



Child Care Administrator's Information Technology and Procurement Guide

Prepared for:

Administration for Children and Families
Office of Child Care

330 C Street, S.W.
Washington, D.C. 20201

Prepared by:

National Center on Subsidy Innovation and Accountability

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Rockville, MD 20852
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Disclaimer:

This Guide is intended as general guidance. CCDF grantees should adhere to their agencies' information technology (IT) and procurement processes, including IT governance and software development lifecycle (SLDC), as established by their Office of Chief Information Officer (OCIO), Contracts department(s) or other oversight entities. This Guide introduces important concepts and considerations for IT projects, but does not override your agency's established processes.

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PART I

Introduction

This Information Technology Guide is written as an advisory resource document for Child Care and Development Fund (CCDF) administrators who are considering information technology projects in support of their child care programs.

Making information technology system changes can seem like a daunting task, but with careful planning, it can be less scary and produce great support to the child care organization's mission, vision, and process of tracking and reporting the children and families served.

Whether the agency is considering small adjustments to an existing information system, developing a new information system, or embarking on major enhancements to an existing system, this guide offers ideas about:

- How to conceptualize an Information Technology (IT) project:
 - Defining the project and what it will accomplish.
 - Reviewing the organization's available resources that can be devoted to the project (financial and staff).
 - Setting up a defined project governance structure that best supports the project.
 - Reviewing current child care business processes and planning for how they will change under an IT project.
 - Approaching the project with some important technical considerations.
- Project planning activities that will aide success – this includes initial planning and a deep-dive analysis into requirements, solution options, and processes to evaluate solutions to best meet the agency's business needs.
- Key success factors in developing a request for proposal (RFP) and in evaluating proposals.
- Helpful resources to inform projects.

PART II

Conceptualizing the Information System Project



There are a number of high-level considerations that agencies should examine once it has been determined that an IT investment may be needed to address the replacement or enhancement of existing automation for the child care program. The child care agency, typically with the assistance of their IT staff, would discuss and document the high-level vision and objectives that underpin the planned IT project. Addressing the following questions will set a context for the project and will ensure that all involved parties understand and are invested in the effort:

- What is the business vision for the child care agency as it relates to the new automation, and what goals and objectives are to be met by the automation?
- What financial and organizational resources are available to support the project?
- Who will be ultimately responsible for the project and who should be involved in overall project governance?
- How will the new automation affect the organization and its business processes?
- Will the new investment support multi-agency collaboration and intra-agency shared services?

Agency Vision, Goals, and Project Objectives

One of the most important first steps for a new IT project is to clearly define what the project will accomplish. This should be anchored in a clear understanding of the business objectives to be met by the new automation. Projects can succeed technically yet still fail to accomplish improvements to business operations simply because the vision and objectives were not understood from the beginning and by all involved parties. This step defines the reason for the IT effort and states the business case for acquiring the new automation.

When undertaking a major initiative such as a new information system, it is useful to begin with a strategic analysis of the agency. The strategic analysis begins with the articulation of the agency vision, which forms the basis for identifying information needs and specifying system requirements. The business vision may be related to specific problems that the child care agency has identified (e.g., high incidence of improper payments or the need to implement a waiting list) or to a more global vision for systemic improvements in the child care program.

Objectives for the IT investment typically fall into one or more of the following categories:



Although the vision may relate to the child care program alone, agencies may want to consider the overall vision of the umbrella organization of which child care is a part (departments of human services or education, depending on the structure of an agency's services). As agencies face shrinking budgets, there often is an initiative to increase the efficiency of government agencies — **finding ways to achieve the same or better outcomes with less money and fewer personnel**. Some child care agencies may be examining the potential for consolidating services and, in most states, there is interest in better integrating the services of existing programs (e.g., child care, TANF, SNAP, employment programs, and child support). From an IT perspective, this may lead to an interest in developing an "enterprise" information system that supports all or most of the programs of the umbrella agency. If the agency is moving toward integrating human services programs, and especially if an enterprise information system is being considered, the child care program should be sure that all necessary parties are involved in the initial stages of conceptualizing the IT project.



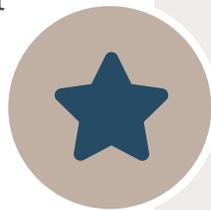
It is important that the project be driven by the program's objectives so that the implementation of technology supports, rather than defines, the way the program will operate.

The process of clarifying and articulating the child care agency's vision and goals helps to keep policy and program at the center of project planning. **It is important that the project be driven by the program's objectives so that the implementation of technology supports, rather than defines, the way the program will operate.** While there is necessarily some give and take among the various parts of the project, in the end the system should be responsive to and meet the information needs of the agency's program.

The agency's programmatic and technical strategic plans can provide important insight into current and future plans for service delivery and technical support. This discussion may bring to light opportunities for enterprise investment, organizational changes that can create efficiencies and improve effectiveness, and constraints the project will face. **For example, if one agency is moving forward with a technology that could be adapted to meet a child care function, there may be an opportunity to leverage staff and resources to implement that technology for the child care program.** In addition to surfacing opportunities to leverage existing technology, examining IT strategic plans may identify important constraints, such as the movement away from outdated software or hardware.

At the outset of planning for the project, the child care agency should determine how it wants the business process to change in the child care program and what specifically will be addressed by the new automation. If the agency is considering a new replacement system, or a major enhancement of the existing system, a high-level visioning activity is an opportunity to make significant practice changes. **The definition of required functionality in the new or enhanced system must be consistent with the way the agency wants its staff to work, rather than letting the design of these functions dictate how they must work.** Although this is a general rule, administrators should recognize that if they choose to implement an existing product or transfer a system from another agency, some amount of adaptation of business process to fit the system will probably be required. Even so, the agency should be clear about how it wants practice to change with the new automation. Doing so will ensure that the selection of a software product or the design of new automation will fulfill the program's objectives. If the project is aimed at addressing isolated features, such as enhancing automated eligibility or adding a new licensing function, the new functionality may not have major implications for the operation of the child care program. Although the vision for practices in the child care program may not change, the objectives of the automation should still be clear.

The initial goals and objectives formulation will set the stage for the specific identification of system requirements for the new automation.



At the outset of planning for the project, the agency should determine how it wants the business process to change in the child care program and what specifically will be addressed by the new automation.

Financial and Organizational Resources

The amount of funding available and the number and capabilities of in-house staff members who can work on the project will impact both the scope of new automation that can be implemented and whether the agency can perform the project in-house or will have to purchase services or products from the private sector. It is recommended that the agency identify the fiscal and personnel resources that are available to support the project early in the process. State, federal, and private funding might be a potential way of providing fiscal support for the system.

Existing federal and state child care program dollars may be reallocated to fund the project. Funds may be found through special initiatives or grants for technology improvements. The amount of funding available is the major factor that will determine the scope of new automation. Personnel resources to be applied to the project may be more difficult to identify and quantify. If an agency has a consolidated IT division that includes a project management office (PMO), the agency is more likely to have the capacity to perform the IT project using its own IT staff. If technical and/or project management capabilities are limited, the agency likely will have to seek outside assistance for all but the most limited IT projects.

All IT projects, whether conducted in-house or by a vendor, require the involvement of agency child care program staff. These staff will need knowledge about how practice is carried out within the agency, as well as the essential needs for the IT project. They may, and probably should, be asked to participate in requirements and design sessions and possibly to perform testing of the system before it is implemented.



All IT projects, whether conducted in-house or by a vendor, require the involvement of agency child care program staff.

Project Governance

The agency always maintains ultimate decision-making authority regarding the IT project and the system that will be implemented. **Selecting the project management team and the project governance body is critical to the success of any major IT project.** It is common for a project manager to be a relatively high-ranking member of the agency IT staff or a high-level staff member from the child care program. In some cases, the agency may designate both a project manager and a technical project manager. Since these projects have both business concerns and technical considerations, both aspects should be addressed and remain in focus throughout the project.

Most large-scale projects require a governance committee to oversee and provide input to the IT project. For an IT project focused solely on child care automation, the child care program administrator is the likely chair of the project governance body (sometimes referred to as the steering committee). Senior program officials from all programs supported by the new system should be active participants in project governance. Without strong program involvement, agency personnel are likely to view the entire effort as “just another IT project” and be unwilling to participate and support the project as effectively as they should to ensure that the system truly supports agency information needs. Senior staff from the agency’s office of the chief information officer (OCIO) may need to be included to consider compliance and collaborate with agency IT portfolio.

An essential component of the project governance structure for the IT project is the assignment of decision-making authority. Many issues requiring prompt decisions arise during the course of an IT project. Having a clear line of authority for these decisions is critical to an efficient project. Many projects have been delayed, sometimes incurring additional cost, because decisions are not made quickly and with certainty as they arise. The plan for project governance should clearly specify who will make the final business-related and technical decisions during the course of the project. This may involve a hierarchical escalation structure so that minor decisions are made at lower levels and more critical decisions are presented to higher-level staff, or the governance committee itself, for final resolution.

Business Processes and Organizational Change

Implementation of a new system, and even major modifications to an existing system, provide opportunities for the agency to review the way it does business and to identify processes that could be made more efficient with automation. Even if the child care program is not trying to change its business process significantly, new automation is likely to cause changes in the way people work. One term commonly used for the assessment and implementation of changes to the business processes of the program is “business process reengineering” (BPR). The overall project activities engaged to ensure that the users of the new automation are prepared and ready to use the system are typically referred to as “organizational change management.”

