of having departments release personnel to the project as needed. The government simply tells departments to “find a way” to address the person’s regular duties without additional funding. This approach works under the assumption that departments have slack budgetary or staff resources. It more often fails as departments waiver in their commitment by pulling people periodically off the project during peak periods (e.g., production of the budget or audit).

The “selective backfilling” approach assumes that departments have slack resources but perhaps not at the level required to staff the systems project. In these cases, departments are allowed to selectively hire staff. Typically, the more senior and experienced the staff member, the more likely the systems project funding will be used to compensate the department.

The “complete backfilling” approach simply funds the department dollar for dollar for staff it has assigned to the project. The department uses the reimbursements to either hire staff to make up for the hours dedicated to the systems project or for other purposes.

The main issue with all of the approaches is the difficulty of replacing a department’s most experienced employees assigned to the ERP project with temporary or new staff.

9) **Should we place constraints on the type of technology we are willing to use?**

Governments should be cautious in placing technology constraints on the selection process. Most modern systems are flexible enough to run on diverse database platforms and server and desktop operating systems. Recognizing that governments may have already invested considerable resources into certain technologies, it is a good business strategy to try to preserve as much of that investment as possible. However, governments should realize that most systems will not be able to use everything they have previously invested in.

10) **Is there a difference between “Web-enabled” and “Web-based architecture”?**

Recognizing the power of the Internet, many software companies are taking the expensive step of re-architecting their products to be accessible through a browser. The terms “Web-enabled” and “Web-based” are used to describe such applications. While both terms permit the application to be accessed through a browser, there are important differences between the two terms.

Web-enabled architecture refers to conventional client-server software that can be configured for access through a browser. Under this architecture, there may be important limitations on the functionality available to the end-user ranging from only being able to perform inquiries through the Web interface (i.e., no data entry or modification), to not being able to perform certain power-user tasks (e.g., creating...
custom reports), to virtually no limitations on the end-user at all but limits on sys-

Web-based software refers to the re-architecting of the entire suite of modules from
the ground up to be accessed through a Web-browser. The value of Web-based
architecture—besides the major business process improvement benefits—include
a lower total cost of ownership. Desktop PCs, for example, do not have to be up-
graded nearly as fast because Web-based software does not place code on the client.
Web-based software also has more flexible deployment options including mobile
access to the financial management system (e.g., access through PDAs and other
non-PC internet appliances). Web-based software currently represents the leading
edge of technology and is offered by only a few software vendors today. Govern-
ments should carefully weigh their need for flexibility and ease of deployment and
lower total cost of ownership in Web-based applications against a potentially
higher up-front cost for software and implementation services.

11) Should software and implementation services be procured together?

There are advantages and disadvantages to procuring software and services to-
gether or separately.

Consolidated Procurements. Under a consolidated procurement, software and
services are bid in a single RFP. Typically the software firm is required to either bid
its own firm’s services for implementation or propose a certified implementation
partner.

Advantages. A big advantage of this approach is that it streamlines the procure-
ment cycle by allowing you to evaluate software and services firms at the same
time. Another advantage of this approach is that the software firm is likely to know
which implementation partner brings the best set of skills for a particular engage-
ment. For example, a transit agency may require a different type of expertise than a
city government or water and sewer agency. The software firm can match such ex-
pertise to the client. Another advantage is that it is easier to hold one party account-
able for results, assuming that one firm is indeed designated as the “prime”
contractor.

Other advantages include the opportunity to observe and evaluate how well the
two (or more) vendors work together during procurement. This is a good indica-
tion of how well they will work together during the implementation. The consoli-
dated bidding approach reduces the risk that a software firm is partnered with the
least qualified implementation firm. One more advantage stems from the state-
ment of work and the final contracts being developed with the input from both
vendors, thereby ensuring that the responsibilities for all parties involved in the
implementation have been sufficiently and uniformly addressed.

Disadvantages. The main disadvantages of this approach include: (1) the imple-
mentation firm proposed may have less to do with the well being of the client than
the internal politics of the software firm (i.e., implementation firm X helped us sell
software at a corporate client, so let’s choose them as our preferred partner for
County Y); (2) in the consolidated approach, a software firm may bid its own ser-
vices division for implementation. Developing and selling software—rather than
efficiently implementing it—is the core competency of software firms; and (3) there
is limited ability of the client to get competitive pricing for implementation services
(i.e., if you like the software, you are basically stuck with the implementation firm
proposed with little negotiating leverage).