BPR typically entails two steps. First is a detailed examination of the way each component of the agency’s business is currently conducted. This examination results in a description of the “as is” business processes. Such a review often uncovers a variety of discrepancies in the way the same activity is performed in

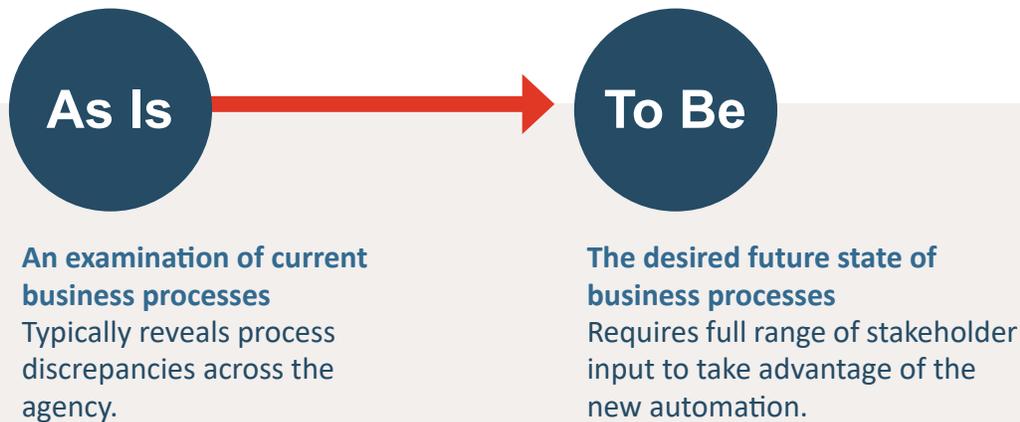


Key Term

Business process reengineering:

The assessment and implementation of changes to the business processes of the program.

various parts of the state. Second, when the “as is” processes have been detailed and the problems have been assessed, the desired way of operating – the “to be” processes – can be developed. By working with the full range of staff and agency stakeholders, administrators can determine the way they want business to be conducted in the future in order to realize the agency vision and take advantage of the new automation. When this is clearly understood and consensus has been reached, the “to be” processes form the basis for identifying the information system’s functional requirements.



Making changes to the organization and its business processes can impact the existing staffing structure and the child care program’s policies and procedures. It is important to address the following considerations in order to implement the new automation:



In some instances, the child care program may have to request specific changes in laws or regulations or make changes to policies and procedures in order to allow the implementation of the new automation. One obvious area is a requirement to submit forms or maintain documentation that the new system will now make obsolete. An agency should consider the time required to issue regulatory and procedural changes so that the new provisions will be in place prior to the implementation of the new automation.



The new automation may alter the responsibilities of organizational units or specific staff. In some cases, the job descriptions, reporting relationships, and/or responsibilities of specialized units change with the implementation of the new system. If the new automation makes certain tasks performed by staff obsolete, the program will have to consider whether this will impact the overall staffing requirement of the child care program.



Existing agreements with organizations or individual providers may have to be altered. Changes to provider contracts and interactions between providers and the child care agency may require new procedures and/or the collection of baseline information (e.g., provider staff information, rates, etc.) to implement the new automation.



If the automation will create new groups of information system users, such as providers or agency fiscal staff, a great deal of advanced planning is required. New system users must be prepared for the new responsibilities, trained on the application, and provisions have to be made for their access and security rights.

Technical Considerations

In most cases, the agency's IT staff will play a major role in determining the best approach and solution for implementing the new automation. The IT solution chosen must align with the technical standards determined by the IT staff and must be compatible with the hardware and network architecture within which it will operate. Many agencies have strategic plans outlining the future infrastructure and tool sets that the child care agency wishes to use. The IT strategic plan may specify the methods and tools to be used for mobile computing, system security, document management, and other specific components of planned information systems.

The IT department also may have plans for the way that systems will be supported and maintained, including the degree to which systems will be operated directly or outsourced to external entities for maintenance and operations. Any selection of a software solution should be done with recognition of future IT plans. The agency's entity responsible for IT standards and planning should be involved at the earliest stages of project planning to ensure that decisions about scope, technology, and system implementation are consistent with the overall agency plans and standards.

Data Governance and Data Integration

Data governance is a collection of processes, standards, and policies by which the rights, access, value, and security of information is managed. It is a key consideration while conceptualizing a system as it is critical to the discussion related to the ownership of data. In terms of multi-agency collaboration and intra-agency shared services, data integration plays a vital role. Establishing common data formats to implement uniformity, linking various data systems to improve data usability, and sharing available data should be part of the strategic plans. If the new automation includes data sharing with other agency information systems (i.e., system interfaces) interagency agreements generally are required to allow the exchange of information. This may require discussion with the other program administrators to resolve issues related to information use, privacy, and security concerns.



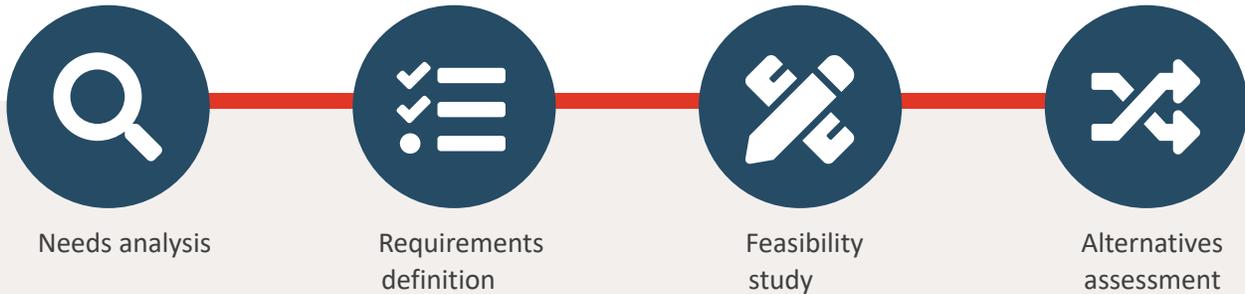
Key Term

Data governance:
A collection of processes, standards, and policies by which the rights, access, value, and security of information is managed.



Project Planning Activities

Once the agency has worked through the preliminary considerations and decided to undertake the IT project, there are several planning activities to be complete. These activities include:



The discussion below examines each of these activities and presents some fundamentals of each activity. Readers should recognize that these are described from the context of a major IT project. If the agency is planning a more limited effort, some of these activities may not be necessary, or may not be needed to the degree described here. However, the first activities—needs analysis and requirements definition—should be performed at a sufficient level to clearly define the IT project regardless of the size and complexity of the planned project.



Performing a Needs Analysis

The needs analysis is based on the vision and objectives for the IT project. The assessment of needs as they relate to automation is necessary to ensure that the new system will support the planned business processes and to achieve the child care program’s goals and objectives. Even if the agency executes all other aspects of the procurement project management process flawlessly, misstated needs can lead to a less than desirable outcome. The defined business needs form the basis for the definition of systems requirements discussed in the next section.

The needs gathering and assessment effort requires involvement by many different stakeholders so that the system functionality being designed will have the best chance of meeting the child care program's needs. It generally is more effective for specific groups of stakeholders to focus on one or more broad areas that the system will address, pooling their specialized knowledge to define agency needs. The following are some typical groups that would meet to define needs related to specific areas of the child care program:

- Child care application, eligibility, and authorization.
- Provider application, inspection, and licensing.
- Provider contracts, billing, and payments.
- Child care reporting and quality assurance.
- Technical and interfaces.

Once the teams articulate their needs in these broad areas, a group of stakeholders representing all of the broad areas can collectively determine the priority for addressing each identified need. In this process, some needs identified in one or more areas may be consolidated, rewritten, or eliminated. When the needs have been identified and prioritized, a formal "statement of needs" document can be created and used for reference throughout the project. A useful needs statement focuses on desired outcomes rather than specific functions, incorporates both short- and long-term goals and objectives for the requested solution, and defines the criteria on which the agency will base its assessment that the need has been met.

Taking adequate time to define the business needs pays off in the long run. If the business needs are not articulated comprehensively, the system requirements are likely to be incomplete. If a critical need is missed in the analysis, this can have cost implications for the IT project. Failure to include a major area of functionality after the child care agency has estimated costs, procured services and products, or designed the new automation will result in additional cost, as well as adding time to the IT project schedule.

Effective methodologies for assessing needs include structured group sessions, key informant interviews, job shadowing, and surveys. Group sessions are most productive when led by an experienced, skilled facilitator and include enough stakeholders to be fully representative. In these sessions it is important for the facilitator to identify clear limits on the areas to be discussed. Otherwise it is easy for sessions to generate an uncontrolled "wish list" that is both duplicative across sessions and difficult to prioritize.

Key informant interviews may be effective for gaining needs analysis input from senior management such as the chief information officer (CIO), the child care administrator, and the umbrella department's director. They can help clarify their expectations and identify any planned policy, program, or technology changes that may affect the design and implementation of the system.

For some particularly complex tasks for which system support is critical, it may be effective for a member of the project team to observe one or more workers performing the task. This technique is known as job shadowing.

Surveys can be used to capture input on the business needs from a wide range of staff and other stakeholders, such as providers. Surveys can be used to validate input from needs analysis sessions or even prior to the sessions to see the full range of possible automation that should be discussed in sessions.



Defining System Requirements

The needs analysis will result in a detailed list of the business needs that the new system or new enhancement functionality will serve.

After the needs have been clearly defined, the next step is to transform these needs into system requirements. The system requirements will define the specific functions that will be implemented. Although the system requirements are detailed statements about what the system will do, they do not discuss how the system will implement these functions. In fact, prescribing how the system will function within the requirements can restrict the freedom of system designers to employ the best possible design approaches for implementing the required functions.

System requirements often are developed in group sessions similar to those described in the above needs analysis discussion. The requirements sessions may involve the same people who defined the business needs, possibly augmented by additional staff and other stakeholders. The requirements sessions will be most effective if led by an experienced facilitator, either from the agency or someone brought in from the outside. The purpose of these sessions is to identify the functions that the new automation must include in order to fulfill the identified business needs. **It is important to include staff members who are familiar with the business processes to be impacted, as they will recognize where automation can provide the greatest benefit.**

Requirements statements should be carefully worded so that they clearly define all of the specific functionality for the new system. The system requirements are used by those responsible for designing the system to ensure that the new automation includes all of the functions the child care program staff have defined as necessary. The requirements are used throughout the IT project to verify that the developers have created functions aligned with the requirements and

that no required functionality is lost as the system goes through the various phases of development and testing. If a vendor is hired, the requirements are often used as the basis for determining that the vendor has fulfilled the obligations of the contract. The quality of the system requirements is paramount in ensuring that the new system (or new functions) supports the program's business objectives for the new automation.



Requirements statements should be carefully worded so that they clearly define all of the specific functionality for the new system.

The agency should try to define requirements so that each requirement is clear and concise and states specifically what automated functionality is required. The following is an example of a requirement statement that is not sufficiently clear and is too prescriptive:

“Emails should be sent when a case needs to be redetermined.”

This requirement has various flaws. The requirement is not specific enough regarding who is to be alerted to the upcoming redetermination or to what type of redetermination this requirement applies. Although it may be implied, the requirement does not say that the system is going to generate the notification automatically, only that an email will be sent. The requirement also specifies that the method of alerting the user should be an email, which may or may not be the best way to alert a worker of the upcoming action.

A better way to state the same requirement is as follows:

“The system shall automatically alert the assigned worker when a child care eligibility redetermination is due.”

Because the agency may discover that the full set of requirements is too costly to implement and may need to be deferred, it is suggested that each requirement be prioritized, as some are likely to be more essential than others. Requirements that are essential to effective system functioning can be designated as “mandatory.” If the requirement refers to a system action that is desirable, but not critical to effective functioning, it can be designated as “optional” or “desired.”

Since the system requirements will be used for design and verification throughout the course of the IT project, the requirements should be assembled in a database that allows tracking of all changes, additions, and deletions to the initial set of requirements. There are software applications available for this but depending on the complexity of the planned project, an agency may begin by tracking the requirements through a relatively simple database tool or even a spreadsheet. The key is that the tool for managing system requirements contains all of the information about each requirement (description, priority, area of functionality to which it applies, etc.) and that any changes to individual requirements are documented and tracked.

Data Integration and Interoperability (DII) are processes related to the movement and consolidation of data within and between data stores, applications and organizations. Integration consolidates data into consistent forms, either physical or virtual. Interoperability is the ability for multiple systems to communicate. When defining requirements for a new system it is important to think about basic data management functions that will be needed. Some of these functions may include:

- Data migration and conversion.
- Data consolidation into hubs or marts.
- Integration of vendor packages into an organization's application portfolio.
- Data sharing between applications and across organizations.
- Distributing data across data stores and data centers.
- Archiving data.
- Managing data interfaces.
- Obtaining and ingesting external data.
- Integrating structured and unstructured data.
- Providing operational intelligence and management decision support.

Development of data integration requirements should start with asking, for example, why is the data integration being done, and what are the objectives? From what systems will the data be sourced? Is all the data available to fulfill the requirements? What are the business rules? What is the support model and service level agreement (SLA)?

One final suggestion regarding system requirements definition is that an agency may want to explore the availability of existing system requirements in other states. An agency may save a great amount of time if it can obtain a core set of requirements from another state with similar business practices and automation needs. The agency can then modify and augment the core requirements to address its own specific needs.



Feasibility Study

The feasibility study is the preliminary study that determines whether a proposed systems project is technically, financially, and operationally viable. The alternatives analysis, usually included as part of the feasibility study, identifies viable alternatives for the system design and development. The feasibility study consists of presenting your business case and performing a thorough alternatives analysis that includes gap analyses and a cost analysis. The study also forms the framework for the system development project and establishes a baseline for further studies.

Between them, the documents provide:

- An analysis of the system objectives, functional requirements, and system design concepts.
- A determination of the feasibility of applying automated systems to effectively, efficiently, and economically improve program operations.
- An evaluation of alternative approaches for reasonably achieving the objectives and goals.
- Identification of a proposed approach.

Depending on the systems project being analyzed, the following factors may be addressed:

- Programmatic functions.
- Information architecture.
- System architecture.
- Hardware and software inventory.
- Interface and matching.
- Processing and data flow diagrams.
- Storage and retrieval.
- Inputs.
- Outputs.
- Workload,
- Validation/internal control.
- Security/privacy.
- Emergency response, back-up, and disaster recovery.
- Personnel.
- Space and environment.

Identify System Constraints and Assumptions

Constraints are factors that lie outside, but have a direct impact on, the system design effort. Constraints may be:



Laws and regulations:

For example, agencies may require specific design approaches for new systems or mandate specific changes to existing systems.



Technological:

For example, new equipment must be compatible with existing equipment.



Socio-political:

For example, the governor mandates that all programs be managed by a common data base management system.



Financial:

For example, proposed development and implementation costs must remain within a specified budget.



Assessing Solution Alternatives

High-Level Information System Solution Options

There are various technical approaches for implementing new automation that meet the defined system requirements. This section examines the high-level solution approaches that can be used to implement new automation and the process for evaluating these options.

For an accurate analysis of different technology solutions, it is helpful to understand the advantages and challenges of the various approaches. The options available are to:

- Enhance the agency current system (referred to as the legacy system).
- Adopt functions available in other state, territory, or tribal systems.
- Purchase and implement prepackaged solutions—referred to as commercial off-the-shelf or COTS products.
- Transfer a system from another state, territory, or tribe.
- Develop and implement a new child care information system.

There are advantages and disadvantages to each technical approach. The decision about which option or combination of options to pursue depends on many factors. These include the scope of functionality required to implement the new automation, funds and personnel available for the project, and the extent to which available technical options meet the agency’s current or planned standards for information technology. This discussion focuses on the attributes of the various technology options and the general advantages and disadvantages of each.

Enhancing the Legacy System

The lowest cost and often the quickest to implement are IT projects that involve retaining the legacy child care system but adding a module or two to expand the system's functionality. For example, an agency might enhance customer access to child care information by adding a web-based portal through which the prospective customers can search for licensed child care programs by ZIP code to find one near their home or work. The agency might also replace its eligibility determination module with functionality in the portal that allows customers to enter their own data required to determine eligibility for subsidized child care and receive a preliminary determination from the system. Such functionality would be expected to increase customer satisfaction and decrease staff time. These functions would be added to and integrated with the existing child care case management system.

The primary advantages of this approach are its simplicity and relatively low immediate cost compared to more extensive system modifications or replacements. The major disadvantage is that the bulk of the legacy system will continue to operate as is. If the legacy system is using outmoded technology, the new modules would be added to a system that may be difficult to sustain over the coming years. The legacy system might also have high overhead and limited potential for future enhancements. If functionality is added to the legacy system in such a way that these investments can be maintained even if the legacy system is replaced, the risk of enhancing an existing system is reduced.

The legacy system enhancement approach, assuming that the existing system is based on older technology, can rarely address the weaknesses of the fundamental system architecture. Although the enhanced modules might be reusable when the system eventually has to be replaced, over time the legacy enhancement approach might cost significantly more than a more complete system upgrade. Agencies should consider not only what they want to accomplish with the upcoming IT project, but what will be required from the system in the long term.



Advantages

- Simplicity.
- Relatively low immediate cost compared to more extensive system modifications or replacements.



Disadvantages

- Bulk of the legacy system will continue to operate as is.

Adopting Functionality from Other Agency Systems

The child care program may have the option of adopting functionality that has been built into other state, territory, or tribe’s systems. This may be done by using the design and program code (if compatible) of the other system’s functions to build similar functionality into the child care information system. For example, if other agencies’ programs have automated eligibility determination processes, it is possible that with some adaptation the application code could be used to build a child care eligibility module.

For agencies that have begun building information systems using Service Oriented Architecture (SOA), there may be even more efficient ways to leverage the functions built into other systems. Although a complete description of the SOA approach is beyond the scope of this IT Guide, the basics of SOA are described below.

SOA refers to the ability to build information system components in such a way that they can be reused across many different information systems. The term “service” in this context does not refer to services in the sense of services to a customer. SOA services are information system components that can be used by multiple systems to perform the same process.

For example, if one agency were to develop a “service” that performs eligibility processing, other programs and organizations could use this service as part of their own systems. This requires that the eligibility function can be adapted to the specific data and business rules of the new program. Because eligibility programs are often based on rules engines that allow data and business rules to be changed relatively easily, the potential to reuse such a function becomes possible. This can be a time-saving and cost-effective approach to adding new functionality to an existing child care system.

Although SOA offers a very efficient approach to building and reusing specific information system components across programs, there are substantial infrastructure requirements. In order for the components from one system to be reused by another, the agency must have the necessary enterprise service infrastructure to support this and the component modules must be built in a manner that allows the shared use. The agency’s IT staff would be aware of the potential to address child care information system needs through the SOA approach.



Advantages

- Efficient approach to building and reusing specific information system components across programs.



Disadvantages

- Must have the necessary enterprise service infrastructure.
- Modules must be built in a manner that allows the shared use.