Separate Procurements. Under a separate procurement scenario, an RFP is re-
leased to software firms first. Software is selected and then a separate RFP is re-
leased to all firms that are certified to implement the selected software.

Advantages. The main advantages of this approach relate to greater competition
and breadth of vendors that the government would get to evaluate. As ERP prod-
ucts mature, implementation services are becoming a cottage industry. The only
way small and mid-size governments may be able to afford ERP is to use a smaller,
less-prominent but qualified firm to implement it. This approach allows govern-
ment to assess the benefits of using different types of firms.

Disadvantages. One disadvantage of this approach is the longer and costlier pro-
curement cycle needed to separately evaluate software and service vendors. Also,
potential finger pointing might result during implementation if the software firm
can claim, “you picked the implementation vendor, not us” as the implementation
firms cites “bugs and software defects” for poor system performance. It is also
more difficult to evaluate the total project cost when software and services are sepa-
rated. The latter point is especially important if there are strict budgetary con-
straints for the project. In essence, the top-rated software vendor may also be the
most expensive package to implement. Not knowing the services costs when the
software is selected erodes the government’s ability to negotiate toward a specific
bottom line budget.

12) Does a new system require more personnel than what it took to maintain the
old system?

As governments consider replacing their legacy systems with modern systems,
many are carefully examining the hidden costs imposed by new systems, espe-
cially the personnel required to maintain the system once it is installed. ERP sys-
tems provide greater functionality precisely because they are more complex and re-
quire more frequent upgrades. If ERP systems provide benefits because of
advanced technologies, it is also likely that these systems require personnel with
different skill sets. It is possible that personnel maintaining the current system can
be retrained with skills needed to support the new system. It is also possible that
some technologies of newer systems will require “hot skills” that may not be avail-
able internally (i.e., a new database platform that the government has not previ-
ously used). Since on-going support costs impact both the TCO and the ROI of the
system, it is important to understand obligations that new systems place on an organization that go beyond software and implementation costs.

GFOA has conducted research on the question of system support personnel and the answer varies by context. In some instances, governments that have installed new systems do not end up having to hire more staff. Instead, personnel that were working in departments may be centralized in a single project management office that will administer the system on an ongoing basis. In other cases, a government may wish to use the systems project to enhance the level of technical support to departments and will therefore increase staff beyond what was required for legacy systems. Because of the large number of intervening variables (e.g., current level of systems support, sophistication of the new technology compared to the current staff skill sets), it is difficult to generalize.

13) **Is the government better off if the software company is also serving as the implementation consultant?**

Especially for Tier III and IV products, software companies often serve in an implementation capacity. In the Tier I arena, it is more common for software companies to partner with firms specialized in implementation. There are two general views of using the software firm in a Tier I implementation. The first views the involvement of the software firm as essential because once the license is paid for there is no stake in the outcome. The second view is that software companies are primarily experts at developing and selling software. Under this view, implementation firms bring far greater project management discipline and knowledge of business processes reengineering than software firms do. GFOA consultants are generally comfortable with software companies also serving as the main implementation mechanism for small to mid-size implementations. For larger implementations, it is our experience that software companies do not have the implementation discipline, change management methodologies, or “bench strength” of the firms that focus solely on integration.

14) **How intensive is the role of IT in a needs assessment?**

A needs assessment for a financial system is more a “business” project than an IT project. While the IT department can certainly lead the effort, the role of technical staff (DBAs, security administrators, or network personnel) is minor in comparison to the major business process owners.

15) **Is the implementation finished once the software is put into production?**

More often than not, in an effort to stay within budget and complete the project on time, governments often do not fully install the software. Features such as workflow, Web-enablement of some modules, e-procurement, and non-core modules are not installed. Instead, many governments implement some of the addi-
16) Can the government simply outsource the entire system implementation on a “turnkey” basis?

Although turnkey implementations (i.e., those where consultants do all of the work with minimal government staff involvement) were common a decade ago, modern systems are implemented primarily on the basis of significant government staff involvement. Part of the reason for this is that no consultant can efficiently configure the software if they have to take the time to learn the many nuances of each government they work at. For similar reasons, a system implemented solely by consultants is unlikely to really meet the needs of the government. Governments should expect to contribute at least half of the staffing effort toward a system implementation.