Purchasing a COTS Product

Child care agencies also have the option of purchasing software products either as their complete solution for a child care information system, or to add functionality to their existing system. COTS systems are developed based upon common requirements of, and functionality needed for, a specific program (e.g., child care) or for a related set of programs (e.g., human services). COTS products are expected to be implemented with little or no customization. However, most COTS products allow a certain amount of configuration. For example, a COTS product for child care typically would allow those who purchase the product to configure the application for their own rules and criteria for determining eligibility as this is expected to vary by agency. On the other hand, the way that the system users view their cases, general case assignment functions, and the methods for issuing alerts are typical functions that cannot be changed without significant programming effort. Changing the program code of a COTS product not only eliminates the major advantage of purchasing a product (i.e., that it can be implemented “out of the box” with minor configuration), but changing the base product will likely complicate the ability to accept future upgrades to the application from the COTS vendor.

COTS products are available as complete, integrated child care information systems, as well as fully integrated human services systems. In addition, COTS products are available for specialized and ancillary functions that are important to the core child care system. For example, there are COTS products that can be implemented to perform data-reporting functions, content and document management, and financial functions. COTS products can be considered as an option to fully implement a child care information system or to add new modules to an existing system.

The primary advantage of a COTS solution is that it offers an expected short cycle to implementation, eliminating the need to build modules from the ground up. However, the extent to which the COTS product meets all the system requirements will determine whether the solution is the most cost-effective approach for the child



Key Term

Commercial Off-The-Shelf systems:

Developed based upon common requirements of, and functionality needed for, a specific program (e.g., child care) or for a related set of programs (e.g., human services).

care program. It is incumbent on the agency to examine the product carefully and, when possible, to explore the experience of other agencies that have implemented the COTS product to assess the feasibility of the solution for its own program.

Two important considerations for agencies before purchasing a COTS solution are whether the COTS product fits the agency's current technology infrastructure and is consistent with the IT plans for the future. If not, the COTS product may not be a viable solution even if it does have the required functionality to meet the child care program's automation needs.

Ongoing cost is another very important factor to consider. Some COTS solutions are sold with an upfront purchase price and an ongoing license fee, which is often based on the number of users. Agencies should consider very carefully the licensing structure for the COTS solution. In addition to the initial costs for implementing the COTS, the agency should explore the pricing structure for future upgrades and enhancements.

In summary, COTS products have many advantages, such as potentially lower costs, easier modification, and faster implementation. As with other options, however, there are also potential disadvantages including the extent to which the product supports planned business practices and fits within the existing IT technical structure. Each state, territory, or tribe should determine whether this approach aligns with its technical and business direction, as well as training, licensing, system upgrades, and service agreements.



Advantages

- Potentially lower costs.
- Easier modification.
- Faster implementation.



Disadvantages

- Changing the base product will likely complicate the ability to accept future upgrades to the application.
- May not support planned business practices.
- May not fit within the existing IT technical structure.

Transferring a System from Another State, Territory, or Tribe

A number of agencies have implemented, or are in the process of implementing, comprehensive child care information systems. Agencies that are replacing their legacy systems may want to consider transferring a system from another state, territory, or tribe. In most cases a transfer from another agency is performed by the vendor that implemented the system in the originating agency. Usually agencies will acquire a transfer only after an open request for proposal (RFP) process, during which the agency has viewed demonstrations of the software and conferred with representatives of the originating agency before acquiring a transfer system. Agencies should determine whether the original vendor is highly experienced with the transfer application and knowledgeable about the implementation requirements and how modifications to fit the new agency can be made.

There are advantages to transferring another agency's system. Because child care programs have similar high-level automation needs, the transfer system is likely to have most of the core functionality required. A well-designed system will have the appropriate integration across the system modules; for example, data entered when doing an authorization are verified against a client's eligibility status and the status of the selected provider. This is an important component of a comprehensive child care system. A transfer system has the advantage of being tested in a true operational environment, with the assumption that some of the early issues have been identified and resolved.

However, while core program needs are usually similar from one agency to the next, there are almost always differences in policies, procedures, or processes that require some tailoring of a transferred system. Transferring a system requires that the agency considering it examines the business processes of the agency that originally implemented it. If the processes are significantly different, the system transfer effort may not be successful. When an agency decides to commit to a transfer from another agency, it is important to recognize that some adaptation of its own business processes may be necessary. The more modifications that are required, the less advantage is gained from the decision to transfer another agency's system.



Advantages

- Likely to have most of the core functionality required.
- A well-designed system will have the appropriate integration across the system modules.
- Has been tested in a true operational environment.



Disadvantages

- System transfer effort may not be successful if business processes of the original agency are significantly different.
- May require some adaptation of agency's business processes.
- May not fit in existing enterprise architecture (EA) and not allowed by OCIO.

The system also must be integrated with the receiving agency’s IT infrastructure, including interfaces with other agency systems required by law, regulation, or agency-specific situations. IT staff must assess the compatibility of the transfer system’s architecture and technology to ensure that it meets the state’s standards and that the system can be operated and maintained by the IT department.

Finally, to implement another agency’s system, the agency must ascertain the ownership rights over the software. Although some systems are in the public domain (meaning that others can use the program free of charge), this is usually only the case for systems built with federal funds. The agency will have to examine the potential costs of acquiring the software if it is owned by another state, territory, or tribe, or by the vendor that developed the system.

Develop a New System

Although building a new system from the ground up allows an agency to implement the exact functionality that meets its existing or planned business processes, building a new information system is generally very expensive and often takes considerable time from project initiation to final implementation. Given the large number of new child care information systems, most agencies will only consider developing a new system if their automation needs are profoundly different from the functionality available in these existing systems. Generally, adopting one of these existing solutions, even if it requires some amount of adaptation, will be a less expensive solution and can be implemented in much less time. IT projects that are based on ground-up development are likely to be those in which an agency is only implementing a new system module or creating a standalone system for a very specific purpose.



Advantages

- Allows an agency to implement the exact functionality that meets its existing or planned business processes.



Disadvantages

- Generally very expensive.
- Often takes considerable time from project initiation to final implementation.

Blended-Solution Approaches

These approaches to IT investment are not mutually exclusive. For example, an agency may choose both a COTS product for a specific child care function such as document management and use the modification of legacy system components to further enhance the overall child care information system capabilities.

In another example, an agency may choose an enterprise framework COTS product and then train IT staff to configure that product to meet the business and service needs of the child care program. Enterprise framework technologies in the human services arena offer the opportunity for skilled users to configure the software to support many core functions including eligibility determination, case management, reporting, financial management, workflow management, and the development of online forms and webpages. With training, skilled business analysts may be able to configure the software and may require limited assistance from technical programmers.

Another agency may choose to implement a combination of applications developed in-house, COTS applications, and web services available from other state programs. This option may be more frequent in states with SOA capabilities (as described above).

Regardless of the approach, it is important for the agency to assess the potential solution alternatives in order to make the right choice for its IT project. The next section discusses the process for evaluating the various solution alternatives.



Advantages

- Allows greater flexibility in piecing together an overall system with possible cost savings.



Disadvantages

- There are potential interoperability issues between the components selected - great care will be needed in deciding on how the components will fit together.

Process for Evaluating Solution Alternatives

Once the potential approaches to implementing a new child care solution have been identified, the agency should follow a relatively rigorous process for examining the fit and feasibility of each option under consideration. As noted above, each option has its advantages and disadvantages and the true test is how well any specific solution under consideration will meet the specific agency's needs, available resources, and technology strategy.

In general, the process to examine the project and technology options is referred to as an "alternatives analysis." An alternatives analysis can be conducted by an individual or a small team that possesses program knowledge, financial analysis skills, and the ability to assess legal and financial considerations related to system ownership and implementation.

The first step in conducting the alternatives analysis is to identify the basic criteria that will be used to evaluate the possible alternatives considered. The analysis should address the following questions:

- Does the solution meet the agency's business objective and system requirements, and does it do this in an efficient manner?
- Does the solution meet all of the legal and regulatory requirements?
- Can the solution work within the agency's technical structure and capabilities?
- What are the specific constraints and risks involved in implementing the solution?

Each of these criteria indicates specific analyses that the alternatives analysis should include.

Meeting the Business Objective and System Requirements

To be a viable solution, the alternative under consideration must be able to address the program objectives, administrative requirements, and system requirements of the child care program. The IT project will not succeed if it does not help the agency achieve its vision as defined by agency leadership. Most government agency administrators are responsible to political stakeholders that may have strong views regarding the operations of government. Many technically successful projects fail because they do not meet the needs of key stakeholders or diverge from the stated direction of agency leadership. In reviewing the alternative approaches to system development, the political context in which decisions will be made must be kept in mind. Agency leadership, and other critical stakeholders, if appropriate, should be interviewed to determine whether there are particular constraints that need to be considered in the alternative's analysis process.

Assuming that one or more of the alternatives under consideration involves a currently implemented system (such as a system in another state) or an available COTS product, the alternatives analysis can assess the scope of functionality available in the system, how closely it meets the requirements of the child care program, and how easy the application is to use and implement.



There are various ways to assess an existing application. The agency may see whether there is existing documentation available. This documentation may include user manuals, product or system descriptions, a list of requirements used to develop the system (for a system in another state), or demonstration versions of the software. If the agency is seriously considering a project procurement, one pre-procurement step may be to issue a request for information (RFI) to solicit information from interested vendors. Either as part of an RFI, or as a separate activity, the agency may also ask vendors to demonstrate their software to interested staff from the child care program and the technical services unit. If the agency is leaning strongly toward implementing another state's child care system, it also may be possible to schedule a visit to the other state for an in-person demonstration of the software. Visiting another state, or states, can have the added advantage of hearing firsthand the types of implementation issues (including training requirements and system acceptance by staff) that resulted, as well benefits that have been gained, from the implementation of the system.

One major consideration in assessing any system alternative, however, is the ease with which agency workers, providers, and clients can use the system. If system users find it difficult to navigate or enter data, the system may increase staff workload, rather than improving staff efficiency. This is a difficult aspect of the application to judge prior to implementation.

However, to the extent possible, it is important to assess how information is organized in the application, how users view and enter data, and what is required to maintain and operate the application. A usability assessment for a functioning system typically includes comparing a system to the agency's specified design standards and then assessing how users interact with the system to perform their work. As noted above, it is very advantageous to visit, or at least speak with, organizations that have direct experience using the software.

One major consideration in assessing any system alternative, however, is the ease with which agency workers, providers, and clients can use the system. If system users find it difficult to navigate or enter data, the system may increase staff workload, rather than improving staff efficiency.

Legal Analysis

Government information systems are subject to an ever-expanding and sometimes complex array of laws and regulations with which the agency must comply; often there also is “guidance” which must be adhered to for approval by state and federal agencies that control the funding for the system. Such requirements may include:

- Security and privacy of information.
- Restrictions on information system usage, such as internet access.
- Fraud avoidance requirements.
- Software ownership related to the use of public funds (especially relevant if COTS products are being considered).
- Federal and state requirements for approval.
- Access for physically challenged users.
- Procurement rules that may impact the selection of the alternative.

It is essential that agencies identify all of the legal and regulatory requirements that are relevant to the IT project. The agency will want to identify and recognize these requirements prior to assessing the detailed functional and technical attributes of the potential options as these may impact the judgment of the various alternatives. For example, an agency may have restrictions on purchasing proprietary software (software that is purchased, but the vendor maintains control over the use, modification, and distribution of the programs). If so, this will affect whether certain COTS products can be considered. Finally, agencies often have various regulations that define preferences or requirements when procuring vendor services. Limitations regarding procurement can be taken into account as decisions are made about whether to use an in-house or a vendor-developed information system.

Technical Analysis

An agency should assess whether it can implement the technical approach within the agency’s current technical architecture (network, hardware, software) and whether the approach is consistent with IT plans for future. The technical approach for a new child care system may have to be consistent with the IT strategic planning of other agency human services and related programs. For example, if the agency chooses to adopt electronic benefit transfer (EBT), online card technology for its government-sponsored services (e.g., SNAP, WIC, or TANF), an alternative that includes a swipe card solution to track time and attendance for subsidized child care may be more feasible

to implement and be seen as consistent with the overall technology direction the agency is taking.

In assessing alternatives from a technical perspective, it is important to determine whether they may require equipment or skills that are not currently available in the agency. If an alternative requires a considerable investment in new hardware, the cost of the hardware must be factored into the analysis comparing possible alternatives. Participation of the enterprise architect, who most likely will be reporting to the CIO, is key during the technical analysis to assess compliance and enterprise applicability.

Evaluating the Constraints

Assessing whether a solution fits within the known constraints is an important component of a feasibility analysis. The most common constraints are cost, time, and scope. Cost constraints refer to the available resources for system development and maintenance. For example, a great data mining product may be available that can profile cases and determine which are at greatest risk for resulting in an improper payment, but the agency must have adequate funds for its acquisition and implementation.

Agencies also may have specific time constraints stemming from requirements related to state or federal legislation, or based upon commitments made by the child care program administration. One or more alternatives may require more time to implement and may not allow the child care program to meet deadlines that have been promised to stakeholders. For example, an agency may be able to develop a solution or integrate a system that meets the stated user requirements, but the timeframe for this development may exceed a requirement set forth in legislation or a budget appropriation.



Assessing whether a solution fits within the known constraints is an important component of a feasibility analysis. The most common constraints are cost, time, and scope.

Analyzing and Tracking Risks

The purpose of a risk analysis is to identify possible situations that might inhibit the success of the project. By identifying potential risks as early as possible, the project staff can develop contingency plans to address the risks or strategies for ameliorating the conditions that lead to them so that the risks are prevented or reduced.

Risks for an IT project may derive from many factors. Risks may be related to implementation concerns (e.g., staff resistance to the changes that new automation will bring) or very specific activities within the project (e.g., lack of available child care staff to perform acceptance testing of the system once it is developed).

While some risks are largely the same for all alternatives, such as potential loss of funding before the project is completed, other risks

are different for each alternative. The following are some examples of risks that may be associated with one of the solutions under consideration by the agency:



Enhancing an existing system, if based on obsolete technology, may pose a challenge for retaining staff with the requisite skill sets to maintain the system, or the development of the system enhancement itself may overburden existing staff.



Risks for **implementing a COTS product** include the substantial reliance on the company that owns the product and the possibility that licensing and maintenance costs will increase over time.



A major risk in **transferring another state's system** is that the project may find that the functionality is not as compatible with the agency's business processes as was thought when the transfer was selected. The need to perform extensive modifications to the software may lead to costs (and time) that exceed the initial project estimates.

Potential project risks of each solution can be weighed against the advantages of the solution to determine the viability of each option under consideration.

Gap Analysis

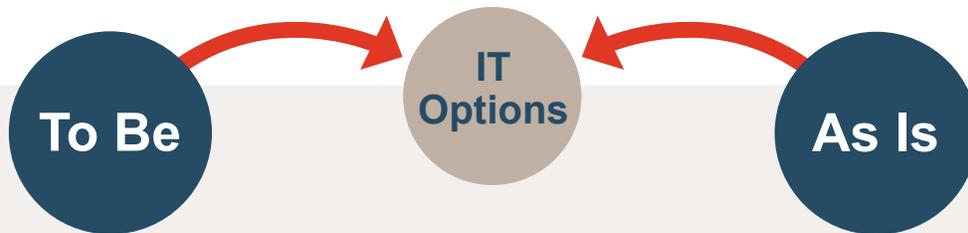
The purpose of the gap analysis is to identify gaps between the current state and the future state. When gap analysis of functionality is performed subject matter experts should be included in the discussions and review. A list of required functionalities should be developed to determine whether the feature exists in the alternative form and whether the agency is willing to pay to have it developed.

- A list of “nice to have” functionality that may be used as trade-offs when it comes to selecting a best fit alternative must be developed. Or, they can become part of the enhancement list.
- The agency should analyze how many changes would be needed for each alternative to meet the needs.
- The goal to meet the needs for a more efficient process must be determined.

In many cases, the most cost-effective alternative is a transfer with minimal changes. The software/code modifications are where the big costs are in development. This is why there is rarely a complete

ground-up build. Under-estimating the amount of work and/or the number of changes needed to make a transfer system fit the agency's needs is one of the major reasons why system transfers have floundered in the past.

The gap analysis has two parts, and both are critical for selecting the right system:



How big is the gap between the future vision (the “to be” scenario) and each of the available options?

How big is the gap between the starting point (the “as is” scenario plus budget and resources) and each of the available options? These are the constraints—the agency can only spend so much and only has a certain time period to get the system implemented.

Other considerations include:

- Can existing equipment be used or is there a need to purchase new PCs and/or servers?
- Will the agency's communications infrastructure support the alternatives?
- Are there trade-offs that can be made between technology and business processes?
- If the business process is changed, will it minimize the potential changes to a system?

Sometimes technology isn't the total solution. Agencies may need and want to change business processes to gain efficiencies there as well as with a new system.

Cost Benefit Analysis

Once the agency has narrowed down the technical alternatives to replacing or enhancing the child care information system, including the possibility of an enterprise system to accommodate multiple programs, it is important to assess the expected benefits and costs of

pursuing the IT project. A cost benefit analysis (CBA) may be used to assess the costs and the expected benefits of one or more of the alternatives under consideration. Doing so will not only help in selecting the alternative solution but will provide important justification for the IT investment itself.

A comprehensive CBA provides managers, users, and designers with the information necessary to evaluate alternative system development, enhancement, or improvement approaches. The analysis provides the estimated costs of developing and operating each feasible alternative and the benefits to be derived from each. Therefore, CBA is not simply a method of determining the least cost alternative, but a means of determining the most cost-effective alternative.

The agency likely will do a CBA only for the most promising of the technical approaches as determined by the alternative's analysis. In some cases, only one solution will be deemed to meet the agency's needs and the CBA will be done for this option alone.

A typical CBA includes estimating direct costs, quantifying benefits, and evaluating the impact on existing systems and business processes. It usually estimates both one-time costs and recurring or ongoing costs (e.g., licensing fees, customer support, operations and maintenance costs).

An agency may at times be required to determine whether to characterize an element as a cost or a benefit. If so, the agency should consider the following. If a benefit can be depicted as directly affecting a cost element of the status quo and can be predicted with virtual certainty to occur, then it should be factored into the cost side of the analysis. An example would be higher staff costs when a reduced personnel ceiling has been approved for the new system.

On the other hand, cost elements to be characterized as benefits are normally costs or savings which are more indirect or hidden, which may or may not accrue, and which must be monitored. Benefits can derive from elements such as greater productivity, reduced training costs, less overtime, and reduced staffing not planned and approved at the time of the CBA.

One-time costs are generally the costs of the IT project per se. These costs should be examined across the full term of the project and should include costs associated with the following:

- Site/facility.
- Hardware and software.
- Agency personnel.
- Vendor services (for all contracted services).
- Training.
- Testing.
- Organizational change management and other implementation activities.