17) How much customization is really allowed in ERP implementations?

The philosophy of ERP implementation differs from that used to install accounting and payroll packages a decade ago. Nearly all of GFOA’s clients adopt the approach of “vanilla installations” or “zero customizations.” Customization involves making changes to the underlying source code to accommodate a requirement or a “specialized” process of an organization. Such changes impact the ability to adopt upgrades to new releases of the software since the customization must now be carried over. Significant customization may make upgrades altogether impractical because of cost. ERP systems permit a great degree of configuration (i.e., set up steps) that do not require source code changes (e.g., adding a field to the data being captured in a human resources application). ERP systems permit customization but for the reasons already mentioned it is worth investigating alternatives that minimize source code changes.

18) Should e-government applications such as constituent relationship management (CRM) be installed before ERP?

Under an ideal scenario, a government is likely to make the most use of its IT investments by automating its back-office before it makes large investments in technology focused on customers or suppliers. But life in government organizations is seldom based on ideal scenarios.

If the government unit has especially numerous and active constituent contacts it may be more in line with the government’s mission to procure a different e-government functionality, such as CRM, first. For instance, a pension organization dealing with thousands, and in some cases millions, of active accounts (e.g., re-
tirees, active members) may be better served by spending IT resources on a CRM system before ERP. Another example may be an economic development organization whose central mission is to foster positive economic development deals for its jurisdiction. This might be another case where CRM might be a better use of scarce IT resources. This same line of reasoning could be extended to any special purpose government. For example, it may more appropriate for a utility district to procure a customer information system (CIS) before ERP.

In any of these cases though, it should be remembered that ERP is the backbone of digital government so that unless there is an overriding need to procure a different application (such as the examples cited above), then it would be preferable to establish the ERP foundation first and then integrate other applications into the ERP system. If the government is compelled to procure other e-government applications first, it should place a premium on open architecture so that these systems can be easily integrated with ERP down the road.

19) **What factors should governments consider in ERP system outsourcing?**

The prime vehicle for outsourcing ERP systems is application services provider (ASPs) approach. ASPs host applications over the Internet often using a pay-as-you-go pricing mechanism. However, there are a number of questions and issues that should be resolved before entering into any ASP arrangement. These are:

- Does the government own the software license or just “rent” it? The answer is important if the government wishes to move to another ASP or bring the application in-house later on.
- The government needs to retain ownership over the data and ensure that the ASP takes steps to secure it.
- Level of responsibility the ASP has for the line of communication must be clearly established. Some ASPs bear no responsibility for the communication between ASP and the government (that is between the government and its associated telecommunications provider), while others will take complete responsibility up until the point where the communications line meets the government’s internal network. Of course, these latter type of ASPs will be more costly.
- The ASP should commit to performance metrics for uptime and response time, along with penalties for not meeting those metrics.
- A comprehensive exit strategy, should the government decide it needs to exit the ASP arrangement, must exist. The exit strategy must include “disengagement” procedures for the government to acquire its data, procedures for the government to acquire documentation of its software’s configurations (to facilitate future setup), transition services that are provided for both the cases where the government is taking the application in-house and where the government is moving to another ASP, and, finally, what other
ASP options are available should the government decide the vendor’s particular ASP option is no longer tenable.

- Financial stability can be a concern with any technology company, especially for those with untested business models, such as ASPs.

20) Is there any value in retaining an independent Quality Assurance/IV&V consultant?

In addition to contracting with a firm to implement financial or ERP software, some governments retain an independent consultant for project management oversight. Such oversight activities are also referred to as “Quality Assurance” (QA) or “Independent Verification and Validation” (IV&V). A QA consultant’s role is to help manage the implementation firm, monitor and evaluate project progress, review and approve project deliverables, fine tune project and training plans, take action to mitigate risks and take any other steps to have the project meet its business objectives. The authors feel that QA consultants are not always needed for small to mid-size projects that are narrow in scope because the cost might be large in relation to the entire project. However, for large multi-million dollar/multi-year projects or projects complex in scope, a QA consultant can be an extremely worthwhile investment especially if the tasks add value to system design or reduce implementation risk.

Endnote

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