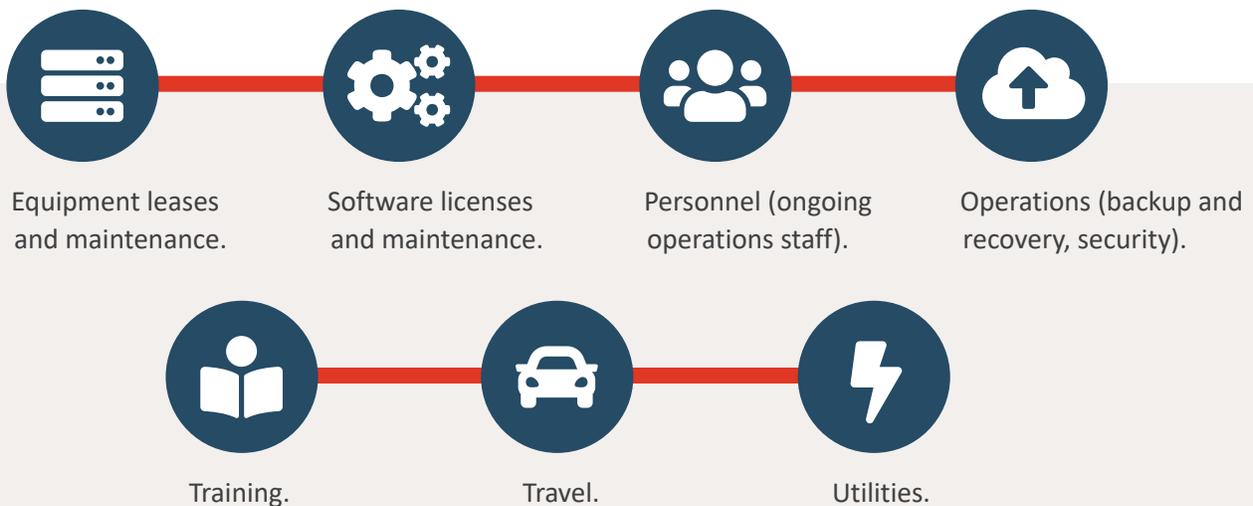
Key Term

Cost benefit analysis:

Used to assess the costs and the expected benefits of one or more of the alternatives under consideration

The time and effort (cost) of the child care staff's involvement in the project may be an important factor in determining the overall cost of the project. For example, child care staff are likely to be needed for defining the requirements, verifying that the system design will work in practice, testing the system once it is developed, and implementing organizational changes.

Recurring, or ongoing, costs should also be examined. These are the costs of operating the system once it is implemented. The agency should consider the costs over multiple years up to the expected life of the new system. Potential categories for recurring costs are:



Evaluating benefits against which the costs can be compared depends to some extent on the objectives and scope of the planned information system project. In most cases there are both quantitative benefits that can be directly measured and qualitative benefits that are generally intangible. Typical categories of benefits to consider in the CBA are the following:



- **Quantitative benefits.**
 - Reduced costs.
 - Reduced staffing.
 - Improved staffing utilization.
 - Increased productivity.
 - Faster response times.
 - Fewer manual functions.
 - Increased resources.
 - Reduced errors.
 - Reduced fraud.



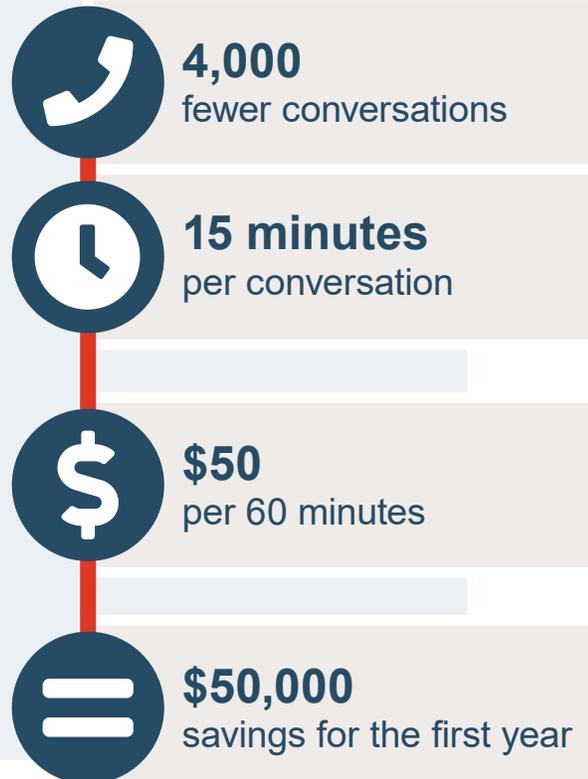
- **Qualitative benefits.**
 - Improved customer satisfaction.
 - Increased accessibility.
 - Increased worker satisfaction.
 - More timely reporting.
 - Improved security.

Benefits should be assessed using objective metrics to the extent possible. The financial benefits of implementing the system alternative should be estimated as these can be directly balanced against the costs of implementing the alternative solution. Ultimately the costs of the selected solution will be compared against the dollar savings to judge the true cost of implementing the new automation. The following is an example of calculating benefit savings for one particular type of new automation:

If one of the solutions includes a new portal to provide potential clients with web-based access to the system so that they can apply for child care services directly, the automation may not only provide increased access to services (a qualitative benefit), but it may also reduce staff time (a quantitative benefit).

For example, if the average conversation with a potential client requires 10 minutes of worker time that would be reduced or eliminated with the implementation of web-based client access, the cost benefit could be estimated as follows:

- The number of telephone conversations with potential clients is reduced from 5,000 per year to 1,000, a reduction of 4,000 conversations per year.
- The average conversation requires 10 minutes of worker time, plus an additional 5 minutes to complete required documentation for a total of 15 minutes per conversation.
- The average hourly salary, benefits, and overhead cost per worker is \$50.
- The financial benefit in terms of reduced worker time would be calculated according to the following formula:
- $(4,000 \times 15/60) \times \$50 = \$50,000$ for the first full year of system operations.



The benefits are realized once the new automation is implemented. Estimating these benefits provides a perspective on both the dollar savings and service improvements that may be realized for one or more of the solution alternatives being considered.

All costs and benefits of each option under consideration should be judged against the costs and benefits of maintaining the current system and scope of automation as well as against each other.

Although the complexity of the CBA undertaken by the agency will depend on the level of investment and scope of automation under consideration, some degree of CBA is warranted for any significant IT project. Prior to engaging a major IT investment, it is critical that all parties involved in the decision to go forward are clear about the project's estimated costs, as well as what will be gained by implementing the new automation.

The final step in the CBA process is calculating the return on investment (ROI) over a system's life cycle. An ROI calculation includes costs, savings, benefits, and the ability to meet strategic objectives. This kind of assessment also includes one-time costs (e.g., hardware, software, and data conversion) and recurring costs for enhancements and customer support. An ROI calculation also should include benefits such as reduced staff time for performing each work function, cost savings from fewer improper payments, and cost savings from reduced fraudulent claims. Other benefits that are not easily quantifiable, such as an increase in public trust and an increase in customer satisfaction, should also be considered.



Initial Project Planning

Once an agency has evaluated the alternatives available for acquiring new automation, the next step is initial project planning. In this phase, the primary considerations are how long the project is expected to take; who will manage and oversee the progress, quality, and resolution of issues; and who will perform the various services required to carry out the IT project. Before starting this project planning effort, it is important to understand the typical phases of a major IT project.

Major Project Activities

An IT project must proceed in an organized and structured manner to ensure that the new automation includes the intended functionality and is successfully implemented. For this reason, all major projects follow a set of structured activities, each of which builds upon the activities performed and products produced in the preceding stage. These activities are often referred to as the system development life cycle (SDLC), which is intended to be a disciplined and structured path for IT projects. The primary activities that comprise the SDLC of a major IT project are described below:

- **Requirements Definition and Validation:** The SDLC begins with the initial steps required to plan for the IT project. Although the principles and processes for analyzing needs and defining requirements were discussed earlier in this part of the IT Guide, these activities are the first phase of the SDLC. Once the agency's IT staff and/or a vendor begin the process, they will typically hold a series of meetings to review and validate the requirements and to clarify any areas that require further information or discussion. This requirements validation exercise may result in requirements being modified, deleted, or added to fully describe the new system. Such changes should be documented in the agency's requirements tracking tool.
- **System Design:** The system design specifies the way functions will be implemented in the application. Developers will use the system design documents to develop the programming code or to configure the system to perform the functions as specified in the requirements. The design process should involve extensive discussions with experienced agency staff and other stakeholders

and the IT staff responsible for creating the system. The amount of design work required for any specific IT project depends upon whether the automation is being built from the ground up, or a product or transfer system is being implemented. If a product or transfer is being implemented, the level of design work is predicated on the amount of modification and configuration required to make the system perform as needed by the agency.

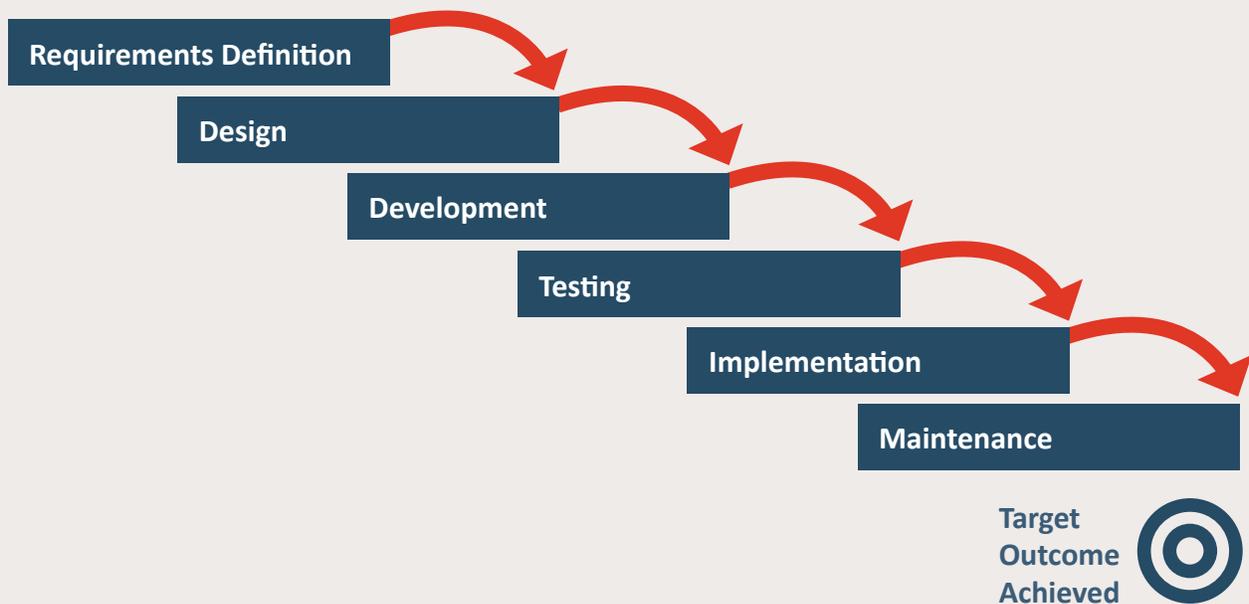
- **System Development and Configuration:** During the development phase, programmers write the technical code in the development language needed for the system design. A product or transfer implementation may involve little or no actual programming work depending on how well the product or transfer system fits the agency’s business processes.
- **Testing:** Development is followed by testing. Testing is an iterative process where components of the system are tested on their own and then the system is tested as a whole. For a new development effort, the IT staff or the vendor will be testing the modules of the system as they are developed. These processes are called unit, system, and regression testing. User acceptance testing (UAT) ensures that the system performs as users expect. There may be a phase of pilot testing during which the application is installed at one or more sites to test that the new system operates effectively in the “real life” environment. During the course of all testing, system failures—bugs—are reported, rectified, and retested.
- **Implementation:** A number of activities are required for successful implementation of new automation in the child care organization. Implementation includes training the agency staff on how to use the new system, implementing support structures such as help desks, and installing and turning on the system (often referred to as system integrators).
- **Maintenance and Operations:** Once a system is implemented and fully operational, it must be maintained and updated to support changing agency requirements and conditions. After the implementation of new technology, it is possible that issues will arise that were not discerned during the initial testing. Remediation and enhancements are usually implemented via maintenance releases to the software.

These phases describe the typical activities performed in an IT project. The two major approaches to how these project activities are carried out, traditional and agile, are explained below.

Traditional Approach

The traditional model is the earliest SDLC approach that was used for software development and illustrates the software development process in a linear sequential flow. This means that any phase in the development process begins only if the previous phase is complete. In this model, the phases do not overlap. Each project phase is completed and verified before the next phase occurs; it is often referred to as the “waterfall” approach to a project.

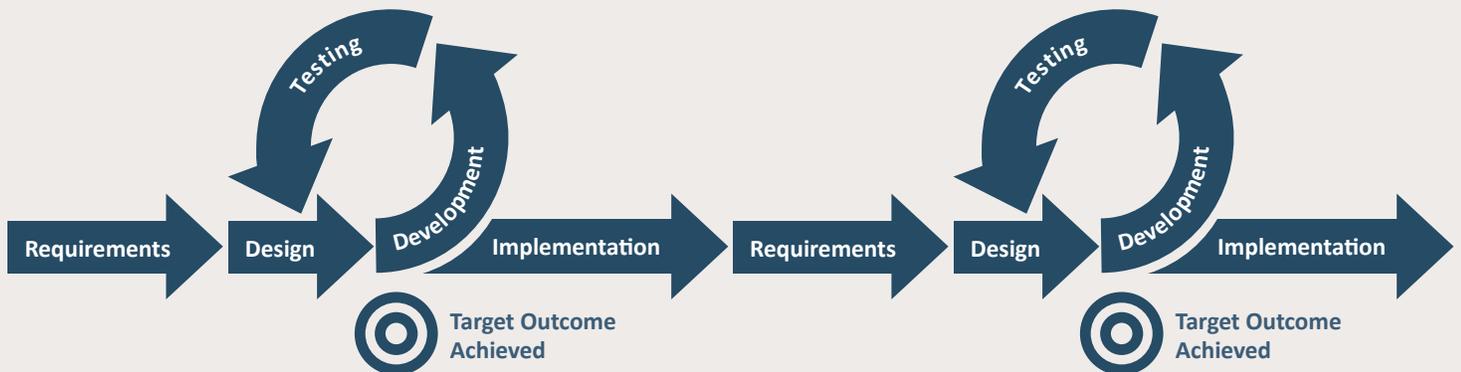
Traditional / Waterfall Approach



Agile Approach

There are other ways to conduct an IT project. For example, some large-scale projects are implemented in an iterative fashion. System development is broken into several sprints with each sprint lasting from one to four weeks. Each sprint consists of development and testing and results in a production-ready component of the system. The agile approach enables functional and technical enhancements to be quickly coded, tested, and released. In this approach, one module of the system is planned, designed, developed, tested, and implemented, while other modules are being designed and developed and tested as other iterations. The iterative approach allows system functionality to be released incrementally with new features added based on priority.

Agile Approach



Regardless of project approach, an IT project requires constant management to ensure that the work performed proceeds according to the established schedule, is done within the budget set for the project, and that all products of the project (e.g., design documents) are of sufficient quality to advance the project and result in a quality information system.

In-House versus Contracted Services for IT Projects

After identifying the work that must be done during the course of the project, including the management and quality assurance functions, an agency must decide whether the work can be done by its own staff (in-house) or requires procuring services from a vendor (contracted). Agencies will need to decide whether in-house staff will perform the work or a contract will be sought with a vendor for each of the following aspects of system implementation:

- **Project Planning:** Project planning was discussed earlier in this document and involves a wide range of activities including evaluating needs, defining requirements, assessing alternatives, and evaluating the costs and benefits of the new automation project. Although these activities can be performed by staff, some agencies prefer to hire firms with experience in these detailed analyses to conduct the assessments.
- **Design, Development, and Implementation (DD&I):** These are the central activities for creating and implementing the new automation. Specialized skills are required to design the new automation, to program and/or configure the software, to test the

new software, to prepare the hardware and network infrastructure for the new application, and to prepare the organization and system users for the implementation. For major IT efforts, agencies often seek the assistance of companies that specialize in IT services (often referred to as system integrators).

- **Project Management and Quality Assurance:** Even when a system integrator is hired to perform the DD&I services, agencies must still perform project oversight and quality assurance services throughout the project. For complex projects, agencies may decide to hire a vendor, separate from the DD&I vendor, to assist the agency in managing the project and to provide oversight of the DD&I vendor’s work. These services are typically titled quality assurance (QA) or independent validation and verification (IV&V) services.
- **Maintenance and Operations:** Maintenance and operations refers to the activities that are required to ensure that the system remains functional following implementation. In the past, almost all new information systems were maintained and operated by the agency’s IT staff and were housed on the agency’s computers. Although this is still true for most new systems, depending on the solution that has been implemented, there may be an option to have the system “hosted” by an external vendor. This means that the application and database are housed outside of the agency’s own technology infrastructure and the vendor is responsible for maintaining the software and performing day-to-day tasks such as backing up and managing disaster recovery when the system fails. Although there is a cost for these hosting services, and hosting services are not always available for every solution alternative, this can be cost effective in some situations. The technical staff of the agency likely will determine whether this arrangement is worth evaluating as part of the IT planning effort.

The following presents some of the advantages and disadvantages of conducting the IT project primarily using agency staff or contracting with vendors to perform the project.

In-House

The first option is the in-house approach to system management and development. In this approach the agency is fully responsible for the design, development, management, testing, training, and implementation of the system. Although certain vendor staff may be involved to augment the skills of existing staff (through a new contract or an existing maintenance contract)¹, the success or failure of the new system to meet the child care agency's information needs and achieve the agency vision is wholly the responsibility of the agency. The agency is responsible for managing the day-to-day project operations; assessing and resolving issues and risks; developing and executing training and change management activities; and assessing organizational and system readiness for implementation.

Agencies that typically embrace this approach have the fiscal and personnel resources, time, and expertise to perform custom system development or to implement COTS products. Given the limits on agency budgets, there almost always are competing demands for in-house development resources that must support both new development and maintenance activities. For this reason, it is often difficult for agency IT departments to dedicate enough technical resources for a major IT project.

Even when an agency has a well-staffed IT department, the agency should determine whether the IT department has the project management capabilities to manage a major system implementation. This recognizes that a major IT project usually requires dedicated management personnel to oversee the progress, resolve ongoing project issues, maintain plans for all phases of the project, and evaluate the products required to move the project forward (requirements, design documents, testing plans, and developing the application itself).

¹ Some agency IT departments use contractor personnel on an ongoing basis or hire IT personnel through contracts to augment the IT personnel for specific projects. Contractors acquired on this basis are often acquired through master agreements from which vendors can be selected or under existing maintenance agreements with IT vendors. Since a major procurement effort for staff augmentation is not required, these arrangements are considered under the in-house model discussed in the IT Guide.



Advantages

- The agency has greater control over project resources and timelines.
- Personnel assigned to the project are familiar with the business operations of the program.
- There is little to no learning curve regarding the existing technical environment.
- The approach enables the agency to avoid long-term dependence on or financial obligation to a vendor.



Disadvantages

- The approach requires agency IT personnel who may be needed to support other development or maintenance tasks.
- Agency staff may not have the experience in system design and integration that is needed for the project.
- The agency does not receive the benefit of new "outside" ideas that a contractor can provide.

Contracted Project Services

Agencies often consider contracting when their internal development staff is fully engaged on other projects or when moving to a different technical environment in which their current staff members do not have the requisite skills and experience. Additionally, some agencies recognize that they do not have the requisite project management structure or personnel to manage a major IT development effort. IT projects require a mix of business analysts, programmers, trainers, and testers that often are not available from within existing staff in the numbers required by the planned IT project.



Advantages

- Contractors have or can obtain staff with the appropriate technical skill and experience.
- Contractor resources may be more flexible than those of the agency, so it is easier to adapt to changes that impact the project schedule.
- The design and development process may be more efficient and result in lower costs or a shorter schedule than an in-house team might have required.
- The approach may enable moving to a new technical environment that would not have been possible using in-house staff.
- Project risk is shared between the agency and the contractor rather than falling exclusively on the agency.



Disadvantages

- The approach may require greater financial outlays.
- Changing regulations, policies, or processes may require expensive and time-consuming change orders to enable the contractor to comply.
- It may be more difficult to adequately communicate program mission, goals, and service requirements to contract personnel.

If the IT project requires vendor assistance to develop or implement the new automation, or the agency plans to acquire a COTS product, the agency should determine its method for procuring the services or products. The procurement guidance included in the next section, describes the activities involved in preparing and evaluating an RFP², which is the typical vehicle for soliciting bids from available vendors.

² An RFP may be issued for the solicitation of any contracted resources, generally including the purchase of a COTS product; the transfer of another state, territory, or tribal system; or development of a new system.

PART V



Developing a Request for Proposal (RFP)

After conceptualizing the IT project and working through the initial planning phase, agencies will likely come to one of three conclusions on how to proceed:



Write a request for information (RFI);



Write a request for proposal (RFP); or



Have the work completed in-house.

Request for Information (RFI)

When the initial planning phase does not result in a clear conclusion to proceed with developing an RFP or completing the work in-house, consider starting with an RFI. An RFI is a way to formally request information from potential bidders regarding solutions that will meet the needs of the agency, without committing to a contract.

Once the RFI period has closed, the responses are used to inform the final determination on whether to proceed with the RFP process or complete the work in-house. If the decision is to proceed with the RFP process, it is likely a substantial amount of work done to write the RFI can be utilized to write the RFP.

RFP Writing Approaches

The most common approach to writing an RFP incorporates the entire IT project in one request. It is an attempt to capture every system feature and other requirements upfront, and then rely on change orders to add anything that might have been missed, overlooked, or ended up not working out quite right after the system goes live.

An alternative to this conventional approach is a modular RFP writing approach. *18F*, an office with the federal General Services Administration, describes modular contracting (aka modular procurement) as “a strategy that breaks up large, complex procurements into multiple, tightly-scoped projects to implement technology systems in successive, interoperable increments.” *18F* has shown how this approach can reduce costs, decrease risk, and speed up the time it takes for users to begin using the new system. To learn more about this RFP approach, see the additional resources section at the end of this guide for links to the information available on the *18F* website.

Key Success Factors

Although states and territories likely have laws and regulations that govern the RFP process, there are several key success factors that can be incorporated upfront. Regardless of which RFP writing approach an agency decides on, the same key factors to success apply.



RFP Development Team Composition

- Subject matter experts (SME) – policy, front-line staff, etc.
- Procurement specialist.
- Executive management (IT and program area).
- IT business analyst.
- Legal counsel.
- Specialized IT staff (database administrator, developer, data warehouse, security, etc.).
- Budget/fiscal staff.
- Other key stakeholders (internal or external) specific to the proposed project.



Procurement Management Plan Characteristics:

- Covers all phases and activities of the procurement process.
- Identifies responsibilities of each RFP development team member.
- Provides a timeline that includes:
 - Bidders enough time to develop proposal responses that are clear and complete.
 - An opportunity for a bidder's conference (if desired).
 - Time to respond to vendor questions.
 - Evaluation period and award/negotiations period.



Establish an Online RFP Document Library

Includes all procurement documents:

- RFP.
- Amendments.
- Vendor questions with responses.
- Any other supplemental materials that may increase the vendor's understanding of requirements and expectations.

Incorporating these success factors will increase the likelihood of creating a well-conceived vision of the agency's desired outcome and business needs, clearly defined system requirements, and consistent criteria for accepting or rejecting vendor responses.

Writing the RFP

Now that the RFP development team has been established, the procurement plan is written, and the online repository started, it is time to start writing the proposal. Successful RFPs use clear and concise language to communicate the agency's business needs, performance expectations, technical specifications, and other terms and conditions.

Key Considerations

- Will the agency require a specific solution or allow flexibility? More flexibility allows vendors to consider more innovative or cutting-edge solutions.
- The best requirements strike a balance between clearly communicating what the system must do without precluding vendors from proposing alternative approaches that may accomplish the same goals more efficiently or effectively.
- Require vendors to provide current and past project references similar to the one being proposed in order to ensure the vendor has the necessary knowledge, skills, and experience.
- Require identification of key project staff, including resumes, to verify the vendor's proposed team to lead this project also have the applicable knowledge, skills, and experience.

Evaluating Proposals

Key Considerations

- Do the technical processes comply with agency policies and procedures?
- Are all required software purchases and software license fees included?
- Is the agency required to assume any ongoing maintenance supports once the system is implemented?
- What is the conversion approach, especially for legacy data?
- Are the proposed personnel qualified to meet the project's objective?

- Has the vendor committed the necessary management, programmatic, and technical expertise to successfully complete the project?
- Are staffing contingency plans clearly delineated should critical staff become unavailable?



Proposal Evaluation Tips

- Consider a site visit to observe the product or service in action.
- Request final vendors demonstrate system functionality being proposed.

Best Value

The best-value approach is a process that does not solely rely on cost, but also evaluates and compares all relevant factors. Put more simply, it is a comparison of costs and benefits. The relevant factors that make up the evaluation criteria for a best value bid should be included as a part of the RFP.

Best-value factors may include long-term project benefits, cost avoidance, increased productivity, maintenance and replacement costs, cost versus technical superiority tradeoffs, vendor support, less risk, and enhanced user satisfaction.

- **Evaluating best-value bids is more complicated than evaluating bids based solely on cost.** Make thoughtful decisions about the relative weight of evaluation criteria. For example, what percentage of the overall evaluation will the agency base on cost, corporate qualifications, technical approach, and understanding the business need?
- Make sure the data used to evaluate factors are reliable and clearly articulate evaluation standards.



National Institute of Governmental Purchasing (NIGP), the Institute for Public Procurement writes³:

“There are three basic stages to choosing factors to guide a procurement toward best value.

- **Identify possibilities.** List all the possible solutions, and the possible pros and cons of each. Conduct market research, consult others, and collaborate with stakeholders).
- **Choose relevant factors.** Decide what is relevant to each specific acquisition.
- **Assign values** or ‘weights’ to the chosen factors and create selection criteria.”

³ https://www.nigp.org/docs/default-source/New-Site/position-papers/150105_best-value_position-paper-complete_updated.pdf

Lessons Learned: Evaluating the Proposal Process

Getting Started (Plan)

An effective IT project plan builds in a "lessons learned" process that addresses all major project areas, including procurement. One of the key principles in the Agile approach creates opportunities for regular review and adjustment along the project life cycle. Changes are made in both the short-term and long-term in order to make continuous improvements.

It is recommended that a lessons learned template be adopted by the IT project team so that every team member can document their comments in a consistent manner under a defined set of categories. There are many widely available document templates available to guide the process of capturing team feedback.

During the Effort (Do)

Encourage regular open communication throughout the process so that all RFP team members can share what is working well and what requires improvement for the current process or for the future.

After RFP is Complete (Study)

An invaluable tool that can be used after the RFP process is complete is to conduct an RFP retrospective, a look back at what worked well, and what needs improvement. In this effort all team members participate and provide their open and honest feedback that they have documented within their lessons learned tool.

Make Identified Improvements (Act)

Critical to the continuous quality improvement effort is the organization acting on recommended improvements. If no action is taken, then improvements are lost, and project risks and missteps increase.

Key areas that may need correction include:

- Policy change.
- Procedural updates.
- Process improvement.
- Resource needs.



Additional Resources

- **Section 508 Website**
 - By: U.S. General Services Administration (GSA)
 - URL: <https://www.section508.gov/>
- **Modular Procurement Resources for State and Local Government**
 - By: General Services Administration (GSA) 18F
 - URL: <https://18f.gsa.gov/2016/11/15/modular-procurement-state-local-government/>
- **Pulling Back the Curtain on IT Procurement**
 - By: General Services Administration (GSA) 18F
 - URL: <https://18f.gsa.gov/2017/10/11/pulling-back-the-curtain-on-it-procurement/>
- **Using Agile Methods to Improve the RFP Process**
 - By: General Services Administration (GSA) 18F
 - URL: <https://18f.gsa.gov/2018/05/22/using-agile-methods-to-improve-the-rfp-process/>
- **12 Principles Behind the Agile Manifesto**
 - By: Agile Alliance
 - URL: <https://www.agilealliance.org/agile101/12-principles-behind-the-agile-manifesto/>
- **Lessons Learned Template**
 - By: Project Management Docs (template based on PMI's PMBOK)
 - URL: <https://www.projectmanagementdocs.com/template/project-closure/lessons-learned/#axzz5wZnAnJKa>
- **Best Value in Government Procurement: Concepts and Practices**
 - By: NIGP, the Institute for Public Procurement
 - URL: https://www.nigp.org/docs/default-source/New-Site/position-papers/150105_best-value_position-paper-complete_updated.pdf